Multipro 200SP

WELDING MACHINE

USER MANUAL

Meet a better way of welding!

For your own and other people's safety, please read the manual carefully before operating. And the user manual must always be available near the welding machine.

Announcement

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

Version

Version YF-TAE-0129, A1. Released on August 16, 2022.

The images shown here are indicative only. If there is inconsistency between the image and the actual product, the actual product shall govern.

CONTENTS

SAFETY WARNING

Security Definitions

	It indicates that neglecting safety warnings may result in serious accidents, even death or serious injury.
	It indicates that neglecting safety warnings may result in minor injury to personnel or property damage.
	It indicates that neglecting safety warnings may result in equipment failure or damage.

Personal Protection Precautions

- Personnel with professional qualifications or relevant knowledge and skills are requested to install, operate, maintain and repair the power source.
- Installation, inspection and repair of power source must be carried out by electricians, and temporary construction points should be connected by electricians.
- Supervisors shall be provided for working in high altitude or narrow places, such as boxes, boilers, cabins, etc.
- Personal protective equipment, such as protective masks, overalls, insulating gloves and insulating shoes, should be worn when working.
- Those who use cardiac pacemakers shall not approach the power source in use and welding workplaces without the permission of a physician.

Installation Operation Precautions

	The power source shall not be used for pipeline thawing, battery load or motor start-up.

Beware of Electric Shocks

- Before welding, the yellow-green grounding wire in the power line must be grounded and the insulation of the welding cable must be ensured.
- During welding operation, do not touch live parts such as workbench, welding parts, earth clamp, electrode holder or welding torches.
- Rubber insulation pads should also be laid on the ground near the operating table for welding operations with high no-load voltage and in wet working places.
- In the welding process, do not open the machine house and side cover.
- Do not touch the electrically charged parts.
- Do not use cables with insufficient cross-section, damaged insulation sheaths or exposed conductors.
- Maintenance operation should be carried out after 5 minutes of disconnection of the power supply until the power indicator is completely turned off, otherwise there is a risk of electric shock.
- Turn off all input power when transferring work place, replacing fuse, repairing or not using the equipment.

Beware of welding fume and harmful gases

- When welding steel plates with coatings or coatings, harmful fumes and gases will be produced. Full ventilation or exhaust facilities should be used to keep fumes and toxic gases away from the breathing area. If necessary, wear breathing protection tools.
- When working in narrow places, such as boxes, boilers, cabins, etc., please accept the inspection of supervisors. In order to prevent hypoxia, we should fully ventilate and wear respiratory protective equipment.
- Keep ventilation system of welding machine unblocked. The minimum distance between power source and surrounding place should be greater than 0.5m. Do not cover the inlet and outlet of equipment to ensure smooth circulation of cooling air.

Welding Sparks May Cause Fire or Explosion

- Corresponding protective measures should be taken in the welding area to avoid fire caused by welding mars.
- Do not carry out welding operations in degreasing, cleaning and spraying areas.
- Do not weld gas-filled pipes, sealing grooves (boxes) and other devices, otherwise explosions or fires are likely to occur.
- Do not weld near flammable gases or devices with flammable substances, otherwise explosion or fire may occur.
- When not welded, make sure that any component in the wire circuit does not contact the workpiece or the earth, otherwise it may cause overheating and fire.
- When the welding operation is stopped, remove the electrode in the welding pliers or cut off the welding wire in the nozzle of the welding torch.

Electrical Base Field May be Dangerous

- Those who use cardiac pacemakers shall not approach the power source in use and welding workplaces without the permission of a physician.
- It is strictly forbidden to place or wrap welded cables around the body.
- Do not place the body between the welding wire and the workpiece cable. If the welding wire cable is on the right side of the body, the workpiece cable should also be on the right side of the body.

Arc Rays May Cause Burns

- When welding or supervising welding, please wear protective appliances with adequate shading.
- Protective barriers are set around the welding site to prevent arc or welding spatter from injuring others.

Avoiding Electromagnetic Interference

- Users should ensure that the welding power supply and other equipment in the environment do not produce electromagnetic interference, otherwise corresponding shielding and protection measures should be taken.
- According to the manufacturer's suggestion, the power source should be connected to the main power supply line.
- The length of welded cables should be shortened as far as possible to make them close to each other and to the ground.
- Safety of all metal assemblies assembled by welding and the assemblies connected with them should be confirmed.
- The yellow-green grounding wire in the power line must be grounded, and the workpiece must be well connected with the ground clamp.
- Users should be responsible for the interference caused by welding.

Noise Produced during Welding can Easily Cause Hearing Loss

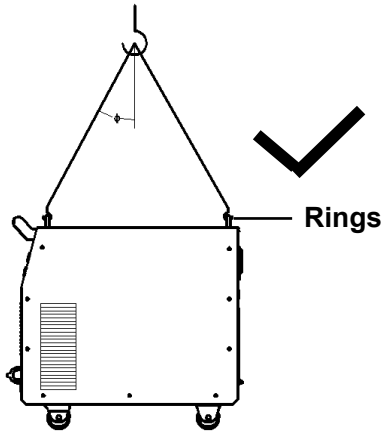
- In order to avoid the harm of noise to you and others, please wear the prescribed protective equipment.

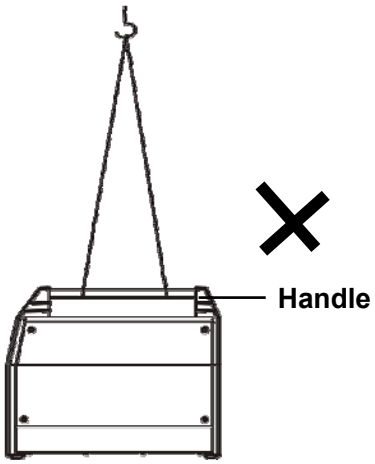
Cautions for Hoisting

- The power source with strap or handle is prohibited from using strap or handle for lifting.
- When lifting power source with lifting forklift truck, in order to prevent dumping, please fork-fit and fix it from side.
- When lifting power source with crane, the cable should be tied to the suspension ring, and the angle between the cable and the vertical direction should not exceed 15 degrees.
- When the power source with cylinder and wire feeder is hoisted, the two equipments should be

unloaded from the power supply first. When moving the power source on the ground, it is necessary to fix the cylinder with a strap or chain to prevent dumping and injuring people.

