

# WLF-72

## Azimuth control lever

User manual



# User notice

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## ► Disclaimer

**Warning:** Before using this product, please refer to the important safety information in the user manual and review all warnings, limitations and disclaimers.

This product is no substitute for proper training and careful seamanship. Proper installation and proper use of the equipment is the responsibility of the owner to avoid accidents, personal injury or property damage. The user of this product is solely responsible for compliance with maritime safety practices.

The owner is solely responsible for installing and using the equipment in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for compliance with maritime safety navigation practices.

This document represents the product at the time of release. Ningbo SHANBEI Technology Co., Ltd. reserves the right to change product specifications at any time without prior notice. If you need any further assistance, please contact your nearest dealer.

## ► Governing language

This Statement, any instruction manuals, user guides and other Product-related information (documentation) may be or have been translated into another language (translation). If there is any conflict between any translated version of the document, the Chinese version of the document will be the official version of the document.

## ► Copyright

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## ► Cautions

- 1 Do not place the equipment at will without fixing it, so as to avoid serious damage when it is dropped due to turbulence or other factors during the voyage.
- 2 Do not use any power adapter that is not equipped with this product. Otherwise, the device may not work due to the different circuit design, or the performance may be affected or even damaged.
- 3 Do not disassemble the equipment. If the maintenance engineer is not authorized by the company to disassemble the equipment, the free warranty will be lost.
- 4 During use or cleaning, avoid any liquid or other objects falling into the equipment to avoid circuit damage or short circuit.
- 5 Do not place the device and its accessories in an environment prone to humidity or direct sunlight. Keep the device in a dry environment.
- 6 In case of hardware failure (such as damage to the machine shell or foreign matter falling into the machine, etc.), please stop using the machine immediately and contact the dealer in time.
- 7 The company shall not assume any legal or other liability for any maritime accident, monetary loss or loss of interests that occurs on vessels using this equipment.

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# 1 Introduction

## 1.1 Overview

The WLF-72 full-rotation control handle is used in various ships or test equipment where both speed and orientation need to be adjusted simultaneously. It is generally placed on an electrical centralized control console to control the azimuth Angle, tilt Angle, thrust, and speed of the thruster in a linked manner. The product has the following characteristics:

Made of all-aluminum alloy, the handle is ergonomically designed for convenient long-term holding. The scale is backilluminated for indication, and the control damping, rotary damping, and gear feedback feel are adjustable. It meets the electromagnetic compatibility and vibration requirements of IEC60945 standards. The product supports multiple functional customizable features a compact design, sturdy structure, and high precision.

		Basic options	(Note: Option 1 is the default option)
Style of handles	1	Ball head handle	
	2	Finger grip handle	
Number of handles	1	Left Single(72L)	
	2	Right Single(72R)	
Operating range	1	±60°	
	2	0~60°	
Rotation range	1	±180°	
Output signal	1	Propulsion/ rotation: 4~20mA	
	1	Propulsion 5K/ rotation sincos	
Backlight adjustment	1	0~24V	
Operation position	1	FWD	
	2	AFT	

Table 1.1

## 1.2 Product appearance

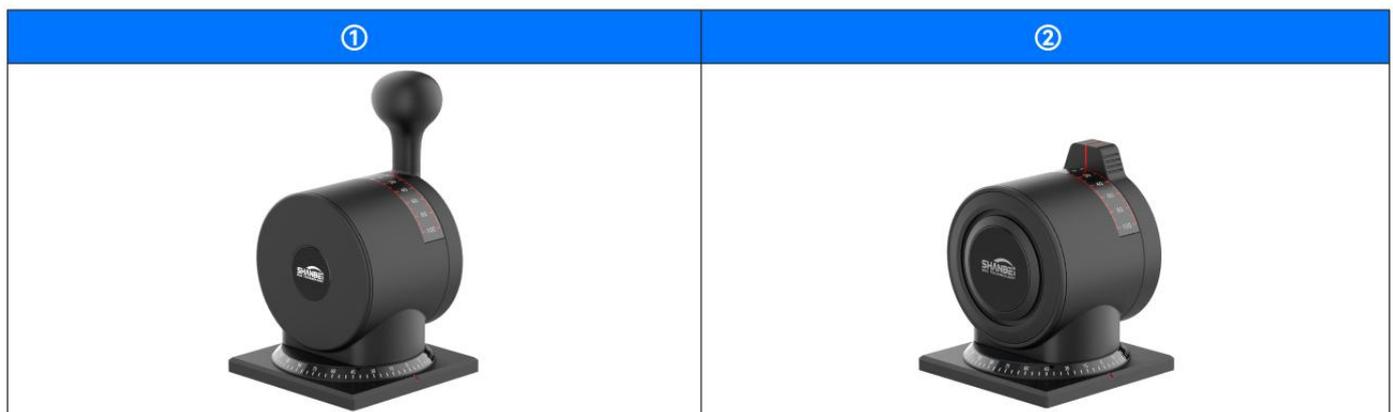


Figure 1.1

Products are divided into left paddle handle and right paddle handle according to the position of the handle, as shown in Figure 1.2. When selecting, we should inform our sales staff according to personal needs to avoid unnecessary economic losses! If the contract does not specify the style required by the customer, we default to the right paddle handle.

