PoWer MIG Series

GeKaMac®

POWER MIG 3500 LST-R

Users Manual

Please Read and Understand This Manual
Before Operating The Welding Machine

www.gedik.com.tr

Dear Customer

This instruction manual will help you get to know your new machine. Read the manual carefully and you will soon be familiar with all the many great features of your new product. Meanwhile, please remember well safety rules and operate as instruction.

If you treat your product carefully, this definitely helps to prolong its enduring quality and Reliability things which are both essential prerequisites for getting outstanding results.

Production specification may change without advance notice.

The model you purchase is:

☐ **PoWer MIG 3500 LST-R**

Please find corresponding models from the "Contents".

Important:
Please take special note of safety rules and operate as instruction in case of damage and serious injury.

Safety Rules

“Danger” indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

“Warning!” indicates a possible hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are explained in the text.

“Caution” indicates a possible hazardous situation which, if not avoided, may result in slight or moderate injury.

“Note!” indicates a situation which implies a risk of impaired welding result and damage to the equipment.

Utilization for intended purpose only

- The machine may only be used for jobs as defined by the “Intended purpose”.
- Utilization for any other purpose, or in any other manner, shall be deemed to be “not in accordance with the intended purpose”. The manufacturer shall not be liable for any damage resulting from such improper use.

Safety signs

- All the safety instructions and danger warnings on the machine must be kept in legible condition, not removed, not be covered, pasted or painted cover.

Safety inspection

- The owner/operator is obliged to perform safety inspection at regular intervals.
- The manufacturer also recommends every 3-6 months for regular maintenance of power sources.

Electric shock can kill

- Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In MIG/MAG welding, the wire, drive rollers, wire feed housing and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.
- Do not touch live electrical parts of the welding circuit, electrodes and wires with your bare skin or wet clothing.
- The operator must wear dry hole-free insulating welding gloves and body protection while performs the welding.
- Insulate yourself from work and ground using dry insulating protection

which is large enough to prevent you full area of physical contact with the work or ground.

- Connect the primary input cable according to rules. Disconnect input power or stop machine before installing or maintenance.
- If welding must be performed under electrically hazardous conditions as follow: in damp locations or wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or in occasion when there is a high risk of unavoidable or accidental contact with the work piece or ground. Must use additional safety precautions: semiautomatic DC constant voltage (wire) welder, DC manual (Stick) welder and AC welder with reduced open-load voltage.
- Maintain the electrode holder, ground clamp, welding cable and welding machine in good, safe operating condition. Replace damaged part immediately.

Electric and magnetic fields (EMF)may be dangerous

- If electromagnetic interference is found to be occurring, the operator is obliged to examine any possible electromagnetic problems that may occur on equipment as follow:

- mains, signal and data-transmission leads
- IT and telecoms equipment
- measurement and calibration devices
- Wearers of pacemakers

- Measures for minimizing or preventing EMC problems:

– Mains supply

If electromagnetic interference still occurs, despite the fact that the mains connection in accordance with the regulations, take additional measures

– Welding cables

Keep these as short as possible

Connect the work cable to the work piece as close as possible to the area being welded.

Lay term well away from other cables.

Do not place your body between your electrode and work cables.

– Equipotential bonding
– Workpiece grounding (earthing)
– Shielding

Shield the entire welding equipment and other equipment nearby.

ARC rays can burn.

- Visible and invisible rays can burn eyes and skin.
- Wear an approved welding helmet or suitable clothing made from durable flame-resistant material (leather, heavy cotton, or wool) to protect your eyes and skin from arc rays and sparks when welding or watching.

- Use protective screens or barriers to protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or material.

Fumes and gases can be dangerous

- Welding may produce fumes and gases, breathing these fumes and gases can be hazardous to your health.
- When welding, keep your head out of the fume. If inside, ventilate the area at the arc to keep fumes and gases away from the breathing zone. If ventilation is not good, wear an approved air-supplied respirator.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator.
- Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

Welding and cutting sparks can cause fire or explosion.

- When not welding, make sure the electrode circuit is not touching the work or ground. Accidental contact can cause sparks, explosion, overheating, or fire. Make sure the area is safe before doing any welding.
- Welding and cutting on closed containers, such as tanks, drums, or containers, can cause them to blow up. Make sure proper steps have been taken.
- When pressure gas is used at the work site, special precautions are required to prevent hazardous situations.
- Connect work cable to the work as close to the welding zone as practical to prevent welding current from passing too long and creating fire hazards or overheat.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- Be attention that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas and start a fire. Remove fire hazardous from the welding area, if not possible, cover them thoroughly. Do not weld where flying sparks can strike flammable material and where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Protect yourself and others from flying sparks and hot metal. Remove any combustibles from operator before perform any welding.
- Keep a fire extinguisher readily available.
- Empty containers, tanks, drums, or pipes which have combustibles before perform welding.
- Remove stick electrode from electrode holder or cut off welding wire at

contact tip when not in use.

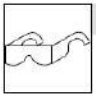
Apply correct fuses or circuit breakers. Do not oversize or bypass them.

Cylinder can explode if damaged.

- Pressure gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.
- Cylinders should be located away from areas where they may be struck or subjected to physical damage. Use proper equipment, procedures, and sufficient number of persons to lift and move cylinders.
- Always install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling over or tipping.
- Keep a safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- No touching cylinder by welding electrode, electrode holder or any other electrically “hot” parts. Do not drape welding cables or welding torches over a gas cylinder.
- Use only correct compressed gas cylinders, regulators, hoses, and fittings designed for the process used; maintain them and associated parts in good condition.
- Use only compressed gas cylinders containing the correct shielding gas for the and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
- Open the cylinder valve slowly and keep your head and face away from the cylinder valve outlet.Valve protection caps should be kept in place over valve expect when the cylinder is in use or connected for use.

Hot parts can burn

- Do not touch hot parts with bare hand or skin.
- Ensure equipment is cooled down before perform any work.
- If touching hot parts is needed, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



Flying metal or dirt can injure eyes

- When welding, chipping, wire brushing, and grinding can cause sparks and flying metal. It can hurt your eyes.
- Remember wear appropriate safety glasses with side shields when in welding zone, even under your welding helmet.

Noise can damage hearing

- Noise from some processes or equipment can damage hearing.

Remember wear approved ear protection to protect ears if noise level is high.

Moving parts can injure

- Stay away from moving parts such as fans.
- Stay away from pinch points such as drive rolls.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for servicing and maintenance.
- Reinstall doors, panels, covers, or guards when servicing and maintenance is finished and before reconnecting input power.

Overuse can cause overheating

- Use machine follow duty cycle. Reduce current or reduce duty cycle before starting to weld again.
- Allow cooling period.

Do not block or filter airflow to unit.

Safety markings

Equipment with CE-markings meets the basic requirements of the Low-Voltage and Electromagnetic Compatibility Guideline (e.g. relevant product standards according to EN 60974).

Safety markings

Equipment with CCC markings meets the requirements of implementations rules for China compulsory certification（e.g. relevant product standards according to GB/T 15579）.

Safety markings

CSA marked equipment meets the requirements of the North American market safety certification implementation rules (e.g. relevant product standards according to CAN/CSA-E60974,ANSI/IEC 60974)

Contents

1-GENERAL REMARKS

1-1 Power source features

This series of power sources apply IGBT soft switch inverter technology. Its internal control system applies DSP which ensures quick response to any change during the welding process so as to achieve precise control of welding process and ensure optimal welding results. The strong ability of arc self-adjustment ensures a highly stable welding current against grid fluctuation and arc length change to get optimal results.

This series has 3 core system, almost can communicate with all robots on market by digital /analogue interface. Perform welding work easily.

Features and benefits:

- High speed DSP+FPGA multi-core system, can shorten control period to control arc effectively;
- Periodic molten drop control technology, molten pool is more stable, with beautiful welding seam formation;
- Welding spatter for carbon steel decreases 80%, reduce spatter clean work; heat input reduces 10%~20%, small deformation;
- Work with robot like KUKA,ABB,FANUC,YASKAWA,KAWASAKI,COMAU,IGM etc;
- Built-in integrated analog communication.Optional expansion of DeviceNET, RS485, CAN, EthernetIP, PROFINET and other digital communication interfaces to seamlessly integrate with the robot;
- Open type communication mode, robot can control all parameters of welding machine;
- Built-in start point test function, can achieve welding seam start point test without adding robot hardware;
- With precise pulse waveform control technology, and lower heat input to avoid burn through and deformation, also reduce 80% spatter, realize very thin plate low spatter welding. This technology is widely used in bicycle, fitness equipment, automobile component, and furniture industries.

1-2 Functional principle

This series of power sources adopt IGBT soft switch inverter technology to improve the dynamic response rate and make the machines with small size and light weight. The control circuit's closed-loop control makes the power source enjoy strong ability against power grid fluctuation and perfect welding performance. The schematic diagram is as shown in Fig. 1-2-1:

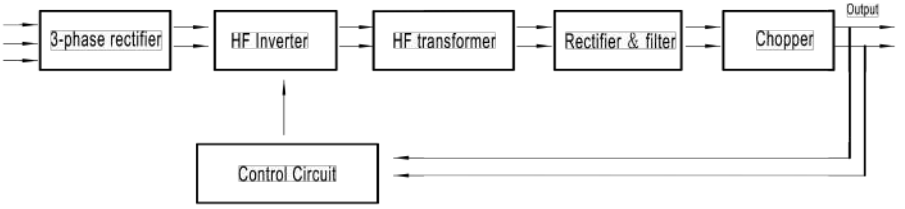


Fig.1-2-1 Schematic diagram

1-3 Output characteristics

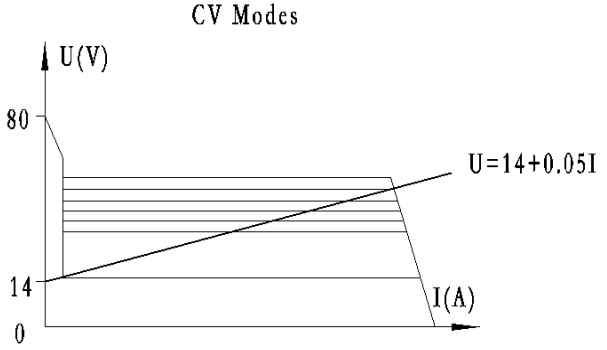


Fig.1-3-1 Output characteristics

1-4 Duty cycle

Duty cycle is percentage of 10 minutes that a machine can weld at rated load without overheating. If overheats, thermostat(s) will open, output stops. Wait for fifteen minutes for the machine to cool down. Reduce amperage or duty cycle before welding.

Note! Exceeding duty cycle can damage the machine and greatly reduce its lifespan.

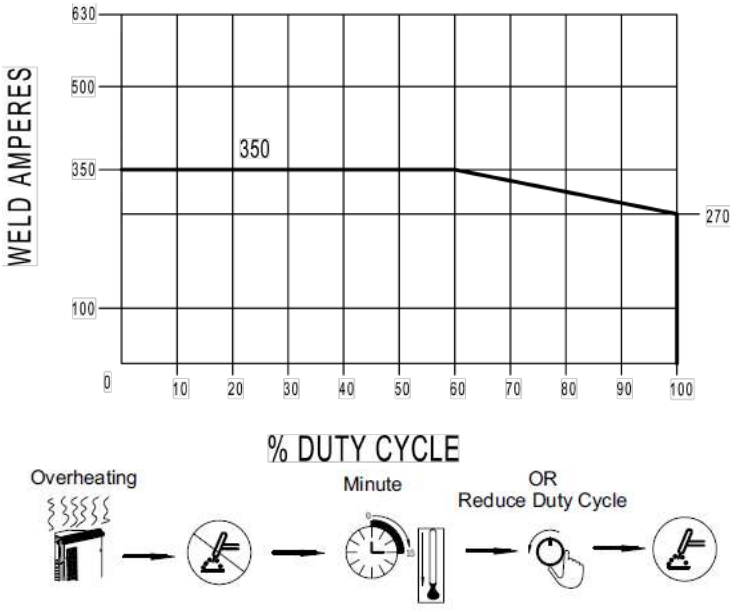


Fig.1-4-1 Duty cycle

1-5 Applications

This series of machines have many welding processes and can weld most of the metal materials, including carbon steel, alloy steel, etc.

Recommended areas of use as follows:

- Automated application
- Robot application
- Automobile and components supply industry
- Chemical plant construction
- Boiler and pressure vessel
- Shipyards
- Power plant construction
- Vehicle manufacturing
- Machinery industry
- Others

1-6 Warning label

The warning label is affixed on the top of machine.

