

WLF-180

Propulsion control lever

User manual



User notice

► 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.

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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-180 main control handle is suitable for single and dual main engine control in the propulsion systems of large and medium-sized ships.

The product has the following characteristics:

- The aluminum alloy shell allows each scale to light up separately according to the grip position.
- The control damping and rotation range can be fine-tuned, meeting the requirements of electromagnetic compatibility and vibration in the IEC60945 standard.
- It supports customized functions such as electric shaft synchronization and scale for each position, featuring a fashionable and elegant appearance. as shown in Table 1.1.

Basic options		(Note: The first option is the default option)
Handle type	Dual (180D)	
	Left Single(180L)	
	Right Single(180R)	
Scale	Chinese	
	Percentage	
	English	
Operating range	±60°	
	0~60°	
Tap feedback	Each position feedback	
Output signal	4~20mA	
	Switch	
Backlight adjustment	0~24V	
Electric shaft synchronization	No	
	Yes	
Operation position	FWD	
	AFT	

Table 1.1

1.2 Product appearance



Figure 1.1

1 Introduction

According to the position of the handle, the products are divided into two main push 180D, left main push 180L and right main push 180R, as shown in Figure 1.2. When selecting, we should inform our sales staff according to personal needs to avoid unnecessary economic losses!



Figure 1.2

1.3 Product composition

Number	Name	Quantity
1	Main propulsion control lever	1
2	Accessories kit, including 16-bit terminal, screw fastener, etc	2(single deduction is 1)
3	Certificate of conformity	1
4	Warranty card	1
5	Specification	1
6	Factory test report and wiring diagram	1

Figure 1.2

1.4 Product size drawing

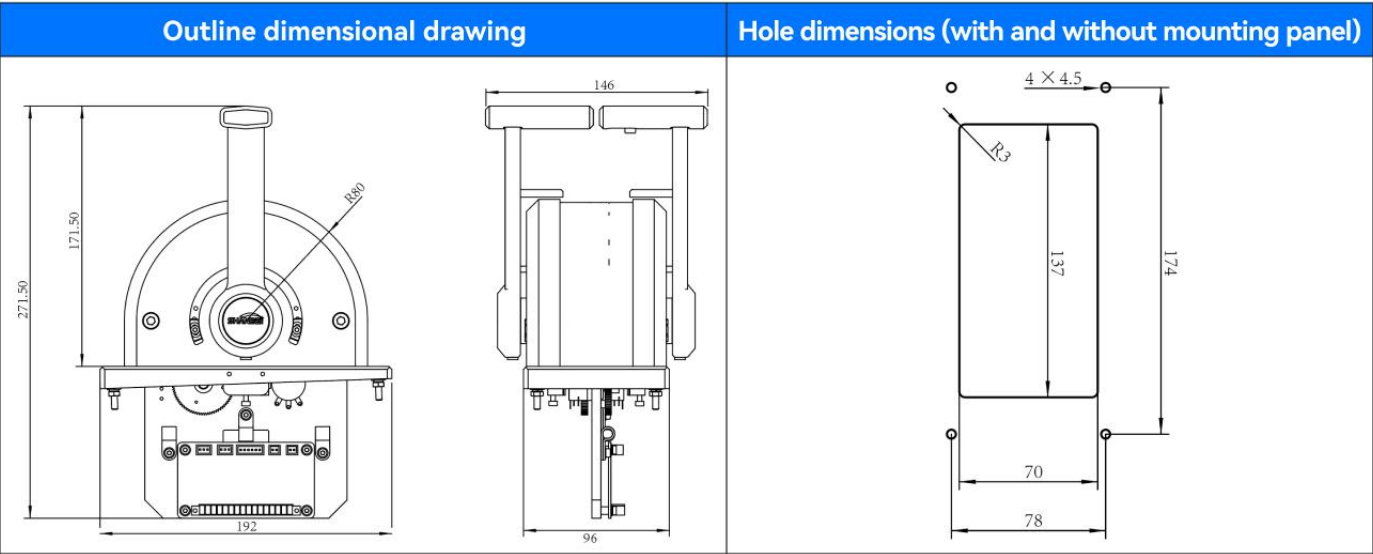


Figure 1.3

1 Introduction

1.5 Product wiring diagram

The product has a gear position indication function. The scale band has backlighting and the backlight can change along with the rotation of the handle. It provides 4-20mA analog output. The interface definition is as follows:

Connect according to Figure 1.4 on the 16-bit terminal block. P1/P2 are the current outputs of the left grip, P3/P4 are the current outputs of the right grip, and P13/P14 are connected to the 24V regulated power supply.