- If the wire feeder is hoisted by lifting lugs for welding, it is necessary to ensure that it is firm and insulated.





PRODUCT DESCRIPTION

The welding machine applies the most advanced inversion technology in the world.

The principle of inversion is to transform the power frequency of 50Hz/60Hz into direct current and invert it into high frequency (50KHz) through high-power device IGBT, then perform voltage-drop and commutation with the output high-power D.C power supply via Pulse Width Modulation (PWM). Since the switch power inversion technology is adopted, the weight and volume decrease greatly while the conversion efficiency increased by more than 30%

The welding machine has the functions of MMA, TIG and MIG. It adopts full digital panel display, which can realize synergic adjustment of feeding speed and welding voltage as well to regulate the welding parameters easily.

Our CO_2 gas shielded welding machine is equipped with unique electronic reactor circuit, which can precisely control the short-circuiting transfer and mixed transfer resulting in better performance than other machines. Compared with silicon-controlled welding machines and tapped welding, our products have the following advantages: stable wire feed rate, portable, energy-saving, electromagnetic noise free. Besides, our products spatter less, easier arc starting, deep welding pool, high duty cycle etc.

This equipment is portable with full function of MMA and plasma cutting having merits of high-efficiency; power-saving etc .It is especially suitable for family usage and need of different metals or techniques demand.

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

WARNING !

The machine can cause radio interference. The operator shall take preventative measures to mitigate them.

TECHNICAL PARAMETERS

Type / Item	Multipro 200SP	
Power voltage (V)	1 phase 230V±15%	1 phase 115V±15%
Frequency (Hz)	50/60	50/60
Maximum rated input current (A)	32.7 (MIG) 26.7 (TIG) 32.2 (SMAW)	24 (MIG) 17.2 (TIG) 24.5 (SMAW)
No-load voltage(V)	61	61
Output current adjustment (A)	35-200 (MIG) 15-180 (TIG) 15-160 (SMAW)	40-90 (MIG) 15-85 (TIG) 15-75 (SMAW)
Output voltage (V)	15.7-24 (MIG) 10.6-17.2 (TIG) 20.6-26.4 (SMAW)	16-18.5 (MIG) 10.6-13.4 (TIG) 20.6-23 (SMAW)
Duty cycle	25%	30%
Power factor	0.73	0.73
Efficiency (%)	80	80
Type of wire feeder	Internal	Internal
Wire feed speed (inch/min)	120-440 (3-11m/min)	120-240 (3-6m/min)
Post flow time (s)	3	3
Welding wire diameter (inch)	.030"/.040" (0.8/1.0mm)	.030" (0.8mm)
Insulation grade	H	
Housing protection grade	IP21	
EMC grade	B	
Welding thickness (inch)	More than .030" (0.8mm)	
Weight (lb)	28.2 (12.8kg)	
Overall dimension (inch)	16.5*8.7*17.3 (420*220*439mm)	

INSTALLATION INSTRUCTION

The welding equipment is equipped with power voltage compensation device. It keeps the machine working normally when power voltage fluctuates ±15% of rated voltage.

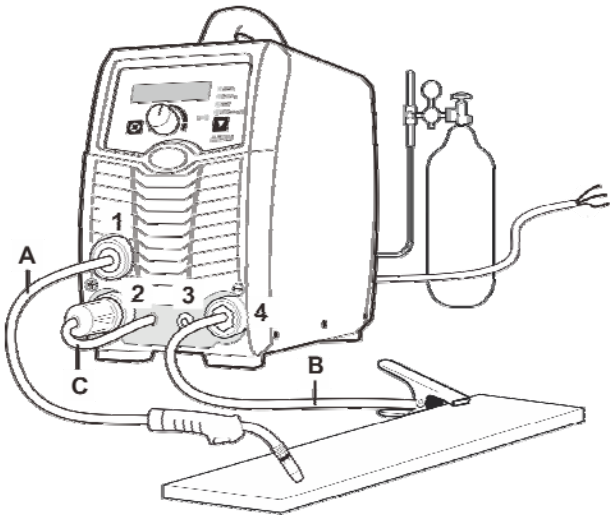
When using long cable, in order to reduce voltage drop, big section cable is suggested. If the cable is too long, it will affect the performance of arcing and other system functions, it is suggested to use the recommended length.

1. Make sure the intake of the machine is not covered or blocked to avoid the malfunction of the cooling system.
2. Make sure the earth end of power interface has been reliably and independently grounded.

Installation Procedures:

■ **Installation for MIG process**

1) Connect the gas cylinder to the regulator. Select correct shielding gas for the application.
2) Fit the wire spool to the machine. Select correct welding wire for application.
3) Select the appropriate feed roller to suit the wire being used.
   - V groove for use with solid carbon manganese and stainless steel.
   - U groove for use with soft wires such as aluminum.

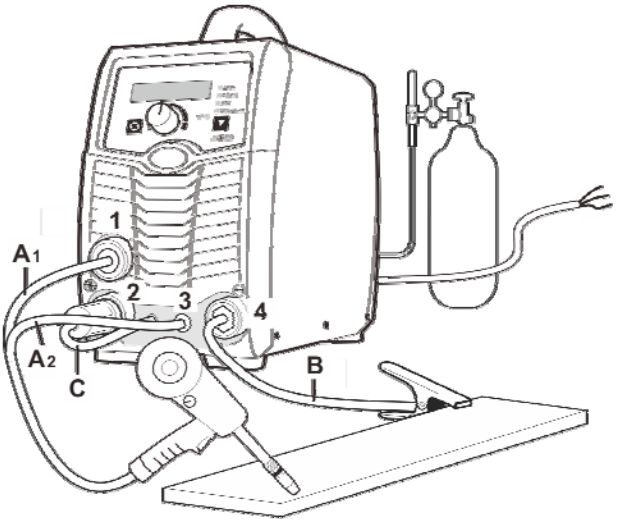


4) Loosen the wire feed tension screws and insert the wire. Refit and tension rollers ensure the wire is gripped sufficiently so as not to slip but avoid over-tightening as this can affect feed quality and cause wire feed components to wear rapidly.
5) Fit and tighten the torch (**A**) on the output connection (**1**). Ensure correct torch liner and contact tip are selected.
6) Select the correct polarity for the type of wire used as indicated on the consumable packaging. This is achieved by swapping the polarity terminal wires. For most solid wires the terminal should be set as torch positive.
   - ◆ For torch positive, plug the short mechanical connector (**C**) on the front panel into the positive terminal (**2**) and the work return lead (**B**) into the negative terminal (**4**).
   - ◆ For torch negative, plug the short mechanical connector (**C**) into the negative terminal (**4**), and the work return lead (**B**) into the positive terminal (**2**).

