Pipeline welding equipment manual

Thank you for purchasing the automatic welding products. We will accompany you in using this product with our sincere service!

In order to cooperate with our service, we recommend that you read the "Instruction Manual" carefully before using this product. Among them, the basic structure, product functions, usage methods and technical parameters of this product are introduced in detail. So that you can use it as a reference and reference in the specific process of use. During use, we recommend that you keep this "Instruction Manual" handy for reference at any time.

If you have doubts and corrections about some of the contents and opinions in the "Instruction Manual", or have doubts and corrections about this product, please contact our service phone, our customer service staff will provide you with professional services, and sincerely accept Your criticism and correction. Please feel free to contact our company.

Before using automatic welding machine

In order to ensure safe operation, please observe the following items

WARNING! Pay attention to avoid ANY personal accidents!
• Wearing clothing and safety protection equipment In order to prevent eye inflammation and skin burns, please follow the labor safety and health rules and wear corresponding protective equipment. • Precautions during ventilation In order to prevent harmful gas poisoning and suffocation (welding fumes and gases are harmful to humans), it is necessary to comply with the rules on dust infringement in the Machinery Implementation Order of the Labor Safety and Health Law, install local exhaust devices or use effective respiratory protective equipment.

Notice! Prevent the machine from burning and fire accidents!
• Prevent fire and machine damage caused by overheating Please keep flammable items at a distance of more than 50cm. • Prevent fire accidents and machine burns caused by sparks Remember to splash sparks (splash, flash) on combustible materials. • Prevent bumps and machine damage caused by falling When installing the machine on the stand, ensure safety and prevent it from falling off. • Must read the operation manual *Please read the operation manual carefully before using this machine.


Swing mechanism
Left and right telescopic adjustment mechanism
Gun clamping mechanism
Working magnetic wheel


Pipeline trolley swing
焊接自动化
Hj18

1. **Summary**:

CO2 welding automatic trolleys are widely used in shipbuilding, bridges, locomotives, steel structures, petrochemical industries and other industries. They are suitable for welding various welded structures, such as: welding of stiffener plates, ribs, cross parts, welding of box beams, etc. Wait. Its main advantages are:

- Reduce labor intensity and improve working environment
- Improve work efficiency, 1.5 times that of manual welding
- Avoid poor welding seam quality caused by human factors. Generally, the defect rate of manual operation is about 20%, and the use of automatic welding trolleys does not result in poor welding rate.

Therefore, its comprehensive benefit is nearly 200% higher than that of manual welding

- High degree of automation to ensure the stability of welding quality
- No need for skilled workers

FY-QB-06 is suitable for welding the inner and outer walls of pipelines. It does not require rails and can be welded along the arc of the workpiece.

2. **Features**:

(1) FY-QB-06 is a swing type automatic welding device, which can obtain a wider weld seam in one welding.

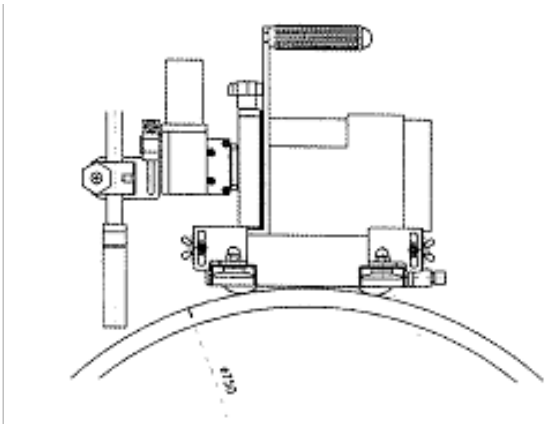
(2) The swing speed, swing amplitude, center position and left and right residence time can all be adjusted, which is suitable for various welding beads of different specifications.

(3) Small size, light weight, easy to install and move, unskilled workers can also perform welding.

(4) Permanent magnets are installed to avoid the phenomenon of welding wire detachment during welding.

3. **Applicable environment**:

Suitable for circumferential seam welding of pipes with a diameter greater than 150MM.