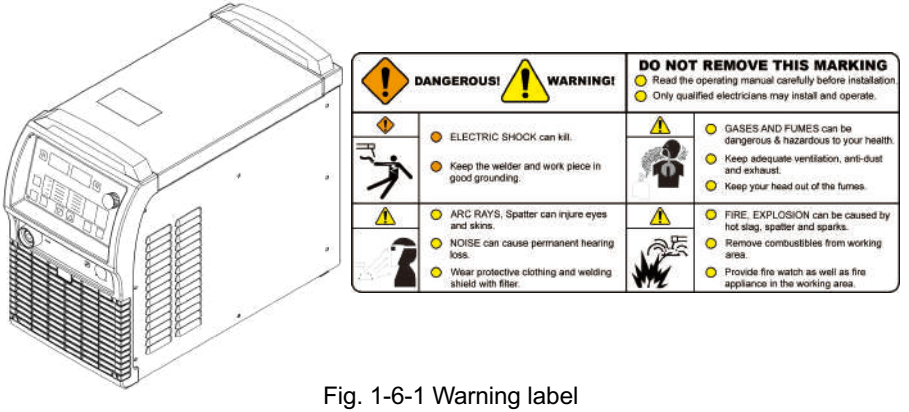


Fig. 1-6-1 Warning label

2-VERSIONS BRIEFS

Professional welding of special materials requires special welding parameters. Different models of the power sources are matched to different welding

- **PoWer MIG 3500 LST-R**

This series inverter welding machine is specially designed for working with robot, equip with robot matching wire feeder, which communicate with robot through digital/analogue interface, and combine robot welding system. It has MIG,LST (low spatter technology) welding processes.

3-BEFORE COMMISSIONING

Warning! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described here until you have read and completely understood “safety rules”.

3-1 Utilization for intended purpose only

The power source may only be used for MIG,LST. Utilization for other purposes, or

in any other manner, shall be deemed to be "not in accordance with the intended purpose". The manufacturer shall not be liable for any damage resulting from such improper use.Operate, inspect and maintain should follow all the instructions given in this manual.

3-2 Machine installation rules

According to test, protection degree of this power source is IP23. However, the internal key components must be protected from direct soaking.

Warning! A machine that topples over or falls from its stand can cause injury. Place equipment on an even, firm floor in such a way that it stands firmly.

The venting duct is very important for safety protections. When choosing the machine location, make sure it is possible for the cooling air to freely enter and exit through the louvers on the front and back of machine. Any electro conductive metallic dust like drillings must not be allowed to get sucked into the machine.

3-3 Power source connection

- The power source is designed to run on the voltage given on the nameplate.
- The mains cables and plugs must be mounted in accordance with the relevant technical standards.
- The power supply sockets that come with power source are designed to use strictly according to the marked voltages.

Note!Inadequately dimensioned electrical installations can lead to serious damage. The mains lead, and its fuse protection, must be dimensioned in accordance with the local power supply. The technical data shown on the nameplate shall apply.

3-4 Welding cables instruction

When welding, please pay attention to the followings:

a. The welding cables should be kept as short as possible;

b. If extended cable is used, please do as shown in Fig. 3-4-1.

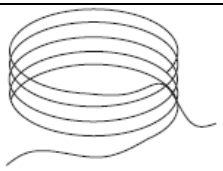
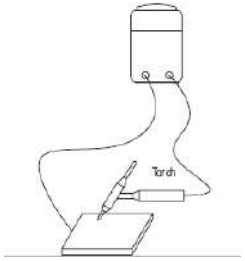
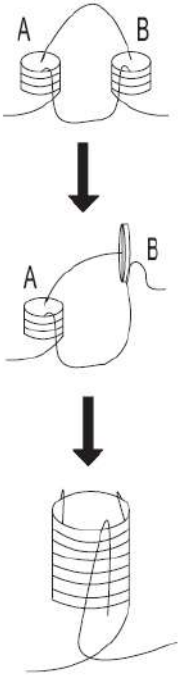
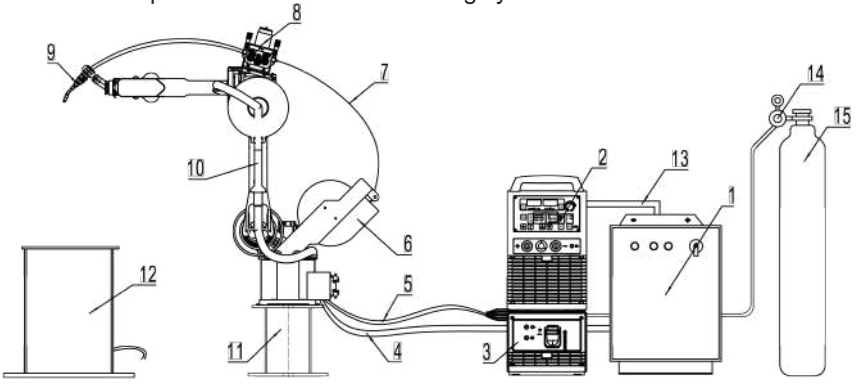
Wrong Coil the excess ground cable and welding cable in same direction respectively.	
Correct Straighten the ground cable and welding cable and make them close to each other. Bundle the ground cable and welding cable together, running the wires close to the ground.	
Correct When the excess cables are only be used by rolling up, coil the cables to two windings in reverse direction and overlap them. The number of turns for A is same as the number for B. Handle the welding cable and ground cable according to above-mentioned method.	

Fig. 3-4-1 Welding cables instruction

4-ROBOT SYSTEM

4-1 System components

This series inverter welding machine is specially designed for working with robot, it needs follow parts to combine robot welding system.



1.Robot Control cabinet	5.Wirefeeding cable	9.Torch
2.welding machine	6.Wire box	10.Robot body
3.water cooler	7.Guide wire tube	11.Robot support
4.Robot control cable	8.Wirefeeder	12 Tooling table

Fig. 4-1-1 System components

4-2 Installation

● **Power supply and cable requirement**

Model		PoWer MIG 3500 LST-R
Power supply		3phase,AC380/400/415/460V±10%, 50/60Hz
Electricity grid min. power (KVA)	Power grid	22
	Generator	30
Input protection(A)	Fuse	30
	Circuit breaker	63
Cable size (mm²)	Power cord	≥4
	Welding cable	50

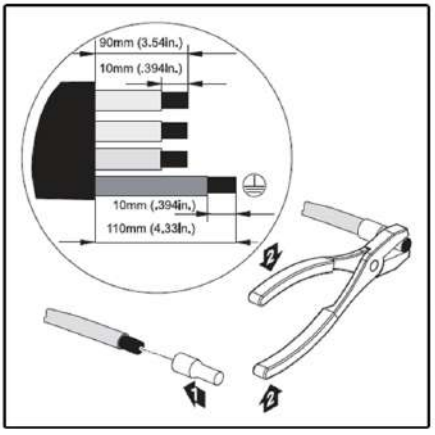
	Protective GND wire	≥4

Table4-2-1: Power supply and cable requirement

Note! Welding machine must be taken special design if it is powered by generator, please contact with manufacturer if you have such needs.

Warning! Be careful! Short circuit will cause the risk of personal injury and property loss.

- Operating by professional electrician
- Avoid hot-line work



1.The user should have a corresponding power distribution cabinet and a corresponding circuit breaker, and its current rating should be greater than or equal to the rated current specified on the nameplate of the welding power source.

2.Please connect according to the diagram or other correct way, the yellow-green wire should be grounded reliably.

Fig. 4-2-1 Connections for power cord and distribution box

● **Welding cable connection**

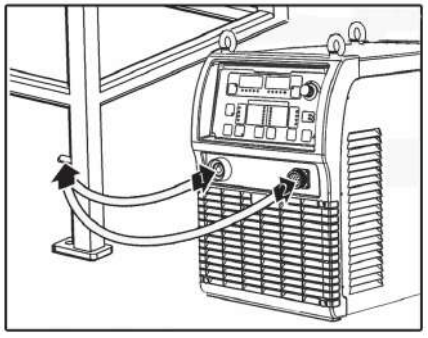
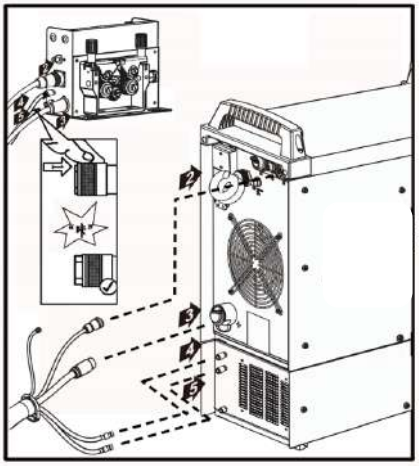


Fig. 4-2-2 Welding cable installation

1.Plug one end of the ground cable to the output socket (-) of power source and turn it to fasten it,connect the other end of the ground cable to the work piece.

2.Plug one end of the voltage feedback cable to the control socket of power source,connect the other end of the voltage feedback cable to the work piece.

● **Wire feeding cable connection**



1.Check the water outlet and inlet

2.Connect the welding power source and the wire feeder with a control wire.

3.Connect welding power source and wire feeder with welding cable.

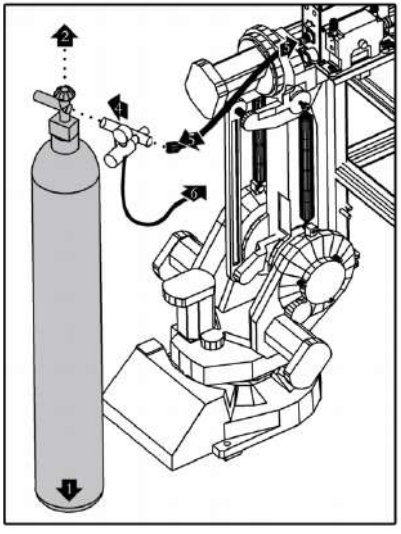
4.Connect the water outlet of the water cooler and the wire feeder with a blue water pipe

5.Connect the water inlet of the water cooler and the wire feeder with a red water pipe

Fig. 4-2-3 Wire feeding cable installation

●**Gas cylinder installation**

Warning! The falling of the gas cylinder will bring the risk of personal injury and property damage.



1. Place the gas cylinder in a flat place and fix it.

2.Remove the protective cap of the cylinder.

3.Open the cylinder valve and close it immediately to blow off all dust.

4.Tighten the gas meter to the gas cylinder.

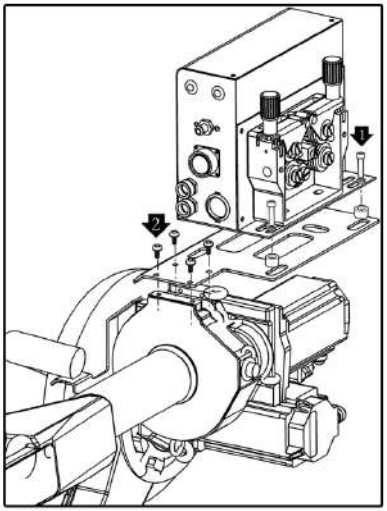
5.Use a gas pipe to connect the protective gas hose to the gas meter; the recommended gas flow is 15 ~ 20L / min.

6.Connect the gas meter heating device cable to the heating power output socket on the rear panel.

Fig. 4-2-4 Gas cylinder installation

● **Wirefeeder installation**

Note!.Insulation pads and insulation sleeves must be used for insulation between the wire feed mechanism and the wire feeder bracket. Make sure that the fixing bolts are not in contact with any conductive objects.

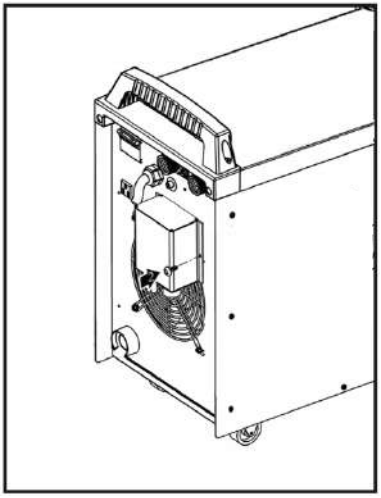


1.Fix the wire feed mechanism on the wire feeder bracket with screws.

2.Fix the wire feeder bracket on the four bolts On the axis of the robot (for the specific position, refer to the robot specification).

Fig. 4-2-5 wirefeeder installation

● **Communication controller installation**



1.Place the communication controller in the position shown in the figure

2.Use two screws to fix the communication controller.