■ Installation for MIG setup with optional spool torch

⚠ **NOTE**: Ensure that all power to machine is turned off before connecting the spool torch.

1) Connect the gas cylinder to the regulator. Select correct shielding gas for the application.
2) Plug spool torch connection (**A1**) into output connection (**1**).
3) Plug spool torch control cable (**A2**) into control connection (**3**).
4) Fit wire spool to the spool torch.
   - Lift cover up
   - Remove retaining screw by turning clockwise.
   - Slide mini spool in
   - Adjust spool tension using knurled ring on the spool shaft
   - Feed wire through front of the torch
   - Close cover

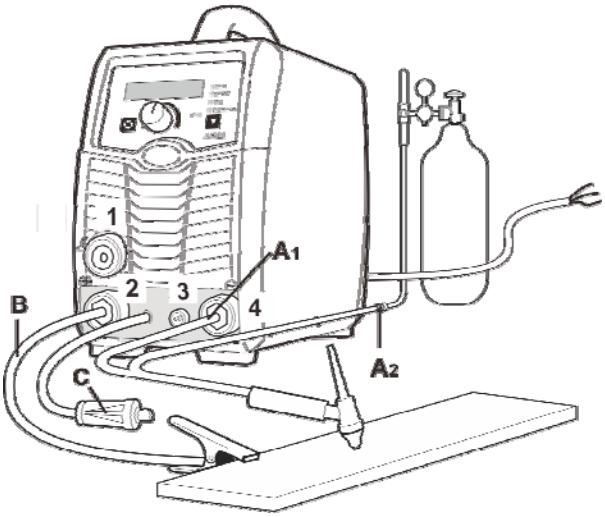


Optional spool gun purchased separately

5) Select the correct polarity for the type of wire used as indicated on the consumable packaging. This is achieved by swapping the polarity terminal wires. For most solid wires the terminal should be set as torch positive.
   - ◆ For torch positive, plug the short mechanical connector (**C**) on the front panel into the positive terminal (**2**) and the work return lead (**B**) into the negative terminal (**4**).
   - ◆ For torch negative, plug the short mechanical connector (**C**) into the negative terminal (**4**), and the work return lead (**B**) into the positive terminal (**2**).
6) Turn machine on.
   The spool torch indicator light will illuminate.
   Please note wire feed speed is only active from the spool torch.

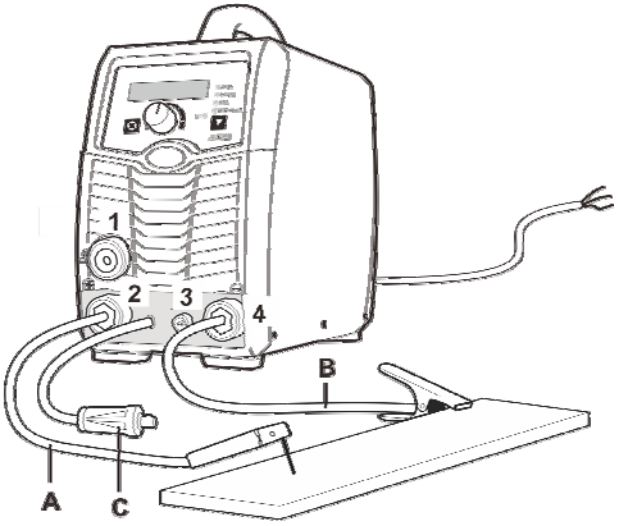
■ Installation for TIG process

1) Connect the gas cylinder to the regulator. Connect gas hose to the regulator. Connect the TIG gas hose (**A2**) to the free end of the gas hose. After disconnecting the gas hose from the back of the machine. Select correct shielding gas for the application.
2) Connect the plug (**A1**) of the TIG torch to negative (**4**) terminal of the front panel, and fasten it clockwise.
3) Connect work return lead (**B**) to positive terminal (**2**) on the front panel, and fasten it clockwise. Connect the clamp end to the workpiece.
   The short mechanical connector (**C**) should remain hanging free.



