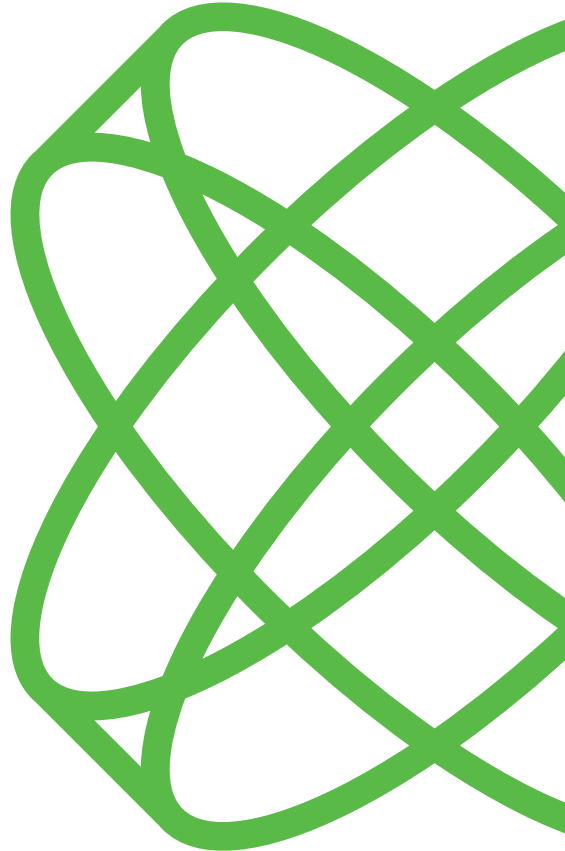




EGGENBERG
INDUSTRIAL TOOLS

OPERATION MANUAL

MMA160 - TIG200P - MIG200G






WARNING!

This operator's Manual including the guides of equipment and installation descriptions, protect yourself and others from possible serious injury or death, please read this manual carefully.

Symbol definition

This Manual contains symbols as blow, please refer to their means expressed

Symbol	Definition
 DANGER	Texts beginning with this symbol indicate potentially serious dangers and, if not avoided, could result in serious accidents that could result in death or serious injury to personnel.
 WARNING	The text beginning with this symbol indicates a potentially hazardous situation that, if not avoided, could result in minor injury to persons or property damage.
 ATTENTION	Texts beginning with this symbol indicate potential risks which, if not avoided, may cause malfunction or damage to the equipment.

Version

Due to product version upgrades or other reasons, the contents of this document are not regularly updated. Unless otherwise agreed, this document is intended as a guide only and all statements, information and recommendations in this document do not constitute any guarantee, expressed or implied.

The pictures in this document are for reference only. If the picture is different from the real one, then prevail in kind.

		Plate thickness (mm)	Wire diameter (mm)	Welding gun vertical angle(°)	Current (A)	Voltage (V)	Welding speed (cm/min)	Wire extension (mm)	Gas flow rate (L/min)
Horizontal fillet butt welding T joint	Low welding speed	1.0	0.8,0.9	450	70~80	17~18	50~60	10	10~15
		1.2	0.9,1.0	450	85~90	18~19	50~60	10	10~15
		1.6	1.0,1.2	450	100~110	19~20	50~60	10	10~15
		2	1.0,1.2	450	115~125	19~20	50~60	10	10~15
		2.3	1.0,1.2	450	130~140	20~21	50~60	10	10~15
		3.2	1.0,1.2	450	150~170	21~22	45~50	15	15~20
		4.5	1.0,1.2	450	140~200	22~24	45~50	15	15~20
		6	1.2	450	230~260	24~27	45~50	20	15~20
		8.9	1.2,1.6	500	270~380	29~35	45~50	25	20~25
		12	1.2,1.6	500	400	32~36	35~40	25	20~25
	High welding speed	1.0	0.8,0.9	450	140	19~20	160	10	15
		1.2	0.8,0.9	450	130~150	19~20	120	10	15
		1.6	1.0,1.2	450	180	22~23	120	10	15~20
		2	1.2	450	210	24	120	15	20
		2.3	1.2	450	230	25	110	20	25
		3.2	1.2	450	270	27	110	20	25
		4.5	1.2	500	290	30	80	20	25
		6	1.2	500	310	33	70	25	25
Horizontal fillet welding joint	Low welding speed	0.8	0.8,0.9	100	60~70	16~17	40~45	10	10~15
		1.2	0.8,0.9	300	80~90	18~19	45~50	10	10~15
		1.6	0.8,0.9	300	90~100	19~20	45~50	10	10~15
		2.3	0.8,0.9	470	100~130	20~21	45~50	10	10~15
			1.0,1.2	470	120~150	20~21	45~50	10	10~15
		3.2	1.0,1.2	470	150~180	20~22	35~45	10~15	20~25
		4.5	1. 2	470	200~250	24~26	45~50	10~15	20~25
	High welding speed	2. 3~3.2	1.2	470	220	24	150	15	15
				470	300	26	250	15	15

CONTENTS

CONTENTS.....	- 3 -
1 Attention.....	- 4 -
2 Product brief introduction.....	- 9 -
2.1 Summarize.....	- 9 -
2.2 Technical parameters.....	- 13 -
2.3 Panel description.....	- 16 -
3. Installation instructions.....	- 27 -
4. Operating instructions.....	- 30 -
4.1 Welding operation instruction.....	- 30 -
4.2 Polarity conversion joint.....	- 31 -
4.3 Welding environment and safety.....	- 31 -
4.4 Welding problem and solution.....	- 32 -
5. Daily maintenance and checking.....	- 33 -
6. Trouble shooting and error checking.....	- 36 -
Appendix I parameter list.....	- 41 -

1. Attention

The precautions listed in this manual are intended to ensure the safe use of the machine and to protect you and others from harm and injury.

The design and manufacture of the welding machine power take full account of the safety, be sure to comply with the precautions in this manual, otherwise it will cause serious accidents.

Wrong use of welding machine power supply will cause the following kinds of different degrees of harm and injury. Please read this manual carefully to avoid or minimize such harm.

Symbol	Description
	✧ Touching any live electrical part may cause fatal electric shock or burns.
	<ul style="list-style-type: none"> ✧ Welding fumes and gases are hazardous to health. ✧ Working in tight places can cause suffocation due to lack of oxygen.
	<ul style="list-style-type: none"> ✧ Splashes and hot finished base metal can cause a fire. ✧ Poor cable connection, steel and other parent metal side current loop is not in full contact, it will cause heat conduction and cause a fire. ✧ Do not weld on containers containing flammable substances as this may cause an explosion. ✧ Do not weld sealed containers, such as tanks (boxes), pipes and other devices, otherwise it will rupture.
	<ul style="list-style-type: none"> ✧ Arc light can cause eye irritation or skin burns and other body injuries. ✧ Spatter and welding slag can burn eyes or burn the skin.
	<ul style="list-style-type: none"> ✧ Dumping cylinders can cause injury. ✧ Cylinders with high pressure gas, wrong use can cause high pressure gas spouts, causing accident.
	✧ Do not place fingers, hair, clothing, etc. near rotating parts such as cooling fans
	✧ The welding wire is shot from the torch and can stab eyes, face and other exposed parts of the body
	✧ When lifting, staffs shall not be standing under the welder, or standing in front of the movement, to prevent the welder falling injured.


