Operation Manual

RBM2500 MIG Welding Machine

Version

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

Contents

1 Brief Product Introduction

1.1 Summarize

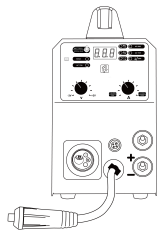
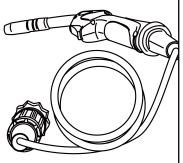
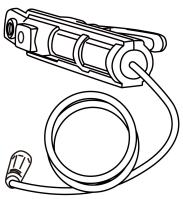
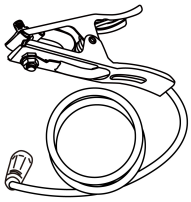
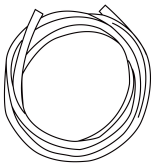
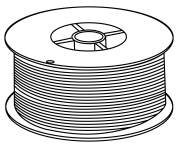
1	IGBT Inverter Technology	This device uses single tube IGBT inverter technology (the inverter frequency range is from 25-50KHz) to convert 50/60Hz alternating current (AC) to direct current (DC) and then to high frequency and lower voltage rectification. The resulting pulse width modulation (PWM) output can be used for the high-power DC power supply, Due to switching power inverter technology adopted, the weight of the welder has been significantly decreased and the conversion efficiency of the whole machine is increased by more than 30%.
2	Superior Performance	The machine can be used for gas shielded welding. The welder is equipped with a unique digital electronic reactor circuit. The welding process of short circuit transition and mixed transition can be controlled very precisely. It has excellent welding characteristics.Compared with silicon controlled welders and tapped welders, it has the following advantages: stable wire feeding speed, low energy consumption, energy saving and no electromagnetic noise.It also has the characteristics of reduced spatter, stable arc, deep pool and high load.
3	Wide Voltage	Our welding machine is equipped with a power supply voltage compensation device，The power supply voltage will work when the rated voltage is within 15% of requirements. When using extension cords, in order to reduce voltage drop, use a heavy duty extension cord (10 or 12AWG or greater) or use the recommended configuration length.
4	Multifunction	The machine is a versatile product which include MIG gas, MIG gasless, Lift TIG , STICK welding and spool gun function.It has the advantages of high efficiency and power saving, and it is suitable for welding of multi-metal and multi-process requirements.
5	Digital Control	The machine use full digital panel display，Wire feeding speed and welding voltage centralized regulation can be achieved. It is easier to adjust welding parameters.Thanks to digital control, the machine comes with synergy software, it match wire diameter, material and current. Excellent choice for freshman welder and easier for welding professionals. Additional voltage and inductance setting for professionals to find the precise welding performance for different project.
6	Portability	The equipment applicable to family customers.Portable, light weight with only 12.8KG. 80% duty cycle on 116A, perfect for on-site job and DIY project.With fluxed core wire, this welder can weld sufficiently without bringing heavy gas cylinder. This is your ultimate welding stationary partner!
7	Attention	Wire spool hold down not put on correctly, this will make the wire not come off the spool smoothly. To much tension on the drive roller or not enough tension. Using the wrong size roller for wire. Not connecting the mig to the + or- terminal before trying to weld.

1.2 Technical Parameters

Machine type	RBM2500	
Supply voltage (V)	1 phase AC 120V/240V±15%	
Frequency (Hz)	50/60	
Rated Max. Input current (A)	120V 65 (MIG) 76 (MMA) 48 (TIG)	240V 48.6 (MIG) 55.1 (STICK) 36.7 (TIG)

Output current adjustment (A)	120V 40-182 (MIG) 20-182 (STICK) 15-182 (TIG)	240V 40-250 (MIG) 20-250 (STICK) 15-250 (TIG)
Output voltage (V)	120V 16-23.1 (MIG) 20.8-27.3(STICK) 10.6-17.3 (TIG)	240V 16-26.5 (MIG) 20.8-30(STICK) 10.8-20 (TIG)
No load voltage (V)	50±5	
Duty cycle (%)	60	
Power factor	0.7	
Efficiency (%)	85	
Wire feeder type	All-in-one	
Wire feed speed(m / min)	2-15	
Wire diameter (mm)	0.8/1.0	
Insulation grade	F	
Enclosure protection class	IP21	
Suitable plate thickness (mm)	0.5-8	
Weight (kg)	10.4	
Overall dimension (mm)	455*280*315	

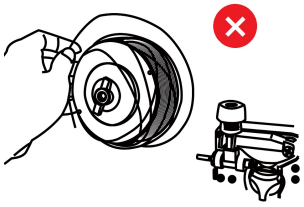
1.3 Accessories list

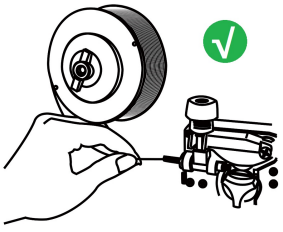
					
RBM-2500*1	Welding Torch *1	Electrode Holder Set *1	Work Clamp*1	Gas hose*1	Flux Cored Welding Wire *1

2 Installation Instructions

2.1 Welding Wire Installation Steps:

To install a fresh reel of welding wire into the wire feeder. The hole position of the wire plate should be aligned with the fixed plug on the shaft.



