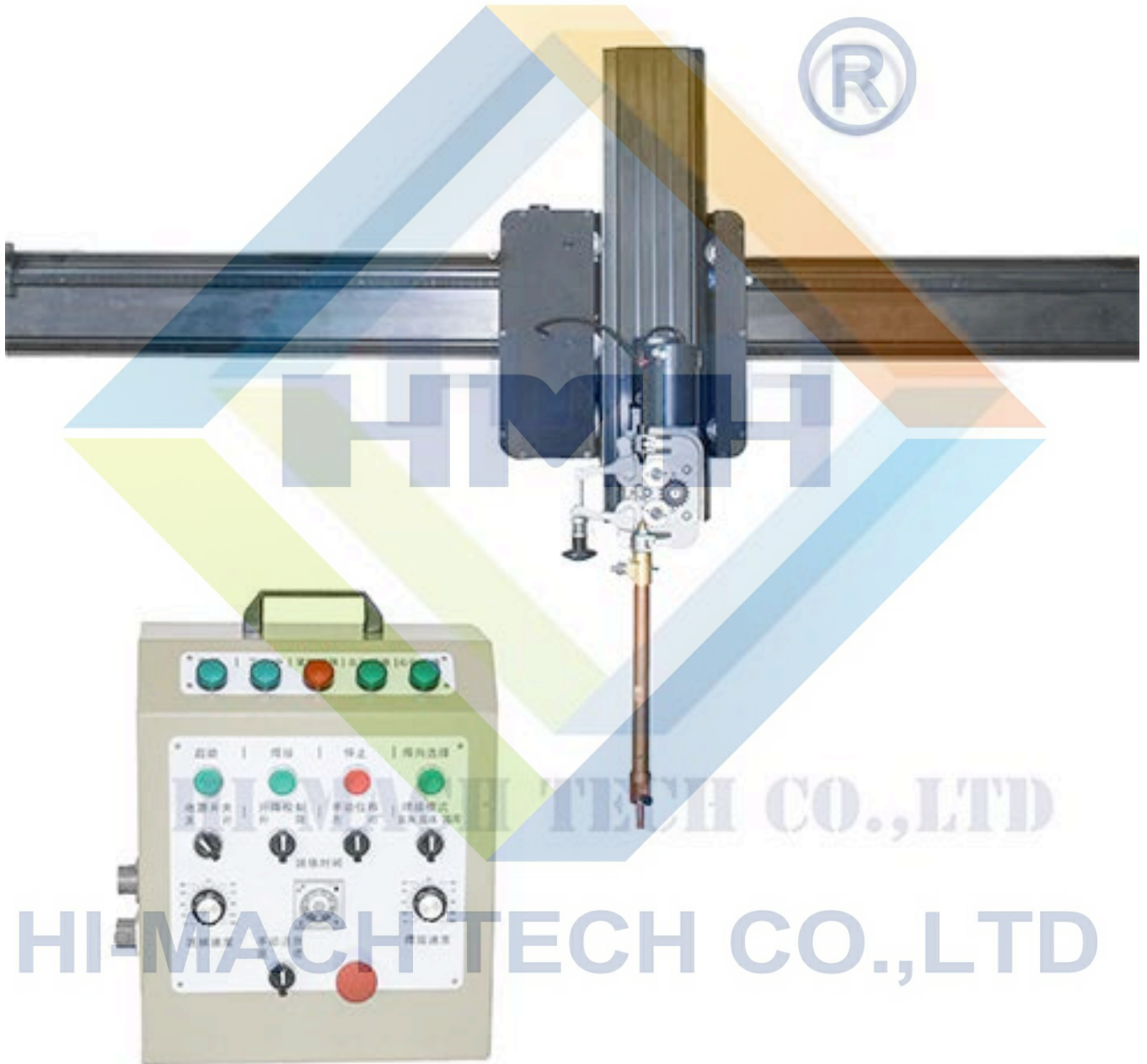




昆山利玛赫自动化科技有限公司  
KUNSHAN HI-MACH TECH CO.,LTD

# Product Manual



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# Table of Contents

I. Preface .....	2
II. Safety Precautions.....	3
III. Technical Indicators.....	4
IV. Connection Mode .....	5
V. Panel Function.....	5
VI. Side Panel Function.....	6
VII. Operation and Use.....	7
VIII. Equipment Installation.....	12
IX. Key Points for Inspection in the Event of Abnormalities.....	13