■ Installation for MMA process

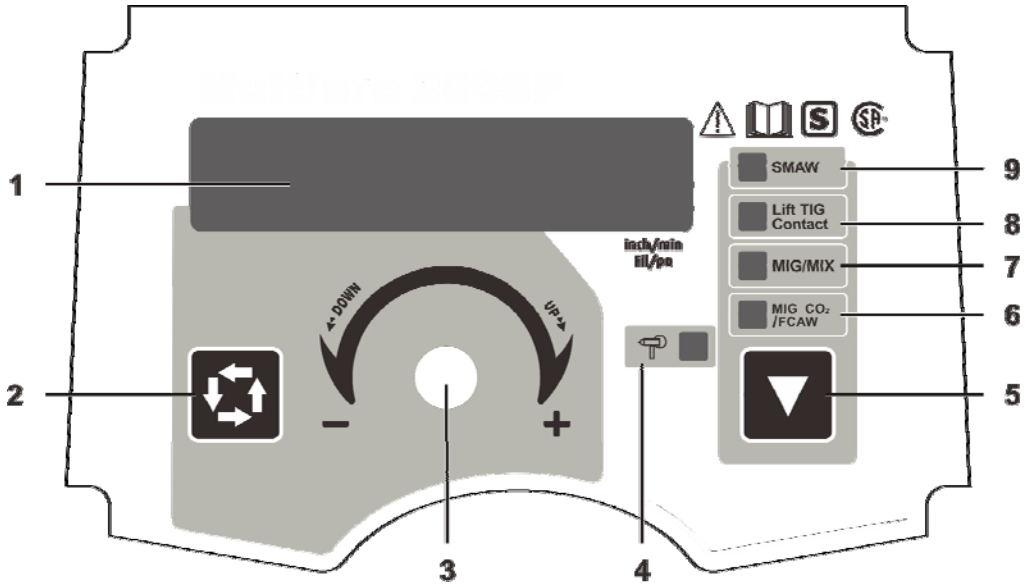
1) Connect the electrode holder (**A**) to the positive terminal (**2**) of the machine and fasten it clockwise.
2) Connect the work return lead (**B**) into the negative terminal (**4**) of the machine and fasten it clockwise.
   Please note that for manual metal arc (MMA) welding the electrode holder can be switched to the negative pole of the welding machine if so required by the specification of the electrode.
   The short mechanical connector (**C**) should remain hanging free.



This procedure shall be operated by electrician!

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

PANEL FUNCTION ILLUSTRATION



1 **Multifunctional Data Display**

2 **Data Selection Key**

Under MMA mode: can open or close VRD function by long pressing on the data selection key.

Under MIG mode: can select parameters and choose the welding mode (2T/4T) by pressing the **Data Selection Key**.

3 **Multifunctional Data Adjusting Knob**

Fine tuning: press the knob and turn the knob.

Coarse tuning: turn the knob.

4 **Spool Torch Indicator**

5 **Function Switch Key**

The MIG-CO_2/FCAW, MIG/MIX, Lift TIG and SMAW switch key.

6 **MIG-CO_2/FCAW Indicator**

7 **MIG/MIX Indicator**

8 **Lift TIG Indicator**

9 **SMAW Indicator**

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 using 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 using flux-cored wire, the two connected cables should be exchanged.

Operation instruction:

1） **The starting up display**

Switch on the welding power source, the front panel displays as **Fig.1**. After the **Multifunctional Data Display** (or any key or knob on front panel) flashes for 5 seconds, the machine enters into the welding mode that saved in the last shutdown.

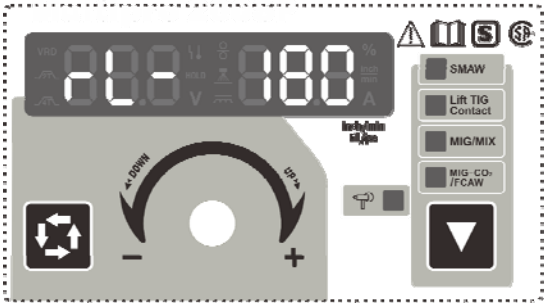


Fig.1 Starting up Display Interface

2） **Operation instruction under MIG mode**

① Set welding mode:

When welding stops, press the **Function Switch Key** to choose the welding mode, the machine enters into MIG/MIX mode (**Fig.2**) while **MIG/MIX indicator** lights up, and enters into MIG-CO_2/FCAW mode (**Fig.3**) while **MIG-CO_2/FCAW indicator** lights up.

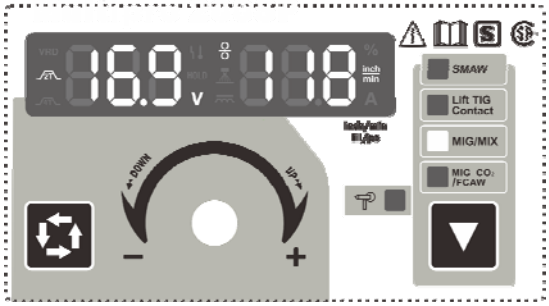


Fig.2 MIG/MIX Mode

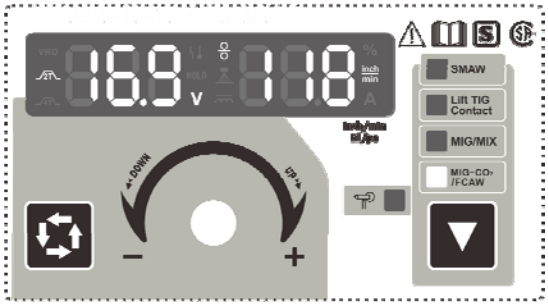


Fig.3 MIG-CO_2/FCAW Mode

Under MIG mode, the wire can be fed at high speed by pressing the torch switch for a while without welding. To stop wire feeding, press the torch switch again.

② 2T/4T mode:

Under MIG mode, press **Data Selection Key** for 2s to choose the 2T/4T mode.

2T icon in the **Multifunctional Data Display** lighting up means 2 step control way: press the torch switch, feed the gas in advance, and perform welding normally; release the torch switch, burn back and get rid of the ball on the end of wire, then stop feeding gas 3 seconds later.

4T icon in the **Multifunctional Data Display** lighting up means 4 step control way: press the torch switch for the first time, feed the gas in advance, and ignite the arc to perform welding, then release the torch switch and perform welding normally. Press the torch switch for the second time, the welding current attenuates until to crater value and keep on, then release the torch switch again, burn back and get rid of the ball on the end of wire, then stop feeding gas 3 seconds later.

③ Adjusting parameters:

Under MIG mode, you can adjust the voltage, inductance and wire feeding speed.

By default, you can adjust the wire feeding speed.

Press the **Data Selection Key** for the first time, the **Multifunctional Data Display** shows as **Fig.4**, which means the welding voltage is adjustable, and the adjustment range of preset voltage is ±20%.

Press the **Data Selection Key** for the second time, the **Multifunctional Data Display** shows as **Fig.5**, which means the inductance is adjustable, and its adjustment range is ±10%.

Without any operation after 5s, the **Multifunctional Data Display** would turn back to the default state. The settings will be retained when the machine closed, and displayed when the machine restarts.