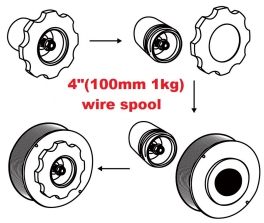


The wire reel should be rotated so that the wire feeds from the bottom of the reel into the wire feeder. Following the diagrams below as a guide, place the reel over the spindle in the machine and fasten it into place with the washers, spring and nut. There should be slight tension on the reel, just enough to prevent it from unwinding. While using one

hand to prevent in the wire from suddenly unwinding from the reel, loosen the free end of the wire from the edge of the reel. Snip off the crooked or bent tip and insert the tip of the wire into the metal spring wire guide of the wire feeder.

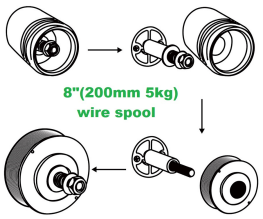
0.030”(0.8mm)/0.035”(0.9mm)diameter

4”（100mm 1kg）wire spool



0.030”(0.8mm)/0.035”(0.9mm)diameter

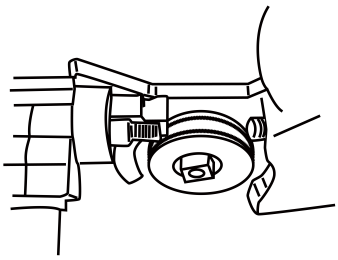
8” (200mm 5kg)wire spool

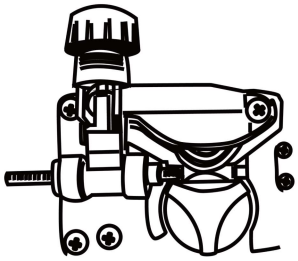


According to the type and diameter of the wire, select the appropriate wire feed roller. V-grove roller for stainless steel and carbon steel, Knurled-grove roller for flux cored wire and U-grooved roller for welding aluminum in the spool gun (spool gun and U-groove roller are not included with the machine and must be purchased separately.) Please match diameter size on the roller with the welding wire diameter. Please note that the wire feeder feeds the wire over the inboard side of the feeder mechanism make sure you install the drive roller so that the desired groove is towards the machine!

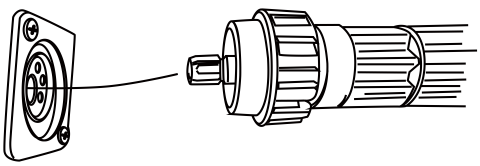
Release the drive tension mechanism by rotating the drive tension knob down. Now pass the wire through the wire guide spring over the top of the groove of the drive wheel. Using your finger to aim the wire thought the second guide that is at the front of the machine. Push the wire out a few inches or centimeters. Now bring down the top roller mechanism and raise the tension knob to lock it into place. Adjust the tension knob so that the pressure on the welding wire, guarantees the welding wire is not slipping if the wire is blocked, and not continuing to fed the wire, This would cause a huge mess called a bird’ s nest inside the machine.

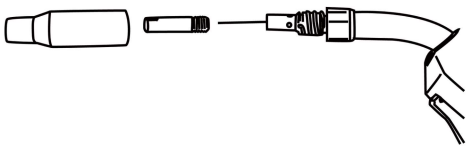
Roller size: external diameter ∮30mm/ internal diameter ∮10mm/ height 10mmm



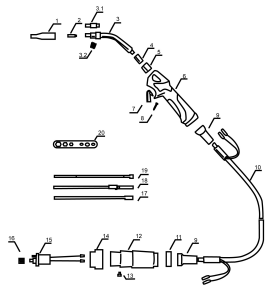


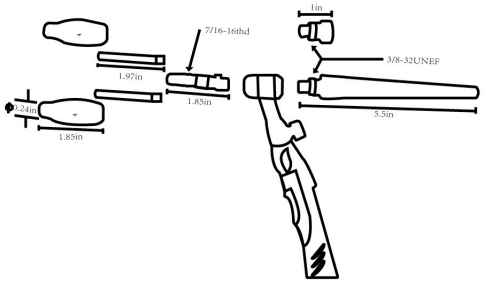
Guide the wire sticking out the front of the machine into the welding gun cable. Now insert the welding gun cable into the socket on front panel and screw it in firmly.Unscrew the nozzle and contact tip from the MIG gun and feed the wire through the cable by pulling the trigger on the gun. To ensure the wire feeds quickly, you can turn tew amperage knob on the front panel to it’s maximum setting. After the wire successfully fed reinstall install the contact tip and appropriate nozzle. For fluxed core wire, install a ceramic nozzle, for solid wire install a copper nozzle.





2.2 MIG & TIG Torch Exploded Diagram -TIG torch is not included in standard accessories





Torch nozzle 1 and contact tip 2 are consumables. Please change when needed.