Appendix I Welding parameter list

The values listed in the following table are the general specification values under standard condition.


	Plate thickness (mm)	Wire diameter (mm)	Interval (mm)	Current (A)	Voltage (V)	Welding speed (cm/min)	Wire extension (mm)	Gas flow rate (L/min)
I Square butt welding	Low welding speed	0.8	0.8,0.9	0	60~70	16~16.5	50~60	10
		1.0	0.8,0.9	0	75~85	17~17.5	50~60	10~15
		1.2	0.8,0.9	0	80~90	16~16.5	50~60	10~15
		1.6	0.8,0.9	0	95~105	17~18	45~50	10~15
		2.0	1.0,1.2	0~0.5	110~120	18~19	45~50	10
		2.3	1.0,1.2	0.5~1.0	120~130	19~19.5	45~50	10~15
		3.2	1.0,1.2	1.0~1.2	140~150	20~21	45~50	10~15
		4.5	1.0,1.2	1.0~1.5	160~180	22~23	45~50	15
	High welding speed	1.2	1.2~1.6	220~260	24~26	45~50	15	15~20
		1.2	1.2~1.6	220~260	24~26	45~50	15	15~20
		1.2	1.2~1.6	300~340	32~34	45~50	15	15~20
		1.2	1.2~1.6	300~340	32~34	45~50	15	15~20
		0.8	0.8,0.9	0	100	17	130	10
		1.0	0.8,0.9	0	110	17.5	130	10
		1.2	0.8,0.9	0	120	18.5	130	10
		1.6	1.0,1.2	0	180	19.5	130	10
		2.0	1.0,1.2	0	200	21	100	15
		2.3	1.0,1.2	0	220	23	120	15
		3.2	1.2	0	260	26	120	15

	Plate thickness (mm)	Wire diameter (mm)	Current (A)	Voltage (V)	Welding speed (cm/min)	Wire extension (mm)	Gas flow rate (L/min)
Fillet butt welding	1.6	0.8,0.9	60~80	16~17	40~50	10	10
	2.3	0.8,0.9	80~100	19~20	40~55	10	10~15
	3.2	1.0,1.2	120~160	20~22	35~45	10~15	10~15
	4.5	1.0,1.2	150~180	21~23	30~40	10~15	20~25

- Do not welding gas-filled trachea, seal groove, etc.
- Place a fire extinguisher near the welding work site to prevent the fire from happening.

 **WARNING** To avoid breathing these fumes and gases hazardous to health, please use the required protective equipment.


- To prevent accidents such as gas poisoning and suffocation, please use the prescribed exhaust facilities and use respiratory protection equipment.
- To prevent welding fumes and other dust damage and poisoning, please use the prescribed local exhaust equipment and respiratory protective equipment.
- When working in cabinets, boilers, cabins, etc., CO₂, which is heavier than air, stays at the bottom. To prevent lack of oxygen, please fully ventilate and use an air respirator.
- When working in a confined area, please accept the inspection of the supervisory staff, and fully breathe and use respiratory protection equipment.
- Do not weld in the degreasing, cleaning, and spray operation areas.
- When welding plated or coated steel plates, harmful fumes and gases are generated. Please use respiratory protection equipment.

 **WARNING** To avoid harm to you and others caused by arc, splashing, welding slag, noise, etc., please use the specified protective equipment.

- When using welding or supervising welding, use protective equipment with sufficient shading.
- Please wear protective glasses.
- Wear protective equipment such as leather gloves for protection from welding, long-sleeved clothes, feet, and aprons.
- Set up a protective barrier around the welding site to prevent the arc from endangering others.

 **WARNING** To prevent the dumping, cracking, etc. of gas cylinders, please observe the following regulations:

- Please use the cylinder correctly as specified.
- Please use the gas regulator supplied with our company or recommended.
- Please read the gas regulator instruction manual before use, please observe the precautions.
- Use a dedicated cylinder holder and related parts to secure the cylinder.
- Do not leave cylinders exposed to high temperatures or sunlight.
- When opening the cylinder valve, do not approach the gas outlet on the face.
- When the cylinder is not in use, attach the cylinder cap.
- Do not place the welding torch on the cylinder. The electrode must not touch the cylinder.

 **WARNING** Contact with rotating parts can cause injuries. Please observe the following rules:
Do not use the welder with the case removed.

Initial problems diagnose

Abnormal Items		No arch	No Gas out	No Wire Feeding	Bad Arc Ignition	Unstable Arc	Dirt on Edge of Weld Sea	Wire Stick to Parent	Wire Stick to Conductive	Blowhole Formed
Area and Item to be Inspected and Maintained										
Wire Feeding Device	<ul style="list-style-type: none"> ➢ Wire feeding wheel does not match with the diameter of wire in texturing tube ➢ Crackle on wire feeding wheel, groove blocked up or defect ➢ Too tight or loose of the handle ➢ Wire powder accumulated on the inlet of SUS pipe 			○	○	○	○		○	
Weld Gun and Cable	<ul style="list-style-type: none"> ➢ 1. Weld gun cable rolled up or over curved ➢ 2. Adaptability of conductive tip, wire feeding pipe and cable diameter Worn, blocked up or deformation, etc. 				○	○	○		○	
Body of weld gun	<ul style="list-style-type: none"> ➢ Loose connection of conductive tip, nozzle and nozzle contactor ➢ Contactor of weld gun body is not plunged in or tightened well 						○			○
Power supply cable of weld gun as well as cable of switch control	<ul style="list-style-type: none"> ➢ Break off (bending fatigue) ➢ Damaged by weighted drop 	○	○	○		○		○		
Surface Condition of Parent material and length that wire stretches out	<ul style="list-style-type: none"> ➢ Oil, dirty, rust and paint residues ➢ Too long length of wire stretched out 					○	○	○	○	○