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# Preface

In order to adapt to the unceasingly improved automation and welding technologies, we promptly have launched this high-performance, highly cost-effective and industrial-grade automatic straight-line walking mechanism. This mechanism has selected imported motors and control devices of famous brands, and adopted pulse width modulation technology, current feedback and other integrated technologies, which effectively ensure the quality of mobile welding.

Specially designed for construction objects in the cement machinery, electrical equipment, smelting machinery and other highly demanding industries, the mechanism can meet a variety of physical requirements and also sway and walk. Overall, the mechanism boasts the following excellent performances: 1. straight-line walking is steady with low noise, and repetitive travel is highly precise; 2. walking distance can be set at will; 3. a variety of walking modes can be achieved; 4. fast walking and slow walking are of the same precision; 5. the gun support mechanism can be automatically adjusted. Therefore, the mechanism can help users not only reduce the investment in the device, but also improve the production efficiency, demonstrating very high cost-effectiveness.



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Thank you for using our straight-line walking mechanism. In order to help you to correctly grasp the operating methods and safety use the mechanism, please be sure to read the instructions carefully before use.

1. The warranty period of the host of the product is one year. All other accessories and wear parts are not covered under warranty.
2. Within the warranty period, non-artificial damage and damage caused by unnatural disasters may be repaired for free. Man-hour cost will be charged for damage in other cases.
3. Customers shall not disassemble, modify and replace parts without permission. Otherwise, serious consequences may be caused. For any consequence generated by the abovementioned factors, the Company will not bear any responsibility.

## II. Safety Precautions

1. The walking mechanism shall be placed in the place with good ventilation; the rear panel shall be kept more than 50cm away from the surrounding goods or the wall in order to facilitate heat emission of the control box. The distance between combustibles and the mechanism shall be no less than 5m.

2. The walking mechanism shall be kept sufficiently away from combustibles around the control box. Be sure to confirm that sparks and fumes generated in electric arc would never fall directly on the

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touch screen of the control box and never reach any combustible.

3. The walking control box mechanism shall be grounded reliably. Protective clothing, insulating gloves and safety shoes shall be worn properly according to safety requirements.

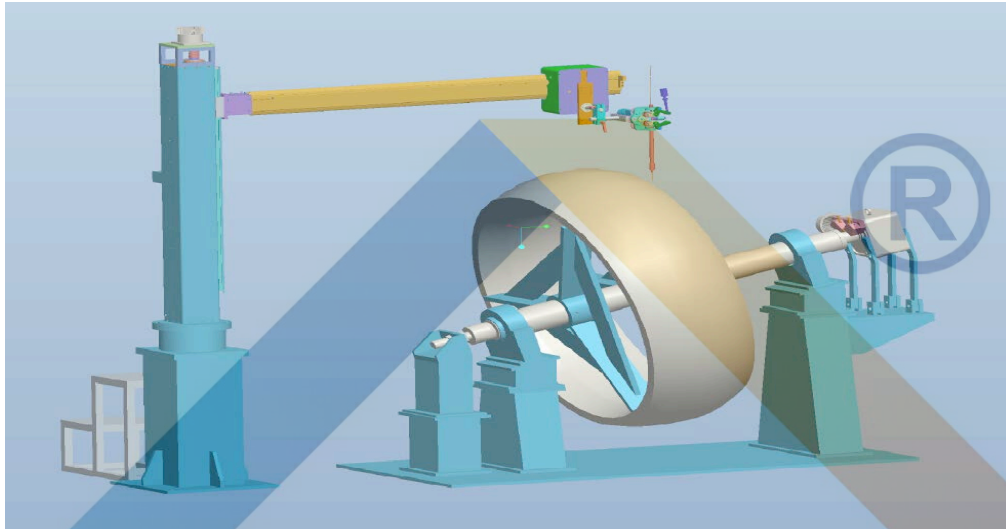
4. Single-phase power supply shall be connected to the walking mechanism's control box through single-phase knife switch. The knife switch shall be cut off in the event of lightning or when the welder is stopped.