4. **Description of main components**:

Body components: welding torch swinger, slider, welding torch handle, control box, control panel and other accessories

(1) Oscillator: drive the welding gun to perform pendulum swing welding

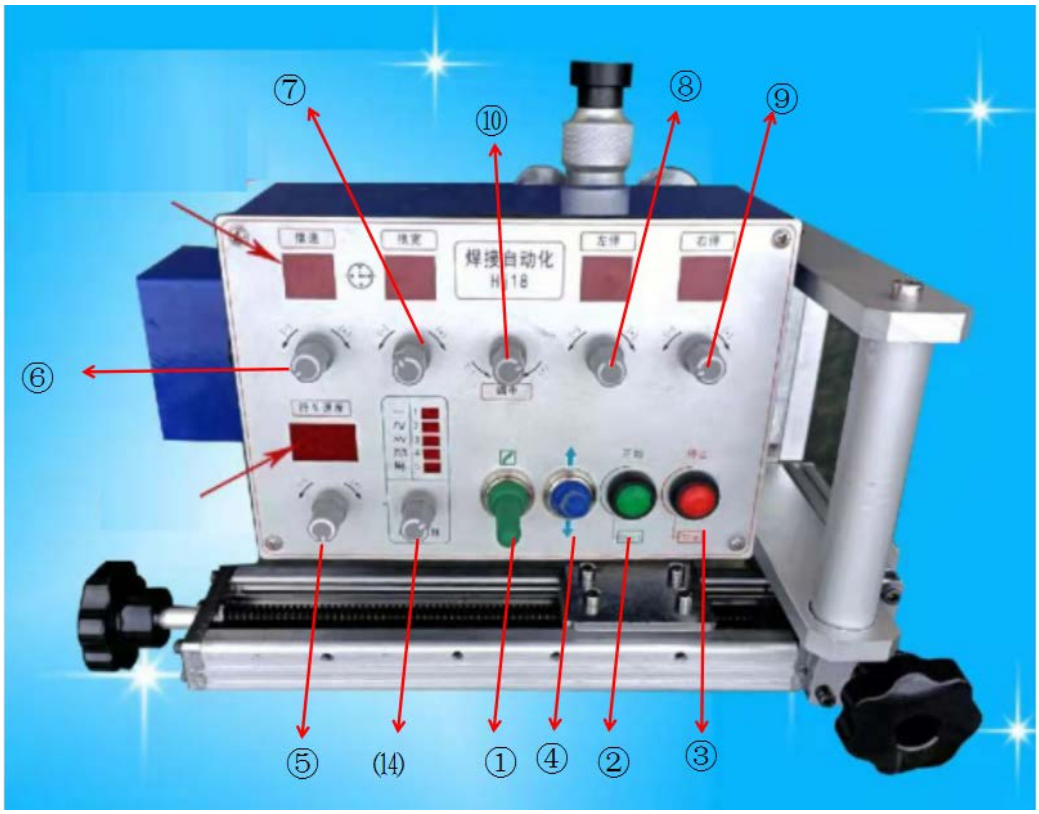
(2) Drive part: the power device for the trolley to travel, consisting of four magnetic wheels, helical gears, chains, and sprockets

(3) Slider part: a device for adjusting the position of the welding torch, which can be fine-tuned back and forth during welding

(4) Welding gun clamp: the holding device of the welding torch, which can adjust the angle of the welding torch.

(5) Control box; all actions of the trolley can be adjusted. For details, please refer to the operation method of the control panel

6. **Control panel description**:



(1) **"Welding/non-welding" switch**: when the "welding" position is selected, it will enter the welding preparation state, press the "start" switch to weld; when the "non-welding" position is selected, press the "start" switch, the cart will only move but not proceed welding.

(2) **"Start" switch**: Turn on the switch and the trolley start to walk. If the "welding/non-welding" selector switch is set to the "welding" position, then welding will start; if the "welding/non-welding" selector switch is set to "non-welding" at this time in the "welding" position, only the trolley is traveling but welding is not performed.

(3) **"Stop" switch**: If you press the stop switch while the car is moving, the car will stop all actions.

(4) **Walking direction selection switch**: you can choose to walk up or down.

(5) **Walking speed**: the speed value is displayed by digital, the maximum walking speed is 1040mm/min, and the digital display value is 999.

(6) **Swing speed adjustment knob**: rotate clockwise to increase the swing speed, and the maximum value is 1520mm/min. It is expressed in scale, and the maximum scale is 10.

(7) **Swing amplitude adjustment knob**: Turn clockwise to increase the swing amplitude, and the maximum value is 20mm. It is expressed in scale, and the maximum scale is 10.

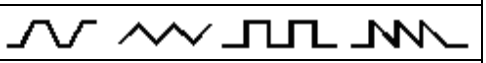
(8) **Left stop time adjustment knob**: the adjustment range is 0~2S, increasing clockwise.

(9) **Right stop time adjustment knob**: the range is 0~2S, increasing clockwise.

(10) **Center movement adjustment knob**: when rotating clockwise, the center will move to the right, when rotating counterclockwise, the center will move to the left, and the maximum range of movement is ±5mm.