# 1 Introduction



Figure 1.2

## 1.3 Product composition

Number	Name	Quantity
1	Azimuth control lever	1
2	Accessories kit, including 16-bit terminal, screw fastener, etc	1
3	Certificate of conformity	1
4	Warranty card	1
5	Specification	1
6	Factory test report	1

Table 1.2

## 1.4 Product size drawing

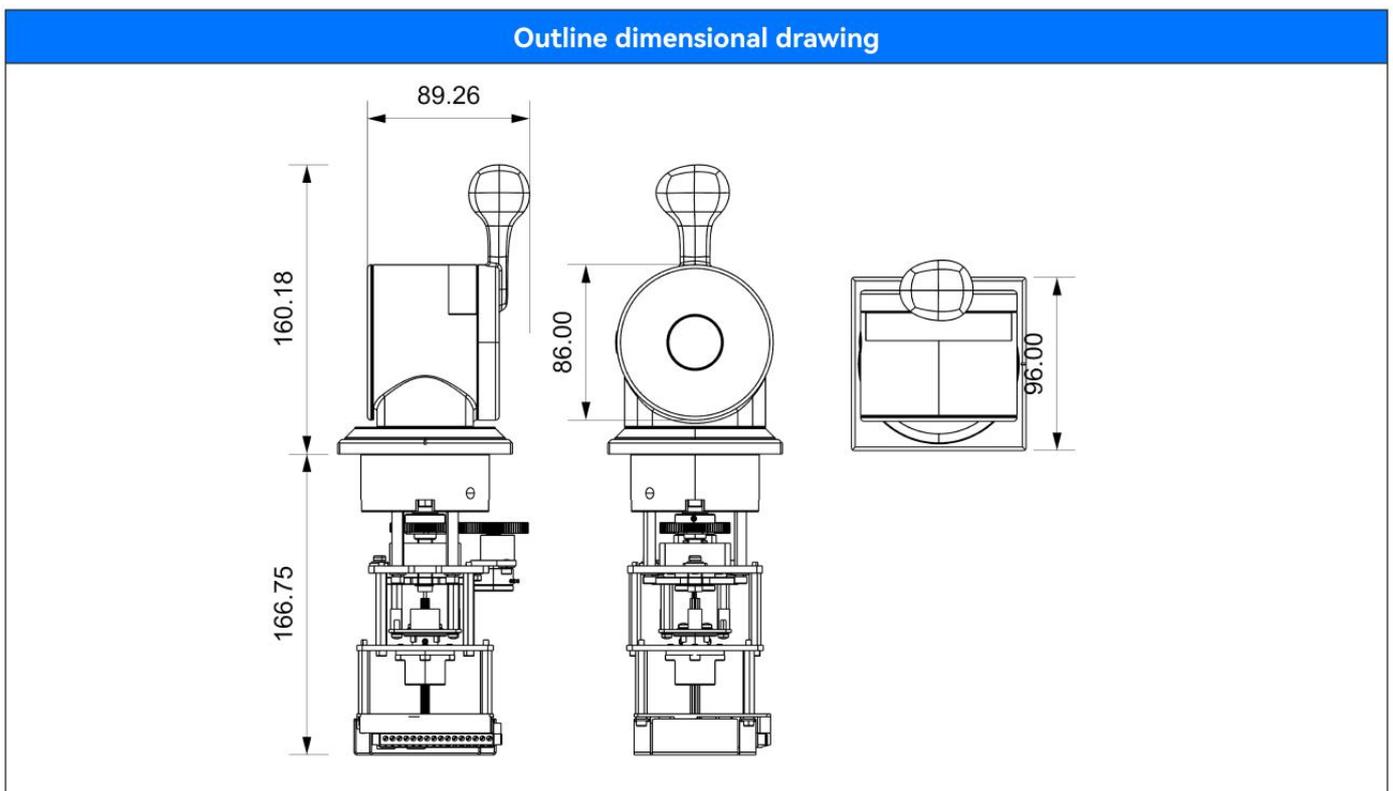


Figure 1.3

# 1 Introduction

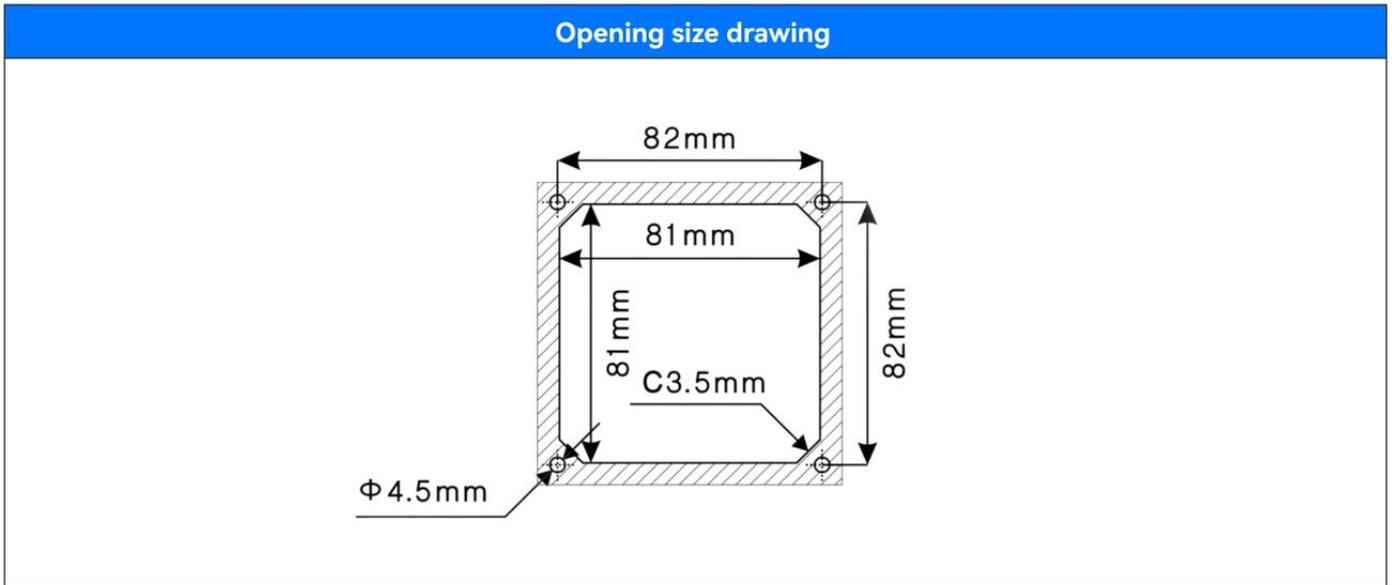


Figure 1.4

## 1.5 Product wiring diagram

The product provides 16 terminals, using DC24 power supply separately, Y axis and Z axis each output 1 4~20mA current signal, with 1 potentiometer dimming interface (if not dimming, can not be connected). The wiring diagram is shown in Figure 1.5:

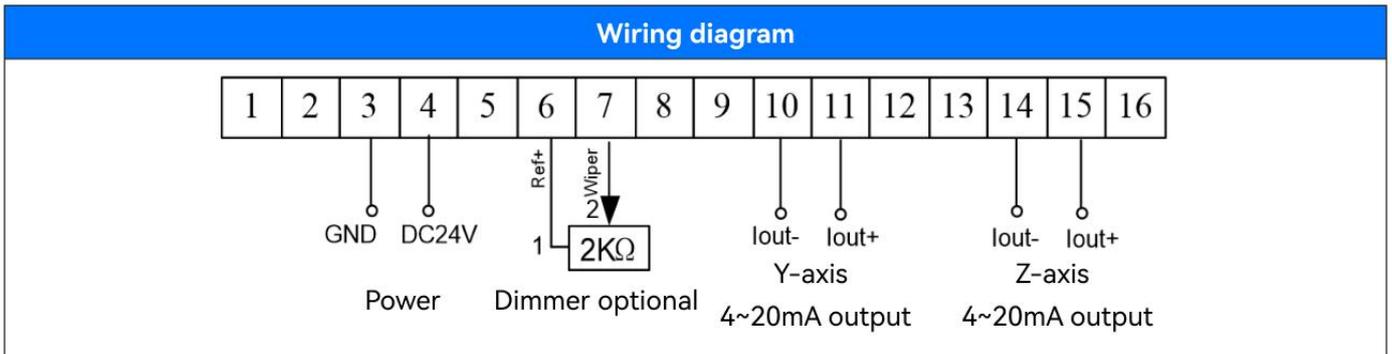


Figure 1.5

The product uses DC24V power supply, and other voltage levels are strictly prohibited.

## 2 Technical parameter

### 2.1 Product basic parameter

Y-axis range	$\pm 60^\circ$
Y-axis potentiometer	5K $\Omega$ , linear
Y-axis stuck	0 $^\circ$
Body material	Aluminum alloy black spray
Gear material	Copper alloy
Backlight	Cold light film
IP lever	IP56
Install	4XM4 stud, panel thickness 8mm
Z-axis range	$\pm 180^\circ$
Z-axis potentiometer	5K $\Omega$
Z-axis stuck	0 $^\circ$ , $\pm 90^\circ$ , 180 $^\circ$
Spindle material	Stainless steel
Transmission mode	Gear drive
Dimming mode	0~24V
Linear tolerance	$\leq 0.5\%$
Wiring	16 I/O terminal blocks

Table 2.1

### 2.2 Standard version product technical description

#### 1. Y-axis

- (1) The scale range is 0~100, the background color is green before and red after, the scale line and digital white, the backlight is adjustable, and the brightness is adjusted by the circuit board knob;
- (2) Constant operating torque, adjustable rotating torque and caton point feel, good feel;
- (3) Output mode: 4~20mA current output, linear relationship with the scale, as shown in Figure 2.1.