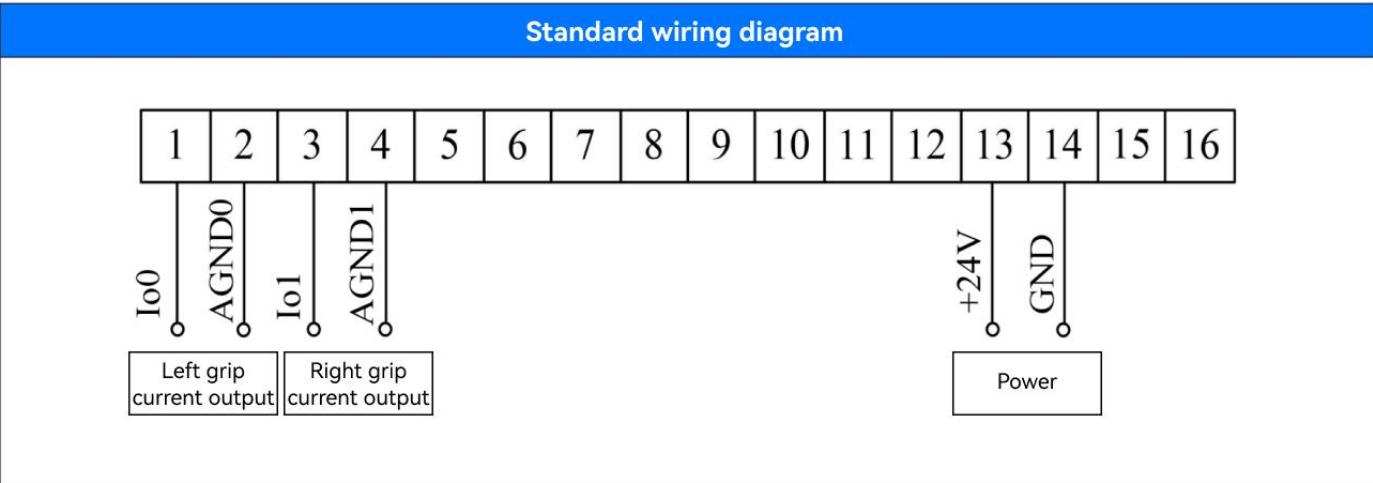


Figure 1.4

2 Technical parameter

2.1 Product basic parameter

Supply voltage	24VDC
Body material	Aluminum alloy black spray
Spindle material	Stainless steel
Grip material	POM
Potentiometer	5K $\pm$ 10%, 0.3% linearity
Transmission mode	Gear drive
Lever rotation range	$\pm 60^\circ$
Wiring method	16-digit terminal block
Analog output	4-20mA, accuracy of 1%
Operating Temperature	5~55°C
Feedback Precision	$\leq 1.0\%$
rotection Rating	IP56

Table 2.1

2.2 Standard version product technical description

1. The main body is machined from aluminum alloy, with a black powder-coated surface. The main shaft is made of stainless steel, and internal transmission uses copper gears.
2. The gear position panel is black. The gear positions include green zones (Ahead 1, Ahead 2, Ahead 3, Ahead 4), yellow zones (DEAD SLOW, STOP, DEAD SLOW), and red zones (Astern 1, Astern 2, Astern 3, Astern 4). The gear indicator changes as the handle grip rotates, and dimming is achieved via an external dimmer.
3. Operating torque is constant. The rotational torque and detent feel are adjustable.
4. Potentiometer resistance tolerance: $\pm 10\%$; independent linearity tolerance: 0.3%.
5. Output mode: 4–20 mA linear output, linear with respect to the scale. Theoretical output is shown in Figure 2.1; actual output is provided in the product factory inspection report.

