

USER MANUAL






TGWMIG165MST MIG /STICK/DC TIG

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.

Contents









1	Attention.....	1
2	Product brief introduction.....	6
	2.1 Summarize.....	6
	2.2 Technical parameters.....	7
3.	Installation instructions.....	8
4	operating instructions.....	10
	4.1 Operation panel interface.....	10
	4.2 Welding operation instruction.....	11
	4.3 Polarity conversion joint.....	12
	4.4 Welding environment and safety.....	12
	4.5 Welding problems and solution.....	13
5	Daily maintenance and checking.....	13
6	Trouble shooting and error checking.....	16
	Initial problems diagnose.....	17
	Initial problems diagnose.....	17
	Appendix I Welding parameter list.....	19

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
	<ul style="list-style-type: none"> ◇ 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.
	<ul style="list-style-type: none"> ◇ Do not place fingers, hair, clothing, etc. near rotating parts such as cooling fans
	<ul style="list-style-type: none"> ◇ The welding wire is shot from the torch and can stab eyes, face and other exposed parts of the body
	<ul style="list-style-type: none"> ◇ 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:

- 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.

2 Product brief introduction

2.1 Summarize

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.



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

2.2 Technical parameters

Machine type	TGWMIG165MST
Supply voltage (V)	1 phase AC 240V±15%
Frequency (Hz)	50/60
Rated Max. input current (A)	26.2 (MIG) 30.1 (MMA) 18.7 (TIG)
Output current adjustment (A)	40-165 (MIG) 30-160 (MMA) 20-160 (TIG)
Output voltage (V)	16.0-22.3 (MIG) 21.2-26.4(MMA) 10.8-16.4 (TIG)
No load voltage (V)	62
Duty cycle (%)	15
Power factor	0.73
Efficiency (%)	80
Wire feeder type	All-in-one
Wire feed speed (m / min)	2-15
Post flow time (S)	1.0
Wire diameter (mm)	0.8/1.0 (stainless steel/carbon steel) 1.0/1.2(flux cored)
Insulation grade	F
Enclosure protection class	IP21
Suitable plate thickness (mm)	0.5-5
Net Weight (kg)	7.8KG
Overall dimension (mm)	410 × 165 × 300

3. Installation instructions

Our welding machine is equipped with power supply voltage compensation device, The power supply voltage can continue to work when the rated voltage is within 15% range.

When using longer cables, in order to reduce voltage drop, use a larger section of the cable is recommended; If the connection cable is too long, It may have a great influence on the arc performance of the welder as other performance of the system. So we recommend that you use the recommended configuration length.

Confirm that the vent of the welding machine is not covered and blocked so as to avoid the failure of the cooling system.

The yellow and green water line of the power supply must be effectively grounded.

gas shielded welding Installation.

- 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

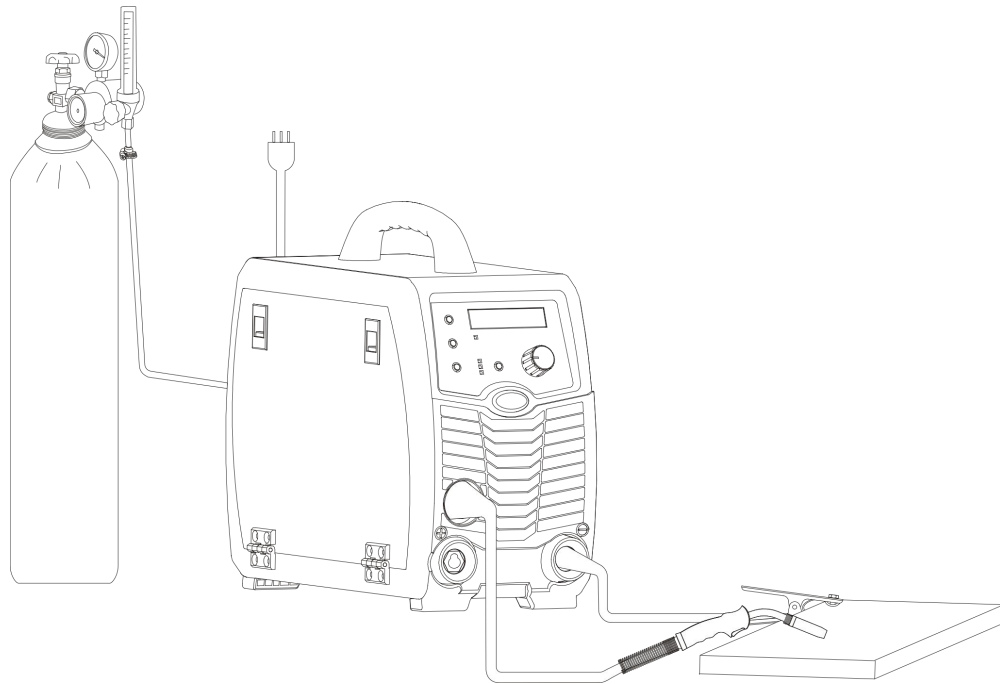
- There are two ways to connect the dc welder normally: Positive connection and negative connection.
Positive connection: Welding pliers connected to the negative pole, workpiece connected to positive pole. Suitable for acid electrode.
negative connection: workpiece connected to the negative pole, Welding 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.