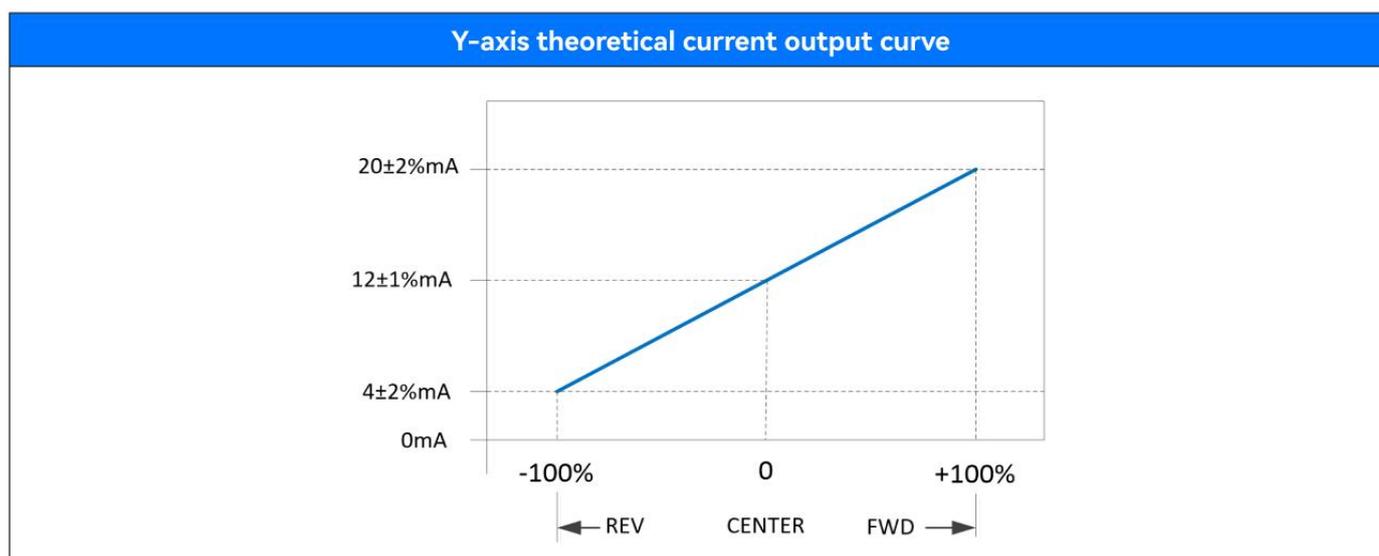


Figure 2.1

## 2 Technical parameter

### 2. Z axis

- (1) The scale range is 180~0~180, the background color is black, the scale line, the number is white, the backlight is adjustable, the brightness is adjusted by the circuit board knob;
- (2) Constant operating torque, adjustable rotating torque and caton point feel, good feel;
- (3) Output mode: 4~20mA current output, linear relationship with the scale, as shown in Figure 2.2.

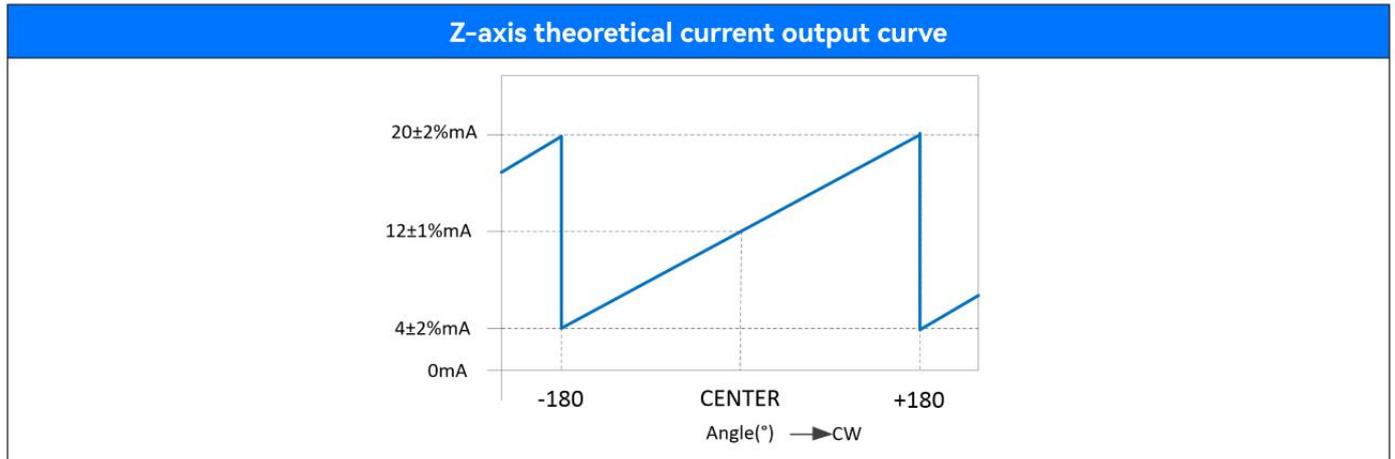


Figure 2.2

## 2.3 Custom item technical description

1. Output signal: The full-rotating handle can choose direct potentiometer output mode, wherein Y axis adopts linear potentiometer output and Z axis adopts triangle wave potentiometer output. The wiring diagram is shown in FIG. 2.3, and the corresponding output relationship is shown in FIG. 2.4.