Fig. 4-2-6 Communication controller installation

● **Torch installation**

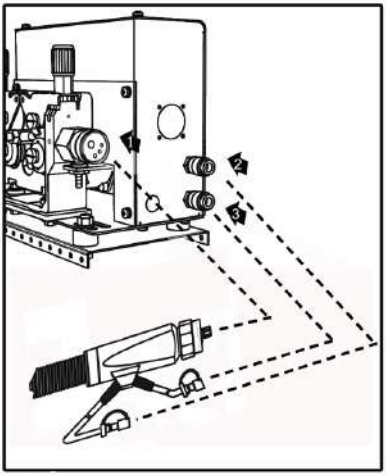


Fig. 4-2-7 Torch installation

1. Connect the tail of the torch to the welding torch interface of the wire feeder.

2.Connect the red water hose of the torch to the red water port of the wire feeder

3.Connect the blue water hose of the torch to the blue water port of the wire feeder

5-PoWer MIG 3500 LST-R

5-1 Interface

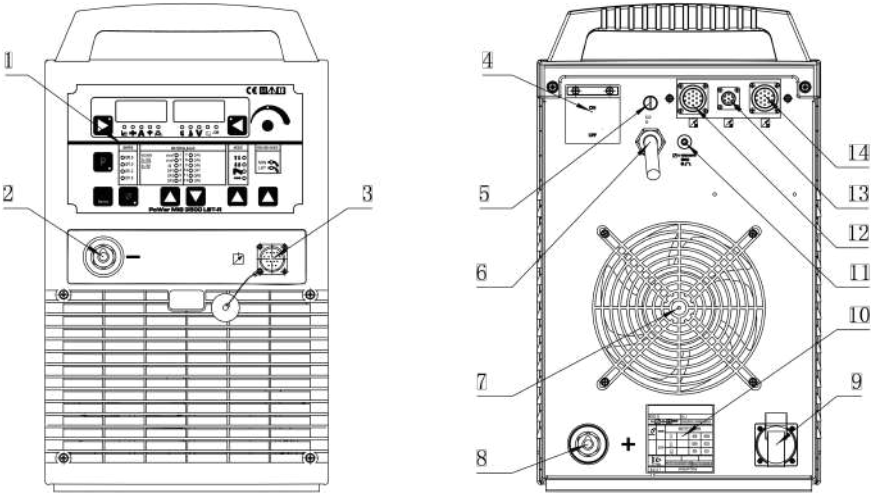


Fig. 5-1-1 interface

1. Control panel

2. Quick socket (-)

For connecting with the work piece by ground cable.

3.Arc voltage feedback socket

It is connected to the work piece through the arc voltage feedback line.

4.Circuit breaker

The function of circuit breaker is to protect welding machine and operator by automatic trip to turn-off power supply when overload or short circuit happens to the power source. Normally, the switch flipped to upward means power- on. To start or stop the welding machine is done by the mains switch in the distribution box. Please do not take this circuit breaker as the power switch.

5.Power cord

Yellow-green cable needs to be grounded firmly.

6.Power supply socket for gas heater(AC36V)

For connecting the heater coil of the CO2 gas regulator.

Note!In different countries and regions, the socket standards are different, please refer to the actual product.

7.Fan

8.Quick socket +

Connect with wire feeder by wire feeder cable.

9.Nameplate

Please refer to the nameplate for the technical parameters of the welding machine.

10.Communication controller

Digital interfaces include EtherNetIP,CANOPEN,CAN,DeviceNet,485, Profinet, and EtherCAT etc.

11.Wire feeder over load protector

This protector will turnoff (jump up) automatically when wire feeder is in fault, such as over load. Press this protector after trouble shooting.

12. Analogue connector X5

Analogue connector can use analogue control cable to connect robot, low cost, high reliability, can perform basic welding process by robot, but cannot use expert database.please reference robot interface.

13.Wire feeder control socket X7

For connecting with the wire feeder of robot,please reference robot interface.

14.Digital connector X6

Digital connector control function is powerful, with strong universality, can match with most robots in market. But this robot needs to have digital communication module, and need to purchase digital interface box from specified

5-2 Control panel

The functions on the control panels are all arranged in a very logical way. The various modes and parameters needed for welding are easy to select by pressing the appropriate button; parameters are easy to be adjusted by rotating encoder. Synergic adjustment makes the complicated operation much easier.

Note! Some described parameters in this manual may be slightly different from the power source, some identification may be slightly different from power source identification, but the manner of working is the same.

Warning! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described here until you have read and completely understood all content of this manual.

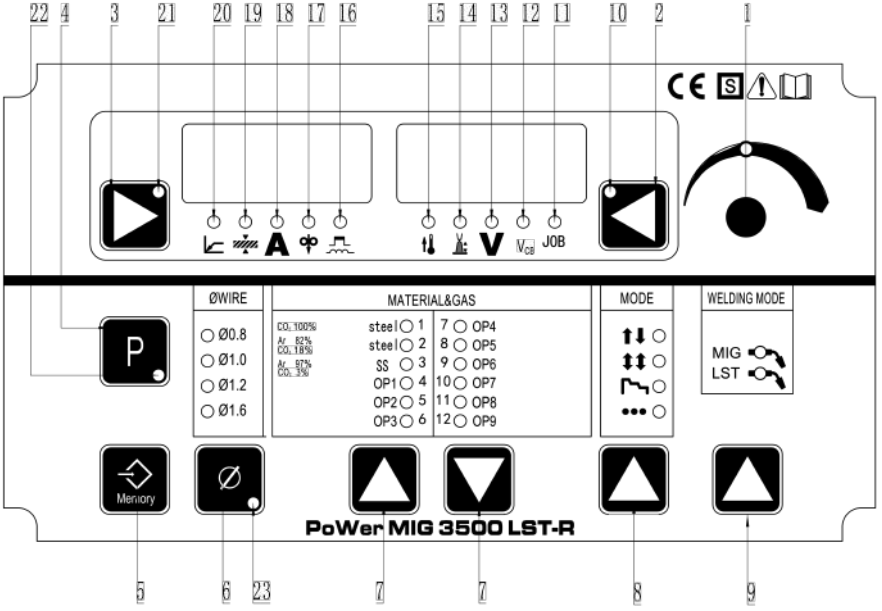


Fig. 5-2-1 Control panel

1. Adjustment knob

Adjust the parameters. When the light is on, this knob can be used to adjust parameters of selected item.

Reset:Press adjustment knob (1) for about 5 seconds, it comes back to factory set.

Important! Values increase in clockwise direction while values decrease in anti-clockwise rotation. To turn the knob left or right while pressing it will achieve quick adjustment.

2.Parameters selection button

Press this button, one parameter indicator light is on, the corresponding parameter is chosen; keep pressing this button can switch among the following parameters:

- Arc length adjustment
- Welding voltage
- Job (Channel) No.

If both the indicators of parameter selection button and the adjustment knob (1) are on, the indicated/ selected parameter can be adjusted with the knob (1).

3. Parameters selection button

Press this button, one parameter indicator light is on and the corresponding parameter is chosen; keep pressing this button can switch among the following parameters:

- Welding current
- Wire speed
- Arc force/ Arc stiffness

Important!On Panel control mode, press this botton to choose one of the above parameters, and value of the parameter can be adjusted by the knob (1).

4. P button

Load stored set of parameters.

5. Memory button

- For accessing the sub-menu parameter set-up menu or (in job mode) for storing parameter settings.

- During creating or correcting a job, store parameter settings.

6. Wire diameter button

For selecting wire diameter.

7. Wire material selection button(s)

For selecting the filler metal and shielding gas type. OP is used for upgrade.

8. MODE button(s)

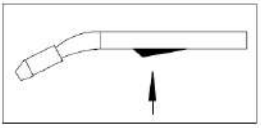
For selecting the operating mode of the torch.

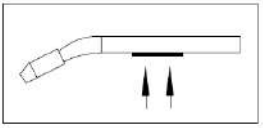
- 2-step mode (standard operating mode)

- Spot welding mode

Operating mode of torch

Graphic symbol





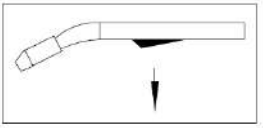


Fig. 5-2-2 Press torch trigger Fig.5-2-3 Hold torch trigger Fig.5-2-4 Release torch trigger

P03……Pre-gas time

I……..Welding current: Uniform thermal input for the preheated base metals.

P08……Spot welding time

P04……Post-gas time

P01……Burn back time

- 2-step mode

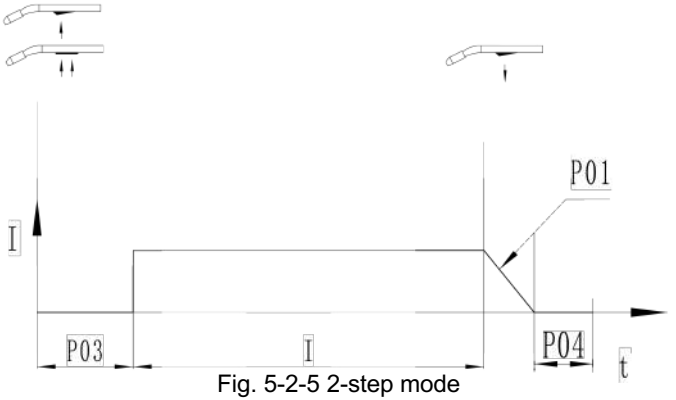


Fig. 5-2-5 2-step mode

- Spot welding mode

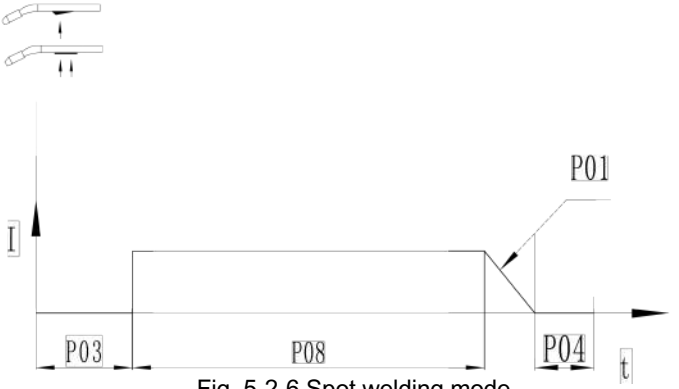


Fig. 5-2-6 Spot welding mode

9. Process button

For select welding process.

- MIG
- LST

10. Selection button indicator

When the indicator lights up, the button(2) works.

11. "JOB" No.

For receiving parameter records/job numbers that were previously saved with "Memory" button.

12 Welding speed indicator

When the light is on, the right display shows the preset welding speed (cm/min) , and the wire speed and welding current & voltage are calculated as a function of the “a”-dimension parameter (20).

13. Welding voltage indicator

When the indicator lights up, the right display shows the preset or actual welding voltage.

14. Arc-length correction parameter

For correcting the arc length (-5.0-+5.0) by adjustment knob (1) when indicator is on, the right display shows the arc length value when the indicator lights up.

- \- shorter arc length
- 0 neutral arc length
- \+ longer arc length

Important!The range (-5.0-+5.0) means that, when preset welding current, the arc length value is -50％～+50％ of the corresponding welding voltage.

15. Temperature Indicator

This is reserved function, cannot operate right now.

16. Arc force/Arc stiffness

Pulse MIG mode adjusts the arc force, MIG mode changes the stability of short-circuit transition.

-The arc is hard and stable

0 Medium arc

+ Soft arc and small splash

17. Wire feeding speed indicator

When the indicator is on, the left display shows the wire feeding speed (in/min), when adjust this button, the relevant parameters will change automatically.

18 Welding current indicator

When the indicator is on, the left display shows the preset or real welding current values

19. Sheet thickness indicator

When the indicator is on, the left display shows the preset sheet thickness (mm). The relevant parameters will change automatically when this value is changed.

20. “a” dimension indicator

When the indicator is on, the left display shows “a” dimension (mm). Wire speed and welding current & voltage are calculated as a function of the “a”-dimension parameter.

(21) Selection button indicator

When the indicator lights up, the button(3) works.

(22) P program mode indicator

When the indicator is on, power source is in “p” program mode.

(23) Sub menu parameters regulation indicator

This indicator is on when in sub menu parameters adjustment.