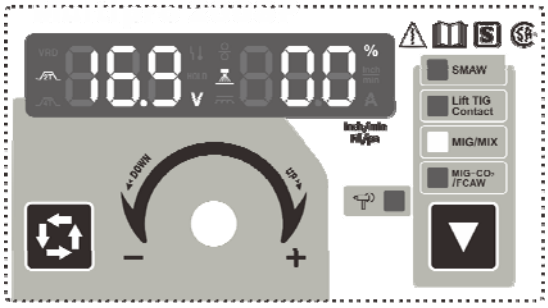


Fig.4 Fine Adjustment Display of Voltage Presetting Range

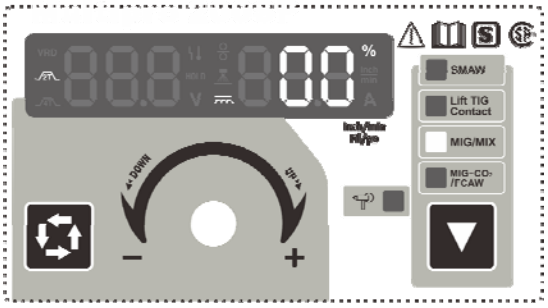


Fig.5 Fine Adjustment Display of Inductance Range

④ Spool welding mode:

The machine will go to the spool welding mode when connecting with spool torch, the **Spool Torch** indicators light up (**Fig.6**).

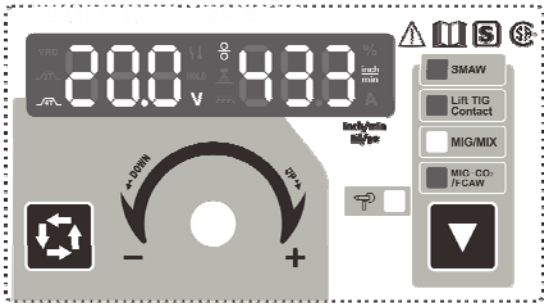


Fig.6 Spool Welding Mode

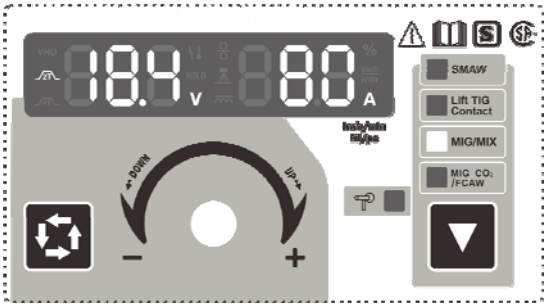


Fig.7 **The Status of Perform Welding**

NOTE:

- While connecting with spool torch, the **Function Switch Key** is not adjustable, and the wire feeding speed is adjusted by the spool torch.

⑤ The panel would display these data when restarting the machine next time if the parameters keep unchanged.

⑥ The panel displays as Fig.7 when performing welding, the welding voltage is 18.4V, and the current is 80A.

⑦ Releasing the torch switch and stopping welding, the panel displays as **Fig.8**. Moreover,

"**HOLD**" flashes for 3 seconds and quenches, which means the welding stops. 2 seconds later, **Multifunctional Data Display** redisplays the preset current.

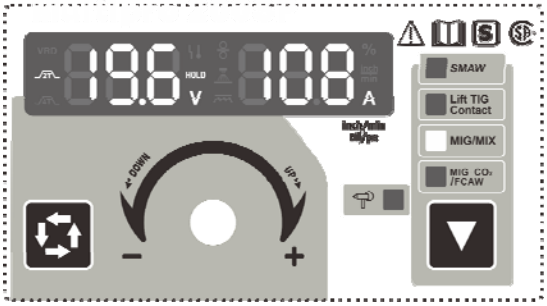


Fig.8 The Status after Stop Welding under MIG Mode

3） **Operation instruction under LIFT TIG mode.**

① When welding stops, press the **Function Switch Key** to **LIFT TIG** mode. The LIFT TIG indicator light will illuminate (**Fig.9**).

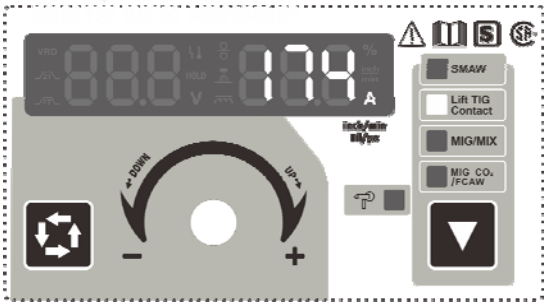


Fig.9 LIFT TIG Mode

② Adjusting current:

The welding current can be adjusted the **Multifunctional Data Adjusting Knob** while welding. See the chapter "**TECHNICAL PARAMETERS**" for the range of output current.

The settings will be retained when the machine closed, and displayed when the machine restarts.

③ The panel displays as **Fig.10** when performing welding, the welding voltage is 13.2V, and the current is 80A. It will go to the default state of welding current in 5 seconds when stopping welding.

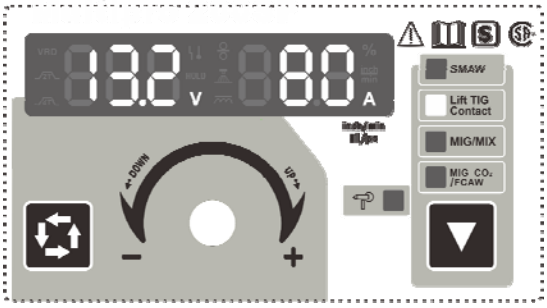


Fig.10 LIFT TIG Mode

4） **Operation instruction under MMA mode.**

① Set welding mode:

When welding stops, press the **Function Switch Key** to MMA mode， the **SMAW indicator lights** will illuminate.

② VRD function:

Press the **Data Selection Key** for 3 seconds, the VRD reduces open circuit voltage to a safe limit and the function is enabled (**Fig.11**).