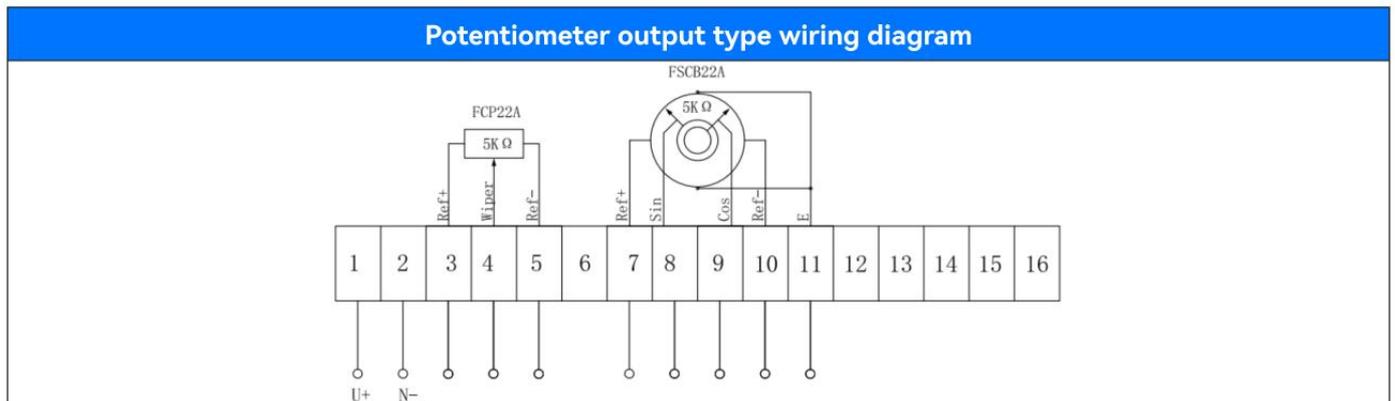


Figure 2.3

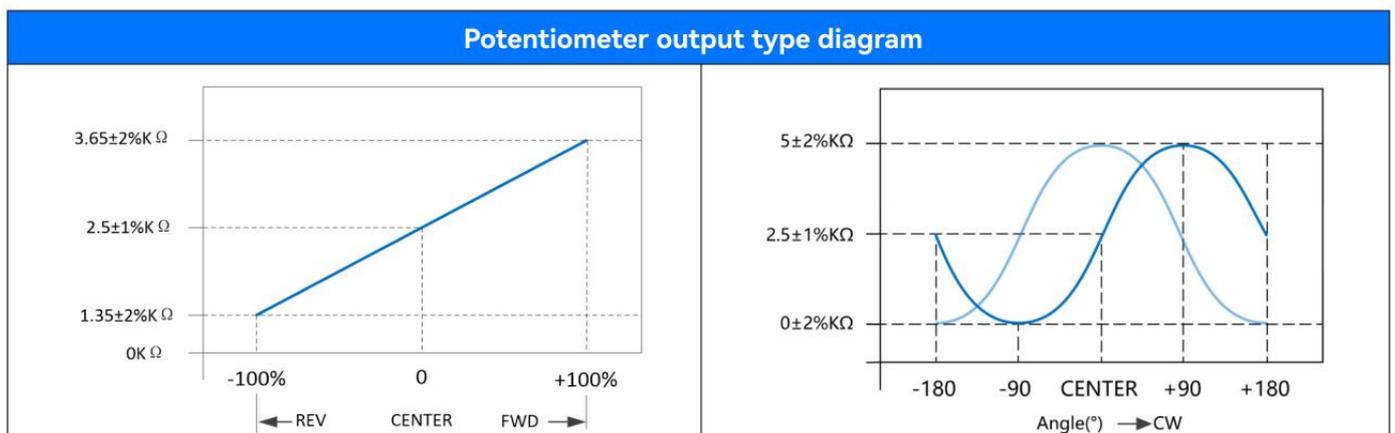


Figure 2.4

## 2 Technical parameter

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2. Stern driving: When the handle is in the stern driving position, the propulsion scale film and the rotation scale film change, as shown in Figure 2.5:



Figure 2.5

### 3 Installation instructions

1. Remove the four sets of installation accessories (nuts, spring washers, flat washers), as shown in Figure 3.1. Do not remove the installation studs. Set aside 4 sets of accessories, remember not to lose.

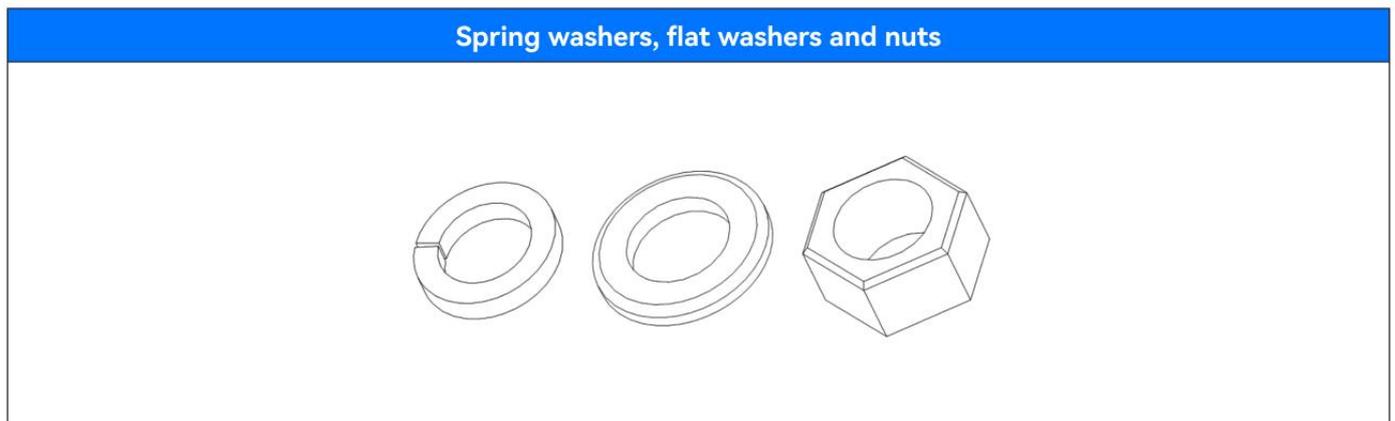


Figure 3.1

2. As shown in 3.2, place the handle vertically in the opening of the mounting plate, and align the screw with the screw hole B. Rotate or tilt the handle into the protruding part.