5-3 Sub menu

5-3-1 Sub-menu parameter

In order to achieve an optimum welding result, it is necessary in some cases to make corrections of the arc-length, arc force as well as parameters like pre-gas time, post-gas time and slow wire feeding. For details of how to set the Sub-menu parameters, please refer to “Sub-menu parameter set”. Specific sub-menu parameters as Table 5-3-1:

Item	Parameters	Setting Range	Min. Value	Factory Setting
P01	Burn back time	0.01～2.00s	0.01s	0.1s
P02	Slow wire feeding	1.0～21.0M/min	0.1 M/min	1.5 M/min
P03	Gas pre-flow time	0.1～10.0s	0.1s	0.20s
P04	Gas post-flow time	0.1～10.0S	0.1s	1.0s
P05*1	Initial period	1～200％	1％	135％
P06*1	Crater filler period	1～200％	1％	50％
P07	Transitional period	0.1～10.0s	0.1s	2s
P08	Spot welding time	0.1～9.99s	0.1s	3s
P09	Digital/Analog signal selection	OFF/ON	--	OFF
P10	Water cooling selection	OFF/ON/ONo	--	OFF
P16	Fan-on demand cooling time	5～15min	5min	5min
P17	Special 2-step arc	OFF/0.1～10s	0.1s	OFF

	start time			
P18	Special 2-step arc stop time	OFF/0.1～10s	0.1s	OFF
P19	Separate adjustment mode	OFF/ON	--	OFF
P22	Arcing pulse current	-50%~50%	1%	0
P23	Duration of arcing pulse	-50%~50%	1%	0
P24	Short-circuit current rise rate	-50%~50%	1%	0
P25	Short circuit current rising knee point	-50%~50%	1%	0
P26	Arcing peak value	-50%~50%	1%	0
P27	Arcing peak time	-50%~50%	1%	0
P30	Inch wire feeding speed	1.0~21.0m/min	0.1	3m/min
P31	Molten drop transition time 1	-50%~50%	1%	0
P32	Molten drop transition time 2	-50%~50%	1%	0
P33	Spatter adjust	-50%~50%	1%	0
P34	Ball removing voltage	-50%~50%	1%	0
P35	Ball removing time	-50%~50%	1%	0

Table 5-3-1: Sub-menu parameter

Note!

*1:P05/P06 need to use the button(2) to switch and display the current percentage and arc length correction value, and the parameter value can be modified by the rotary encoder.

*2: P11-P14 is available on double pulse function;

- P01 Burn back time

If too long time, the wire will burn back too much with too large melting ball at the end of wire; if too short time, the wire will stick with the work piece.

- P02 Slow wire feeding

With too quick feeding speed, the wire will be easily exploding with failed arc-starting; if the feeding speed is slower than the melting speed, the long arc will cause conductive tip burned.

- P03 Gas pre-flow time

Longer time will cause waste of gas and low efficiency; shorter time will cause air hole during arc-starting.

- P04 Gas post-flow time

Longer time will cause waste of gas; shorter time will cause air hole during crater filler period.

- P05 Initial period

Special 4-step mode and set the percentage between initial period and preset parameters. When adjust the initial period, press the button(2) and then adjust dial (1), make correction of the arc length of the initial period. Press this button again to exit.

- P06 Crater filler period

4-sept or special 4-step mode, set the percentage between crater filler period and preset parameters. When adjust the crater filler, press button(2) and then adjust dial (1), make correction of arc length of the crater filler. Press this button again to exit.

- P07 Transitional period

During the special 4-step mode, the time cost from starting current to normal welding current and then to post current.

- P08 Spot welding time

Choose spot welding process and set the welding time.

- P09 Digital/Analog signal selection

In ON mode, welding parameters can be adjusted by welding machine control panel, digital wire feeder control panel; in OFF mode, welding parameters can be adjusted by analog controller.

- P10 Water cooling selection

OFF: gas cooled mode, choose gas cooled torch, no water shortage protection;

ON: water cooled mode, choose water cooled torch, there is water shortage protection.

- P16 Fan-on demand cooling time

Set the time that fan continues to work after power source stops welding.

- P17 Arc start time

On special 2-step mode, time for start period. When choose at number, it is time for start period, when reach to this time, will turn to welding standard; when choose at OFF, the function closes.

- P18 Arc stop time

On special 2-step mode, time for crater filler time. When choose at number, it is time for crater filler, when reach to this time, will turn to stop welding standard; when choose at OFF, the function closes.

- P19 Separate adjustment mode

In OFF mode, current and voltage is synergic adjusted; in ON mode, current and voltage is separately adjusted.

- P22 Pulse current when start arc

Too small will cause wire touches with work piece, and arc start fails. Too large will cause large energy when start arc, and arc has defect.

- P23 Pulse time when start arc

Too short will cause difficult to start arc; too long will cause large energy when start arc, and arc has defect.

- P24 Short circuit rise rate

The higher the short circuit current rise rate is, the harder the arc is, and the large spatter is; otherwise, arc will be softer, spatter will be lesser. Too small will cause unstable welding.

- P25 Short circuit rise knee point

The higher the short circuit rise knee point is, the harder the arc is; otherwise, the softer the arc is. Recommend to use factory setting parameter value.

- P26 Arcing peak value

The higher the arcing peak value is, the longer the arc length is, the stronger the directivity is; otherwise the shorter the arc is, the weaker the arc directivity is. Too low value of this parameter will cause unstable welding.

- P27 Arcing peak time

The longer the arcing peak time is, then the larger arc energy is, the larger welding heat affected zone is; otherwise, the smaller arc energy is, the smaller welding heat affected zone is. Too low value of this parameter will cause deformed weld.

- P30 Inch wire feeding speed

Set manual wire feeding speed.

- P31 Molten drop transition time 1

This parameter is used together with P32, the longer the time is, the larger arc energy is, the longer droplet transfer time is, the softer arc is; otherwise, the smaller

arc energy is, the shorter droplet transfer time is, the harder arc is. Recommend to use factory setting parameter value.

- P32 Molten drop transition time 2

This parameter is used together with P31, the longer the time is, the larger arc energy is, the longer droplet transfer time is, the softer arc is; otherwise, the smaller arc energy is, the shorter droplet transfer time is, the harder arc is. Recommend to use factory setting parameter value.

- P33 Spatter adjust

The longer the parameter is, the larger welding spatter is; otherwise, the smaller welding spatter is. Too small will cause unstable welding, recommend to use factory setting parameter value.

- P34 Ball removing voltage

When remove welding ball, set welding ball removing voltage.

- P35 Ball removing time

When remove welding ball, set welding ball removing time.

5-3-2 Sub-menu parameter adjustment

Enter and exit from the sub-menu and parameters adjustment as Fig. 5-3-1:

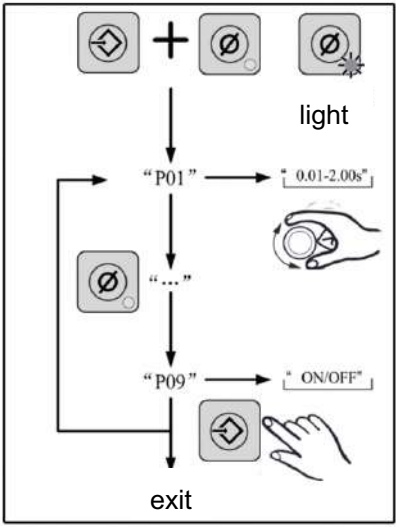


Fig.5-3-1 Sub-menu parameters set

1. Press and hold the “Memory” button(5) and the “wire diameter” button (6) at the same time, the sub-menu indicator lights, and enter the sub-menu.

Important! The last parameter to be selected is displayed! The first-time enter

shows “P01”.

2. Press “wire diameter” button (6) to select parameters.

Note! Also can use wire material buttons (7) to select.

3.Use the adjusting knob to adjust the parameter value.

Important! Adjust the parameters of current percent and arc-length correction firstly before select the parameters of initial standard (P05) and arc stopping standard (P06). Press the button(2) to choose the desired one and then changes the parameters by adjusting knob (1).

4. Press “Memory” button (5) again and then exit from the sub-menu mode. The indicator (23) is off meaning the exiting from the sub-menu.

When this series welding machines are working with robot, some parameters will be adjusted from the robot itself, and the welding machine control panel is not allowed an adjustment, please refer to Table 5-3-2.

While if the operator wants to adjust the parameter from welding machine, please refer to the sub-menu parameter Table 5-3-1, and set the welding machine in panel control mode. Set sub-menu parameter P09 as ON.

Parameters		Parameters that can be adjusted by the welding machine under robot control	
		Analogue Interface	Digital Interface (CAN/485/DEV, etc.)
Arc length correction		×	×
Job No.		√	×
Wire feeding speed		√	×
Welding current		×	×
ARC force/Arc stiffness		√	×
Wire diameter selection		√	√
Wire material selection		√	√
Torch operating mode		√	×
Welding mode selection		√	×
P01	Burn back time	√	×
P02	Slow wire feeding	√	√

P03	Gas pre-flow time	√	√
P04	Gas post-flow time	√	√
P05	Initial period	√	√
P06	Crater filler period	√	√
P07	Transitional period	√	√
P08	Spot welding time	√	√
P09	Local/robot control selection	√	√
P10	Water cooling selection	√	√
P16	Fan-on demand cooling time	√	√
P17	Special 2-step arc start time	√	√
P18	Special 2-step arc stop time	√	√
P19	Separate adjustment mode	√	√
P22	Pulse current when start arc	√	√
P23	Pulse time when start arc	√	√
P24	Short circuit rise rate	√	√
P25	Short circuit rise knee point	√	√
P26	Arcing peak value	√	√
P27	Arcing peak time	√	√
P30	Inch wire feeding speed	√	√
P31	Molten drop transition time 1	√	√
P32	Molten drop transition time 2	√	√
P33	Spatter adjust	√	√
P34	Ball removing voltage	√	√
P35	Ball removing voltage time	√	√

Table 5-3-2 Welding machine controllable parameters for robot applications

Sub-menu parameter for arc start/ crater filler/ short circuit control characteristic

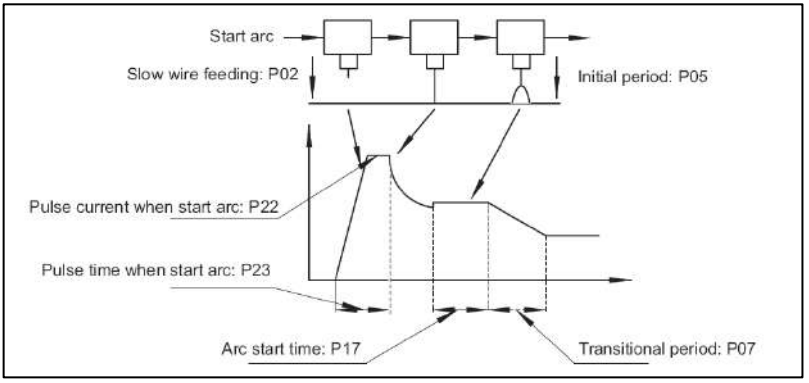


Fig. 5-3-2 Operating mode sequence diagram of start arc

When welding voltage and current settings are correct, but not easy to start arc, please adjust sub-menu parameter as follow table.

Item	Function	Adjust method
P02	Wire feed speed before ignition arc	If the welding wire strikes the work piece quickly before starting the arc, the spatter is severe during the starting arc → reduce the P02 value; if the arc is not open or the starting is very slow → increase the P02 value
P05	Initial period, default state is OFF	Arc start section in weld seam is narrow or work piece does not melt – increase the P05/P17 value Arc start section in weld seam is wide or work piece burned through – reduce the P05/P17 value No problem of arc start section in weld seam - OFF
P17	Initial period function time (arc start time)	
P07	Transitional time from initial period to welding period	Formation changes a lot for arc start section in weld seam – increase the P07 value No problem of arc start section in weld seam - OFF

P22	Pulse current when start arc	Longer arc when start arc, work piece burns seriously, large spatter – increase the P22/P23 value Difficult to start arc, wire explodes, work piece and wire does not fuse - OFF
P23	Pulse time when start arc	

Table 5-3-3 Sub-menu parameter

Sub-menu parameter for crater filler control characteristic

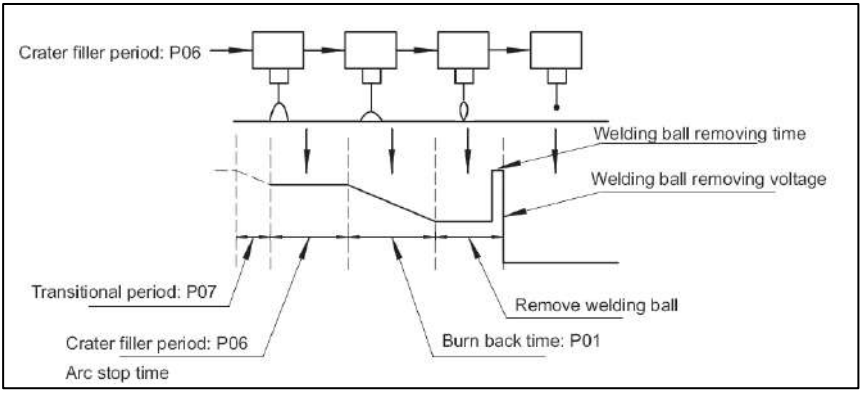


Fig. 5-3-3 Operating mode sequence diagram of crater filler

Item	Function	Adjust method
P07	Transitional time from welding period to crater filler period	Weld seam formation is narrow – increase the paramter value Weld seam formation is wide – reduce the parameter value No problem of weld seam formation - OFF
P18	Crater filler time, default is OFF	
P06	Crater filler period	
P01	Burn back time	Wire sticks with work piece, work piece burns seriously - increase the P01 value Wire sticks with contact tip - reduce the P01 value
P34	Ball removing voltage	No arc start when re-start arc – increase the P34/P35 value Arc is long when re-start arc, work piece burns –