(14**) Swing mode selection knob**: Use this knob to select the swing mode. There are five swing modes for the trolley. Except the first one is the non-swing mode; the rest are as follows:

7. **Main technical parameters**:

type		content	Remark
Trolley	Power supply	AC 220V	
	Size	240×330×310	W×L×H
	Weight	16Kg	Includes the swinger
	Movement	All-wheel drive	Magnetic wheel
	Working speed	0~700mm/min	
	Swing the electric machine	DC24V 18RPM	
	The welding gun adjusts the range The welding gun adjusts the range	up and down	
		before and after	85mm
		Operating angle Adjust fan circumference	360°
		Into the line angle adjusts the fan circumference	0 °
control	The operating function	Swing Mode Select	
		Swing speed	0－10ＲＰＭ（Show with a scale）
		Swing amplitude	0－±10°（Show with a scale）
		Left and right stay time adjustment	0－2Ｓ（Show with a scale）
		Center move	0－±８°
		Tap the wire	
		Start/Stop	
		Welding Flow/ Voltage Control	
		Direction of walking Select	
		Walking speed adjustment	0～1000mm/min（Show with a scale）

		Weld /Non-Weld Selection	

8. **Installation method:**

(1) Installation conditions

a. The necessary tools for welding are welding power source and wire feeder device;

b. Welding power supply for walking and control (AC 220V);

c. CO2 gas tank for welding;

d. Straight welding gun for CO2 automatic welding;

e. Basic tools for other necessary operations;

(2) System connection method

a. Install the track. The installation of the track must ensure that the welding direction of the trolley is parallel to the welding seam

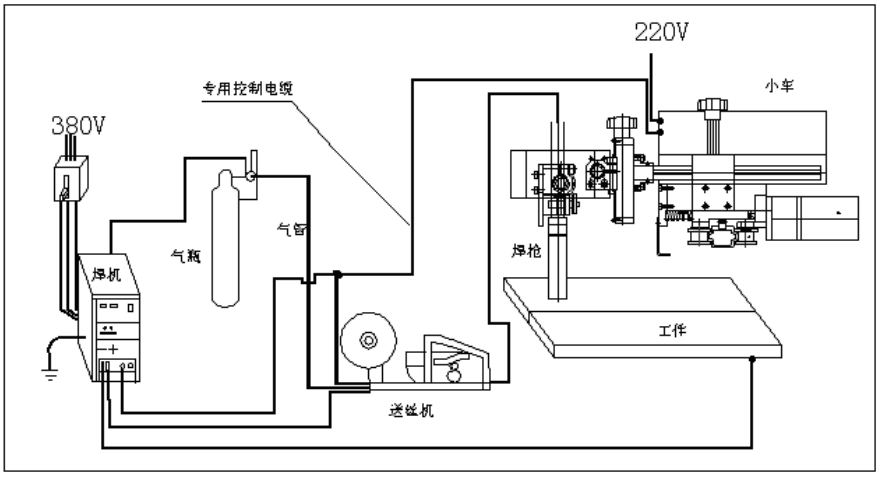
b. Install the trolley, and use the installation handle to clamp the track wheel of the trolley on the track

c. Install the welding wire on the wire feeder and pull it to the end of the welding gun

d. The welding gun port is connected to the wire feeder

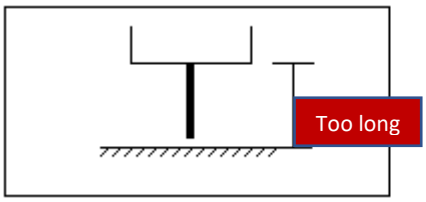
e. Connect one side of the trolley's power cable to the 3P socket of the trolley, and connect the other side to the AC 220 power supply.

f. The dedicated control cable has three connectors, one is connected to the welding trolley, one is connected to the welding machine, and the other is the wire transfer machine.

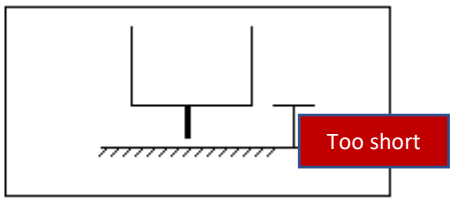


9. **Mode of operation:**

- Select the wire diameter switch in the welding power source.
- Select the type of welding wire in the welding power source, solid-cored or flux-cored.
- Turn on the power switchboard switch----ON.
- Turn on the welding power switch----ON (the self-protection circuit switch of the welding machine is closed----OFF).
- Open the valve of the CO2 gas cylinder and check whether the pressure is above 1kg/cm2. If the gas pressure is below 1kg/cm2, the gas cylinder should be replaced; if the gas pressure is above 1kg/cm2, set the gas switch of the welding power source to the “check” position to adjust the gas flow. After adjusting the flow rate, the "Gas Check" switch of the welding power source is set to "OFF".
- Use manual wire feed to feed the welding wire to the front end of the welding gun, and install a contact tip corresponding to the diameter of the welding wire.
- Confirm the extension length of the welding wire