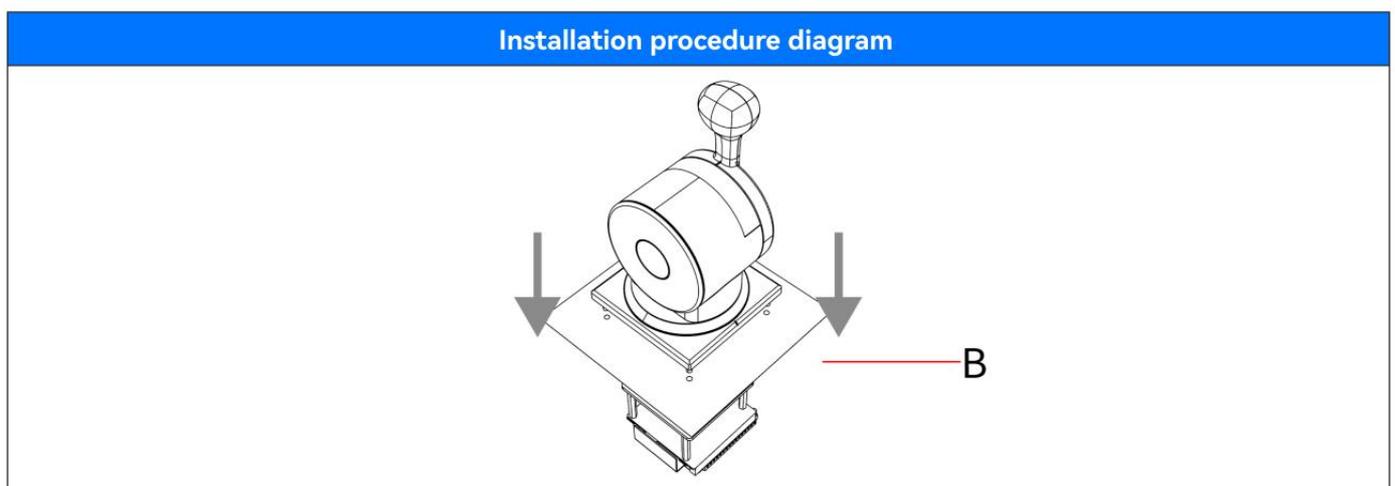


Figure 3.2

3. Fasten the handle to the mounting plate by installing studs and fittings, as shown in Figure 3.3, and tighten nut C. Make the handle and mounting plate tight and reliable. There shall be no gap or shaking on the contact surface.

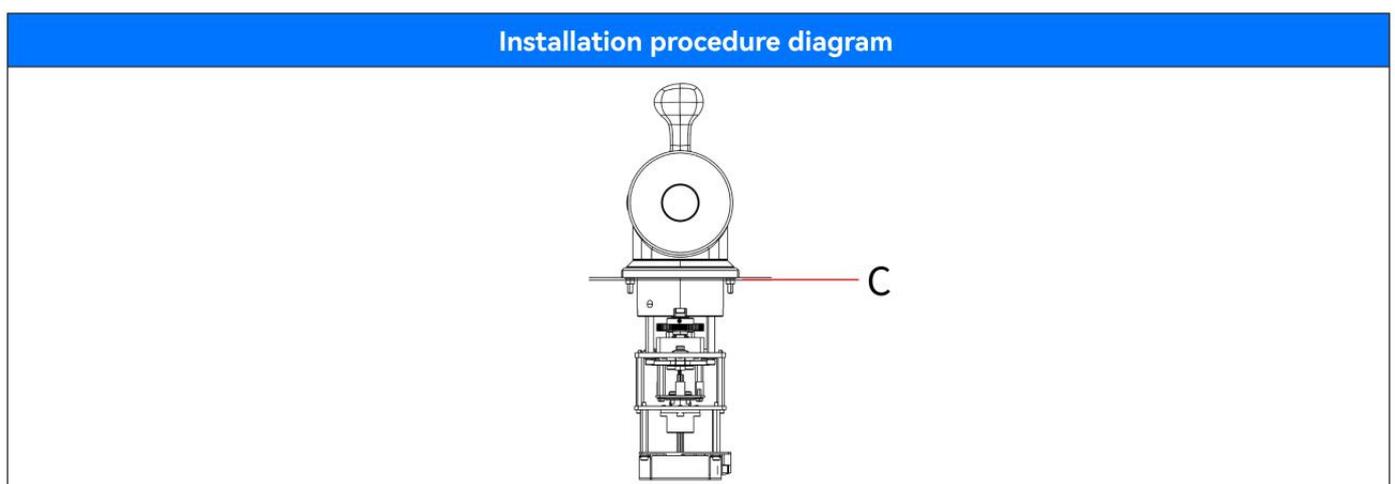


Figure 3.3

## 3 Installation instructions

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4. Install the handle to the mounting plate and connect electrical cables. After the wiring is completed, it should be confirmed that the external wiring is firm and reliable.

5. Check the external cables, which should be connected normally; The backlight should emit light normally; Push the handle, the switch can complete the normal on-off action. After commissioning, disconnect the power supply.

## 4 Instructions and precautions for use

### 4.1 Instructions for use

1. The initial position of the operation handle pointer (including the direction of propulsion and rotation) is in the middle (0 scale). At this time, the output value of the advance direction (the reading of the identification numbers 10 and 11) is  $12\text{mA} \pm 1\%$ ; The output value corresponding to the direction of rotation (reading numbers 14 and 15) is  $12\text{mA} \pm 1\%$ .
2. Switch on the power supply, connect the cable as shown in Figure 1.5, push the handle lever, and the resistance reading between the identification number 10 and 11 is the output value of continuous linear change from 4 to 20mA. The red 100% scale corresponds to 4mA, and the green 100% scale corresponds to 20mA. Rotate the handle rod, the resistance reading between the identification number 14 and 15 is the output value of 4 ~ 20mA continuous linear change, the counterclockwise rotation current decreases, the output is 4mA when it is rotated to  $180^\circ$ , the clockwise rotation current increases, the output is 20mA when it is rotated to  $180^\circ$ ; The backlight emits normally. After the inspection is complete, place the handle lever at 0 scale.
3. The operation handle should be pushed and rotated smoothly and slowly to avoid rapid push and pull, and the speed is too fast to form impact and damage the operation handle.