2.3 Gas Shielded Welding Installation.

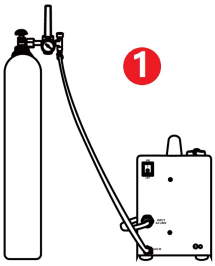
①MIG Welding

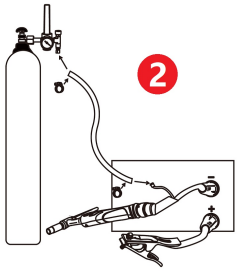
The gas cylinder containing the carbon dioxide gas, mixture gas or argon gas must be tightly connected to the regulator or flow meter must to tightly so that there are no gas leaks.

Connect a gas hose between the machine's rear gas connector and gas regulator or flowmeter with the gas hose clamps provided. Once again there must be no leaks.

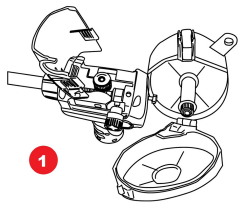
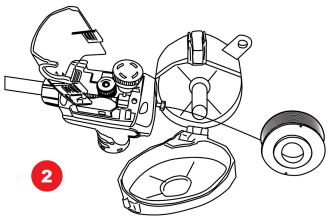
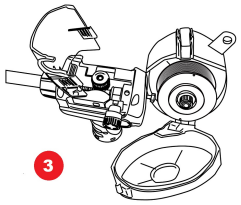
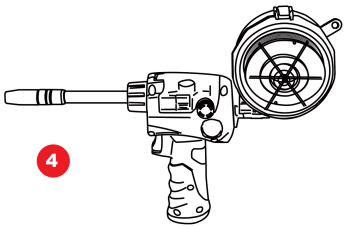
②LIFT TIG Welding

The regulator or flowmeter attached to the gas cylinder containing the argon gas is tightly connected with the gas tube on torch so that there are no leaks.



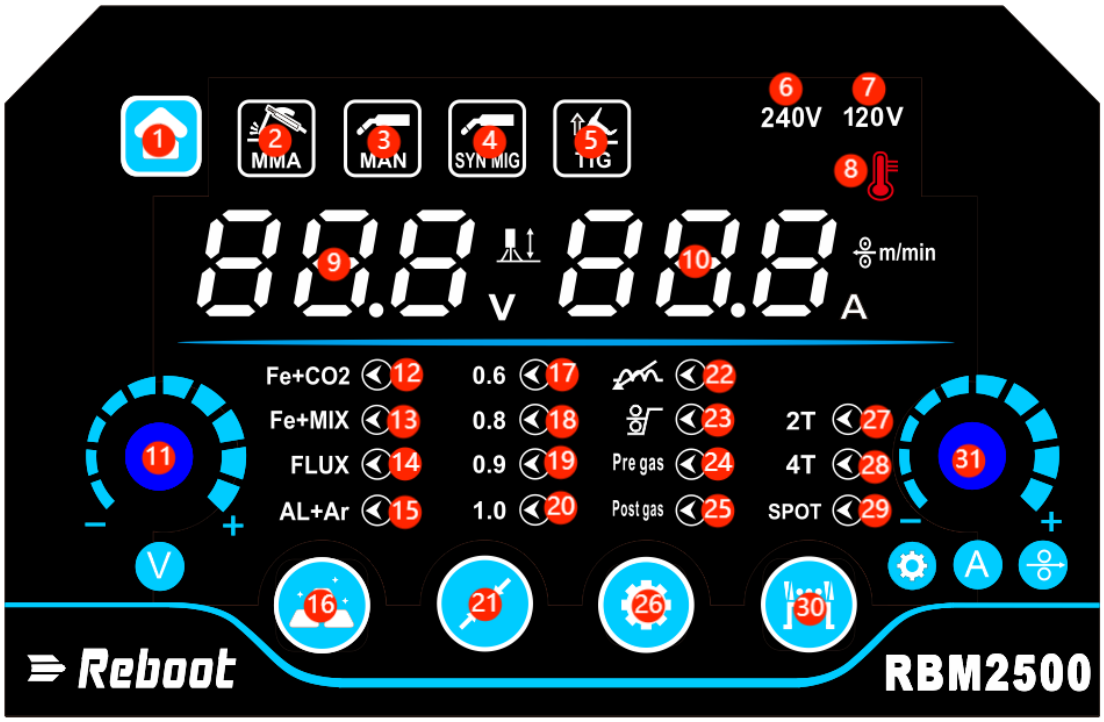


2.4 MIG Spool Gun Installation.

			
1	Open the cover of the wire feeding disc, open the cover of the wire feeding wheel bin, and loosen the pressure wheel of the wire feeding mechanism.		
2	Send the welding wire to the wire feeding wheel (note that the wire feeding wheel matches the diameter of the welding wire)		
3	Install the welding wire on the shaft beside the wire feeding, and tighten the mounting screws.		
4	Press the wire feeding wheel and pressing wheel well, cover the cover of wire feeding bin and the cover of wire feeding tray		