Initial problems diagnose

Area and Item to be Inspected and Maintained		Abnormal Items	No arch Arc Starting	No Gas out	No Wire Feeding	Bad Arc Ignition	Unstable Arc	Dirt on Edge of Weld Seam	Wire Stick to Parent material	Wire Stick to Conductive Tip	Blowhole Formed
Distribution Boxes (Input Protection Devices)	<ul style="list-style-type: none"> ➤ Turn on power supply or not? ➤ Fuse burnt out ➤ Connection joint loose 		○	○	○	○	○	○			
Input Cable	<ul style="list-style-type: none"> ➤ Examine whether the cable is cut off. ➤ Connection joint loose ➤ Over heat 		○			○	○	○			
Welding Power Operation	<ul style="list-style-type: none"> ➤ Turn on power supply or not? ➤ Phase Lacking 		○	○	○	○	○	○	○	○	
Gas Cylinder and Gas Regulator	<ul style="list-style-type: none"> ➤ Turn on gas supply ➤ Residual Amount of Gas in the cylinder ➤ Set value for flow ➤ Connection joint loose 						○				○
Gas supply hose (the whole line from the high pressure cylinder to the weld gun)	<ul style="list-style-type: none"> ➤ Connection joint loose ➤ Gas hose damaged 										○

- Persons with professional qualifications or relevant knowledge and skills can install, operate, overhaul, and maintain the welder.
- Do not put fingers, hair, clothing, etc. Close to the cooling fan and other rotating parts.

 **WARNING** Wire ends can cause injuries. Please must observe the following rules:

- When confirming whether to feed the wire, do not look into the hole of the contact tip. Otherwise, the wire will shoot to hurt the eyes and face.
- When manually feeding the wire or pressing the torch switch, do not place the end of the torch close to the exposed part of the body such as eyes or face.

 **ATTENTION** In order to work better and maintain the power of the welder, please must observe the following regulations:

- If the power source of the welder is placed on an inclined plane, attention should be paid to preventing it from falling.
- It is forbidden to use welding power for the thawing of pipes.
- When the welding power source is lifted using a forklift, it should be mounted sideways to prevent tipping.
- When the welding power supply is lifted by a crane, the cable should be tied at the lifting ring. The angle between the cable and the vertical should not exceed 15 degrees.
- When the welder is equipped with gas cylinders and wire feeders, these two devices should be taken from the power supply and the welder level should be kept as far as possible. When moving the gas shielded welding machine on the ground, be sure to When the welding power supply is lifted by lifting fork lift, to prevent dumping, please install from side.
- When the welding power supply is hoisted, the cable shall be attached to the hanging ring, and the Angle between the cable and the vertical direction shall not exceed 15 degrees.
- When the welding machine is equipped with gas cylinder and wire feeder, the two devices should be connected to the power supply and the welding machine level is maintained as far as possible. When moving the gas shielded welding machine on the ground, be sure to fix the cylinder with a belt or chain to prevent the dumping.
- If the wire feeding machine is used for welding, make sure it is firm and insulated. .
- If the device has a strap or handle, remember that it is only suitable for hand use. It is prohibited to use crane, forklift or other mechanical hoisting.

 **ATTENTION** Attention to electromagnetic interference

- Additional precautions may be required when welding power is used in a local area.
- Before installing the welding equipment, the user should assess the potential electromagnetic problems in the installation environment area, as shown below:

- a) The upper, lower and adjacent power cables, control cables, signal cables and telephone cables of the welding equipment;
- b) Radio and television transmitting and receiving devices;
- c) Computer and other control equipment;
- d) Safety identification equipment, such as the monitoring of industrial equipment
- e) People Health conditions such as cardiac pacemakers and hearing AIDS;
- f) Equipment used for calibration and measurement;
- g) Interference of other equipment in the environment; Users shall ensure that other equipment in the environment is compatible with the environment; This may require additional protection;
- h) The actual situation of welding or other activities carried out.

● Users should comply with the following items to reduce radiation interference:

- a) According to the manufacturer's suggestion, the welding equipment should be connected to the main supply line;
- b) According to the manufacturer's suggestion, welding equipment should be maintained routine;
- c) The welding cables should be as short as possible so that they are close to each other and close to the ground;
- d) All the metal components of the welded assembly and its adjacent components shall be subject to safety verification;
- e) The workpiece should be kept well grounded;
- f) Other cables and equipment in the environment can be selectively shielded and protected, thus reducing the impact of interference. The welding equipment can be completely shielded in special occasions.

● The user should be responsible for the interference caused by welding.

Malfunctions	Solution
Power indicator light is not on, fan does not turn, no welding press output	<ul style="list-style-type: none"> ➤ Power switch is broken ➤ Verify that the electrical grid connected to the input electromechanical regulations has electricity ➤ Enter whether there is a break in the cable
The power switch indicator is on and the fan does not turn	<ul style="list-style-type: none"> ➤ It is possible that the input is misconnected to the 380V power supply, causing the over-voltage protection circuit to start, which is changed to the 220V power supply, and it can be started again. ➤ 220V power instability (too long input line) or input line overlap on the grid, resulting in overvoltage protection ➤ Open and close the power switch continuously for a short period of time, causing the over-voltage protection circuit to start, shut down and wait for 2-3 minutes before starting up again
When the fan turns, the abnormal indicator light is not on and there is no high frequency discharge sound, and no gas flow from the cutting torch	<ul style="list-style-type: none"> ➤ The vh-07 plug-in voltage of multimeter to MOS panel should be about DC308V ➤ The auxiliary power on MOS panel has a green indicator light. If the light is not on, the auxiliary power is not working ➤ Control circuit problem, find the cause or contact the dealer to cut the control line on the gun. Cutting gun cable is broken
Output current during cutting is not stable or not controlled by the potentiometer	<ul style="list-style-type: none"> ➤ 1K potentiometers should be replaced if damaged. ➤ Poor contact at various joints, especially connectors, shall be checked
Abnormal indicator light is not on, high frequency discharge sound, can not cut	<ul style="list-style-type: none"> ➤ It may be overcurrent protection, please turn off the machine, and restart the machine after the abnormal light is off. ➤ May be overheat protection, do not shut down waiting for 2-3 minutes machine can be restored to normal. ➤ It may be the inverter circuit fault, please unplug the power plug of the main transformer on the MOS panel (close to the wind

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.

Malfunctions	Solution
<p>The meter show nothing;</p> <p>Fan does not rotate;</p> <p>No welding output</p>	<ul style="list-style-type: none"> ➤ Confirm the power switch is on. ➤ Power supply available for input cable. ➤ Check if the three phase commute bridge is damaged. ➤ There is malfunction occurs in the supplementary power source on control board (contact dealers).
<p>The meter shows;</p> <p>Fan works normally;</p> <p>No welding output</p>	<ul style="list-style-type: none"> ➤ Check if all the sockets in the machine are connected well. ➤ There is open circuit or badness of connect at the joint of output terminal. ➤ The control cable on the torch is broken off or the switch is damaged. ➤ The control circuit is damaged.(contact to dealers)
<p>the meter shows;</p> <p>Fan works normally;</p> <p>Abnormal indicator lights.</p>	<ul style="list-style-type: none"> ➤ It might be over-current protection, please turn off the power switch; restart the machine after the abnormal indicator light winked. ➤ It might be overheating protection, please wait for about 2-3 minutes until the machine renew without turn off the power switch. ➤ It might be multifunction of inverter circuit. (contact dealers)

2. Product brief introduction

2.1 Summarize

● MMA/ARC Series

MMA/ARC series welding machine applies the most advanced inversion technology in the world.