### 4.2 Adjustment specification

1. As shown in Figure 4.1, open the silicone plug and rotate the hex wrench at A to adjust the size of the propulsion damping.
2. Use the hex wrench at B to rotate and adjust the strength of the push zero feel.

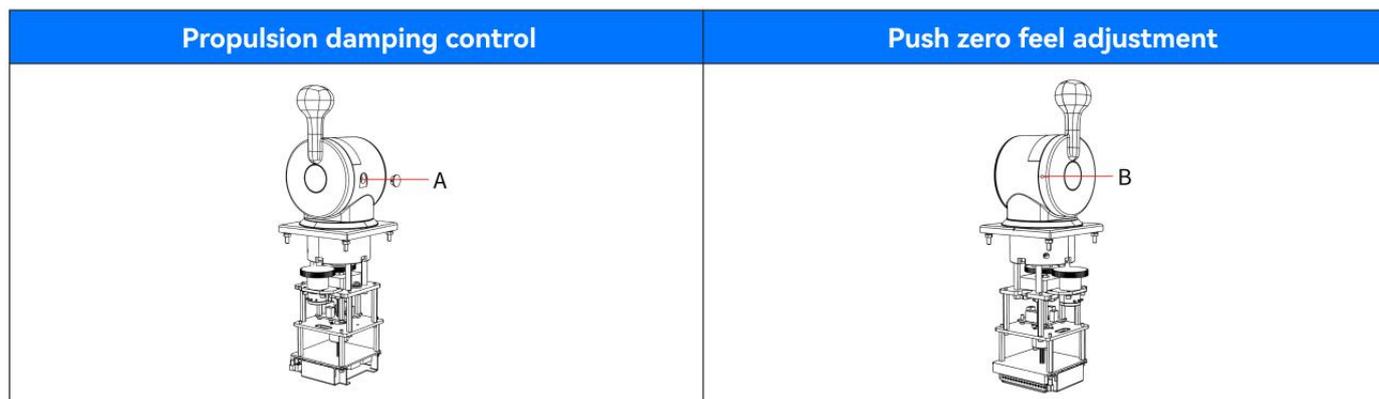


Figure 4.1

3. As shown in FIG. 4.2, use an outer hex wrench to rotate the outer hex screw at C to adjust the size of the rotation damping.
4. Use the hex wrench at D to rotate and adjust the strength of the rotating zero feel.



Figure 4.2

## 4 Instructions and precautions for use

### 4.3 Reset operation

Attention (Please pay attention to the following items, otherwise it may cause serious damage!) : It is recommended that non-professionals do not debug and change the parameters. If there is any need for parameter modification and adjustment, please send it back to our company or carry out under the guidance of our engineers.

1. The 1-bit dip switch shown in Figure 4.1 is factory set at ON. If you need to increase the brightness of the backlight indicated by the scale, you can turn the switch to 1. It is recommended that the dip switch be ON in normal cases or when no rheostat is connected.
2. The reset button in the figure is for factory debugging parameters. Do not touch it for daily use.
3. Do not remove the cable without permission. Misconnection of the propulsion parameter interface and rotation parameter interface wire will cause damage to the control board.