3 Operating Instructions

3.1 Operation Panel Interface



1	Function selection button, press it, it will cycle through four functions [2], [3], [4], and [5].
2	This light is on in MMA mode.
3	MIG welding mode shift button: MIG welding manual adjustment mode: Wire feed speed and voltage are adjusted separately. Experienced welders can choose this mode.
4	MIG welding automatic adjustment mode: The wire feed speed and voltage have been matched to the parameters, and novices can choose this mode.
5	This light is on in LIFT TIG mode.
6	AC 240V:This light is on when the input voltage is 240V.
7	AC 120V:This light is on when the input voltage is 120V.
8	OC light :When the machine overheats, it will automatically protect itself, this light will light up, and the screen [9] [10]will display an "**Err 2**" error code,after the machine cools down, it will automatically return to normal; When the machine malfunctions, this light will light up and the screen [9] [10]will display **Err 1, Err 3, Err 4, Err 5, or Err 6**. Please contact the seller for assistance.
9	Voltage display：Displays welding voltage.
10	Current display：Displays wire feed speed and welding current.
11	Voltage adjust function.
12	MIG CO2 shielded welding mode: 100% CO2 shielding gas, solid wire welding.
13	MIG CO2 and Ar shielded welding modes: mixed gas, solid wire welding.
14	Welding with flux cored wire.
15	MIG Ar shielded welding, aluminum magnesium and aluminum silicon welding, it is recommended to use a spool gun for better welding effect.
16	Selection of welding wire materials, press it, it will cycle through four functions [12], [13], [14], and [15].
17	Welding wire diameter selection: 0.6mm
18	Welding wire diameter selection: 0.8mm
19	Welding wire diameter selection: 0.9mm

20	Welding wire diameter selection: 1.0mm
21	Welding wire diameter selection, press it, it will cycle through four functions [17], [18], [19], and [20].
22	Inductance adjustment,adjust soft or hard arc characteristics in MIG all mode.
23	Slow wire feeding adjustment: At the beginning of welding, there will be no wire pushing.
24	Front blowing time adjustment.
25	Adjust the blowing time afterwards.
26	Function selection button, press it, it will cycle through four functions [22], [23], [24], and [25].
27	2T.
28	4T.
29	Spot welding.
30	Function selection button, press it, it will cycle through four functions [27], [28] and [29].
31	Current and wire feed speed adjustment knob

3.2 Welding Operation Instruction

On display

After turning on the power supply.【Multifunctional data display window】Flash 3 seconds (Or any buttons and knobs on the front panel).

Polarity Selection Procedures

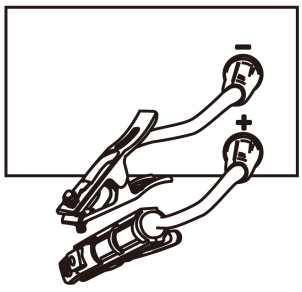
There are two basic ways to configure the welder:

Direct Current Electrode Positive (DCEP):The electrode cable (MMA stinger, MIG gun) connected to the positive (+) connector on the front panel, The workpiece is connected to negative (-) connector by the work clamp cable. Suitable for positive wire or stick electrode.

Direct Current Electrode Negative (DCEN):The workpiece is connected to the positive (+) connector on the front panel. The welding electrode cable (MMA stinger, MIG gun, TIG Gun) is connected to the negative (-) connector pole. Suitable for negative wire stick electrode.

The polarity is selected according to the welding process requirements of the workpiece, use of incorrect polarity may cause arc instability, spatter and lack of fusion.

STICK Manual Welding Operation Procedures



Make sure the electrode cable is connected to the positive front panel connector. The working clamp clamps the workpiece and is connected to the negative connector on the front panel.When using alkaline welding electrode, use DCEP connection mode.**Cellulose electrodes cannot be used.**Pull welding is adopted, which is called right welding, that is, pull welding from the left to the right.

Make sure the [2 Mode Switch] at MMA Mode.Adjust [3 Adjust current] The welding current can be changed.

Operation of LIFT TIG function

Please follow installation instructions to install the TIG torch and working clamp. In Lift TIG welding mode,adjust [3 Adjust current] the welding amperage can be changed.

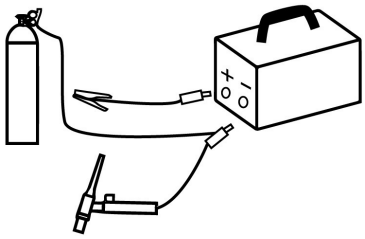
The TIG welding function is for thin workpiece welding or stainless steel welding. Use 100% Argon gas as shielding gas.

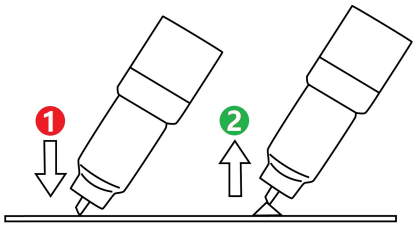
Connect the gas hose with gas tube on torch.Connection of gas cylinder（Refer to 2.3）

Connect the TIG torch on negative connector.