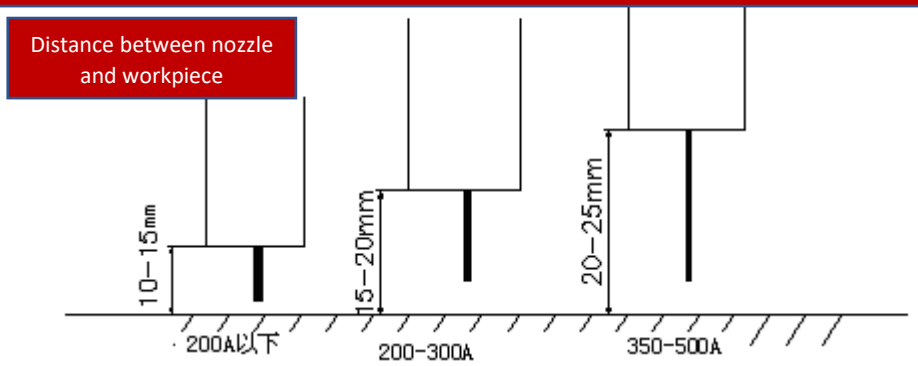
Effect
- cause airhole
- Bad ignition
- Arc instability
- Shallow penetration



Effect
- The nozzle is easily blocked by splashes
- Can't see the welding line
- Penetration becomes deeper

- Clamp the welding torch on the welding torch clamp, and use a special wrench to adjust the operating angle and travel angle of the welding torch
- Adjust the X-Y slider, move the coarse adjustment knob of the welding gun position, and adjust the position of the welding gun
- Adjust the distance between the nozzle and the workpiece

The distance between the nozzle and the working space is too large, which is easy to produce defects (air holes, pits, etc.). The interval should be ensured according to the following methods.

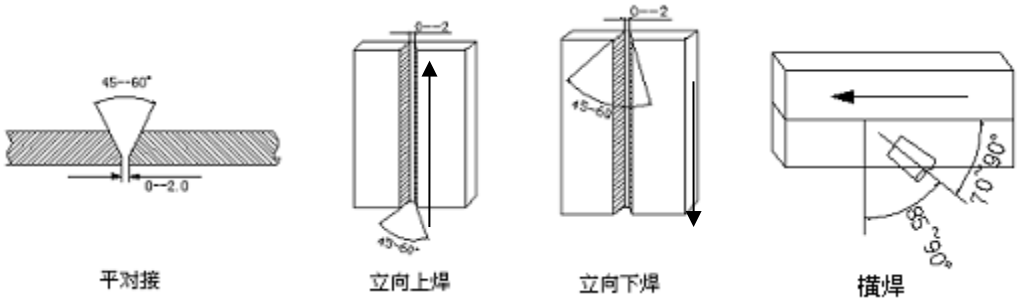


- Preliminary adjustment of process parameters (current, voltage, etc.)
- Confirm the CO2 gas flow rate and the protection effect of the molten pool
- Preliminarily adjust the desired swing mode, swing amplitude, left and right residence time, center position and swing speed
- Start welding, observe the arc, accurately adjust the welding speed, swing speed and other parameters
  (Turn the welding selection switch of the operation panel to the ON position, and press the start switch to weld)
- Press the stop switch after the workpiece is welded

10. **Welding process parameters (for reference only)**:

Welding parameters \ The diameter of the wire		φ1.2mm	φ1.4㎜	φ1.6㎜
Electric current（A）	Flat welding	120~300	150~380	180~430
	Cross welding	120~280	150~300	180~330
	Vertical up welding (upswing)	100~160	120~160	140~180
	Weld down	120~170	140~180.	150~200
voltage（U）		①U=14+0.05I ②300A When it's low U=0.04I+16±1.5 300A When it's high U=0.04I+20±2.0		
The distance between the nozzle and the workpiece（H）		200A When it's low H=10~15mm 200~350A → H=15~20mm 350~500A → H=20~25mm		
The length of the wire protruding（L）		一般取焊丝直径的 10 倍左右，即 L=10φ		