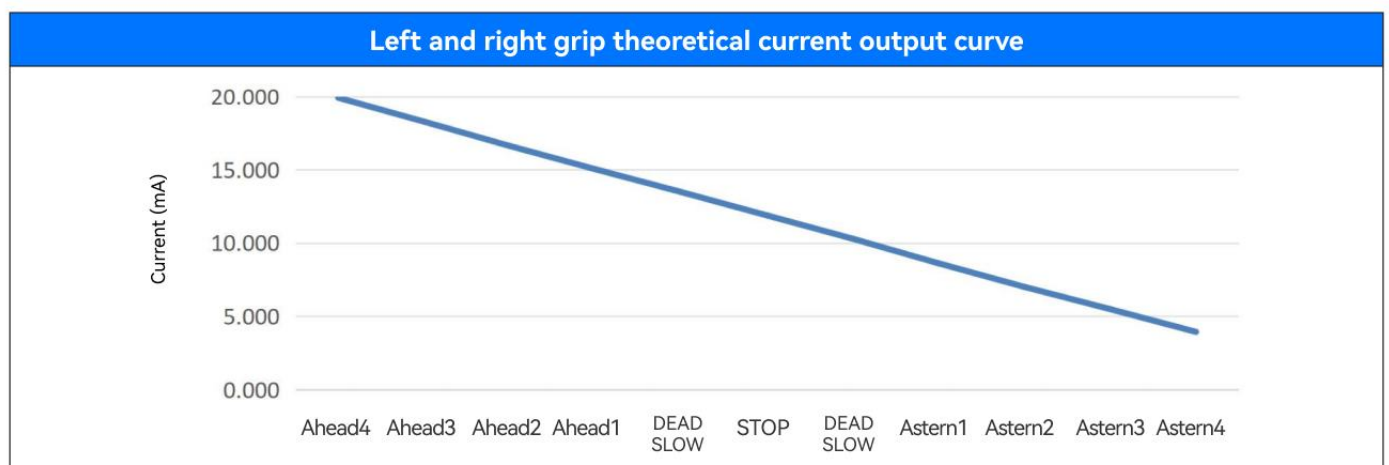


Figure 2.1

2.3 Custom item technical description

For the analog output handle, the analog has been calibrated at the factory and no calibration is required. However, if the mechanical pointer of the push handle is found to be inconsistent with the brightness indicator position during use, secondary calibration can be carried out, and the calibration method is as follows:

2 Technical parameter

Thin-film scale, as shown in Figure 2.3:



Figure 2.2

The analog output of the product has been calibrated at the factory and does not require calibration. However, if during operation the mechanical pointer of the propulsion lever is found to be inconsistent with the brightness indicator position, secondary calibration can be performed as follows:

1. Ensure the propulsion lever is powered on, and locate the three buttons on the circuit board of the propulsion lever, as shown in Figure 2.2:

2 Technical parameter

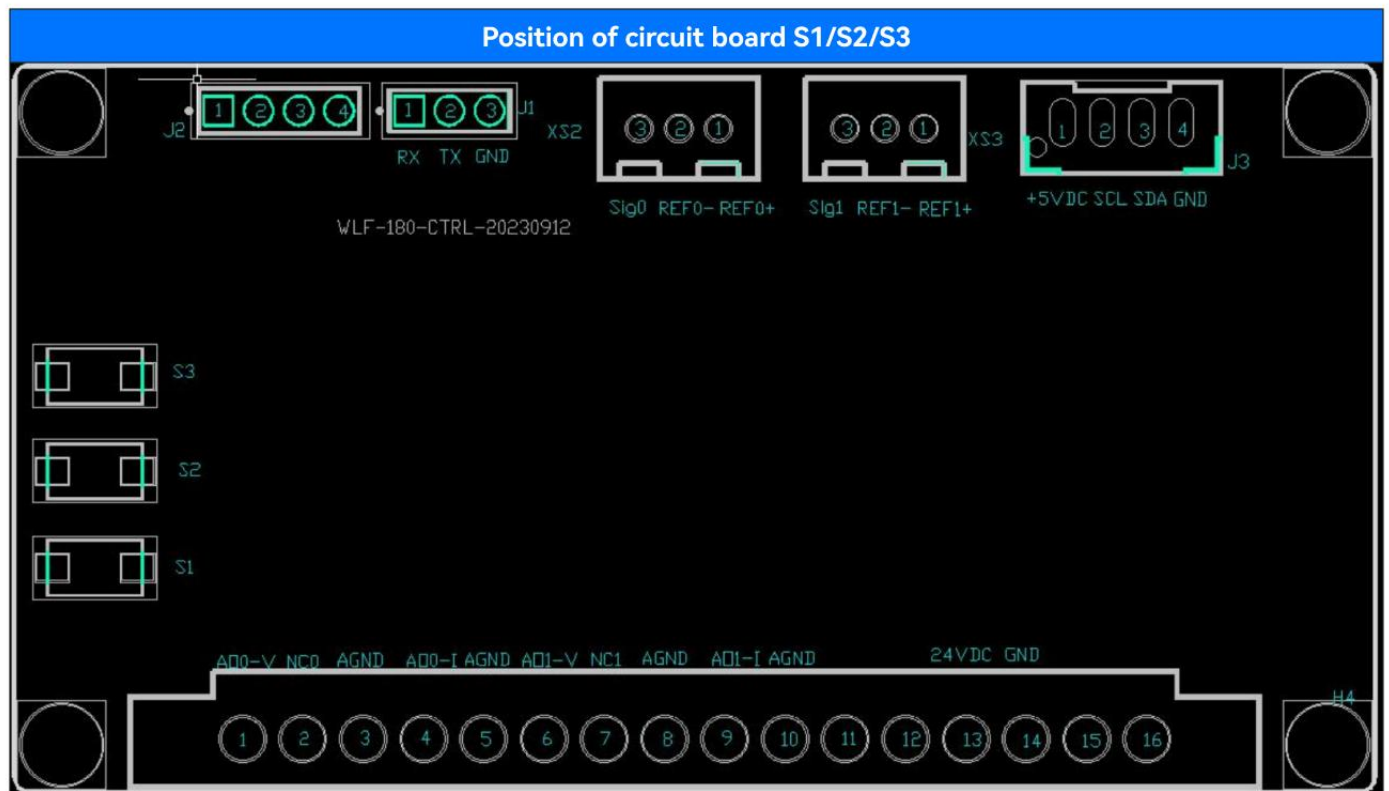


Figure 2.3

2. Press and hold buttons S3 and S2 simultaneously for 3 seconds to enter the left lever calibration mode; or press and hold buttons S2 and S1 simultaneously for 3 seconds to enter the right lever calibration mode.
3. Ahead 4 position calibration: Operate the lever to point the pointer to the Ahead 4 scale position, then press and hold S3 for 3 seconds to complete the Ahead 4 position calibration.
4. Stop position calibration: Operate the lever to point the pointer to the Stop scale position, then press and hold S2 for 3 seconds to complete the Stop position calibration.
5. Astern 4 position calibration: Operate the lever to point the pointer to the Astern 4 scale position, then press and hold S1 for 3 seconds to complete the Astern 4 position calibration.
6. Perform the above steps in sequence. All positions on the left or right side must be calibrated before finishing; otherwise, the calibration will be invalid.
7. Connect the TX, RX, and GND pins using a USB-to-TTL tool. Set the serial port parameters to 115200, 8, N, 1. The serial port will output calibration information.

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.