Connect the working clamp cable on positive connector(DCEN).

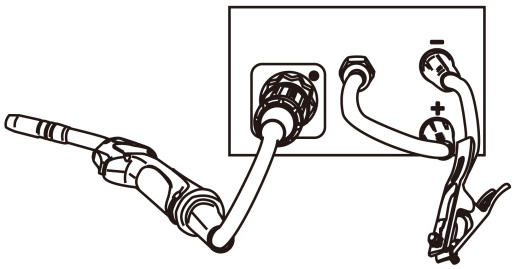
Tungsten needle electrode contact workpiece arc striking





Operating Procedures for MIG

Gas Protection Welding-Solid wire



Welding wire Installation. (Refer to 2.1)

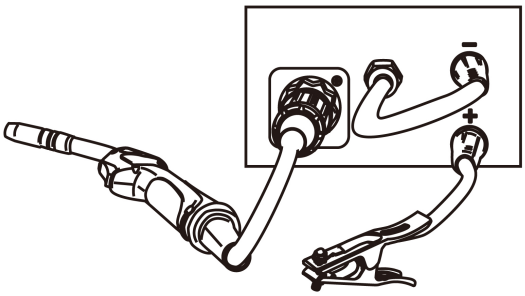
Use the V-groove roller for stainless steel and carbon steel.

Connection of the gas cylinder(Refer to 2.3)

Insert the quick connect end of the MIG Gun selection cable into the positive connector on the front panel (DCEP).Insert the quick connect end of the working clamp cable into the negative connector on the front panel on the machine.Check wire operation：press torch trigger, the wire feeder will feed the wire through the torch tip. Select MIG mode on the front control panel. After that, select the right material and diameter you are welding with. Adjust amperage according your workpiece thickness.

To find the best welding performance and suitable for your welding habits. You may also adjust voltage to build a perfect welding bead and penetration.Push welding is adopted, which is called left welding, that is, push welding from the right to the left.

Gasless Welding-flux cored wire



Welding wire Installation.(Refer to 2.1)

Use the proper diameter Knurled roller for flux cored wire.

Insert the quick connect end of the MIG Gun selector cable into the negative connector on the front panel of the machine (DCEN).Insert the quick connect end of the working clamp cable into the positive connector on the front of the machine.Check wire operation：press torch switch, the wire feeder will feed the wire through the torch tip.Select MIG mode on the front control panel. After that, select the right material and diameter you are welding with. Adjust amperage according your workpiece thickness.

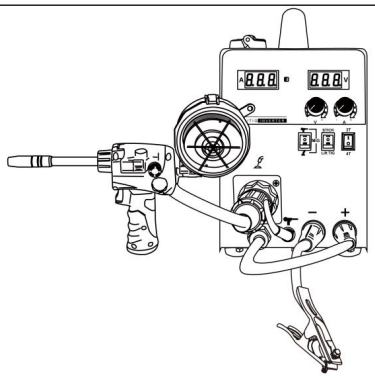
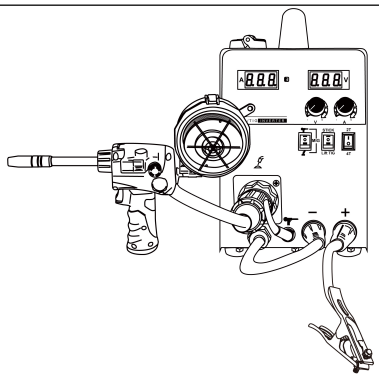
To find the best welding performance and suitable for your welding habits. You may also adjust voltage to build a perfect welding bead and penetration.Pull welding is adopted, which is called right welding, that is, pull welding from the left to the right.

Spool gun torch welding

This machine can be connected to a Spool gun. (the package does not include a spool gun).

The use of spool gun is similar to that of MIG gun, except that the wire is fed through the wire feeding mechanism of the spool gun itself. In the spool gun mode, the feeding mechanism of the original machine does not work.

Select spool gun mode on the front control panel or turn on the “Spool gun” switch at MIG mode.Aluminum welding is supported in spool gun mode.

	
Direct Current Electrode Positive (DCEP):The electrode cable (MMA stinger, MIG gun) connected to the positive (+) connector on the front panel, The workpiece is connected to negative (-) connector by the work clamp cable. Suitable for positive wire or stick electrode.	Direct Current Electrode Negative (DCEN):The workpiece is connected to the positive (+) connector on the front panel. The welding electrode cable (MMA stinger, MIG gun, TIG Gun) is connected to the negative (-) connector pole. Suitable for negative wire stick electrode.
Solid Wire,**Welding aluminum**@MIG Mode,alkaline welding electrode@Stick Mode	Flux Cored Wire@MIG Mode,LIFT TIG Mode

How to welding aluminum:

Because aluminum dissipates heat very quickly, more heat is required during welding, and the cooling speed of the workpiece is too fast, resulting in that the gas generated by various reasons cannot be discharged in time during the welding process, resulting in the formation of pores. The melting point of aluminum is only 600 ℃, and the welding current is slightly high, causing the workpiece to burn through. Aluminum is also very easy to oxidize. The melting point of the surface Aluminum oxide is 2000 ℃, which is very different from that of aluminum. The Aluminum oxide will form welding protection for aluminum; Aluminum has good ductility and soft material, which makes wire feeding difficult; The expansion coefficient of the welding line is large, and it is easy to deform and produce cracks, which brings great difficulties to the welding of aluminum.