（1）docking：



平对接　　立向上焊　　立向下焊　　横焊

The thickness of the plate（δ）	The diameter of the wire（φ）	Root gap (k)	Electric current(I)	Voltage (U)	velocity (cm/min)	conductive nozzle with Workpiece spacing	Gas flow (L/min)
6 mm	1.2 mm	0 mm	270~300 A	27~30 V	60~70	10~15 mm	20
	1.2 mm	1.2~1.5 mm	200~230 A	24~25 V	30~35	10~15 mm	15~20
8 mm	1.2 mm	0~1.2 mm	300~350 A	30~35 V	30~40	15~20 mm	20
	1.6 mm	0~0.8 mm	380~420 A	37~38 V	40~50	15~20 mm	20
12 mm	1.6 mm	0~1.2 mm	420~480 A	38~41 V	50~60	20~25 mm	20

（2）The following are the swing parameters：

The thickness of the plate（δ）	Swing mode	Swing amplitude (scale)	Swing speed (scale)	Left and right stop over time（s）
6 mm	Jagged waves	3~5	4~5	0.2~0.3
8 mm	Jagged waves	4~5	3~5	0.3~0.5
12 mm	Jagged waves	5~7	3~4	0.5~0.7

（3）Weld down:

The thickness of the plate(mm)	The diameter of the wire（mm）	Electric current(I)（A）	Voltage（V）	Walking speed (scale)	Gas flow（L/min）	Swing mode	Swing amplitude (scale)	Swing speed (scale)	Left and right stop over time（s）
6	1.2	120~160	20~22	40~45	13-15	hackle	3	5	0
8	1.2	120~160	20~22	40~45	13-15	hackle	3	5	0
12	1.2	140~170	20~23	40~45	13~15	hackle	4	5	0.4

11. **Inspection and maintenance**:

In order to ensure the long-term and safe use of the welding trolley, the trolley should be inspected and repaired regularly.

1) Is there dust?

-The control box and the switch of the welding gun adjustment part should be kept clean and wiped frequently without dust.

2) Is the stolen goods piled up?

-The deposits on the tip, torch head, guide wheel and sliding block should be removed because it will affect the safe operation of the trolley.

3) Are the screws of the welding gun holder and the guide rail loose?

-Loose screws will lead to poor trolley walking and uneven welding bead. Always check the tightening state of the screw.

4) Confirm that the connectors, connecting wires, hoses, and welding torches are disconnected or damaged?

-Check for slack in joints or connecting wires, hoses, and welding guns for disconnection and damage.

5) Is there any abnormal sound or abnormal heat?

-Regularly check whether there are any abnormalities in the motor, welding torch and other places.

6) Is there any wear on the rack and pinion track?

-The wear of the rack will become the cause of poor walking, so it should be replaced regularly.

7) Is the fuse blown?

-If the power light does not light up after wiring during welding, please check the fuse first.

8) Check whether the oscillator is working properly?

-Check the motor and various adjustment knobs of the swinger.

12. **Troubles and countermeasures**:

-The failure of CO2 trolley and the corresponding countermeasure items are as follows:

1）The power light of the control box does not light up

The cause of the occurrence	Repair measures
The control cable is out of contact	Replace the cable
The control box fuse is broken	Replace the fuse
The power supply 220V current does not pass through	Power confirmation

2）The weld start button does not work

The cause of the occurrence	Repair measures
The wire is in poor contact	Remove the slag
The welding start switch is not good	Switch check and replace or wiring check repair
The drive is not good	Motor drive inspection and repair

3）The welding point of the welding gun does not match the target position

The cause of the occurrence	Repair measures
The welding gun holder does not match the target position	Tighten the welding gun holder

4）Slider adjustment is inflexible

The cause of the occurrence	Repair measures
There is sediment in the slider area	Remove deposits or add lubricants

5）Automatic welding of small cars have stopped phenomenon

The cause of the occurrence	Repair measures
There are obstacles on the track of the Trolley	Remove the obstacle
There is sediment on the orbital wheel	Clean the track wheel

6）The weld stop switch does not eliminate the welding arc by holding down the welding arc

The cause of the occurrence	Repair measures
The weld stop switch is not working	Switch check and replace
The self-guaranteed circuit switch is placed in the "on" position	The self-guaranteed circuit switch is placed in the "None" position

7）Not walking in a vertical plane

The cause of the occurrence	Repair measures
The position of the wheel is not properly fixed.	Re-adjust the position of the wheel.

8）The swinger is not working properly

The cause of the occurrence	Repair measures
There is a problem with the swing motor	Check the motor and wiring and various adjustment knobs