### III. Technical Indicators

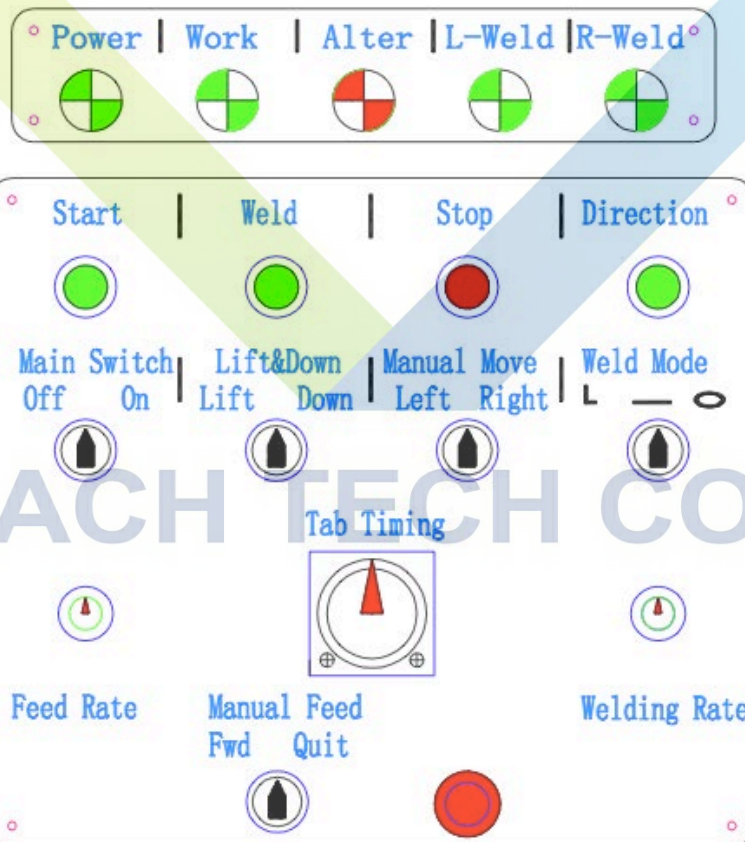
Item	Unit	MH-2500
Input voltage	V	220V±20%, 48~62HZ
Phase number	Phase	Single-phase
Input power	W	200
Rated power input	W	250
Rated output current	A	10
Rated duty cycle	%	60%
Protection class		IP56
Insulation class		F
Volume	mm	340X390X205
Weight	Kg	15



IV. Connection Mode



V. Panel Function





1. **Power (power indicator):** turn the power switch on, and the indicator will light up, showing that the system is in a charged state.
2. **Working (working indicator):** click start/welding, and the working indicator will light up, showing that the equipment is in working state.
3. **Emergency stop/ limit (indicator):** when the mechanism stops in emergency stop and reaches to a limit, the indicator will light up, showing that all actions stop. You may return it by clockwise rotating it — all the functions need to be restarted.
4. **Leftward welding (indicator):** click the leftward welding button and the indicator will light up, showing that the welding direction is from right to left.
5. **Rightward welding (indicator):** click the rightward welding button and the indicator will light up, showing that the welding direction is from left to right.
6. **Start:** start button, press the start button first and then the welding button, and the equipment will start welding in the set mode.
7. **Welding:** welding button, it is required to press the start



button before welding, and this button is invalid when used alone.