The appearance of the invert arc welding machine comes after the invert power theory and components. The principle of the technology is to transform the power frequency of 50Hz/60Hz into direct current and invert it into high frequency (10KHz-100KHz) through high-power device IGBT model,IGBT or MOSFET, then perform voltage-drop and commutation with the output high-power D.C power supply via full digital Pulse Width Modulation (PWM) control technology. Since the switch power inversion technology is adopted, the weight and volume decrease greatly while the conversion efficiency increase for more than 30%.

Our welding power source can offer stronger, more concentrated and more stable arc. When the welding rod and work piece get short circuit, its response will be quicker. It means that it is easy to design welding machine with different dynamic characteristics, and it can even adjust the characteristics to make arc softer or harder.

Under MMA mode, the machine has slope characteristic. The welding current, push current and heat arc initiation current is set by the same knob synchronously, which makes good performance of arc initiation, stable power output, welding shape and internal quality.

MMA series welding machine is widely used to weld different materials, such as carbon steel, stainless steel, alloy steel, copper, non-ferrous metal, etc. It can apply to different electrode, including acid electrode, basic electrode and cellulose electrode. Compared with the other products, it has advantages of light, handy, easy to installation and operation, efficient and energy saving. The conversion rate is above 85%. It applies for higher levels welding, field work and indoors operation.

● TIG Series

The welding machine is adopting the most advanced inverter technology.

The development of inverter arc welding equipment profits from the development of the inverter power supply theory and components. Inverter power source utilizes high-power component MOSFET model, MOSFET to transfer 50/60HZ frequency up to (10KHz-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.

AC/DC series welding machine are the AC/DC two-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. AC/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.

AC/DC series are also with pedal current adjustment device. With that welder can free their hands to adjust current by foot; And at the beginning of welding and at the moment of adding wire, it can increase current to heat quickly; At the end of welding it can decrease current that is good for welding lines shape. With the help of pedal it can improve welding efficiency, reduce welding difficulty and guarantee welding quality.

● MIG/MAG Series

The welding machine of our brand is manufactured by inverter technology.

The principle is to use the single tube IGBT (the inverter frequency can reach 25-50KHz) to convert 50/60Hz to dc and then to high frequency and lower voltage rectification, The pulse width modulation (PWM) output can be used for welding high-power dc power supply, due to switching power inverter technology is adopted. The weight of the welder has dropped considerably. The conversion efficiency of the whole machine is increased by more than 30%.

The machine can meet the requirement of gas protection welding and increases the function of manual arc welding and improving argon arc welding. Use full digital panel display, Wire feeding speed and welding voltage centralized regulation can be achieved. so it is easier to adjust welding parameters. Our carbon dioxide gas shielded welding machine is equipped with unique digital electronic reactor circuit, The welding process of short circuit transition and mixed transition is controlled very precisely, so It has excellent welding characteristics. Compared with silicon controlled welder and tapped welder, it has the following advantages: stable wire feeding speed, light energy, energy saving and no electromagnetic noise. It also has the characteristics of small splash, good arc, deep pool and high load.

The equipment belongs to portable dual function machine. Applicable to family customers. It has the advantages of high efficiency and power saving, and it is suitable for welding of multi-metal and multi-process requirements

Thank you for choosing our products. Please feel free to give your precious suggestions; we will make efforts to perfect our products and service.

CABLE		
Position	Checking keys	Remarks
Output cable	<ul style="list-style-type: none"> ➤ Wearing-out of the cable insulated material ➤ Cable connecting head naked (insulation damage), or loosen (the end of power supply, and cable of main material connecting point) 	<p>For life security and stable welding, adopt suitable method to check according to working place</p> <ul style="list-style-type: none"> ➤ Simple check daily ➤ Careful and in-depth check on fixed period
Input cable	<ul style="list-style-type: none"> ➤ If the connection between the plug and the power socket is firm ➤ If the power input end cable fixed ➤ If the input cable is worn out and bares the conductor 	<p>In case of leakage and to ensure safety, please do perform daily checking</p>
Earth cable	<p>If the earth cable that connects the main part is broken and connects tightly</p>	

● Daily checking

WELDING POWER SUPPLY		
Position	Checking keys	Remarks
Control panel	<ul style="list-style-type: none"> ➤ Operation,conversion and installation of the switch ➤ Check the state of the power indicator light 	Lead to unstable arc and wire sending
Cooling fan	<ul style="list-style-type: none"> ➤ Check if the fan state and the sound is normal or not 	Clean the residue and check the reason and solve it
Power part	<ul style="list-style-type: none"> ➤ Check if there is abnormal liberation and sound when the power is on ➤ Check if there is smell when the power is on ➤ Whether the outside color change or get warm 	
Outer parts	<ul style="list-style-type: none"> ➤ Whether the wire feeder pipe is broken,and the connector is loosen ➤ Whether the outer shell or other connect parts are loosen 	

WELDING TORCH		
Position	Checking keys	Remarks
Loop hole	If installment fixed, the front distorted	Reason for air hole.
	Attach splash or not.	Reason for burning the torch. (can use splash-proof material)
Electric hole	If installment fixed	Reason of torch screw thread damage
	Damage of its head and hole blocked or not	Reason of unstable arc and broken arc
Wire sending tube	Check the extended size of the pipe	Have to be changed when less than 6mm, when the extended part too small, the arc will be unstable.
	Wire diameter and the tube inner diameter match or not	Reason of unstable arc, please use the suitable tube.
	Partial winding and extended	Reason of poor wires sending and unstable arc, please change.
	Block caused by dirt in the tube, and the remains of the wire plating lay.	Reason of poor wire sending and unstable arc, (use kerosene to wipe or change new one.)
	Wire sending tube broken O circle wear out	Pyrocondensation tube broken, change new tube. Change new O circle
Gas bypass	Forget to insert or the hole blocked, or different factory component.	May lead to vice (splash) because of poor gas shield, torch body get burned (arc in the torch), please handle.



WARNING

This equipment is mainly used in industry. In the indoor environment, the equipment may produce radio interference. Please take precautions before use.