Press the **Data Selection Key** for 3 seconds again, the VRD function is closed. (**Fig.12**)

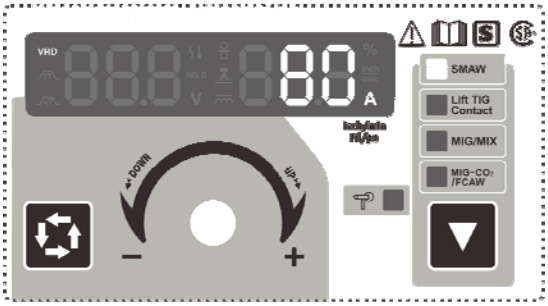


Fig.11 MMA Mode with VRD Enabled

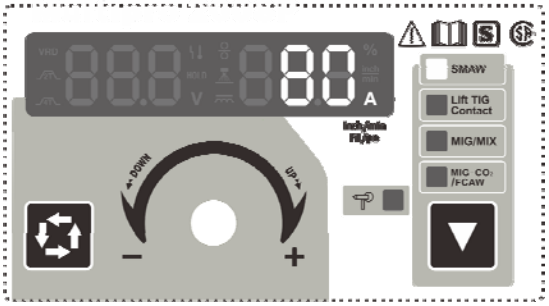


Fig.12 MMA Mode without VRD Display

③ Adjusting current:

Adjusting the **Multifunctional Data Adjusting Knob** can change the welding current during welding process. See the chapter “**TECHNICAL PARAMETERS**” for the range of output current.

The settings will be retained when the machine closed, and displayed when the machine restarts.

④ Three seconds after setting the welding parameters, the **Multifunctional Data Display** will flash for one time, which means the data has been saved. Moreover, the panel will display these data when restarting the machine next time if the parameters keep unchanged.

⑤ The panel displays as **Fig.13** when performing welding, the welding voltage is 23.2V, and the current is 80A. It will go to the default state of welding current in 5 seconds when stopping welding.

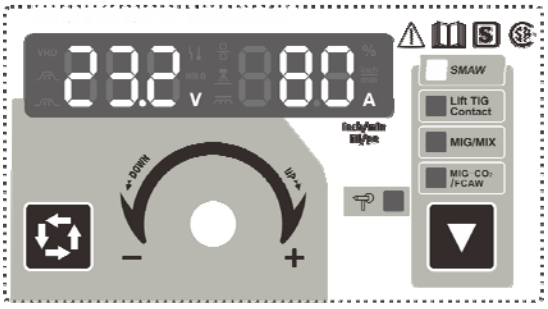


Fig.13 The Displays Status when Welding under MMA Mode.

Malfunction display：

1） **Malfunction display of wire feeder**

The panel displays as **Fig.14** when the wire feeder is malfunctioning, and the **Multifunctional Data Display** flashes continuously, the machine can not work normally. Please restart the machine, the panel would display the parameters that were set before malfunction occurrence.

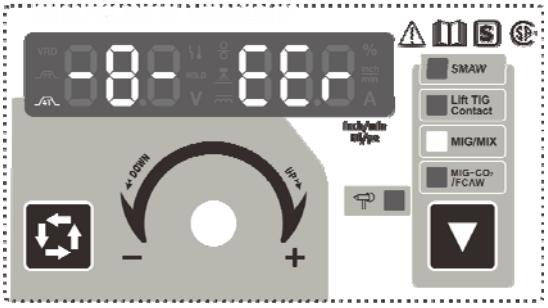


Fig.14 Malfunction Display of Wire Feeder

2） **Malfunction display of over-current**

The panel displays as **Fig.15** when over-current, and the **Multifunctional Data Display** flashes continuously, the machine can not work normally. Restart the machine, the panel would display the parameters that were set before malfunction occurrence.

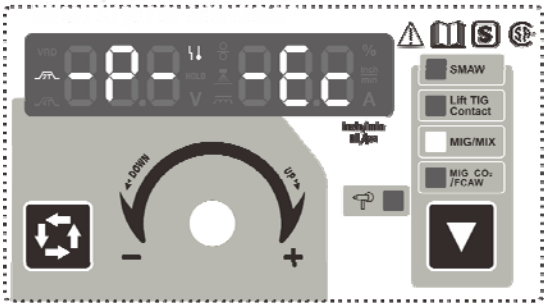


Fig.15 Malfunction display of over current

3） **Malfunction display of overheating protection**

The panel displays as **Fig.16** when overheating, and the **Multifunctional Data Display** flashes continuously, the machine can not work normally. Only when the temperature of the welding machine falls below 60℃, the overheating malfunction would disappear, and the machine work normally without restarting.

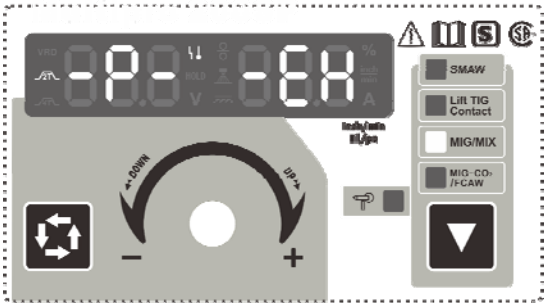


Fig.16 Malfunction display of overheating protection

ATTENTION & PREVENTIVE MEASURES

1. Environment

1） The machine must be operated under dry air conditions and a maximum humidity level of 90%.

2） Ambient temperature must be between -10 to 40 degrees centigrade.

3） Avoid welding in high temperatures, under the sun or in rain. Avoid contact between water and appliance.

4） Avoid welding in dusty areas or near a source of corrosive gas.

5） Avoid welding under conditions of strong wind or strong ventilation.

2. Safety Checkpoints

Our welding machine is equipped with over current, overvoltage and overheating protection devices. When the above elements exceed a certain threshold, the welding machine ceases to function automatically in order to preserve its components and to ensure the safety of its users. The operator must pay close attention to the following.

1） **The working area is adequately ventilated!**

The small or medium-sized welding machine can generate high electrical currents, which can cause overheating that cannot be prevented by natural wind circulation alone. Therefore, each machine has an internal fan to ensure the stability of its operating performance. Make sure the air intake of the fan is not obstructed or covered. There should be a 0.3-meter distance between the welding machine and surrounding objects. User should always make sure the work area is adequately ventilated before starting any work. It is important for the performance and the longevity of the machine.