8. **Stop:** stop button, all the action will stop when the stop button is pressed.

9. **Welding direction selection:** the welding direction selection button indicates the selection of the welding direction (left/right direction). Press the button once and the direction will change one time, and repeat the selection.

10. **Power switch:** refers to the switch to turn the power on or off.

11. **Lift control (lift switch):** when the switch points upwards, the wire feeder bracket will rise (total stroke of 230mm); when the switch points downwards, the wire feeder bracket will drop (total stroke of 230mm).

12. **Manual displacement:** (left and right moving switch of the welding mechanism) handset (to the left/right) when the welding mode is in rectangular mode, and the wire feeder will revolve clockwise or counterclockwise; handset (to the left/right) when the welding mode is straight line, and the welding mechanism will move in straight line to the limit on the rail in the toggled direction.

13. **Welding mode:** (rectangular, straight line, and circumferential switches) refers to the mode of the required





welding. In rectangular mode, welding will be at rectangular position of “L” (the welding mechanism does not move but the welding gun position will change in the set direction); in straight line mode, the welding angle does not change but the welding position will move in the welding direction; in circumferential mode, neither the welding angle nor position changes, and the mechanism will move one time within the set time in the set direction (speed) only when the limit switch is in place once.

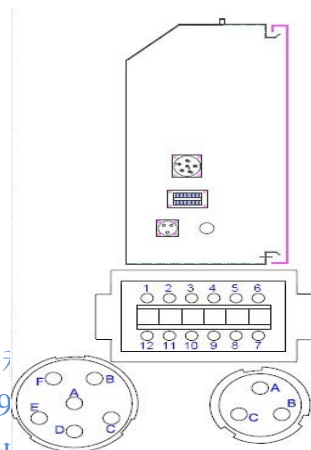
14. Wire feed rate: refers to the feed speed (0-1800mm) of welding wire during welding.

15. Grid jumping time: (time controller) in circumferential welding mode, the limit switch will act once, and the mechanism will move by the set grid jumping time once (set range 0-12 hours).

Welding speed: refers to the moving speed of the welding gun in rectangular welding process or the moving speed of the mechanism in straight line welding process and the grid jumping speed in circumferential welding process.

### VI. Side

### Panel Function





**A: 6P refers to the plug of the welder linkage wire to connect to the welder.**

**B: 12P refers to the plug of the mechanism linkage wire to connect to the walking mechanism.**

**C: 3P refers to the plug of the grid jumping linkage wire to connect to the limit switch.**

**D: refers to the power inlet wire.**

## **VII. Operation and Use**

### **1、 Start display**

**After start, the power indicator lights up, and 5 seconds later, the welding direction indicator lights up to indicate that it is time to adjust and set parameters.**

### **2、 Mode selection**

**Select the mode of welding: rectangular welding, straight line welding and circumferential welding.**

### **3. Operational instructions**

**A. Adjustment and welding when the welding mode is “rectangular”:**

**Mechanism and gun head position adjustment**

**(Manually handset “manual displacement” in the straight line or**



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circumferential mode) Move the mechanism to the distance requiring welding. Then handset the welding mode switch to the position of “welding mode rectangular”, handset “lift control” switch to move the gun head to an appropriate welding height, and handset “manual displacement” switch to move the gun mouth to the specific position requiring welding.

**= Direction and speed setting**

Look at the position of the welding direction indicator (leftward welding/rightward welding), and click “welding direction selection” to the direction required by the welding direction.

Adjust to an appropriate wire feed rate (generally wire feed rate is adjusted between 10 and 50) and welding speed (generally set between 20 and 50). Set an appropriate grid jumping time (shall be 0.5-3' second).

**= Welding:**

Press the start button (suggesting that all actions are ready), and then press the welding button. The mechanism will start automatic welding within the set range.