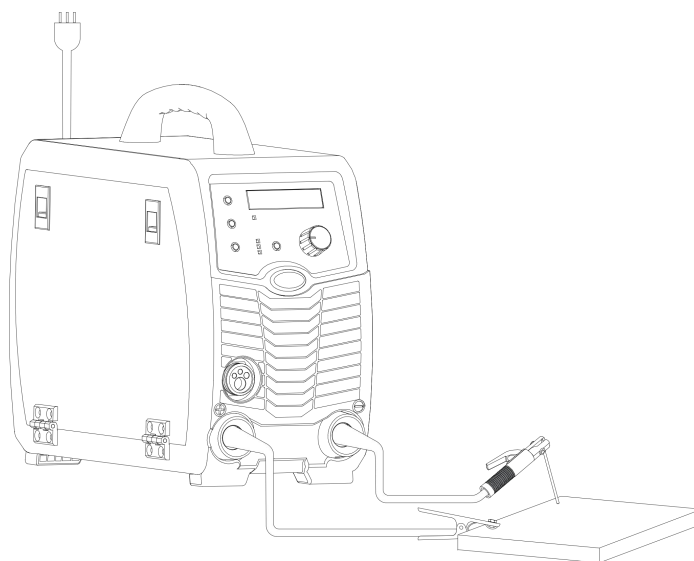
This procedure must be operated by an electrician!

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.

● **Gas shielded welding installation instructions**



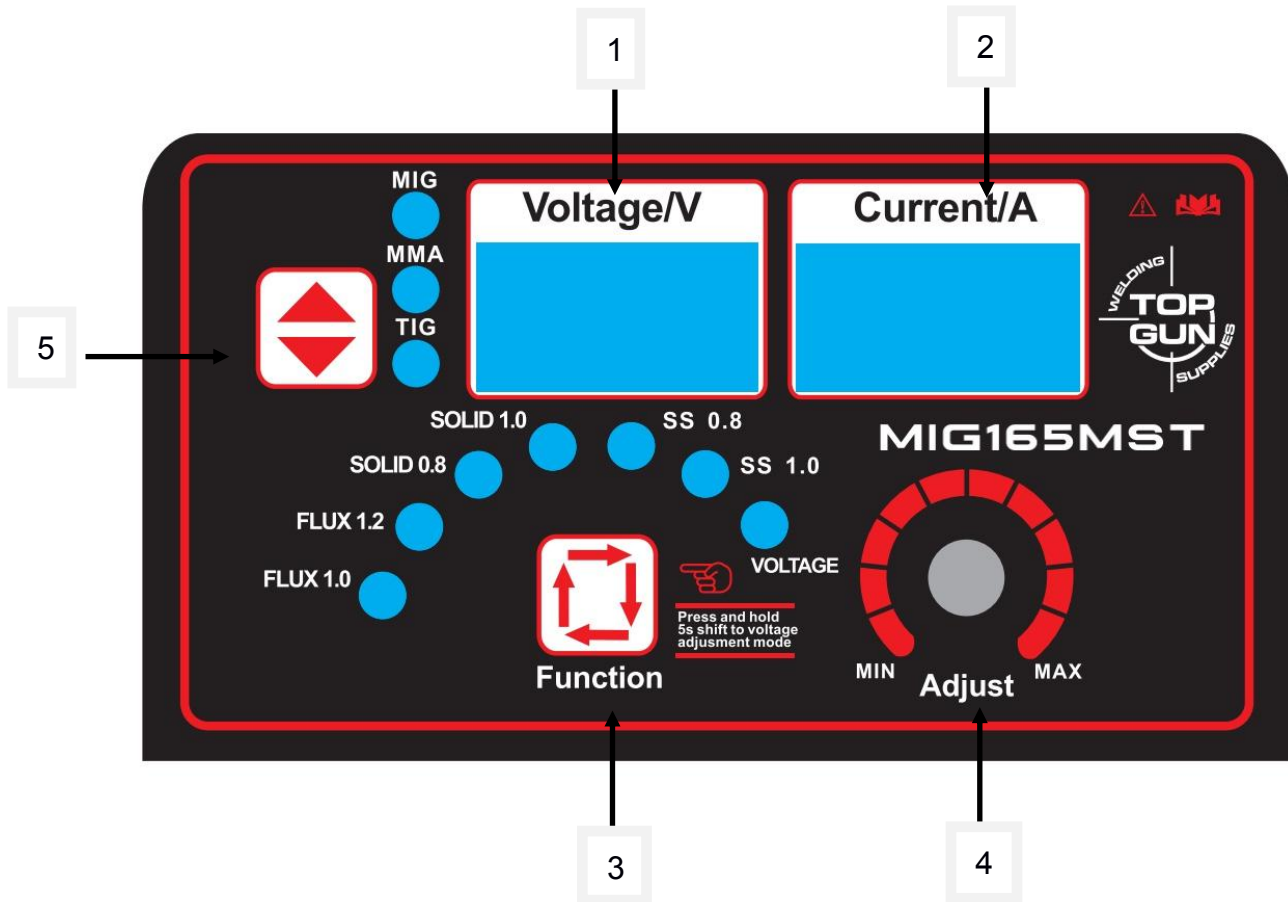
● **Manual arc welding installation (For reference only, please choose the positive connection or negative connection according to the actual choice.)**