2） Do not over load!

The operator should always keep an eye on the maximum operating current to make sure that the working current of the unit does not exceed the maximum duty cycle current. Over current may damage and even burn the machine.

The over current protection device prevents it from operating if the current exceeds the standard duty cycle. Under this circumstance, the temperature control switch is activated due to the overheating. The overheat indicator also lights up. In this situation, it is not necessary to disconnect the machine since the internal fan can work to cool down the machine. When the temperature reaches a safe threshold, the operator is able to start working again.

3） No over voltage!

The recommended power voltages can be found in settings diagram. Automatic compensation circuit of voltage will assure that welding remains within an allowable range. If power voltage is exceeding allowable range limits, it can damage the components of the machine. The operator should understand this situation and take preventive measures.

4） There is a clearly identified grounding cable behind welding machine. Before operation, welding plate must be grounded reliably with this cable, in order to prevent static electricity, and accidents of electricity leaking.

POTENTIAL OPERATING PROBLEMS

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

A. Arc starting difficulty. Arc interruption happens easily:

1) Examine whether grounding wire clamp contacts with the workpiece well.

2) Examine whether each joint has improper contact.

B. The output current fails to reach the set current:

The deviation of power voltage from rated value may cause the output current to not match the set value. When the power voltage is lower than rated value, the maximum output current may be lower than rated value.

C. The current is unstable during operation:

This situation may relate to the following factors:

1) The voltage of electric power network changes;

2) Serious interference from electric power network or other electric facilities.

D. Gas vent in welds:

1) Examine whether the gas supply circuit has leakage.

2) Examine whether there are sundries such as oil, dirt, rust, paint etc. on the surface.

DAILY MAINTENANCE

WARNING!

Cut off the power completely before all maintenance, repair work. Make sure to pull out power plug before opening the case.

1. Remove dust regularly with dry compressed air. Remove dust at least once a month if the welding machine is used in very dusty or polluted areas.
2. Use an appropriate compressed air pressure level to prevent damage to small components in the machine.
3. Check electrical connections of unit (especially plugs and sockets). Tighten the loose connections. In case of oxidation, remove oxidized layer with sand paper and connect again.
4. Prevent water from entering the machine and prevent the machine from getting moist. In case of contact with water, dry the unit with compressed air. Using a megohmmeter, make sure the insulation resistance of the device is appropriate.
5. If the welding machine is not used for a long time, pack the machine in original package and store in dry surroundings.
6. After each 300 hours of use of the wire feeder, check the carbon brush and clean the armature commutator. Rinse speed reducer, apply Molybdenum Disulfide #2 lubricant to the turbine, spindle and bearing.

DAILY CHECKING

WELDING POWER SUPPLY		
Position	**Check points**	**Remarks**
Control panel	1. Condition of operation, transfer and installation of switches 2. Check the power indicator	-
Cooling fan	1. Check if there is wind and if the sound is normal	If abnormal noise and no wind, check the inside of the fan
Electrical components	1. When power on, abnormal smell 2. When power on, abnormal vibration or buzzing 3. Color changing and heating in appearance	-
Peripheral components	1. Gas pipe is broken or loose 2. Housing and other fixed parts loose	-

WELDING TORCH		
Position	**Check points**	**Remarks**
Nozzle	Adequate mounting. Presence of distortion	Reason for air leaks
	Presence of splashes	Reason for burns in the torch (can use spatter-proof material)
Electric hole	Adequate mounting	Reason for torch screw thread damage
	Damage of its head and hole blocked	Reason for unstable and irregular arc
Wire guide tube	Check the extended size of the tube	Change when less than 6mm, when the extended part too small, to ensure arc stability
	Wire diameter matches tube inner diameter	Reason for unstable arc, please use the suitable tube diameter
	Partial bending and extended	Reason of poor wires guiding and unstable arc, please change
	Blockage caused by dirt or residue in the tube	Reason of poor wire guiding and unstable arc, (use kerosene to wipe or change tube)
	Wire guide tube broken	Pyrocondensation tube broken, change tube
Gas bypass	Poor connection or blockage of the hole	May cause spatter due to improper gas shield, unstable arc or burns to the torch body

WIRE FEEDER		
Position	**Check points**	**Remarks**
Pressure arm	Appropriate positioning of the pressure arm	Poor wire guidance and unstable arc
Wire lead tube	Accumulation of dirt or residue in the mouth of the tube	Clean the residue, find the source of the problem and solve it
	Wire diameter matches the tube's inner diameter	If unmatched, may cause residue buildup or unstable arc
	Tube diameter matches the wire wheel slot center. (Eyeballing)	If unmatched, may cause residue buildup or unstable arc
Wire wheel	Wire diameter matches the wheel's requirement If the wheel slot is blocked	1. May cause residue buildup, unstable arc and block wire tube 2. Change for a new one, if necessary
Pressure wheel	Check the stability of its move, and wearing-out of pressed wire, the narrowing of its contact surface	Poor wire guidance and unstable arc

CABLE		
Position	**Check points**	**Remarks**
Torch cable	1. If torch cable is twisted 2. Loosening of metal connection point of the mobile plug	1. Poor wire guidance 2. Unstable arc if cable is twisted
Output cable	1. Wear of the cable insulating material 2. Cable stripped (insulation damage), or loosened (the end of power supply, and cable of main material connection point)	Follow the appropriate safety measures and welding methods to perform these verifications depending on the workplace. ● Daily routine checks ● In-depth checks on fixed periods
Input cable	1. If the connection between the plug and the power socket is firm 2. If the power input end cable fixed 3. If the input cable is worn out and bares the conductor	
Earth cable	State of the earth cable and its connections	

TROUBLESHOOTING AND FAULT FINDING

Notes: The following operations must be performed by qualified electricians with valid certifications. Before performing any maintenance or repair work,it is recommended to contact your local distributor to verify the required qualifications.