● Cutting machine Series

Cutting machine are made by international most advantaged invert technology .50/60Hz frequency is inverted to high frequency (10KHz-100KHz) through high-power device IGBT model, IGBT or MOSFET, then reduce voltage and commute current, inverter power supply generates powerful DC welding current through PWM technology. Because inverter technology of switch power is used, volume and weight of main transformer has reduced substantially and efficiency has been increased by 30%.

Piloting arc system can strike arc easily with principle of high frequency oscillation. It has functions that it can supply gas ahead and turn off gas delayed.

Cutting machine has characteristics as following:

- Stabilizing.
- Reliability.
- Lightness.
- Energy-saving and no noise.
- High cutting speed.
- Cutting smoothly and no polish demands.

Cutting machine can be used widely; it is suitable for cutting stainless, Steel, alloy steel, mild steel, copper and other color metal materials.



WARNING

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- **Stud welding machine Series**

Capacitor energy storage stud welding machine are also known as capacitor discharge stud welders. Named for its power supply as a capacitor bank,

As an energy storage component, the capacitor instantaneously discharges into the stud and the workpiece space, forming an instantaneous unstable arc process, which is thinned by arc heat.

This machine is mainly used for stud connection of structural parts and decorative parts of various low carbon steel, stainless steel and aluminum alloy. Such as a variety of steel or stainless steel cabinets, instrument cases, car, kitchen utensils, hardware and fixed studs on the ceiling of aluminum alloy. After welding, there is no deformation on the back side, no color spots: the welding time is short (1-3ms), and the ratio of the diameter of the stud to the thickness s of the plate is equal to 8-10. It is especially suitable for stud welding on thin plates. Fast welding speed, short welding time and high efficiency specialty. It is the most ideal welding equipment for stud welding.



This equipment is mainly used in industry. In the indoor environment, the equipment may produce radio interference. Please take precautions before use.

5. Daily maintenance and checking

- **Daily maintenance**

- 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.
- The pressure of compressed air shall fall to required level to prevent damage to small components in the machine.
- Examine inside electric joints and ensure perfect contact (Especially plugs and sockets). Fasten the loosening joints. In case of oxidation, remove oxide film with sand paper and connect again.
- 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.
- If the welding machine is not used for a long time, pack the machine in original package and store in dry surroundings.
- Every time the wire feeder operates for 300hours, grind the electrical carbon brush and clear up the armature commutator. Rinse speed reducer, apply 2# Molybdenum Disulfide lubricant to the turbine, whirlpool rod and bearing.



All the maintenance and testing must be carried out when the power supply is totally cut off. Please make sure the power is off before opening the closure.

The Input Voltage could be found in **Technical data diagram**. The auto-compensation function will keep the welding current in the rated range. If the input voltage exceed the permissible value, the machine would be damaged. Users should take protective measures in advance to avoid it.

d) **Make sure earth connected before operation.**

On the rear panel of welding machine, a screw for earth connecting would be found. It must be ground connected with cable whose section is bigger than 6mm² before operation, to avoid accidents caused by static or electricity leak.

4.4 Welding problems and solution

The phenomenon listed below may happen due to relevant accessories used, welding material, surroundings and power supply. Please improve surroundings and avoid these problems..

- **Arc starting difficulty. Arc interruption happens easily:**

- a) Examine whether grounding wire clamp contacts with the work pieces well.
- b) Examine whether each joint has improper contact.

- **The output current fails to reach rated value:**

The deviation of power voltage from rated value may cause that the output current does not accord with adjusted value. When the power voltage is lower than rated value, the maximum output current may be lower than rated value.

- **The current can not keep stable during operation:**

This situation may relate to the following factors:

- a) The voltage of electric power network changes;
- b) Serious interference from electric power network or other electric facilities.

- **Gas vent in welds:**

- a) Examine whether the gas supply circuit has leakage.
- b) Examine whether there is sundries such as oil, dirt, rust, paint etc. on the surface.

2.2 Technical Parameters

Parameters	MMA160
Power voltage (V)	1 phase 220V±15%
Frequency (Hz)	50/60
Rated input current (A)	MMA: 32,9 TIG: 20,4
No-load voltage (V)	62
Output current (A)	20-160
Output voltage (V)	20,8-26,4
Duty cycle (%) / 40°C	25
Power factor	0,73
Efficiency (%)	80
VRD voltage (V)	24
Electrode diameter (mm)	1.6-3,2
Suitable thickness (mm)	1,5-4
Insulation grade	F
Housing protection grade	IP23
Weight (kg)	4,7
Overall dimensions (mm)	300x137x264

Parameters	TIG200P
Power voltage (V)	1 phase 220V±15%
Frequency (Hz)	50/60
Rated input current (A)	TIG: 24,9 MMA: 39,1
No-load voltage (V)	59
Output current (A)	TIG: 10-200 MMA: 30-160
Output voltage (V)	TIG: 10,4-18 MMA: 10,4-27,6
Duty cycle (%) / 40°C	40
Power factor	0,73
Efficiency (%)	80
AC frequency (Hz)	40-200
AC duty cycle (%)	40
Post flow time (S)	1-25
Remote control	Yes
Arcing start mode	HF
Electrode diameter (mm)	TIG: 1,6-2,4 MMA: 1,5-6
Protection grade	IP21
Insulation grade	F
Cooling method	Fan-cooled
Weight (kg)	15,1
Dimensions (mm)	460x220x375

welder's overheating fault will be automatically relieved, and the front panel shows normal, the welder can work normally, then no need to reset the welder.

4.2 Polarity conversion joint

This machine has the polarity conversion; There are positive output terminal and negative output terminal between wire feeder and wire spool; When use solid wire with gas protection, torch socket should be connected to the positive output terminal, ground cable should be connected to the negative output terminal; When use flux-cored wire, the two connected cable should be exchanged.

4.3 Welding environment and safety

● Working surrounding

- Welding should be carried out in dry surroundings. The air humidity level should not be higher than 90%.
- The temperature should be between -10°C to 40°C.
- Don't use the welding machines in sunshine or rain. Keep it off water.
- Don't use the machines in the places of dust or corrosive air.
- MIG welding should not be carried out in places with quick air flow.

● Safety norms

Protection circuit of over-voltage, over-current and over-heat circuits are designed in the welding machines. It will stop working automatically when the input voltage, output current or internal temperature exceed the rated value. But if the machines are excessively used, such as with input voltage higher than the rated, the machine might be damage. Please pay close attention to the following matters.

a) Keep good ventilation! !

The welding machines work with high welding current. Nature air flow can't reach the requirement of heat dissipation. So the fans are installed as cooling system to ensure stable performance.

Make sure the ventilation windows are not covered or blocked. The distance between the machines and things around should not be less than 0.3m. Good ventilation is good for welding performance and operational life.

b) Never over load!

