

Instructions for pipe welding equipment

WeldOrbit 360 Automatic Pipe Welding Carriage



Thank you for purchasing the Cruxweld WeldOrbit 360 automatic welding carriage. We will be pleased to give you sincere service throughout the life of this product.

Before using this product, please be sure to read this manual carefully. It gives a detailed introduction to the basic structure of the product, its functions, the methods of use and the technical parameters, so that you have a reference during use. We recommend that you keep this manual to hand so that it can be consulted at any time.

Matters needing attention

To ensure safe operation, observe the following precautions

Warning! Pay attention to avoid serious accidents!

● **Clothing and safety equipment**

In order to prevent eye inflammation and skin burns, be sure to observe the labour safety and health rules and wear the appropriate protective equipment.

● **Breathing**

In order to prevent harmful gas poisoning and asphyxiation (welding fume and gas are harmful to the human body), it is necessary to comply with the applicable occupational safety and health rules for fume and dust: install local exhaust devices or use effective respiratory protection equipment.

Attention! Prevent machine burning and fire accidents!

● **Prevent fire and machine damage from overheating**

Keep inflammable items at least 50 cm away.

● **Prevent fire accidents and machine damage caused by sparks**

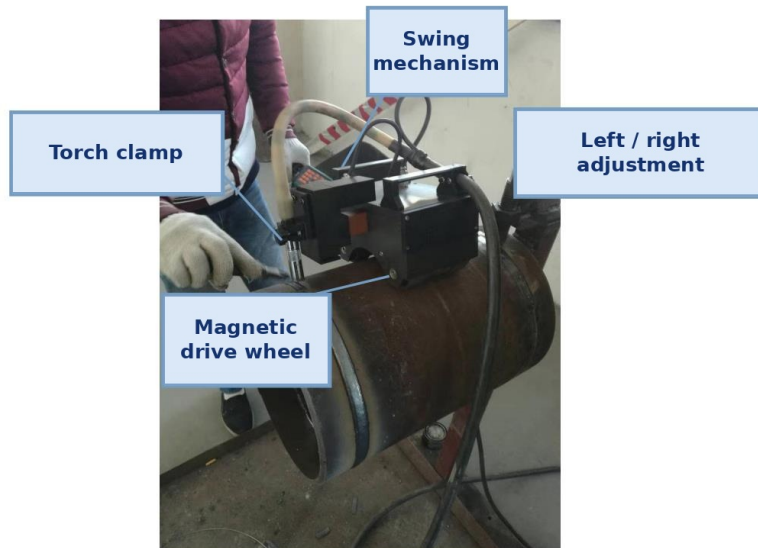
Make sure that sparks (splashes and flashes) cannot reach flammable items.

● **Prevent collisions and machine damage from falling**

When installing this machine on the workpiece, make sure it is secure so that it cannot slide off.

● **The manual is compulsory reading**

Please read the operation manual carefully before using the machine.



Main assemblies of the WeldOrbit 360 welding carriage



1. Summary

The CO₂ automatic welding carriage is widely used in shipbuilding, bridges, locomotives, steel structures, the petrochemical industry and other industries, and is suitable for welding a wide variety of welded structures — for example reinforcement plates, rib plates, cross parts and box beams. Its main advantages are:

- Reduces labour cost and improves the working environment.
- Faster working efficiency — its speed is 1.5 times that of manual welding.
- The weld appearance produced by the automatic carriage is better than manual welding; overall efficiency is raised by up to 200%.
- A high degree of automation ensures stable welding quality.
- No experienced, highly skilled operator is required.

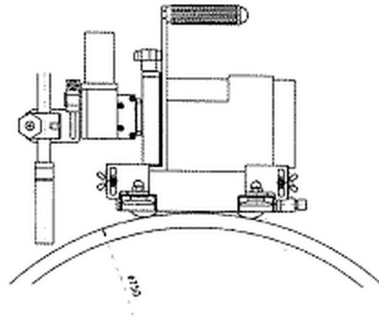
It is suitable for welding the inner and outer walls of pipes. It does not require rails and can weld along the curved surface of the workpiece.

2. Features

- (1) Swing-type automatic welding device: a wide weld bead can be produced in a single pass.
- (2) Swing speed, swing range, centre position and dwell (stop) time can all be adjusted for different weld sizes.
- (3) Small package and light weight; it is easy to move and install, and is suitable for less experienced operators.
- (4) Permanent magnets keep the carriage on the workpiece and prevent the weld line from breaking off.

3. Working condition

The welding carriage is suitable for pipes with a diameter larger than 150 mm.



Pipe welding

4. Main parts

Main parts: wig-wag (swing unit), rail block, welding torch, control box and control panel.

- (1) **Wig-wag (swing unit):** makes the welding torch swing.
- (2) **Drive parts:** drive the welding carriage along the workpiece. They consist of the magnetic wheels, the chain and the chain wheel.
- (3) **Rail block:** adjusts the torch position from front to back.
- (4) **Torch clamp:** adjusts the angle of the welding torch.
- (5) **Control box:** adjusts all the actions of the carriage; for details refer to the control panel operating method.