4 operating instructions

4.1 Operation panel interface

TGWMIG165MST



1	Voltage display.
2	Current display.
3	Welding mode shift button: 1. Press the button can shift “Flux-cord 1.0” / “Flux-cord 1.2” / “Solid wire 0.8” / “Solid wire 1.0” / “MMA” / “LIFT TIG” functions. 2. Press & hold for 3 seconds, can shift to “Voltage-micro-adjustment” mode.
4	Multiple-function knob: set the welding data based on different mode.
5	Function mode selection MIG MMA LIFT TIG
Remark: Fast adjustment: Press and rotate the knob; Slow adjustment: Rotate the knob only	

4.2 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 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.

4.3 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.

4.4 Welding environment and safety

- **Working surrounding**

- a) Welding should be carried out in dry surroundings. The air humidity level should not be higher than 90%.
- b) The temperature should be between -10°C to 40°C.
- c) Don't use the welding machines in sunshine or rain. Keep it off water.
- d) Don't use the machines in the places of dust or corrosive air.
- e) 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!**

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.

4.5 Welding problems and solution

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:**

- 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 no 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.

5 Daily maintenance and checking

- **Daily maintenance**

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

- **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
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	<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 	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	
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6 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
<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)

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

Initial problems diagnose

Area and Item to be Inspected and Maintained		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
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 				○	○	○	○	○
Output Cable	<ul style="list-style-type: none"> ➤ 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					○	○	○	○

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	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	1.0,1.2	0 ~ 0.5	110 ~ 120	18 ~ 19	45 ~ 50	10	10 ~ 15
		2.3	1.0,1.2	0.5 ~ 1.0	120 ~ 130	19 ~ 19.5	45 ~ 50	10	10 ~ 15
		3.2	1.0,1.2	1.0 ~ 1.2	140 ~ 150	20 ~ 21	45 ~ 50	10 ~ 15	10 ~ 15
		4.5	1.0,1.2	1.0 ~ 1.5	160 ~ 180	22 ~ 23	45 ~ 50	15	15
			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	
	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	1.0,1.2	0	180	19.5	130	10	15
		2.0	1.0,1.2	0	200	21	100	15	15
2.3		1.0,1.2	0	220	23	120	15	20	
	3.2	1.2	0	260	26	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	1.0,1.2	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

		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
	Horizontal fillet	Low welding speed	0.8	0.8,0.9	100	60 ~ 70	16 ~ 17	40 ~ 45	10
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

High welding speed	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
	2. 3 ~ 3.2	1.2	470	220	24	150	15	15
			470	300	26	250	15	15