P35	Ball removing voltage time	reduce the P34/P35 value

Table 5-3-4 Sub-menu parameter

Sub-menu parameter for short circuit control characteristic

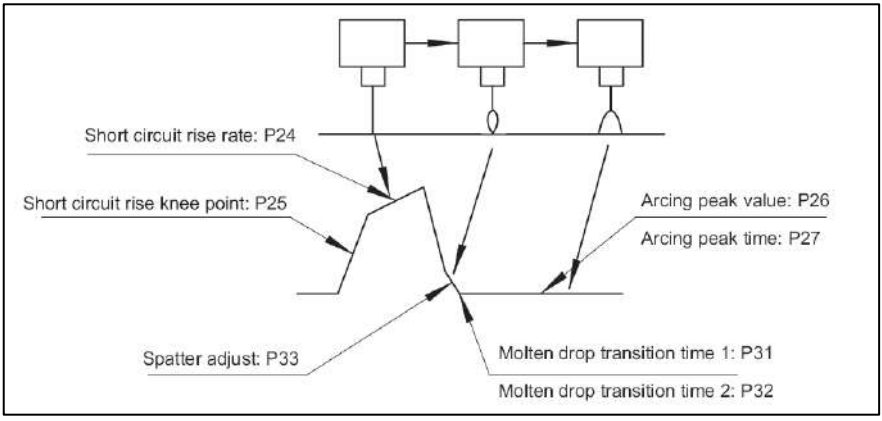


Fig.5-3-4 Operating mode sequence diagram of short circuit control

When welding voltage, welding current are correct, but cannot perform stable welding, please adjust short circuit control parameter, to improve welding stability and weld seam formation.

On condition of stable welding, fine adjust P33 to adjust welding spatter.

Item	Function	Adjust method
P33	Spatter adjust	Unstable welding – increase the P33 value Large spatter during welding – reduce the P33 value
P24	Short circuit rise rate	Large spatter, wire explodes – increase the P24/P25 value Unstable welding arc – reduce the P24/P25 value
P25	Short circuit rise knee point	

P26	Max. length of welding arc	Small welding arc energy, short welding arc, need flat weld seam –increase the P26/P27 value No short circuit of molten drop, arc length is longer-reduce the P26/P27 value
P27	Max. energy of welding arc	

Table 5-3-5 Sub-menu parameter

5-4 Job mode

“Job Mode” enhances the quality of welding, both in semi-automatic and fully automated operation.Traditionally, technical parameters of some repeated operations need to be written down for record. In Job Mode, it is now possible to store and retrieve up to 100 different jobs.

The following symbols are used in Job Mode, on the left displayer:

---……..No job in this program location (only when you try to retrieve a job from this location, otherwise nPG)

nPG……No job in this program location

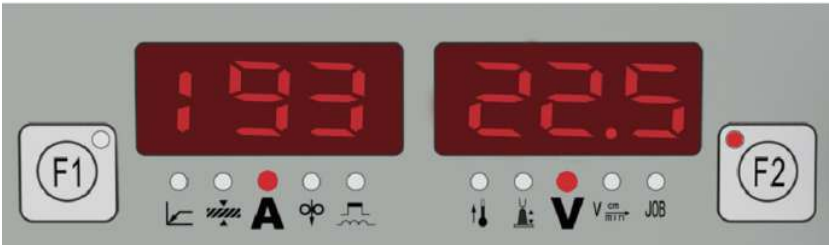
Pro…….Job is being created /copied in this program location

PrG……There is a job in this program location

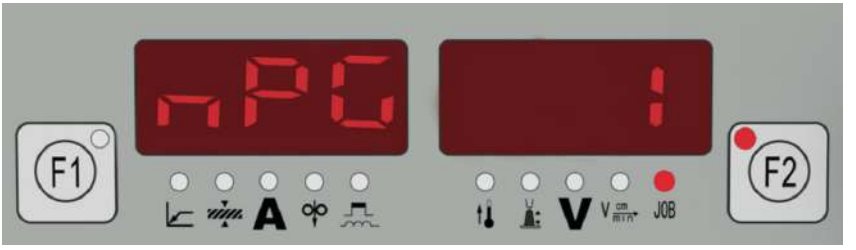
Creating a job

The machine comes with no jobs pre-programmed. A job has to be created before it can be retrieved. To create a job, proceed as follows:

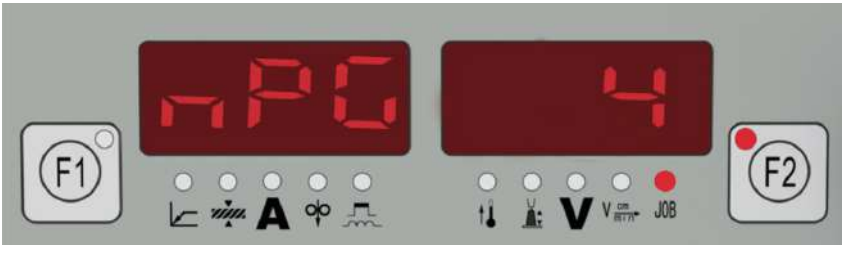
1.Set the welding parameters that you want to store as a “Job”.



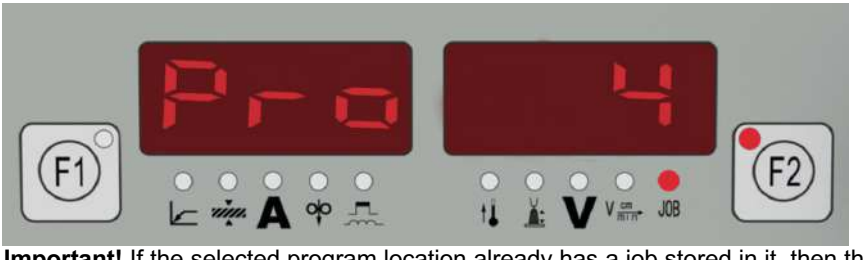
2.Briefly press the Memory button (5) to enter into the job menu. The first vacant program location for the job is now indicated.



3.Select the program location with the adjustment knob (1), or else leave the suggested program location unchanged.

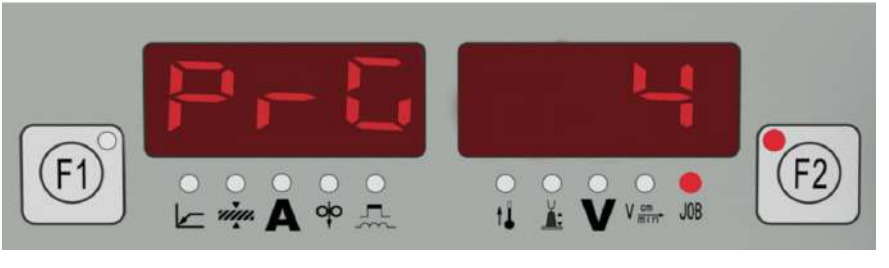


4.Press and hold the Memory button (5). The left display reads “Pro” –the job is stored in the program location you have just selected.

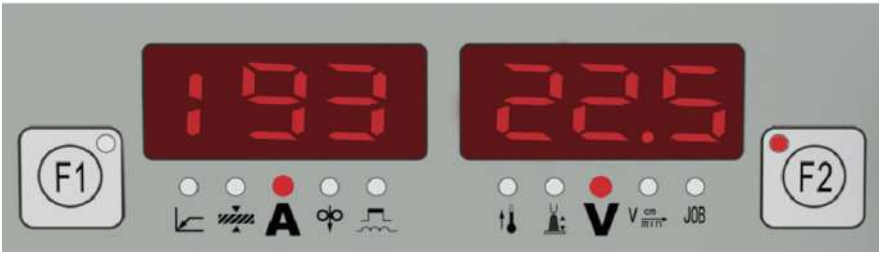


Important! If the selected program location already has a job stored in it, then this existing job will be replaced by the new job.

5.“PrG” appears on the left display to indicate that the job is now stored. Release the Memory button (5).



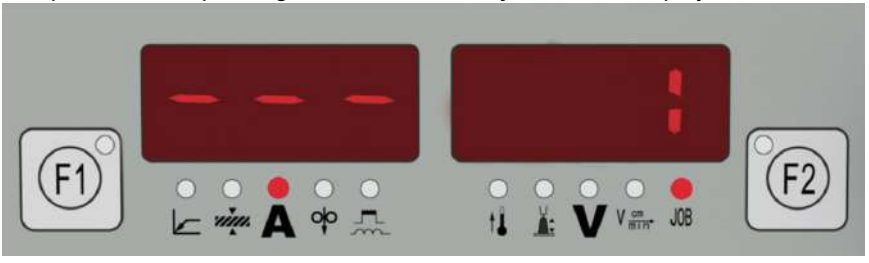
6. Briefly press the Memory button (5) to exit from the job menu.



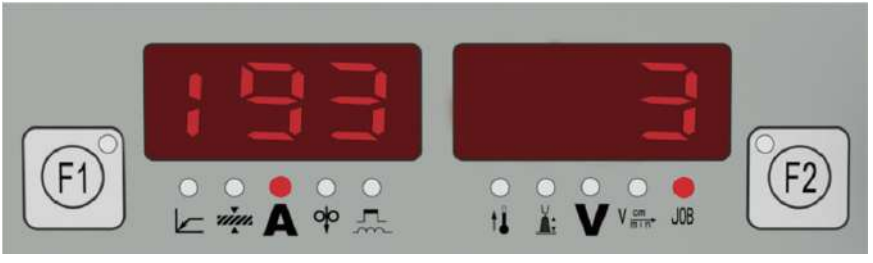
Recall a job

After storage, all jobs can be recalled and used in job mode.

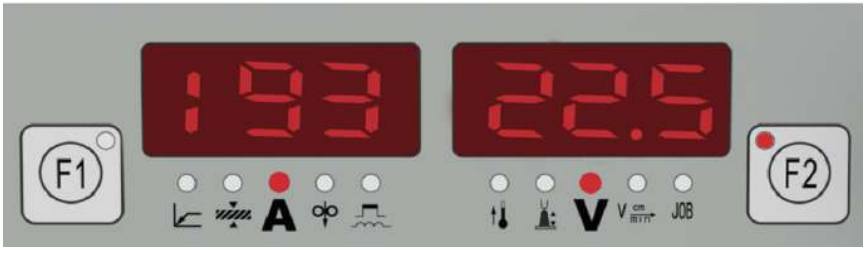
1.With the “P” button (4), indicator (22) is on -the last job used is displayed. To view settings programmed in this job, use the “Parameter selection” buttons (2) and (3). The process and operating mode of the stored job are also displayed.



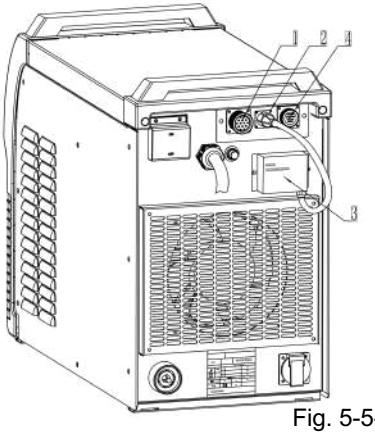
2.With the adjustment knob (1), select the desired job.



3.Press the “P” button (4), indicator (22) is off. Exit from the recall mode.



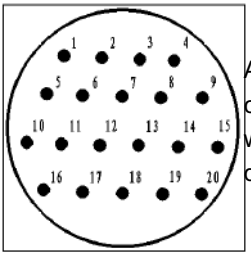
5-5 Robot Interface



1.Analogue interface
2.Digital interface
3.Communication controller
4.Wirefeeder control socket

Fig. 5-5-1 Robot interface

1. Analogue connector X5



Analogue connector can use analogue control cable to connect, low cost, high reliability, can perform basic welding process by robot, but cannot use expert database.