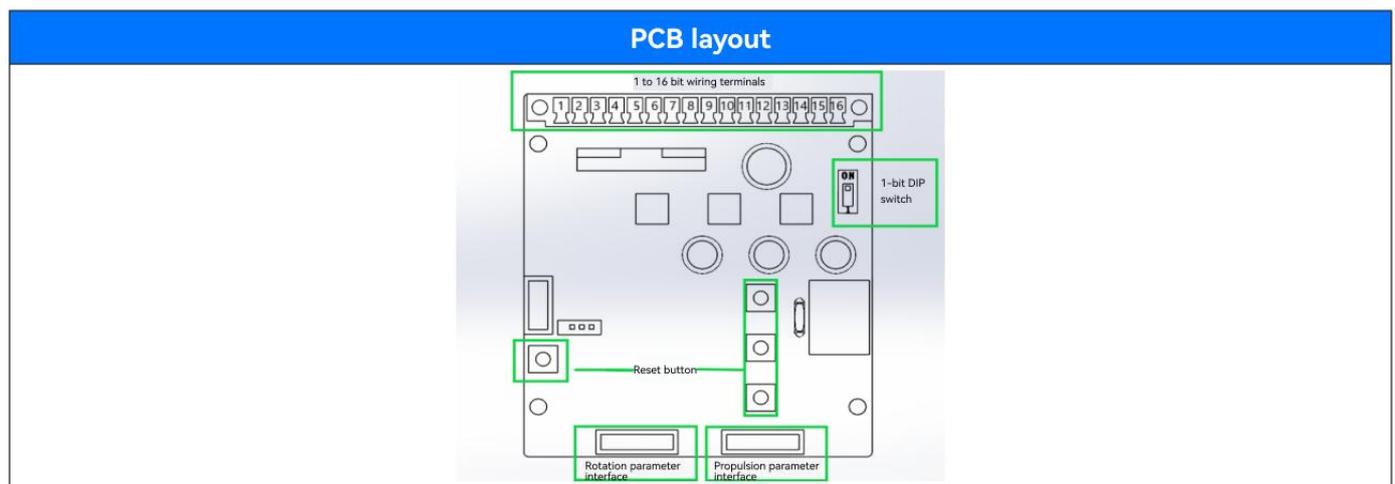


Figure 4.1

### 4.4 Matters needing attention

1. If it is not used according to the requirements in the instructions, the loss shall be borne by the user; Rated backlight voltage  $\leq 24V$ . If the backlight is damaged due to exceeding the rated voltage, the user shall bear the responsibility.
2. In the process of use, when the output of the propulsion direction exceeds the range of 0 ~ 5K, please stop using immediately; When the output value between the identification number 7 and 8 cannot be continuously changed, it should be stopped in time. Method of stopping the service: Disconnect the external power supply.
3. During use, when the rotation direction output exceeds the range of 0 ~ 5K, please stop using immediately; Method of stopping the service: Disconnect the external power supply.
4. According to the characteristics of the accessories used in this product, the instantaneous input voltage shall not exceed 20% of the range specified in Figure 1.5 at any time. Avoid excessive instantaneous current and burning accessories.
5. This product has no scale sign in the direction of propulsion, and the rotation direction sign is only for reference, without accurate feedback function; For accurate feedback, calibrate your own segments.

## 5 Fault analysis and elimination

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This product has been put into operation since the use, basically no fault, with our statistics, the after-sales problem is basically due to wiring errors, resulting in normal use, in addition, there is no technical fault. Customers in the use of the process, if you find technical problems, please promptly communicate with our technical personnel.

(Note: Each handle has a unique factory number)

# 6 Safety protection and accident handling

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## 6.1 Safety protection devices and precautions

1. In the important position of this product, the fastening seals have been processed before leaving the factory, and shall not be disassembled without permission. If the seals are damaged, any product quality problems will be borne by the buyer.

2. The damping part used in this product is a loss part, the warranty period is 1 year, effective from the date of delivery; During the warranty period, damping changes, which can not be used normally or seriously affect the operation, shall be maintained by us free of charge. If damping changes occur outside the warranty period, which can not be used normally or seriously affect the operation, we can charge a small amount of labor and material costs for maintenance. (Troubleshooting)

(Once this product fails to operate normally, please stop using and disconnect the power supply immediately, contact our after-sales service engineer for solutions)

## 6.2 Troubleshooting procedures and methods

1. In the process of use, there is an unsolvable fault problem, contact our after-sales service engineer.

2. During the warranty period, if the fault occurs due to the product itself, we will provide a complete replacement product and send it to the buyer for free replacement. And provide technical support; If the fault is not caused by the product itself, we can provide two options of complete replacement products and on-site services, which are selected by the buyer. All costs are borne by the recipient.

3. If the warranty period is exceeded and the fault occurs, we can provide two service options that can completely replace the product or replace some parts of the product, which are selected by the buyer. The required cost shall be borne by the purchaser.

# 7 Maintenance and repair

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## 7.1 Daily maintenance and maintenance

In the daily non-use state, attention should be paid to the maintenance of this product. Through maintenance, maintenance can improve the service life of the product, the specific maintenance and maintenance methods are as follows:

1. Wipe the surface of the product regularly with a dry rag to ensure that the outside of the product is clean and tidy.
2. Disconnect the external power supply of the product, push and turn back and forth regularly, repeat about 10 times, the cycle is 2 to 3 weeks. It can ensure smooth operation and avoid the phenomenon of "aging" caused by long-term placement, which increases the damping and accelerates the wear of the damping part.

## 7.2 Operation precautions

1. Stop using the device when the control handle cannot position itself at zero position. Contact our after-sales engineer.
2. In the process of use, it should be carried out at a steady and uniform speed to avoid rapid pushing and pulling, and the impact of too fast speed will damage the product.
3. The input voltage shall be carried out in strict accordance with the wiring instructions. Failure to operate according to the regulations will result in product failure or other major accidents, which shall be borne by the buyer.

## 7.3 Long-term maintenance and maintenance

Long-term placement, maintenance maintenance methods, and daily maintenance, maintenance methods are the same.

## **8 Transportation, storage and warranty**

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### **8.1 Transportation precautions**

Physical damage to the product caused by violent shaking and collision should be avoided during transportation.

### **8.2 Storage precautions**

Room temperature, dry, cool environment. Avoid high temperature exposure or low temperature freezing, which will cause irreversible damage to the damping parts and reduce the service life.

### **8.3 Warranty period**

The warranty period of this product is 12 months from the date of receipt of the goods by the buyer. Based on the date of receipt of documents for express delivery or the date of receipt of invoice.

## 9 Other

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### 9.1 Phone number of the after-sales engineer

Contact: Mr.Xu

Tel: 18067343163

### 9.2 Company information

Manufacturer: Ningbo SHANBEI Technology Co., LTD

Address: A2-902, R&D Park, High-tech Zone, Ningbo

Postal Code: 310001

Tel: (0574) 87182781

Fax: (0574) 87182781

For more information, please visit:

[en.shanbei-tech.com](http://en.shanbei-tech.com)  
[shanbei-tech.com](http://shanbei-tech.com)

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**Ningbo Shanbei Technology Co.,Ltd**

**Address:** 902 Area A, R&D Park, High-tech Zone, Ningbo, Zhejiang, China

**WhatsApp:** +86 13958081624

**E-mail:** jeff@hzbingo.cn

**Wechat:** 13958081624

WhatsApp 