**= Stop or emergency stop:**

When a welding process is completed, press the stop button, and

**adjust the next operating position by the method abovementioned**

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and start welding again.

You may stop when you need to. Press start and welding buttons again to resume welding, and then the mechanism will continue welding in the original direction at the original speed.

In case of emergencies, press the **red** “emergency stop” button, and then all actions will stop. When the red “emergency stop/limit” light is on, all elements are in a stop state. To restart, you need to **rotate the red emergency stop button clockwise** to lift the stop state.

To continue welding, you need to press start and welding buttons again, and then the mechanism will continue welding in the original direction at the original speed.

**Note:** When the welding mechanism reaches a limit (left or right limit), “emergency stop/limit” light is on, all elements will be in a stop state (except manual displacement) and all switch buttons will be **invalid**. To lift the stop state, you must manually move the “manual displacement” switch in a direction opposite to the limit position.

When the welding mechanism is in rectangular welding state, “direction selection” and “manual displacement” functions will be invalid. “Lift control” can be normally used. The speed can be adjusted.

**When you switch “welding mode”, this welding cycle will be**





ended.

**B. Adjustment and welding when the welding mode is “straight line”:**

At the “welding mode rectangular” position, handset the “manual displacement” to rotate the welding gun to have a 90° angle with the work piece, and then handset the welding mode switch to the position of “welding mode straight line”, and move the mechanism to the position requiring welding. Handset “lift control” switch to move the gun head to an appropriate welding height.

**= Direction and speed setting**

Look at the position of the welding direction indicator (leftward welding/rightward welding), and click “welding direction selection” to the direction required by the welding direction.

Adjust to an appropriate wire feed rate (generally wire feed rate is adjusted between 10 and 50) and welding speed (generally set between 20 and 50).

**= Welding:**

Press the start button (suggesting that all actions are ready), and then press the welding button. The mechanism will start automatic welding within the set range.



### = Stop or emergency stop:

When a welding process is completed, press the stop button, and adjust the next operating position by the method abovementioned and start welding again.

You may stop when you need to. Press start and welding buttons again to resume welding, and then the mechanism will continue welding in the original direction at the original speed.

### = Stop or emergency stop:

When a welding process is completed, press the stop button, and adjust the next operating position by the method abovementioned and start welding again.

You may stop when you need to. Press start and welding buttons again to resume welding, and then the mechanism will continue welding in the original direction at the original speed.

In case of emergencies, press the **red** “emergency stop” button, and then all actions will stop. When the red “emergency stop/limit” light is on, all elements are in a stop state. To restart, you need to **rotate the red emergency stop button clockwise** to lift the stop state.

To continue welding, you need to press start and welding buttons again, and then the mechanism will continue welding



in the original direction at the original speed.

**Note:** When the welding mechanism reaches a limit (left or right limit), “emergency stop/limit” light is on, all elements will be in a stop state (except manual displacement) and all switch buttons will be invalid. To lift the stop state, you must manually move the “manual displacement” switch in a direction opposite to the limit position.

When the welding mechanism is in straight line welding state, “direction selection”, “manual displacement” and “grid jumping time” functions will be invalid.

“Lift control” can be normally used. The speed can be adjusted.

When you switch “welding mode”, this welding cycle will be ended.

**C. Adjustment and welding when the welding mode is “circumferential”:**

At the “welding mode rectangular” position, handset the “manual displacement” to rotate the welding gun to have a 90° angle with the work piece, and then handset the welding mode switch to the position of “welding mode straight line”, and move the mechanism to the position requiring welding.

**Handset “lift control” switch to move the gun head to an**



appropriate welding height.

**= Direction and speed setting**

Look at the position of the welding direction indicator (leftward welding/rightward welding), and click “welding direction selection” to the direction required by the welding direction.

Adjust to an appropriate wire feed rate (generally wire feed rate is adjusted between 10 and 50) and welding speed (generally set between 20 and 50). Set an appropriate grid jumping time (shall be 0.5-3' second).