Precautions for aluminum welding:

- Clean the oxide film on the aluminum surface with a stainless steel brush, and clean the aluminum welding wire surface with acetone.
- Select MIG mode for machine function and switch the gun mode to spool gun mode.
- Correctly connect the spool gun to the machine(DCEP).
- Install the aluminum welding wire with matching diameter to the spool gun.
- Welding aluminum must be protected with 100% argon.
- Push welding is adopted, which is called left welding, that is, push welding from the right to the left.
- Select the appropriate current according to the thickness of aluminum material. You can try to start with a small current until you find the appropriate current.
- The position and angle of the gun head shall be adjusted according to the position of the welding space, and the speed of the technique shall be determined according to experience. However, when the molten pool is initially formed, the welding gun shall be pushed forward.

How to weld wires of other diameters

Based on the powerful intelligent capability of the digital control panel, the machine has automatically set the current and voltage parameters of welding wires with different diameters in different modes, which is very friendly to novice

users.However, due to the space limitation of the operation panel, the machine cannot display all the welding wire specifications with different diameters on the panel for the user to choose, and can only select the most commonly used welding wire specifications for the user to choose. How to weld the welding wire that is not on the operation panel? This is an interesting thing.

Precautions for welding wires with other diameters

- Prepare a wire feeding wheel that matches the diameter of the welding wire. The knurled wheel or U-shaped wheel is used for flux cored welding wire, and the V-shaped wheel is used for solid cored welding wire.
- Prepare for welding according to MIG mode.
- Machine function selection MIG mode.
- Select the option close to the actual welding wire diameter on the control panel.
- Optimize voltage matching parameters through Voltage minor adjust knob.
- Start welding.
- Adjust the current and fine adjust the voltage according to the actual welding conditions.

Fault display：

OC light

When the welding load is overloaded and the output current of the machine is too large, the internal temperature of the machine will become too high, and the machine fault light will come on. This is normal. The machine will recover after it cools down and the temperature has returned to normal. If it does not, please shut the machine down and restart it. If the machine is damaged, the fault light will be on, in this case, the machine needs maintenance, please contact the supplier.

Failure warning indication

Fault codes	Fault	Cause	Troubleshooting
Err 1	Overcurrent protection.	The machine is overloaded during operation, or internal components are damaged.	Check whether the fan is rotating,let it rest for 5 minutes..
Err 2	Overheat protection.	The welding machine is overheated.	Restart the machine. If it cannot be resolved, please contact your seller.
Err 3	Overcurrent and Overheat protection.	Err 1 and Err 2	Restart the machine. If it cannot be resolved, please contact your seller.
Err 4	+15V undervoltage protection.	control circuit working voltage undervoltage protection.	Restart the machine. If it cannot be resolved, please contact your seller.
Err 5	Overcurrent and undervoltage protection.	Err 1 and Err 4	Restart the machine. If it cannot be resolved, please contact your seller.
Err 6	Overheat and undervoltage protection.	Err 2 and Err 4	Restart the machine. If it cannot be resolved, please contact your seller.

3.3 Polarity Conversion Joint

This machine has the polarity conversion; There are positive and negative connector on the front panel. When using solid wire with gas shielding, the polarity selection cable should be connected to the positive connector, the working clamp cable should be connected to the negative connector; When using flux-cored wire the polarity selection cable should be connected to the negative connector and the working clamp cable should be connected to positive connector.

4 Trouble Shooting And Error Checking

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
The meter show nothing; Fan does not rotate; No welding output	➢ 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).
The meter shows; Fan works normally; No welding output	➢ 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)
the meter shows; Fan works normally; Abnormal indicator lights.	➢ 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)

Even if the machine comes up with abnormal phenomenon such as unable to weld, arc unstable or bad welding effect, it is still early to judge that there is malfunction in the machine.

The above-mentioned abnormal phenomenon may be caused by some reasons. For example: tight parts loosen, forgetting to switch on, wrong set up, cable broken and gas rubber pipe cracked, etc. Therefore, please test and inspect these factors before deliver it back to the factory because a large number of troubles may be easily solved probably.

For this reason, an initial diagnosis list for general welding troubles is shown below. A trouble happened may be found in the column of “Abnormal items” on up-right of the list, please inspect and maintain for the corresponding items which have “○" mark in the column according to the following list respectively.