NO	Description	Function	direction	Signal state
1~3	Null	-------	------	------
4	External power supply	Power supply for wire feeder relay	R→W*	+24VDC
5	Voltage preset signal	Automatic data correction value of preset welding voltage,0~10Vcorresponding arc length correction -50% ~ 50%	R→W	0-10VDC

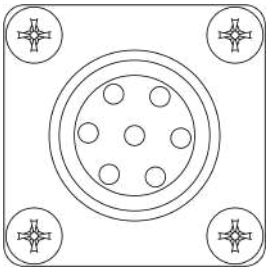
6	Current preset signal	The preset value of welding current (wire feed speed), 0~10V corresponds to 0~ 500A	R→W	0-10VDC
7	Inch	Manual wire feeding, wire detection, initial wire installation	R→W	"0" is valid
8	Gas test (purge)	Open and close the protective gas solenoid valve, preset gas flow	R→W	"0" is valid
9	Trigger (Start/Stop)	Instruction to start and stop welding	R→W	"0" is valid
10	Manual withdrawal wire		R→W	"0" is valid
11	Signal ground	Analog signal ground	R→W	
12 13	Successful arc start signal (relay signal)	Detect the real-time status of the current and determine whether the arc is successfully ignited	W→R	Relay output: (closed: valid)
14 15	Start-end feedback signal (relay signal)	When the wire touches the work piece, the start enable signal at the front end of the welding wire is pulled down, and the welding machine detects this signal and sends it to the robot.	W→R	Relay output: (closed: valid)
16 17	Null			
18 19	Start detection enable signal	The robot gives a start-end enable signal to the welding machine, and a 28V voltage is generated at the front end of the welding wire for positioning	R→W	"0" is valid
20	Null			

Table 5-5-1 Analogue connector

Note: R→W*,R:Robot,W:Welding machine.

2. Digital connector X6

Digital connector control function is powerful, with strong universality, can match with most robots in market. But this robot needs to have digital communication module, and need to purchase digital communication controller from specified manufacturer.



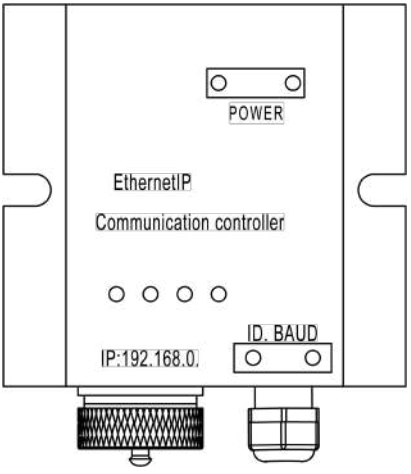
NO.	Description
1	Power supply:38VAC
2	
3	Transmit line (Y\T+)
4	Transmit line (Z\T-)
5	Receiving line (A\R+)
6	Receiving line (B\R-)

Table 5-5-2 Digital connector

3.Communication controller

At present, digital interfaces include EtherNetIP,CANOPEN,CAN,DeviceNet,485, Profinet, and EtherCAT. There are 7 communication methods, which use standard communication protocols. The communication controller is connected to the digital interface connection socket X6 on the rear panel of the welding power source.

3.1 EtherNetIP communication controller



EtherNetIP communication controller is specially designed for robot matched welding machine, communication controller can realize conversion between robot EtherNetIP protocol and welding machine protocol. EtherNetIP adopts standard Ethernet technique, includes IEEE 802.3 standard and TCP/IP protocol. It adopts common industrial protocol (CIP) as its application layer protocol.

Fig. 5-5-2 EtherNetIP communication controller

Ethernet physical interface

EtherNetIP communication controller Ethernet connector adopts water-proof RJ45 standard interface.

Internet parameter setting

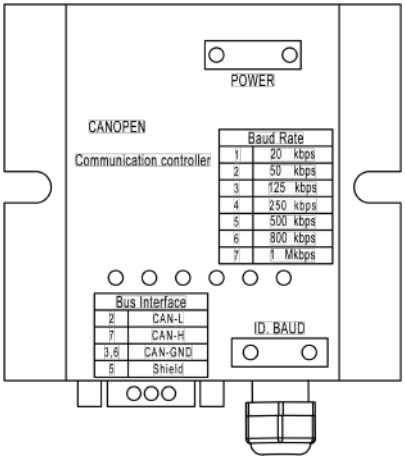
IP address: 192.168.0.2 ~ 192.168.0.99

Sub net mask: 255.255.255.0

Default gateway: 192.168.0.1

Last bit of IP address can be adjusted by knob on communication controller, other parameters cannot adjust.

3.2 CANOPEN communication controller



CANOPEN is used to realize conversion between CANOPEN and welding machine communication protocol. It adopts standard CANOPEN interface, conforms to CIA301, CIA401, CIA402 standard.

Can bus physical interface

CANOPEN communication controller CAN bus physical interface adopts DB9 pin type socket which conforms to CAN bus standard, pin 2 is CAN-L, pin 7 is CAN-H, pin 3, 6 are CAN-GND, pin 5 is shielding

Fig. 5-5-3 CANOPEN communication controller

Address, baud rate selection

Bus address and baud rate of BINR CO v001/CANOPEN communication controller can be set by knob on panel, bus address is 1-9, baud rate is 20Kbps, 50Kbps, 125Kbps, 250Kbps, 500Kbps, 800Kbps, 1Mbps.

3.3 CAN communication controller

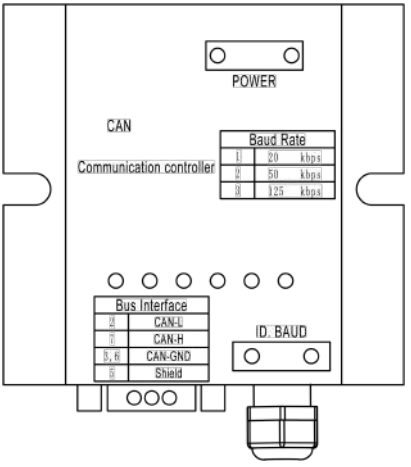


Fig. 5-5-4 CAN communication controller

CAN communication controller is used to realize conversion between CAN bus and welding machine communication protocol. Product meets needs of CAN2.0 protocol standard.

Can bus physical interface

CAN communication controller CAN bus physical interface adopts DB9 pin type socket which conforms to CAN bus standard, pin 2 is CAN-L, pin 7 is CAN-H, pin 3, 6 are CAN-GND, pin 5 is shielding layer.

Address, baud rate selection

Bus address and baud rate of BINR CN v001/CANO interface box can be set by knob on panel, bus address is 1-9, baud rate is 50Kbps, 125Kbps, 250Kbps.

3.4 DeviceNet communication controller

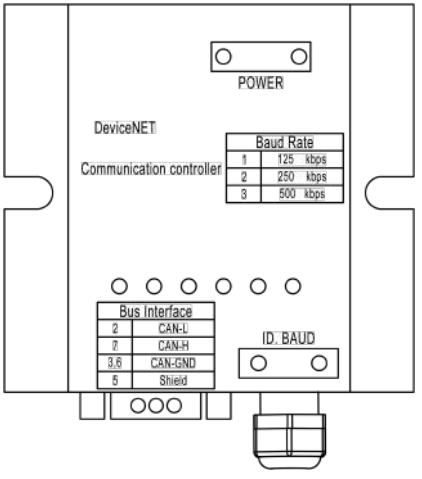


Fig. 5-5-4 CAN communication controller

DeviceNet communication controller is used to realize conversion between DeviceNet bus and welding machine communication protocol. Product meets needs of CAN2.0 protocol standard.

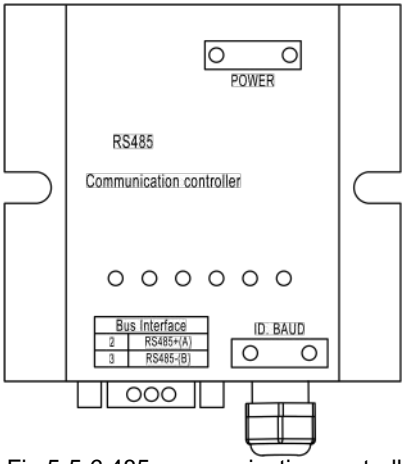
Can bus physical interface

DeviceNet communication controller CAN bus physical interface adopts DB9 pin type socket which conforms to CAN bus standard, pin 2 is CAN-L, pin 7 is CAN-H, pin 3, 6 are CAN-GND, pin 5 is shielding layer,and pin 9 is CAN-V+.

Address, baud rate selection

Bus address and baud rate of DeviceNet communication controller can be set by knob on panel, bus address is 1-9, baud rate is 125Kbps, 250Kbps, 500Kbps.

3.5 RS485 communication controller



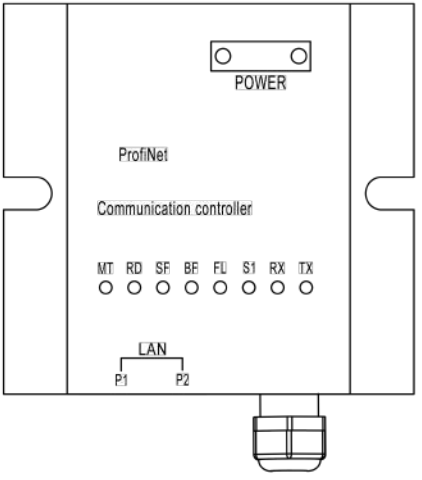
RS485 communication controller adopts standard ModBus RTU method to output data.

Can bus physical interface

BINR 485 v001/RS485 communication controller adopts DB9 pin type socket, pin 2 is RS485+ (A), pin 3 is RS485- (B).

Fig.5-5-6 485 communication controller

3.6 ProfiNet communication controller

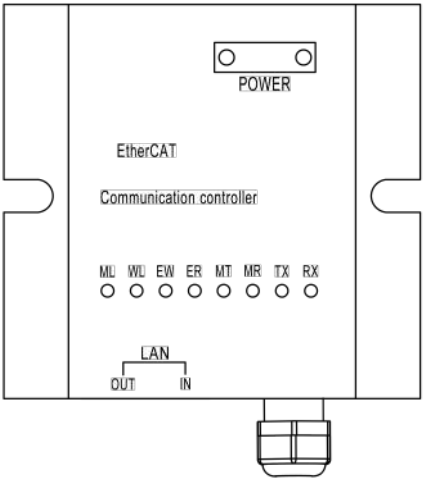


ProfiNet communication controller ProfiNet connector adopts water-proof RJ45 standard interface.

PROFINET is a new generation automation bus standard based on industrial Ethernet technology.This product conforms to the PROFINET IO conformance category: CC-C; supports PROFINET protocol from the hardware level, including PTCP and LLDP; has two Ethernet interfaces that support auto-negotiation, auto-crossover, and full duplex 100Mpbs.

Fig. 5-5-7 ProfiNet communication controller

3.7 Ethercat communication controller



Ethercat communication controller realizes the conversion between the Ethercat protocol of the special machine or the robot and the communication protocol of the welding machine.

The EtherCAT interface of this product uses the EtherCAT protocol chip, which complies with international standards and specifications.

Ethernet physical interface

Ethercat communication controller Ethercat connector adopts water-proof RJ45 standard interface.

Fig. 5-5-8 Ethercat communication controller

4. Wirefeeder control socket X7

For connecting with the wirefeeder,please reference wirefeeder 6-1.