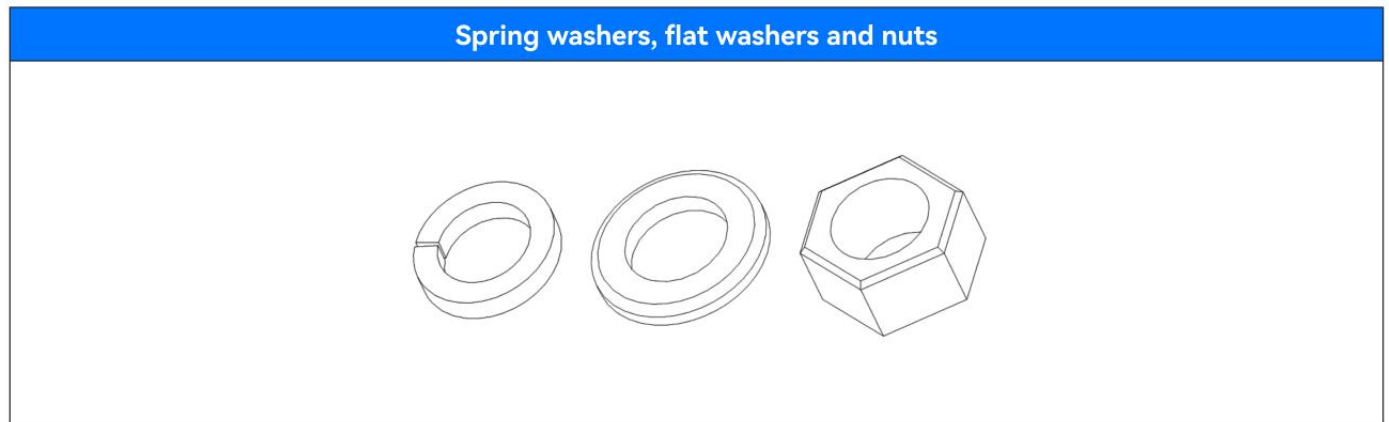


Figure 3.1

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.