Check the maximum rated current (according to the Duty Cycle chosen). Make sure the welding current is never higher than the rated value. Over current running will obviously shorten the operation life, even damage the machine.

c) Never over voltage!

4. Operating instructions

4.1 Welding operation instruction

- **On display**

After open the power supply, front panel display state Sq-type, and 【Multifunctional data display window】 Flash 3 seconds (Or any buttons and knobs on the front panel). Enter the welding mode saved last time.

- **Manual welding operation procedures**

At the welding stop, operation [manual welding and gas protection welding switch key], Manual welding indicator light, into manual welding mode.

In Manual welding mode, operation 【VRD/ 2T/ 4T Function switch key】, VRD Indicates that the VRD function is turned on, meanwhile 【Multifunctional data display window】 display, VRD The indicator light is not on, indicating that the VRD function is not turned on.

during welding process adjust 【Multifunctional data adjusting knob】 The welding current can be changed, in 【Multifunctional data display window】 display. The welding current range is 30A to maximum current adjustment.

- **Operating procedures for gas protection welding**

Check wire operation: press gun switch, within 5S If not enter welding state, it will enter the wire check state, Wire feeder fast wire feeder, It is convenient to send wire from wire feeder to gun head;

2T/4T operation: 【VRD/ 2T/ 4T Function switch key】, select welding mode. 2T indicator light on, Represents two-step control: Press the welding gun switch, Gas flow in advanced, normal weld; Loosen the welding gun switch, burn-back & remove the ball, lag 3 seconds stop gas flow. 4T indicator light on, represents four-step control: Press the gun switch for the first time, gas flow in advance, pilot arc welding; First release the welding gun switch, normal weld; Press the gun switch for the second time. The welding current is attenuated to the arc current and maintained; Release the welding gun switch for the second time, burn-back/ remove the ball, Time delay 3 seconds off gas.

- **Fault display:**

Failure display of wire feeder




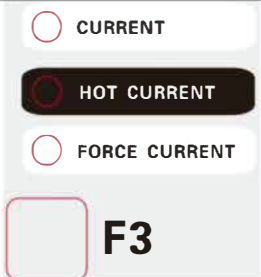



wire feeder fault display Err 003, at 【Multifunctional data display window】 display continuously flashing, the welder does not work properly this moment. Turn off the welder and restart it.

Overcurrent, overheating fault display

The welding machine over flow failure display Err 001, at 【Multifunctional data display window】 display continuously flashing, The welder does not work properly this moment. Turn off the welder and restart it, the front panel normally shows the welding parameters set before the failure, the

Parameters	MIG200G
Power voltage (V)	1 phase 220V±15%
Frequency (Hz)	50/60
Rated input current (A)	MIG/MAG: 37,4 MMA: 43,6 TIG: 28,0
Output current (A)	MIG/MAG: 40-200 MMA: 30-160 TIG: 20-160
Output voltage (V)	MIG/MAG: 16-24 MMA: 21,2-28 TIG: 10,4-18
No-load voltage (V)	65
Duty cycle (%)	60
Power factor	0,73
Efficiency (%)	80
Wire feeder type	All-in-one
No-load loss (w)	120
Wire feed speed (m / min)	2-18
Post flow time (S)	1,0
Wire diameter (mm)	0,8-1,2
Protection grade	IP21
Insulation grade	F
Suitable plate thickness (mm)	0,8+
Weight (kg)	21,3
Overall dimensions (mm)	445x245x485

2.3 Panel description

MMA/ARC Series	
Symbol	Description
	VRD switch indicator light in manual welding state
	Overheat protection
	Mode button, short press to switch manual/argon welding mode; Long press to save current data
	Menu button, short press to convert current/hot current/force current; Long press switch under manual welding state to switch on/off VRD function
	Caution ! Refer to manual
	Current adjustment knob adjusts the current/current according to the current state of the menu button
	Current adjustment knob

positive pole. Suitable for acid electrode

negative connection: Workpiece connected to the negative pole, Welding pliers connected to the positive pole. Suitable for Basic electrode.

The welding is selected according to the process requirements of the workpiece, if selection not well so that Arc instability, spatter and adhesion occur, we can replace the fast plug to change the polarity potable.

- Make sure the cable is connected to the soldering pliers and the quick plug, Connect the quick plug to the corresponding fast socket, And tighten it clockwise. The ground clamp clamps the workpiece.

This procedure must be operated by an electrician

According to the input voltage and current of the welder (See the technical parameters table) Connect proper power cable to the distribution box with corresponding capacity, Do not connect the wrong voltage, make sure that the error of power supply is within permitted range.

● TIG Series

- d) Make sure cable with electrode holder and quick plug connected well. Connect the quick plug to the socket “-” of the machine, and fasten it clockwise tightly.
- e) Connect the quick plug at one end of the cable into the socket “+” of the machine, and fasten it clockwise, the other end clamps the workpiece.
- f) Please pay attention to the connecting terminal, DC welding machine has two connecting ways: positive connection and negative connection. Positive connection: holder connects with “-” terminal, while work piece with the “+” terminal. Negative connection: work piece with the “-” terminal, holder with the “+” terminal. Choose suitable way according to the working situation. If unsuitable choice is made, it will cause unstable arc, more spatters and conglutination. If such problems occur, please change the polarity of the fastened plug. It should adopt negative connection when welding with alkaline electrode, while positive connection when welding with acid electrode.

This procedure shall be operated by electrician!

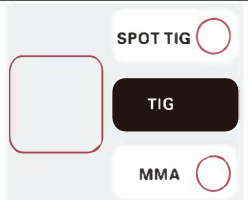


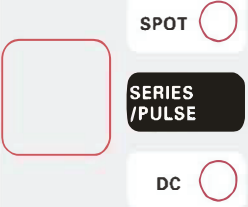
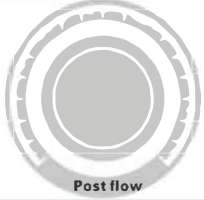

Connect proper power cable to the distribution box with corresponding capacity according to the input voltage and current (See technical parameter table). Do not connect to the inappropriate voltage and make sure that the difference of power supply is within permitted range.