5. Control panel description



- (1) **Welding mode / non-welding mode:** choose “welding mode” and the machine is ready to weld; press the “Start” button to weld. Choose “non-welding mode” and press the “Start” button, and the carriage will move without welding.
- (2) **“Start” button:** press the “Start” button and the carriage will move. In “welding mode” it will weld; in “non-welding mode” the carriage will move without welding.
- (3) **“Stop” button:** press the “Stop” button and the carriage will stop moving.
- (4) **“Moving direction” button:** up or down.

- (5) **“Moving speed” knob:** the fastest speed is 1040 mm/min; the digital display then shows 999.
- (6) **Swing speed:** clockwise rotation increases the swing speed to a maximum of 1520 mm/min. It is expressed on a scale, with a maximum of 10.
- (7) **“Swing range” knob:** clockwise rotation makes the swing wider; the maximum is 20 mm. It is expressed on a scale, with a maximum of 10.
- (8) **“Left stop” knob:** adjustment range 0 – 2 s; clockwise rotation increases the dwell time.
- (9) **“Right stop” knob:** adjustment range 0 – 2 s; clockwise rotation increases the dwell time.
- (10) **“Tune in” knob:** the centre point moves to the right with clockwise rotation and to the left with anti-clockwise rotation; the maximum movement is ± 5 mm.
- (14) **“Mode selection” knob:** use this knob to select the swing mode. The carriage has five swing modes; apart from the first, which is the non-swing mode, they are as follows:



6. Main data

Item		Specification	Remark
Welding carriage	Power	AC 220 V	
	Size	240 × 330 × 310 mm	W × L × H
	Weight	16 kg	including the swing unit
	Movement	Four-wheel drive	magnetic wheels
	Travel speed	0 – 700 mm/min	
	Swing motor	DC 24 V, 18 rpm	

Welding torch adjustment range	Up / down	—	
	Front / back	85 mm	
	Operating angle adjustment range	360°	
	Working angle adjustment range	0°	
Control functions	Mode selection		
	Swing speed	0 – 10 rpm	scale shown on display
	Swing range	0 – ±10°	scale shown on display
	Left / right stop time	0 – 2 s	scale shown on display
	Movement of centre point	0 – ±8°	
	Travel speed	0 – 1000 mm/min	scale shown on display

7. Checking and maintenance

To ensure that the welding carriage works properly for a long time, please check and service the carriage regularly.

1) Is there any dust?

– Keep the control box and the welding torch adjustment slides clean; wipe them often so that no dust remains.

2) Has any dirt accumulated?

– Dirt on the welding torch head, the adjusting wheel and the slider must be removed, because it affects the safe operation of the carriage.

3) Are the screws of the torch fixing frame and the guide rail loose?

– Loose screws lead to poor travel of the carriage and an uneven weld path; always confirm that the screws are tight.

4) Are any connectors, cables, hoses or welding torches broken or damaged?

– Check the joints for slack, and the connection lines, hoses and torch for breaks and damage.

5) Are there any abnormal sounds or heat?

– Check the motor, the welding torch and other parts regularly for abnormalities.

6) Is the rack and pinion worn?

– A worn rack causes poor travel and must be replaced regularly.

7) Is the fuse blown?

– If the power light does not come on after wiring up for welding, check the fuse first.

8) Is the swing unit working properly?

– Check the swing motor and the various adjusting knobs.

8. Faults and countermeasures

The faults of the CO₂ welding carriage and the corresponding countermeasures are as follows:

1) The power light in the control box does not come on

Reasons	Repair measures
Poor contact of the control connection wire	Replace the cable
The fuse in the control box is blown	Replace the fuse
The 220 V supply current is abnormal	Check the power supply

2) The weld start button does not work

Reasons	Repair measures
The welding wire is making poor contact	Remove the welding slag
The welding start switch is faulty	Inspect and replace the switch, or inspect and repair the wiring
Defective driving part	Inspect and repair the motor drive

3) The welding point of the torch does not line up with the target position

Reasons	Repair measures
The welding torch holder is out of position	Tighten the welding torch holder

4) The slider cannot be adjusted smoothly

Reasons	Repair measures
There is sediment at the slider	Remove the sediment or add lubricating oil

5) The automatic welding carriage stops during operation

Reasons	Repair measures
There are obstacles on the carriage track	Remove the obstacles
There are deposits on the track wheel	Clean the track wheel

6) The welding stop switch is held down but the arc does not go out

Reasons	Repair measures
The welding stop switch has failed	Check and replace the switch
The self-protection loop switch is in the “on” position	Set the self-protection loop switch to the “none” position

7) The carriage does not run in the vertical plane

Reasons	Repair measures
Poor wheel position	Reposition the wheel

8) The swing unit is not working properly

Reasons	Repair measures
There is a problem with the swing motor	Check the motor, the wiring and the various adjusting knobs



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Note: the specifications and technical content of this product are subject to change without notice.