Failures and solutions:

Failure	Solution
The meter shows nothing; Fan does not rotate; No welding output	1. Check that the power switch is on. 2. Power flows through the input cable. 3. Check if the silicon bridge is damaged. 4. Failure of the additional power source on the control board.
The meter shows a value; Fan works normally; No welding output	1. Check if all the sockets in the machine are well connected. 2. There is an open circuit or a poor connection at the output terminal. 3. The torch control cable is severed or the switch is damaged. 4. The control circuit is damaged.
The meter shows a value; Fan works normally; Abnormal indicator lights.	1. It might be the over current protection device. Turn off the power switch; restart the machine after the abnormal indicator light turns off. 2. It might be the overheating protection device. Wait for about 2-3 minutes until the machine cools down without turning off the power switch. 3. It might be a multifunction of the inverter circuit.

INITIAL PROBLEMS DIAGNOSE

A new machine may have faults or manufacturing defects, such as unstable arc or poor welding quality. Although it is still too early to judge whether the machine is defective or not.

If the above-mentioned problems occur with a new machine, a verification process should be followed before returning it to the retailer.

The diagram below contains the items to be checked before using the welding machine for the first time. Check the abnormal items "○" associated with the identified problems, where appropriate.

Diagnosis of manufacturing defects

Abnormal Items / Check points and Maintenance		No Arc	No Gas Flow	No Wire Feed	Poor Arc Ignition	Unstable Arc	Dirt on Edge of Weld Seam	Wire Sticks to related material	Wire Sticks to Contact Tip	Porosity Formed
Distribution Boxes (Input Protection Devices)	1. Make sure the unit is turned on 2. Burnt fuse 3. Loose connection joint	○	○	○	○	○	○			
Input Cable	1. Check if the cable is severed. 2. Loose connection joint 3. Overheating	○			○	○	○			
Power source	1. Make sure the unit is turned on 2. Phase problem	○	○	○	○	○	○	○	○	
Gas Cylinder and Gas Regulator	1. Turn on gas supply 2. Residual quantity of gas in the cylinder 3. Adjust the flow value 4. Loose connection joint					○				○
Gas supply hose (the whole line, from the high-pressure cylinder to the welding gun)	1. Loose connection joint 2. Gas hose damaged									○

Initial problems diagnosis

Check points and Maintenance / 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 Tip	Blowhole Formed
Wire Feeder	1. Wire spool does not match the diameter of wire in guide tube 2. Defective wire feeding wheel or groove blocked 3. Handle too tight or loose 4. Metal powder accumulated on the inlet of SUS hose			○	○	○	○		○	
Weld Gun and Cable	1. Welding gun cable twisted 2. Wear, blockage or deformation in the welding gun assembly (contact tip, gas hose, cable, etc.)				○	○	○		○	
Body of welding gun	1. Loose connection of contact tip, nozzle and nozzle contactor 2. Contactor of welding gun body is not properly inserted or tightened						○			○
Power supply cable of welding gun as well as cable of switch control	1. Wear caused by improper cable winding 2. Damaged by weighted drop	○	○	○		○		○		
Wire length and conditions of related material	1. Oil, dirt, rust and paint residues 2. Wire too long				○	○	○	○		○
Output Cable	1. Insufficient section of cable connected to related materials 2. Poor connection to(+), (-) output cable 3. Poor electric conductivity of related materials				○	○	○			
Lengthened Cable	1. Insufficient cable section 2. Folded or twisted cable				○	○	○	○		
Welding Work Conditions	Welding current, voltage, angle of welding gun, welding rate and wire length should be confirmed once again				○	○	○	○	○	

OPERATION PARAMETER RECOMMENDATION

1 **Generally, welding current is adequate to welding electrodes according with as following**

electrode specification	φ2.5	φ3.2	φ4.0	φ5.0
welding current	50-90A	90-130A	140-210A	190-270A

2 **MIG welding parameter variables**

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

		Material 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

	Material thickness （mm）	Wirediameter （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

		Material thickness （mm）	Wirediameter （mm）	Welding gun vertical angle(°)	Current （A）	Voltage （V）	Welding speed (cm/min)	Wire extension （mm）	Gas flow rate （L/min）
Horizontal fillet butt welding T joint	Low welding speed	1.0	0.8,0.9	45^0	70～80	17～18	50～60	10	10～15
		1.2	0.9,1.0	45^0	85～90	18～19	50～60	10	10～15
		1.6	1.0,1.2	45^0	100～110	19～20	50～60	10	10～15
		2	1.0,1.2	45^0	115～125	19～20	50～60	10	10～15
		2.3	1.0,1.2	45^0	130～140	20～21	50～60	10	10～15
		3.2	1.0,1.2	45^0	150～170	21～22	45～50	15	15～20
		4.5	1.0,1.2	45^0	140～200	22～24	45～50	15	15～20
		6	1.2	45^0	230～260	24～27	45～50	20	15～20
		8.9	1.2,1.6	50^0	270～380	29～35	45～50	25	20～25
		12	1.2,1.6	50^0	400	32～36	35～40	25	20～25
	High welding speed	1.0	0.8,0.9	45^0	140	19～20	160	10	15
		1.2	0.8,0.9	45^0	130～150	19～20	120	10	15
		1.6	1.0,1.2	45^0	180	22～23	120	10	15～20
		2	1.2	45^0	210	24	120	15	20
		2.3	1.2	45^0	230	25	110	20	25
		3.2	1.2	45^0	270	27	110	20	25
		4.5	1.2	50^0	290	30	80	20	25
		6	1.2	50^0	310	33	70	25	25
Horizontal fillet welding joint	Low welding speed	0．8	0.8,0.9	10^0	60～70	16～17	40～45	10	10～15
		1.2	0.8,0.9	30^0	80～90	18～19	45～50	10	10～15
		1.6	0.8,0.9	30^0	90～100	19～20	45～50	10	10～15
		2.3	0.8,0.9	47^0	100～130	20～21	45～50	10	10～15
			1.0,1.2	47^0	120～150	20～21	45～50	10	10～15
		3.2	1.0,1.2	47^0	150～180	20～22	35～45	10～15	20～25
		4.5	1．2	47^0	200～250	24～26	45～50	10～15	20～25

CIRCUIT DIAGEAM