**= Welding:**

Press the start button (suggesting that all actions are ready), and then press the welding button. The mechanism will start automatic welding within the set range.

**= Stop or emergency stop:**

When a welding process is completed, press the stop button, and adjust the next operating position by the method abovementioned and start welding again.

You may stop when you need to. Press start and welding buttons again to resume welding, and then the mechanism will continue welding in the original direction at the original speed.





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In case of emergencies, press the **red** “emergency stop” button, and then all actions will stop. When the red “emergency stop/limit” light is on, all elements are in a stop state. To restart, you need to **rotate the red emergency stop button clockwise** to lift the stop state.

To continue welding, you need to press start and welding buttons again, and then the mechanism will continue welding in the original direction at the original speed.

**Note:** When the welding mechanism reaches a limit (left or right limit), “emergency stop/limit” light is on, all elements will be in a stop state (except manual displacement) and all switch buttons will be invalid. To lift the stop state, you must manually move the “manual displacement” switch in a direction opposite to the limit position.

When the welding mechanism is in circumferential welding state, “direction selection” and “manual displacement” functions will be invalid.

“Lift control” can be normally used. The speed can be adjusted.

When you switch “welding mode”, this welding cycle will be ended.

## VIII. Equipment Installation

### 1. Be sure to turn off the knife switch when the control box and

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mechanism are stopped or in the event of lightning.

2. The equipment had better be placed 50cm above the ground to reduce ground dust entering the control box.

3. The mechanism cable is led into the welder through a quick connector. To plug in, aim the projected part of the connector at the socket slot; after plug-in, screw tight the connector clockwise.

4. The connecting cable and the quick connector shall be tightly connected. In wire connection, the core shall be wrapped in a layer of copper wiring to prevent heat damage to the quick connector.

**Mechanism placement shall meet the following conditions:**

- (1) low humidity, little dust;
- (2) no direct sunshine and rain exposure;
- (3) ambient temperature of  $-10\sim 40^{\circ}\text{C}$ ;
- (4) no abnormal vibration and collision;
- (5) no corrosive gas;
- (6) no blocker in the duct in front of and behind the welder

Shell grounding and grounding wire shall be deeply inserted

into the ground, and shall not be connected to general stand

or tap water pipes.



## IX. Key Points for Inspection in the Event of Abnormalities

Item	Failure phenomena	Failure and troubleshooting method
1	Power indicator is not on after the welder is powered on	1. The plug is not properly plugged (re-plug it). 2. Fuse is broken (replace the fuse).
2	After start, the control box displays normally but the mechanism cannot be used	1. The mechanism linkage wire is not properly plugged (re-plug it). 2. The mechanism linkage wire is broken (replace it with a new wire). 3. Fuse on the control panel is broken (replace).
3	After start, the control box and mechanism action are normal, but welding cannot be started.	1. Welder linkage wire is not properly plugged (re-plug it). 2. Welder's power supply is not started (turn on the welder's power supply). 3. Welder's bus line is not well connected (re-connect).
4	After start, the emergency stop/limit indicator is on	1. Emergency stop switch is in a stop state (rotate clockwise). 2. The mechanism has reached a limit (manually move it).
5	Grid jumping cannot be achieved during grid jumping welding	1. Check whether the grid jumping switch and grid jumping wire are intact (replace the wire). 2. Check whether the grid jumping time is correctly set (reset). 3. Check whether the welding speed is too low (adjust welding speed).
6	Wire feeder cannot rise or drop	1. The mechanism linkage wire is not properly plugged (re-plug it). 2. Fuse on the control panel is broken (replace). 3. The wire feeder has reached a limit.
7	The mechanism does not action when manual displacement is moved	1. The mechanism linkage wire is not properly plugged (re-plug it). 2. Fuse on the control panel is broken (replace). 3. "Welding mode" is at "rectangular" position (adjust "welding mode" to "straight line" or "circumferential").