Initial problems diagnose

Area and Item to be Inspected and Maintained / Abnormal Items		No arc Starting	No Gas out	No Wire Feeding	Bad Arc Ignition	Unstable Arc	Dirt on Edge of Weld bead	Wire Stick to material	Wire Stick to Conductive Tip	Blowhole Formed
Distribution Boxes (Input Protection Devices)	➢ Turn on power supply or not? ➢ Fuse burnt out ➢ Connection joint loose	○	○	○	○	○	○			
Input Cable	➢ Examine whether the cable is cut off. ➢ Connection joint loose ➢ Over heat	○			○	○	○			

Welding Power Operation	➢ Turn on power supply or not? ➢ Phase Lacking	○	○	○	○	○	○	○	○	
Gas Cylinder and Gas Regulator	➢ 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)	➢ Connection joint loose ➢ Gas hose damaged									○
Wire Feeding Device	➢ 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	➢ 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	➢ 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	➢ Break off (bending fatigue) ➢ Damaged by weighted drop	○	○	○		○		○		
Surface Condition of Parent material and length that wire stretches out	➢ Oil, dirty, rust and paint residues ➢ Too long length of wire stretched out				○	○	○	○		○
Output Cable	➢ Cross-section of cable that connects to parent material is not enough ➢ Loose connection of （+），(-）output cable ➢ Bad electric conductivity of parent material				○	○	○			
Lengthened Cable	➢ Cross-section of cable is not enough ➢ It is rolled up or folded				○	○	○	○		
Work Condition for Welding	➢ Welding current, voltage, angle of weld gun, welding rate and wire length stretched out should be confirmed once again				○	○	○	○	○	

5 Daily Maintenance And Checking

5.1 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 loosing 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.

⚠ WARNING

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.

5.2 Daily Checking

WELDING POWER SUPPLY		
Position	Checking keys	Remarks
Control panel	➢ Operation, conversion and installation of the switch ➢ Check the state of the power indicator light	Lead to unstable arc and wire sending
Cooling fan	➢ Check if the fan state and the sound is normal or not	Clean the residue and check the reason and solve it
Power part	➢ 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	➢ 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
Loophole	➢ 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.

CABLE		
Position	Checking keys	Remarks
Output cable	➢ 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)	For life security and stable welding, adopt suitable method to check according to working place Simple check daily Careful and in-depth check on fixed period
Input cable	➢ 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	In case of leakage and to ensure safety, please do perform daily checking
Earth cable	➢ If the earth cable that connects the main part is broken and connects tightly	

5.3 Welding Problems And Solutions

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

Arc starting difficulty. Arc interruption happens easily:

- Examine whether the working clamp has good contact with the work pieces.
- Examine all cable connections and make sure they are tight.

The output current fails to reach rated value:

The deviation of power voltage from rated value may cause the output current to not achieve the 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:

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

Porosity in welds:

- Examine whether the gas supply circuit has any leaks.
- Examine whether there is contaminants such as oil, dirt, rust, paint etc. on the surface.

6 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.

6.1 Welding Environment And Safety

Working surroundings

(1) Welding should be carried out in dry surroundings. The air humidity level should not be higher than 90%.
(2) The temperature should be between -10°C to 40°C.
(3) Don’t use the welding machines in sunshine or rain. Keep it dry.
(4) Don't use the machines in the places of dust or corrosive air.
(5) MIG welding should not be carried out in places with god ventilation.

Safety norms

Over-voltage, over-current and over-heating circuits are built into the welding machine. 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 damaged. Please pay close attention to the following matters.

Keep good ventilation!

The welding machines work with high welding current.Normal air flow can’t provide 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 it should not be less than 0.3m. Good ventilation is good for welding performance and operational life.

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 shortens the operational life, and can even damage the machine.

Never over voltage!

The Input Voltage can 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 will be damaged. Users should take protective measures in advance to avoid it.

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.

6.2 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	Texts 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.

Symbol	Description

	➢ Touching any live electrical part may cause fatal electric shock or burns.
	➢ Welding fumes and gases are hazardous to health. ➢ Working in tight places can cause suffocation due to lack of oxygen.
	➢ 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.
	➢ Arc light can cause eye irritation or skin burns and other body injuries. ➢ Spatter and welding slag can burn eyes or burn the skin.
	➢ 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.

⚠DANGER **To avoid accidents, please observe the following rules:**

- Do not use this machine for other works but welding.
- The construction of the input power source, the setting of the installation site, the use of high-pressure gas, storage and disposition, the storage of the workpiece after welding and the disposal of waste shall be carried out in accordance with the relevant regulations.
- Irrelevant staffs do not enter the welding work place.
- Pacemaker wearers should consult with their doctor before operating.
- Please let qualified people or persons which with relevant knowledge and skills to install, operate, maintain and repair the welder.
- To ensure safety, please understand the contents of this manual.

⚠DANGER **To avoid electric shock, please observe the rules：**

- Do not touch live parts.
- Let relevant technicians connect the welder and base metal grounding correctly.
- It must switch off the power when installation, maintenance, and waiting 5 minutes before operation. Capacitors can be charged, even if the power has been cut off, but also to ensure that the capacitor is not charged voltage, and then operate.
- Do not use cables that have insufficient cross-sectional area, damaged insulation sheath, or exposed conductors
- In the cable connection, please ensure the insulation.