5-6 Technical data

Model	PoWer MIG 3500 LST-R
Voltage/Frequency (3~)	380/400/415/460V±10％,50/60Hz
Rated input capacity (KVA)	14.4
Rated input current(A)	26/25/24//21.5
Range of welding current(A)	60-350
Range of welding voltage(V)	17-31.5
OCV(V)	95~103
Duty cycle (%)	60
Full-load efficiency(%)	≥87
Power factor	≥0.9
Wire diameter (mm)	Φ0.8,Φ1.0,Φ1.2
Gas flow(L/min)	10～25
Dimension(mm^3)	670*330*572
Weight (Kg)	55
Insulation class	H
IP class	IP23
EMC emission level	A

Table 5-6-1:Technical data

5-7 Disassembly and reassembly

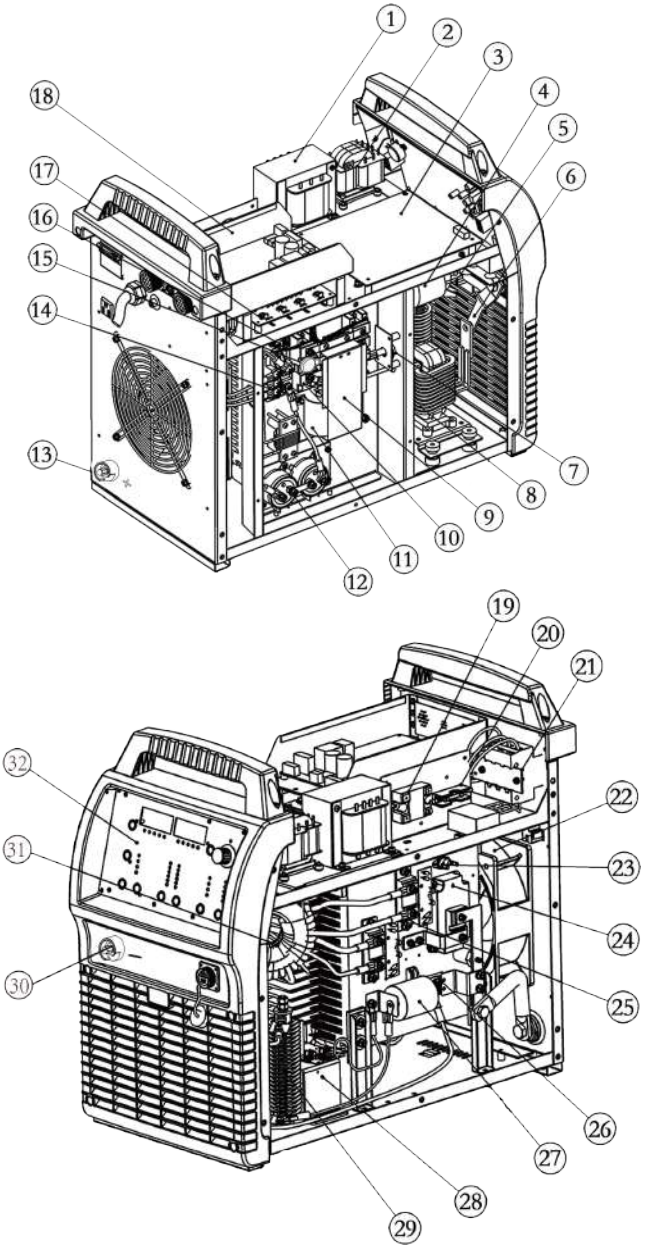


Fig. 5-7-1: Disassemble and reassembly

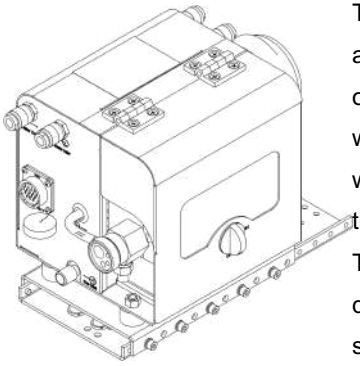
No.	Item	Stock No.	Qty	Remarks
1	Power transformer II	763001-00049	1	
2	Power transformer I	763001-00048	1	
3	Main control board	210580-00821	1	
4	Resonant capacitor	722001-00073	1	
5	Current exchange inductor	220281-00008	1	
6	Current sensor	753001-00020	1	
7	Current transformer	220149-00137	1	
8	Output reactor	763004-00177	1	
9	IGBT protection board	220005-00131	1	
10	IGBT module	735007-00038	2	
11	Polypropylene capacitor	722001-00070	2	
12	Aluminum electrolytic capacitors	722004-00101	2	
13	Quick socket	740002-00027	1	
14	Three phase rectifier module	735005-00002	1	
15	Varistor	720021-00017	1	
16	Temperature relay	745008-00045	1	
17	Drive board	210310-00118	1	
18	Wirefeeder control box	220900-00591	1	
19	Solid state relay	715004-00014	1	
20	Fuse	745007-00011	1	
21	Main circuit breaker	745011-00022	1	
22	Fan	746001-00087	1	
23	Temperature relay	745008-00044	1	
24	IGBT module	735007-00038	1	
25	Fast recovery diode module	735006-00029	2	
26	Fast recovery diode module	735006-00020	1	
27	Polypropylene capacitor	722001-00070	1	
28	Arc ignition control components	220900-00302	1	

29	High power resistance	720006-00072	1	
30	Quick socket	740002-00027	1	
31	Main transformer	220629-00284	1	
32	Display board	220503-00304	1	

Table 5-7-1: Main components list

Note: This table is for reference only, and the detail of actual product shall prevail. If no special remarks, the input voltage mentioned in above table is three phase.

6-WIREFEEDER



The robot dedicated welding wire feed mechanism adopts a lightweight solution, and the control part of the wire feed mechanism is placed in the welding power supply, which greatly reduces the weight of the wire feed mechanism and reduces the load-bearing burden on the robot.

The wire feeding mechanism adopts four-wheel drive, and the wire feeding motor has an encoder speed feedback device, which has the advantages of high control accuracy, stable wire feeding speed, and little influence of wire feeding resistance.

Warning! Incorrect operation may cause serious personal injury and property damage. You must read and understand the instruction manual of this product completely before operation.

Warning! Rotating drive parts may cause personal injury. When performing maintenance or installation work,
make sure that the drive unit of the wire feeder has stopped working.

6-1 Interface

Front panel

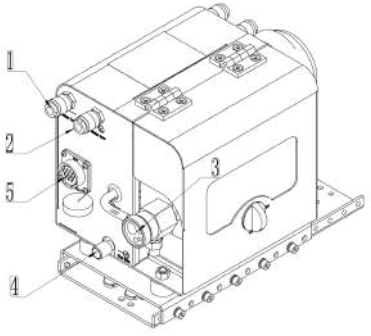


Fig 6-1-1 front panel

1.Water outlet:connect with torch.

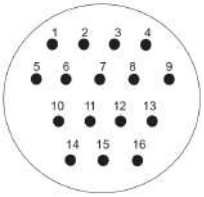
2.Water inlet:connect with torch.

3.Torch connector:connect torch and welding cable.

4.Gas inlet:connect with gas regulator.

5.control socket:connect with the power source,

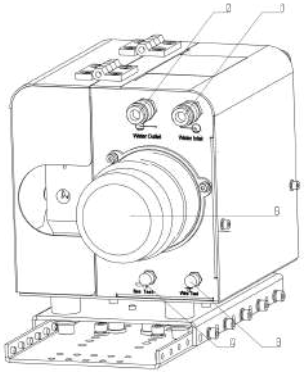
For the function of the pins, please refer to Table 6-1-1.



NO.	Description	Function
1	Solenoid valve positive	Solenoid valve control signal(+24VDC)
2	Solenoid valve negative	Solenoid valve control signal ground
3	Wire feed motor positive	Wire feed motor drive signal
4	Wire feed motor negative	Wire feed drive signal ground
5	Quick socket positive	Arc voltage feedback
6	Anti-collision mechanism	Anti-collision reservation signal
7		
8	Motor speed feedback positive	Motor speed feedback power supply(+5VDC)
9	Motor speed feedback negative	Motor speed feedback power supply ground
10	Motor speed feedback signal output	Motor speed feedback signal output
11	Gas detection switch signal	Detect gas flow (closed: valid)
12	Inch signal	Detect wire (closed: valid)
13	Trigger signal	Welder start and stop (closed: valid)
14	Common ground	Common ground for gas detection, wire detection and trigger signal
15	Null	
16	Null	

Table 6-1-1:control socket Pin function definition

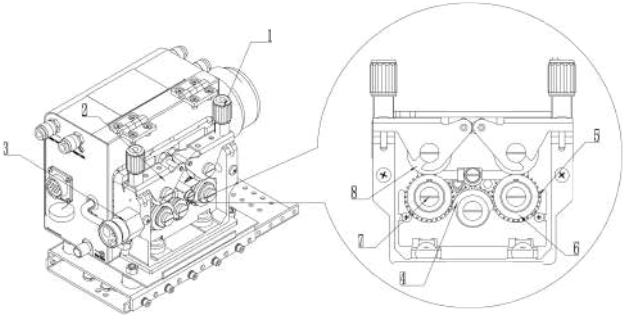
Rear panel



1.Water inlet:connect with water cooling machine.
2.Water outlet:connect with water cooling machine.
3.Wire test:Used for feeding wire when installing welding wire.
4.Gas test:Detection gas flow rate before welding.
5.Wirefeed Motor

Fig 6-1-2 rear panel

Wirefeeder



1.Pressure handle
2.Pressure roller bracket
3.Torch connector
4.Main gear
5.Passive gear
6.Drive roller
7.Screw
8.Pressure roller

Fig 6-1-3 wirefeeder

6-2 Install

● rollers

The proper wire feed rolls must be chosen according to the size and material of the wire. Types of wire feed rollers as Fig. 6-2-1:

Type 1: for hard wire, such as carbon steel wire, stainless steel wire.

Type 2: for soft wire, such as Aluminum and Aluminum alloys, also for copper and copper alloy wire.

Type 3: for flux-cored wire

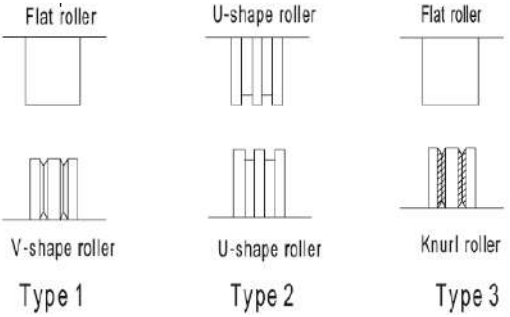
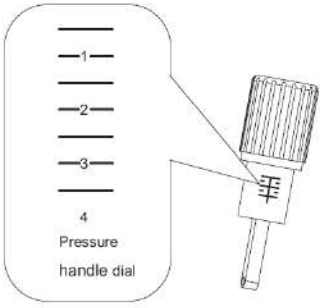


Fig. 6-2-1 Wire feed rollers

● Pressure adjustment

When use pressure device to adjust wire feed roll pressure, too much pressure will cause wire crushed, and the wire coating be damaged, and it will cause the wearing out of feed rollers and increase the wire feeding resistance. Suitable pressures for wires of different materials and diameters are as shown in Fig. 6-2-2.



Diameter / Pressure / Type / Value	φ0.8	φ1.0	φ1.2	φ1.6
V-shape roller	1.5-2.5	1.5-2.5	1.5-2.5	1.5-2.5
U-shape roller	0.5-1.5	0.5-1.5	0.5-1.5	0.5-1.5
Knurl roller	——	——	1.0-2.0	1.0-2.0

Fig. 6-2-2 Wire feed rollers installation parameter

● Mounting the welding torch

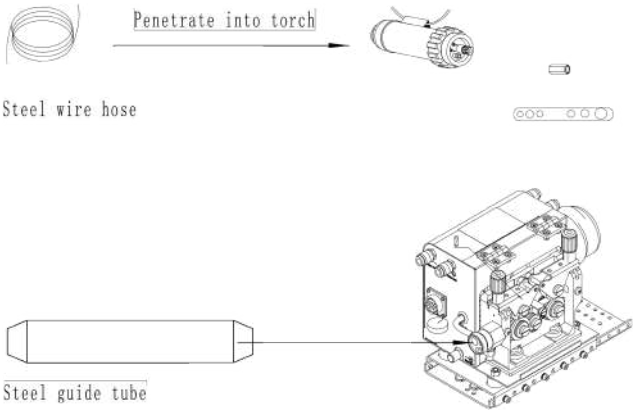
To ensure normal welding, please make sure that the wire diameter, contact tip, welding torch, welding wire tube are

matched to each other.. Choose wire feeding tubes according to wires of different diameters and materials.

- Steel wire hose is suitable for hard wire, such as carbon steel wire, stainless steel wire.
- Teflon wire hose is suitable for soft wire, such as Aluminum and Aluminum alloys, also for copper and copper alloy wire.

Note!If the wire hose is too tight or too loose, it will increase resistance for wire feeding and cause wire feeding unstable.

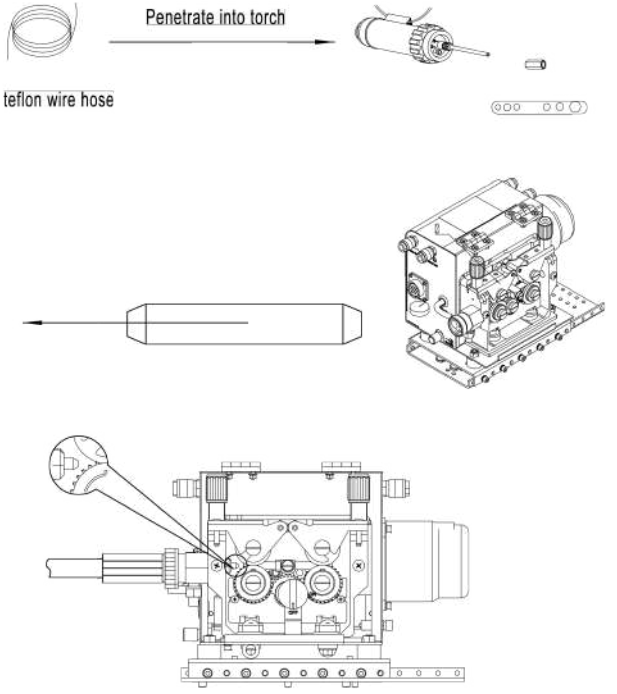
Installation guide for steel wire hose



1.Replace the hose in the torch with a steel wire hose.
2.Replace the guide wire tube in the torch connector with a steel guide tube.
3.The torch is connected to the torch

Fig. 6-2-3 Installation guide for steel wire hose

Installation guide for teflon wire tube



1.Replace the hose in the torch with a teflon wire tube.The hose is reserved for about 100-150mm.
2.Remove the steel guide wire tube from the torch connector.
3.The torch is connected to the torch connector to ensure that the teflon tube can reach the position of the wire feed wheel in the figure.