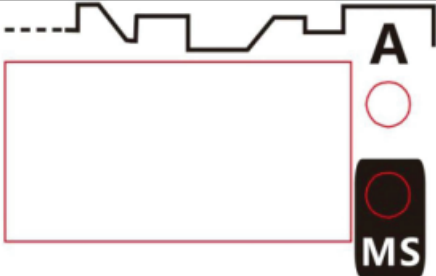
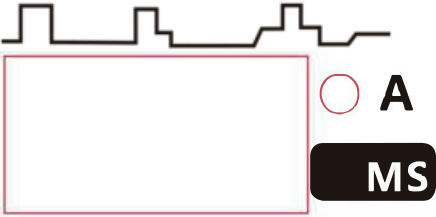
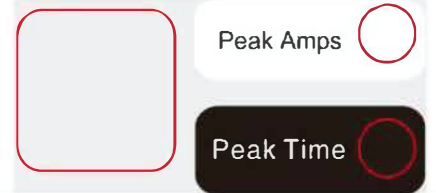
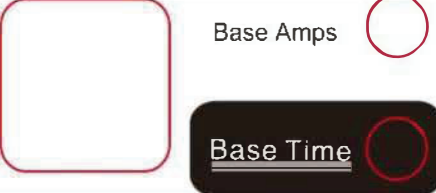

● MAG/MIG Series

- The gas cylinder containing the carbon dioxide gas decompression flow meter is closely connected with the carbon dioxide intake inlet of the machine.
- insert the fast plug of the ground wire in the front panel on the fast socket.
- The wire holder filled with wire installed on the wire feeder, the hole position of the wire plate should be aligned with the fixed plug on the shaft.
- According to the diameter of the wire, choose different wire feeder.
- Loosen the pressure wheel nut, to pass through the guide wire tube into the wire feed wheel groove, adjust the pressure wheel pressure welding wire, guarantee the welding wire is not sliding, but cannot too much pressure, to prevent the welding deformation of wire so as to influent the wire feeding.
- The wire coil should be rotated and loosen the wire, To prevent the wire from loosening, the new wire disk head is usually inserted into the fixed hole at the edge of the wire. In normal use, to prevent the bending of the wire to be stuck, please cut this part of wire.
- The welding gun is inserted into the output socket of the front panel and screwed tightly And put the wire into the gun.

Manual welding installation steps

- There are two ways to connect the dc welder normally: Positive connection and negative connection.
Positive connection: Welding pliers connected to the negative pole, Workpiece connected to

TIG Series	
Symbol	Description
	Mode switch button can convert cold welding, argon arc welding and manual welding successively; Long press 3S can save current data
	Power supply indicator
	Overheat protection
	Function switch button, cold welding state can switch single point/continuous; Pulse/dc can be switched under argon arc welding; Manual welding is in unadjustable dc state; Manual welding is not adjustable under DC condition
	Post flow adjustment
	Caution ! Refer to manual

	Base current & time display
	Peak current & time display
	Switch button for base value time/base value current. In the continuous cold welding state, the base current is 0 and the base time is adjustable. Under the condition of argon arc welding pulse, the base current and base time can be adjusted, and the base current and base time can not be adjusted in the state of cold welding single point, the state of argon arc welding dc and the state of manual welding
	Switch button of peak time/peak current. Under single point and continuous state of cold welding, the peak current and peak time can be adjusted. Under pulse state of argon arc welding, the peak current and peak time can be adjusted. The peak current of argon arc welding can be adjusted under dc and manual welding conditions, but the peak time cannot be adjusted
	Switching button for TIG/MMA, Press down over 3s can save current job

3. Installation instructions

● MMA/ARC Series

The welding equipment is equipped with power voltage compensation device. It keeps the machine work normally when power voltage fluctuating $\pm 15\%$ of rated voltage.

When using long cable, in order to reduce voltage drop, big section cable is suggested. If the cable is too long, it will affect the performance of arcing and other system function, it is suggested to use the recommend length.


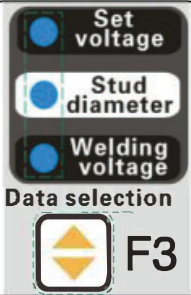

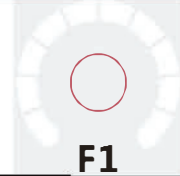

- Make sure the intake of the machine is not covered or blocked to avoid the malfunction of the cooling system.
- Use ground cable whose section no less than 6mm^2 to connect the housing and earth. The method is to connect the grounded interface in the back to the earth device, or make sure the earth end of power interface has been reliably and independently grounded. Both ways can be used together for better security.

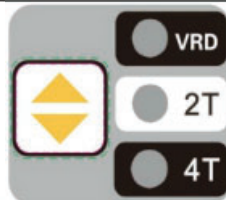


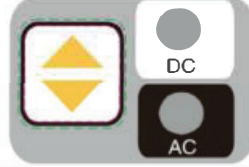
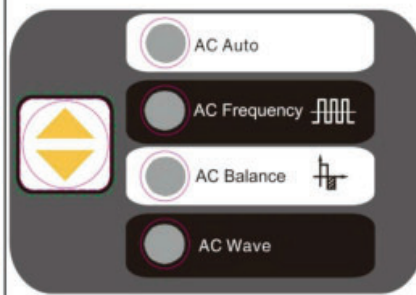

Installation Procedures







- Make sure cable with electrode holder and quick plug connected well. Connect the quick plug to the socket "-" of the machine, and fasten it clockwise tightly.
- Connect the quick plug at one end of the cable into the socket "+" of the machine, and fasten it clockwise, the other end clamps the workpiece.
- Please pay attention to the connecting terminal, DC welding machine has two connecting ways: positive connection and negative connection. Positive connection: holder connects with "-" terminal, while work piece with the "+" terminal. Negative connection: work piece with the "-" terminal, holder with the "+" terminal. Choose suitable way according to the working situation. If unsuitable choice is made, it will cause unstable arc, more spatters and conglutination. If such problems occur, please change the polarity of the fastened plug. It should adopt negative connection when welding with alkaline electrode, while positive connection when welding with acid electrode.








This procedure shall be operated by electrician!







Connect proper power cable to the distribution box with corresponding capacity according to the input voltage and current (See technical parameter table). Do not connect to the inappropriate voltage and make sure that the difference of power supply is within permitted range.