- Do not use the welder when the case opened or removed.
- Do not use insulated gloves which is damaged or damped.
- Please use safety net when working at height.
- Regular maintenance and repair, and please repair the damaged parts before using.
- When not in use, turn off all input power.
- When using AC arc welder in narrow places or higher places, please observe the relevant national and local standards and regulations.

⚠DANGER **To prevent fire and explosion, please observe the following rules：**

- Do not place flammable materials near the welding place.
- Do not welding near flammable gas.
- Do not place the hot finished base material close to flammable material.
- When welding in the patio, on the ground and the wall, please remove the combustible materials on the back.
- The cable connected with the base metal as close as possible to the welding spot.
- 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.
- 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:

(1) The upper, lower and adjacent power cables, control cables, signal cables and telephone cables of the welding equipment;
(2) Radio and television transmitting and receiving devices;
(3) Computer and other control equipment;
(4) Safety identification equipment, such as the monitoring of industrial equipment
(5) People Health conditions such as cardiac pacemakers and hearing AIDS;
(6) Equipment used for calibration and measurement;
(7) 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;
(8) The actual situation of welding or other activities carried out.

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

(1) According to the manufacturer's suggestion, the welding equipment should be connected to the main supply line;
(2) According to the manufacturer's suggestion, welding equipment should be maintained routine;
(3) The welding cables should be as short as possible so that they are close to each other and close to the ground;
(4) All the metal components of the welded assembly and its adjacent components shall be subject to safety verification;
(5) The workpiece should be kept well grounded;
(6) 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.

7 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)
Square butt welding	Low welding speed	0.8	0.8,0.9	0	60～70	16～16.5	50～60	10	10
		1.0	0.8,0.9	0	75～85	17～17.5	50～60	10	10～15
		1.2	0.8,0.9	0	80～90	16～16.5	50～60	10	10～15
		1.6	0.8,0.9	0	95～105	17～18	45～50	10	10～15
		2.0	1.0	0～0.5	110～120	18～19	45～50	10	10～15
		2.3	1.0	0.5～1.0	120～130	19～19.5	45～50	10	10～15
		3.2	1.0	1.0～1.2	140～150	20～21	45～50	10～15	10～15
		4.5	1.0	1.0～1.2	160～180	22～23	45～50	15	15
	High welding speed	0.8	0.8,0.9	0	100	17	130	10	15
		1.0	0.8,0.9	0	110	17．5	130	10	15
		1.2	0.8,0.9	0	120	18．5	130	10	15
		1.6	1.0	0	180	19．5	130	10	15
		2.0	1.0	0	200	21	100	15	15
		2.3	1.0	0	220	23	120	15	20

	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	120～160	20～22	35～45	10～15	10～15
	4.5	1.0	150～180	21～23	30～40	10～15	20～25

		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	45	70～80	17～18	50～60	10	10～15
		1.2	0.9,1.0	45	85～90	18～19	50～60	10	10～15
		1.6	1.0	45	100～110	19～20	50～60	10	10～15
		2	1.0	45	115～125	19～20	50～60	10	10～15
		2.3	1.0	45	130～140	20～21	50～60	10	10～15
		3.2	1.0	45	150～170	21～22	45～50	15	15～20
		4.5	1.0	45	140～200	22～24	45～50	15	15～20
	High welding speed	1.0	0.8,0.9	45	140	19～20	160	10	15
		1.2	0.8,0.9	45	130～150	19～20	120	10	15
		1.6	1.0	45	180	22～23	120	10	15～20
Horizontal fillet welding joint	Low welding speed	0.8	0.8,0.9	10	60～70	16～17	40～45	10	10～15
		1.2	0.8,0.9	30	80～90	18～19	45～50	10	10～15
		1.6	0.8,0.9	30	90～100	19～20	45～50	10	10～15
		2.3	0.8,0.9	47	100～130	20～21	45～50	10	10～15
			1.0,	47	120～150	20～21	45～50	10	10～15
		3.2	1.0	47	150～180	20～22	35～45	10～15	20～25

8 Service Guarantee

This product is made of high quality material and great care has been taken in its manufacture.It is designed to give good performance provided it is properly operated and maintained.The product is sold subject to the understanding that if any defect in manufacture or material shall appear within 12 months from date of consumer sale,if any defect in main parts over 12 months,the warranty period is subject to country Consumer Law , Our Service will arrange for such defect to be rectified without change under the following warranty items and conditions.

Warranty Terms and Conditions:

The defect is not due to use of the product for other than domestic purposes , or an incorrect voltage, or use of improper accessories,or contrary to operating instructions,or to accidental damage, misuse, neglect or inexpert repair, or incorrect installation, or the product is excessively used for improper purposes other than daily consumption, or accessories belonging to the product,transportation.

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

Warranty period from the purchase date :

1、One year warranty for welding and cutting machine.

2、1 month warranty for welding accessories.

3、The warranty does not cover faults resulting from operation careless handing or not following instructions.

4、Please register your after-sales service information in the following way to obtain the services and benefits you deserve.

Customer service: service@mirthtek.com
Whatsapp：+86 18938887689
Contact number ：(904)571-5453