Fig. 6-2-4: Installation for teflon tube

6-3 Technical data

MODEL	500	630
Power supply for motor	DC24V	
Rated input current(A)	3	
Range of welding current(A)	60～500	60～630
Duty cycle (%)	100	100
Wire diameter (mm)	Φ1.0,Φ1.2,Φ1.4,Φ1.6	
Weight (Kg)	10	
IP class	IP23X	

Table 6-3-1: Technical data

6-4 Dimension

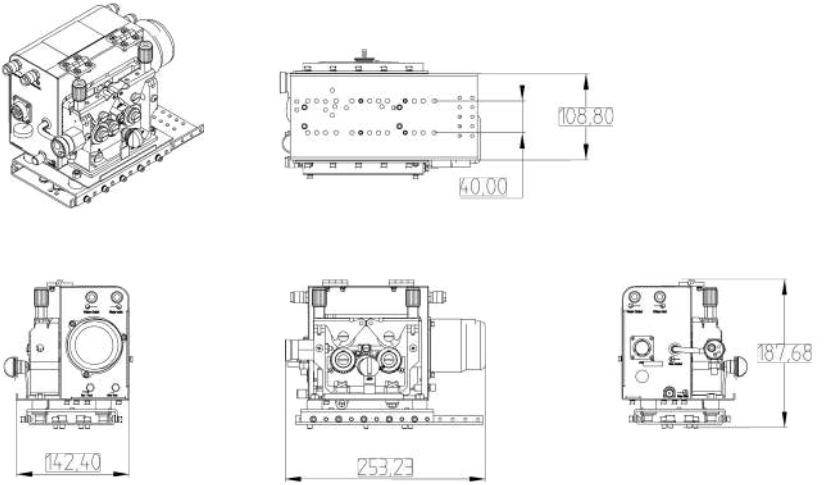


Fig 6-4-1 dimension

6-5 Spare parts

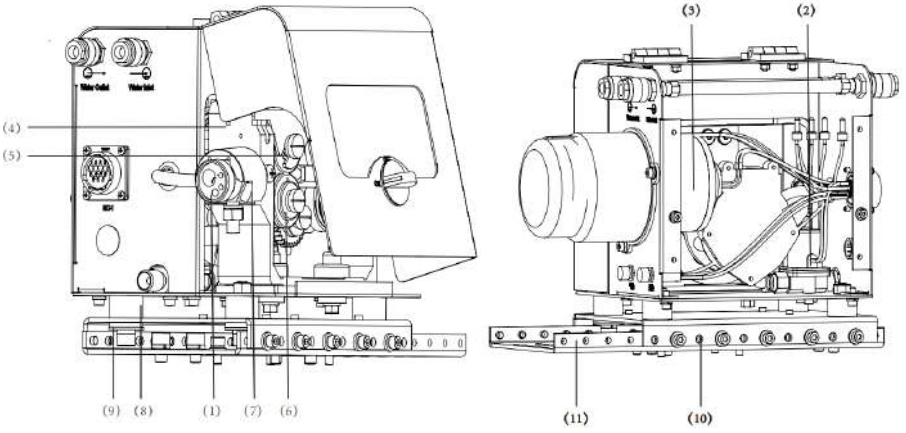


Fig 6-5-1 wirefeeder

NO.	Item	Stock NO.	Qty
1	Torch connector(EURO)	322017-00009	1
2	valve	752001-00047	1
3	Encoder	328005-00065	1
4	Pressure handle	327047-00009	2
5	Pressure roller (use for hard wire)	327023-00002	2
6	Drive roller V type Φ0.8-Φ1.0	327011-00042	2
	Drive roller V type Φ1.2-Φ1.6	327011-00046	2
	Drive roller U type Φ1.0-Φ1.2	327011-00045	4
	Drive roller U type Φ1.2-Φ1.6	327011-00047	4
7	Torch connector cover(EURO)	421042-00023	1
8	Insulation washer for wire feeder	328005-00081	4
9	Insulation sleeve for wire feeder	328005-00066	4
10	Adapter for wire feeder	766002-01395	1

Table 6-5-1 Part list

7-TROUBLE SHOOTING

Warning! An electric shock can be fatal. Before doing any work on the machine:

-Switch it off and unplug it from the mains

-Put up a clearly legible and easy-to-understand warning sign to stop anybody inadvertently switching it on again.

-Check to make sure the electrically charged components (e.g.capacitors) have been discharged.

-Bolts in machine case also work for ground connection. Never use other bolt that can not work for ground connection.

● **Error code display**

This series of machines have automatic protection and error code display function. Relevant Cause & Remedy can be found according to below Error codes, as shown in Table5-1

Code	Trouble	Cause	Remedy
E0A	Water shortage protection	1.Not enough or no circulating water in water-cooling system 2. Water flow switch or signal line are faulty	1. No or not enough cooling water 2.Water hose is blocked or no connection 3. Water circulation of torch is blocked 4.Water-cooling motor is faulty 5. Check water flow switch or signal line 6.Replace control board 7.Adjust sub-menu parameter P10 to

			OFF
E10	No current output protection	1.No current output after welding machine on 2.circuit failure -Short circuit of control cable of wire feeder -Short circuit of signal line -Main control board failure	1.stop welding machine 2.Check circuit failure
E15	Abnormal when power on	The start signal is ON when welding machine power on	Turn off the machine, check the start signal or contact Supplier
E17	Over-current protection	1) Over-current 2) Current sensor fault 3) Signal line is broken 4) Main control board is damaged	1) Check and repair output cable 2) Trouble-shoot the signal line failure 3) Replace current sensor 4) Replace main control board
E18	Voltage feedback is unusual	circuit failure -The voltage feedback signal line is disconnected -Wire feeder welding cable is disconnected -Wire feeder control cable is disconnected -Welding cable of wire feeder is not connected	1.Check Voltage Feedback Wire ; 2.Check wirefeeder cable; 3.check welding cable; 3. replace Main Control Board

		-Welder main control board failure	
E19	Over-heat protection	1.Environmental reasons -The ambient temperature is higher than 40 degrees -The air inlet of the welding machine is too close to the wall -The air inlet of the welding machine is blocked -The dust deposit on the radiator is too thick and has not been cleaned for a long time 2.Reasons for use -Welder use exceeds rated load rate -The welding specification is greater than the rated output 3.Circuit failure -Fan failure -Fan control solid state relay failure -The signal line is broken -Temperature relay failure -Unilateral operation of the main circuit -Main circuit device failure -Main control board failure	1.Environmental reasons :check 2.Reasons for use :check; 3.Circuit failure
E30	Wire feeding is abnormal	1. The welding wire is at the end 2. The wire feed motor is over-current, stuck or damaged	Check and repair wire feeder

E40	Communication between the display board and main control board is abnormal	Main control board does not get the signal from the display board 1.Communication cables are loosen or broken 2.Main control board is damaged 3. Display board is damaged	Pls contact Supplier
E42	Communication between the welding machine and wire feeder is abnormal	1. Control cable of wire feeder is not plugged in or broken 2. Communication cables are loosen or broken 3.Wire feeder main control board is damaged 4. Control circuit of welding machine is faulty	Pls contact Supplier
E84	Communication fault between communication controller and robot control cabinet	1.Setup and operation errors: -Baud rate setting error; -Address setting error; -The robot is powered off or initialization is not completed; 2.circuit failure -DEV bus does not have 24V power supply; -Termination resistor not connected; -Poor contact, open circuit or short circuit of the bus cable; -main control board of the communication controller is faulty; -Poor contact of communication controller cable	1.Check and replace 2.circuit failure:Pls contact Supplier

E85	Communication fault between communication controller and welding machine	circuit failure - main control board of Welding machine failure; - wirefeeder control board of Welding machine failure; -Poor contact, open circuit or short circuit of the communication controller cable; -main control board of the communication controller is faulty;	Check and replace:Pls contact Supplier
E86	Exceed given range	External equipment (robot, automation welding system) given parameters exceed welding procedure's allowed range	Adjust to suitable range for external equipment(robot, automation welding system) or contact Supplier
E87	No corresponding welding procedure	The given procedure channel for robot has no corresponding database, or no stored parameter in store channel which is called	Modify given parameter for robot, switch to the channel which has expert database and stored welding parameters

Table 7-1: Error code

Important! If any error message that is not described here appears on the displays, then the fault is one that can only be put right by a service technical. Make a note of the error message shown in the display, and the serial number and configuration of the power source, and get in touch with our after-sale service, giving them a detailed description of the error

● **Power source trouble shooting**

Note! The flowing troubles and causes are uncertain. However, during the process of MIG Pulse and the normal using conditions, that might happen.

Trouble	Remedy
Power source cannot work	• Check the mains supply lead, make sure that the mains plug is plugged in • Check whether the air switch is on • Check the fuse and breaker • Check whether the junction cable and connectors between power source and wire feeder are correctly fixed. • Check whether the ground cable is connected
Dirty welding face, poor welding seam	• Check whether shielding gas is provided • Check and set shielding gas flow • Check whether shielding gas is correct • Check whether polarity of welding torch is correct
Unstable welding performance	• Check whether wire feeder correctly operate • Check whether wire feed rollers correctly installed • Check whether correctly adjust the braking force of wire spool • Check whether the guide tube of welding torch is blocked, replace whether necessary • Check whether the size and material of filling metal and the guide tube is suitable • Check the size, type and wear patterns of tip • Check whether the welding torch is too hot • Check whether the cables and ground cable are firmly connected • Check whether the setting parameters are correct
Filler wire cannot feed in	• Check the wire feeder • Check ON-OFF function of welding torch • Check whether guide tube of welding torch is blocked • Check the size, type and wear patterns of tip
Too much spatter	• Check whether the setting parameters are correct • Check the setting of arc force • Check the length of the cables

	• Check the type and flow rate of the shielding gas • Check whether welding cable is correctly connected • Check the filing metal • Check whether the feeding of wire is unobstructed • Check whether default phase

Table7-2: Trouble shooting

8 –CARE AND MAINTENANCE

- **Before open the machine**

Warning! An electric shock can be fatal. Before doing any work on the machine:

-Switch it off and unplug it from the mains

-Put up a clearly legible and easy-to-understand warning sign to stop anybody inadvertently switching it on again.

-Check to make sure the electrically charged components (e.g.capacitors) have been discharged.

-Bolts in machine case also work for ground connection. Never use other bolt that cannot work for ground connection.

- **Maintenance**

Please follow the instructions as below to ensure normal lifespan of power source.

- Conduct safety check at regular intervals (see “Safety rules”)

- Dismantle machine side panels and clean machine inside with clean and low-pressure compressed air by professional technician, not less than twice per year. Clean the components at a certain distance only;

- If a lot of dust has accumulated, clean the cooling-air ducts.

- **Maintenance of water-cooled welding torch**

For water-cooled welding torch:

- Check the connections of water cooling system

- Check the coolant level and cleanliness(clean coolant only)

- Frequently check coolant’s back flow state

- **Daily maintenance**

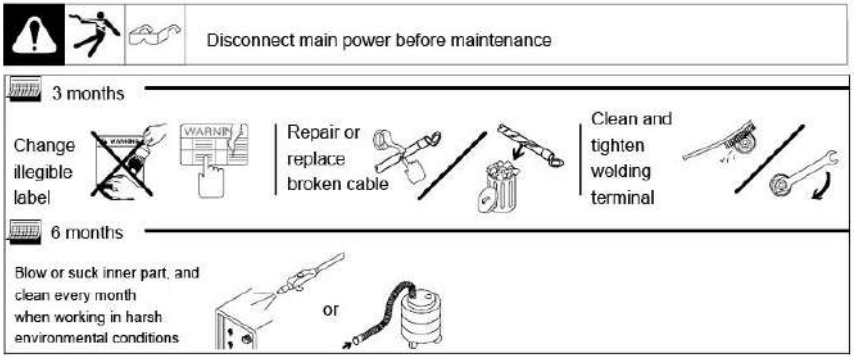


Fig. 8-1 Daily maintenance

PoWer MIG Series

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