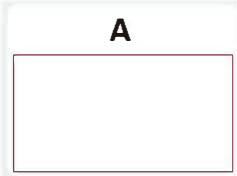
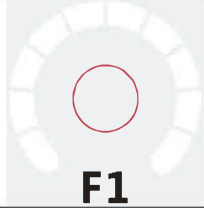


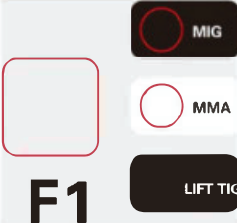
Stud welding machine	
Symbol	Description
	<p>Material selection button: short press can select carbon steel, stainless steel, aluminum, special material in turn Long press 3S above to save the current state Remark: the current setting will be automatically saved after no operation in 5s</p>
	<p>Data selection button: switch welding voltage setting and stud diameter setting</p>
	<p>Caution ! Refer to manual</p>
	<p>Multi-function data adjustment knob: The setting voltage can be adjusted according to the parameter selection button, and the stud diameter</p>
	<p>Welding voltage display indicator: it shows the current welding voltage</p>

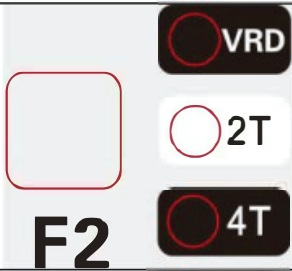
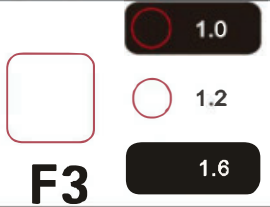
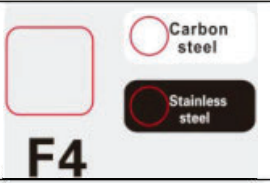
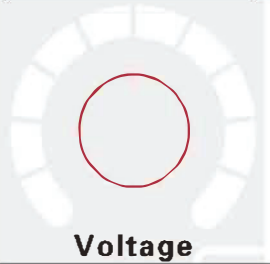
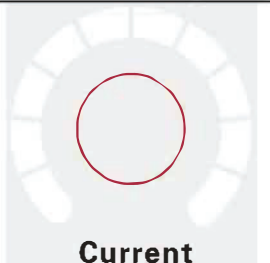
	<p>Switching button for VRD/2T/4T modes , under TIG mode can switch 2T/4T. under MMA mode can switch on of switch off the VRD function</p>
	<p>Pulse on/ Pulse off</p>
	<p>AC function conversion button, can adjust AC frequency and AC cleaning width</p>
	<p>AC/DC switch button</p>
	<p>AC functional button, it can switch on Unified function or switch it off, it can adjust AC frequency, AC clean-up Width and waveform choices. AC Unified function ON and OFF: when AC Unified indicated lights up, you can adjust the data by knob. Current indicator lights up - ON , which means on Unified function mode, AC clean-up width will be auto match automatically. Current indicator lights up – OFF, which means Unified function closed, AC clean-up width would be adjusted by manual</p>
	<p>Multi-functional adjusting knob. According different menus and AC function button, it can adjust relative data</p>

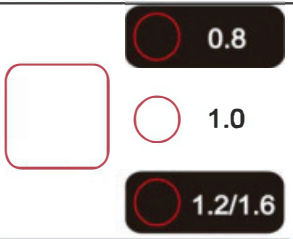
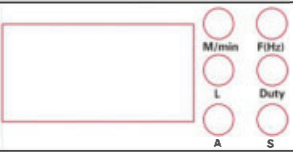
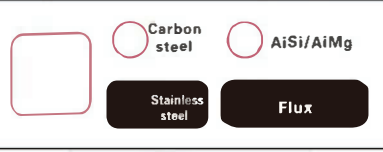
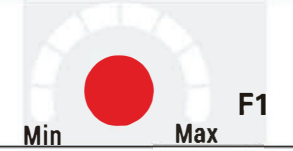

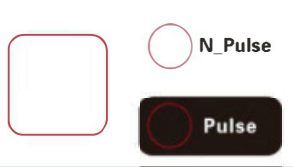
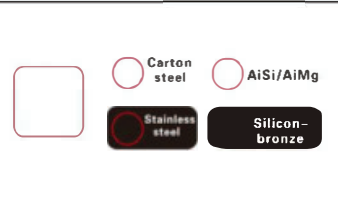
TIG Series (LED Screen)	
Function 	Function left switch button: according to the LCD menu bar, you can switch to the left selection menu
Return 	Return button, switch to the previous menu, or return to operation. Press over 5 seconds will back to factory reset
Execute 	Press this button to enter the next menu or to perform the current operation Long press 5S to save current data
Function 	Function right switch button: according to the LCD menu bar, you can switch to the left selection menu
	Multi-function data adjusting knob: Select the current menu to adjust the data according to the left and right switch buttons
MAG/MIG Series	
Symbol	Description
	Welding voltage digital display meter

	Overheat protection
	Power supply indicator
	Current adjustment
Air pressure 	Air pressure display
Over load 	Over load display
Input fault 	Input fault
	Current display

MAG/MIG Series (LED Screen)	
Execute 	Press this button to enter the next menu or to perform the current operation. Long press 5S to save current data
Return 	Return button, switch to the previous menu, or return to operation. Press over 5 seconds will back to factory reset
Function 	Function right switch button, according to the LCD menu bar to choose the right menu to switch
Function 	Function left switch button: according to the LCD menu bar, you can switch to the left selection menu
Cutting machine series	
Symbol	Description
	Switch on / off button
	Caution ! Refer to manual

	Welding current digital display
	Multi-function adjustment knob Adjust this knob in each mode to change the corresponding setting parameters
	Function conversion button Under the short press condition, it can shift below welding modes: 1.1.0 mm flux-cored wire, gas shielded welding mode; 2.1.2 mm flux-cored wire, gas shielded welding mode; 3.0.8 mm solid-cored wire, gas shielded welding mode; 4.1.0 mm solid-cored wire, gas shielded welding mode; 5.MMA welding mode; 6.TIG arcing welding mode; Under the gas shielded welding condition, press the button 3s, it will shift to voltage micro-adjustment mode
	Data display
	MAG/MIG & MMA & TIG Switch, press hold 3S can save current data

 <p>F2</p>	<p>VRD, 2T, 4T function switch button, switch 2T/4T function in the state of gas shielded welding, long press 3S can switch the display of preset wire feeding speed or welding current, in the state of manual welding of split machine out of VRD function</p>
 <p>F3</p>	<p>Welding wire diameter selection button, long press 3S can turn on or off the remote control function, when the remote control light is on: the current and voltage are adjusted by the wire feeder</p>
 <p>F4</p>	<p>Welding material selection button</p>
 <p>Voltage</p>	<p>Voltage adjustment</p>
 <p>Current</p>	<p>Current adjustment</p>

	<p>Welding wire diameter selection button, long press 3S can turn on or off the remote control function, when the remote control light is on: the current and voltage are adjusted by the wire feeder</p>
	<p>Data display</p>
	<p>Welding material selection button. The state of the lamp is always on when welding aluminum and silicon materials, and the state of the lamp is flashing when welding aluminum and magnesium materials</p>
 <p>F1</p>	<p>Multi-function data adjusting knob: Select the current menu to adjust the data according to the left and right switch buttons</p>
 <p>F1</p>	<p>MAG/MIG & MMA & TIG Switch, press hold 3S can save current data</p>
	<p>Pulse/non-pulse button. Long press 3S in the non-pulse state of gas shielded welding can turn on or off the unified function MAG/MIG mode</p>
	<p>Welding material selection button</p>