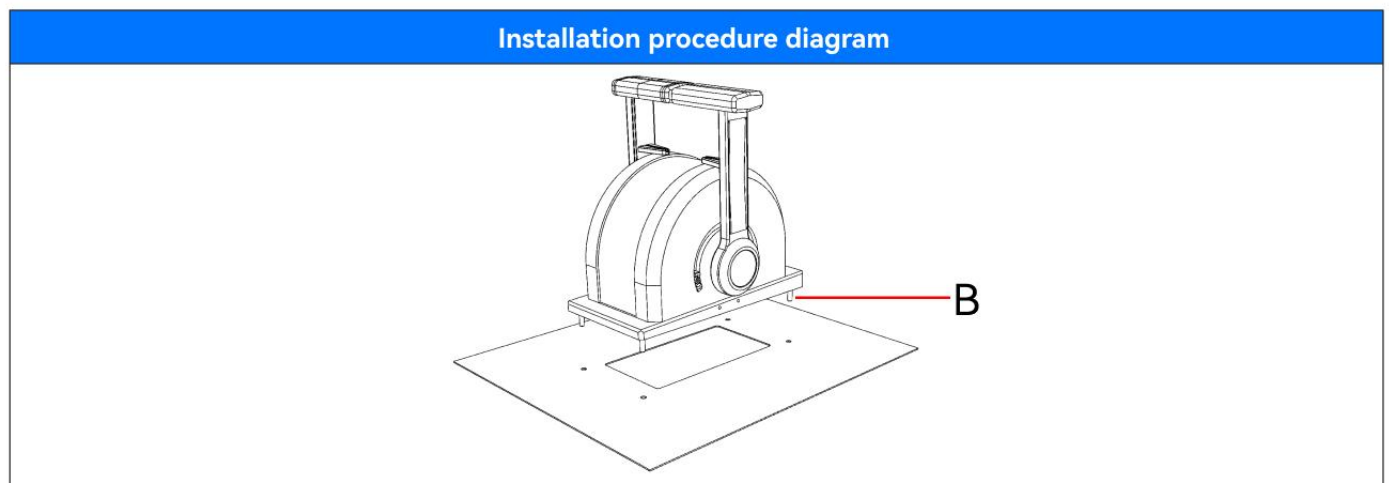


Figure 3.2

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

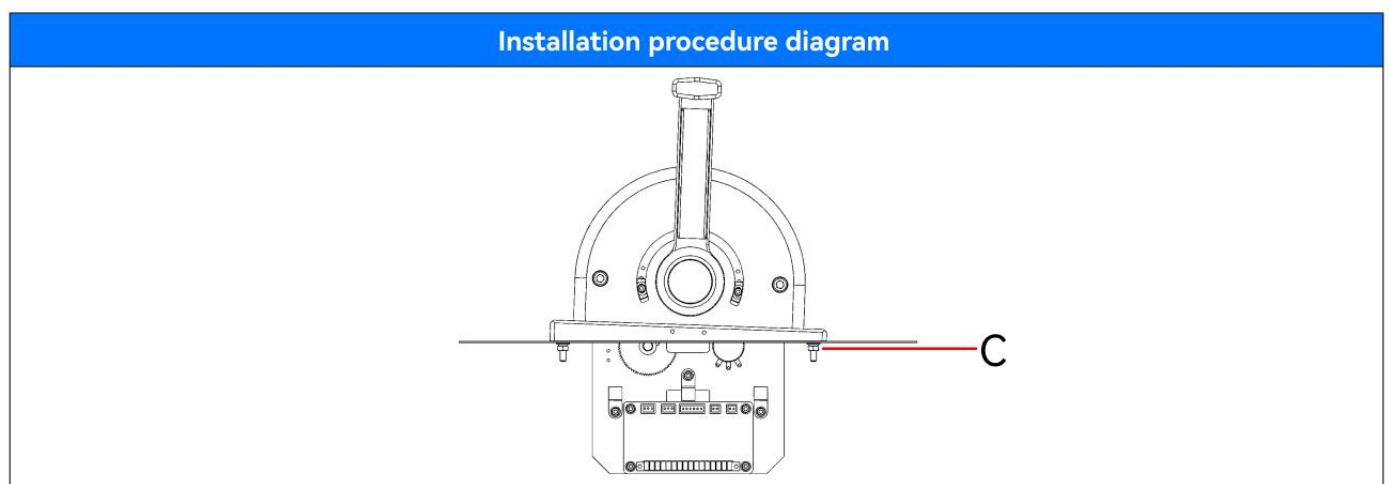


Figure 3.3

3 Installation instructions

4. Install the handle to the mounting plate and connect electrical cables. After the connection is complete, ensure that the external connection is firm and reliable.
5. Check the external cables, which should be connected normally; The backlight should emit light normally; Push the handle lever, 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 is at the center (0 scale mark). At this point, the resistance value corresponding to the push direction of the potentiometer (terminals 1 and 2) is $2.5K\Omega \pm 10\%$.
2. Connect the power supply, wire according to Figure 1.4, push the handle rod, and the resistance reading between terminals 1 and 2 will be the continuously linearly varying output value as shown in Figure 2.1. The backlight lamp should illuminate normally. After inspection is completed, reset the handle rod to the 0 scale mark.
3. When operating the handle for pushing and rotating, it should be done smoothly and slowly. Avoid rapid pushing or pulling, as excessive speed may cause impact and damage the operation handle.

4.2 Adjustment specification

There are two positions that can be adjusted during use, please operate according to the actual situation:

1. Engage and detach the left and right grips, as shown in Figure 4.1.

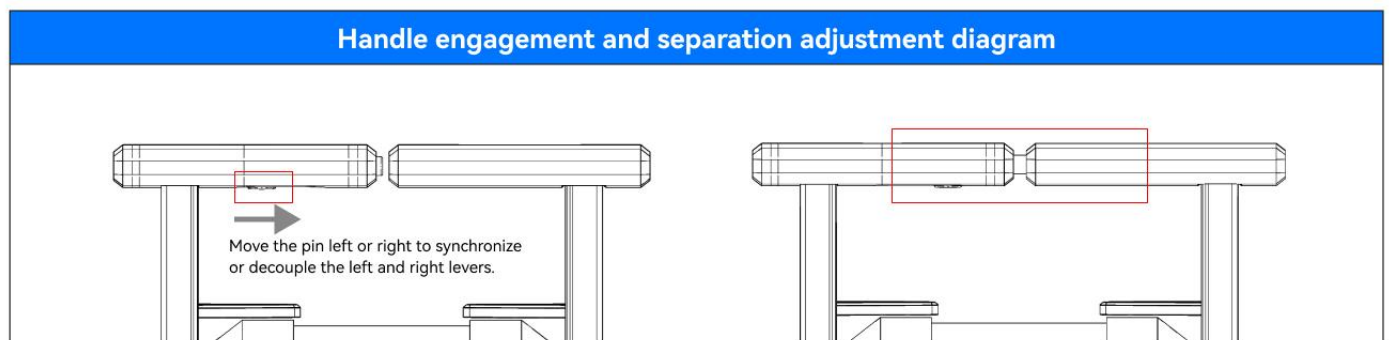


Figure 4.1

2. The adjustment of the rotating range of the handle, as shown in Figure 4.2, is used to adjust the left and right limits, and adjust the slider to the appropriate position when the limits are not accurate.

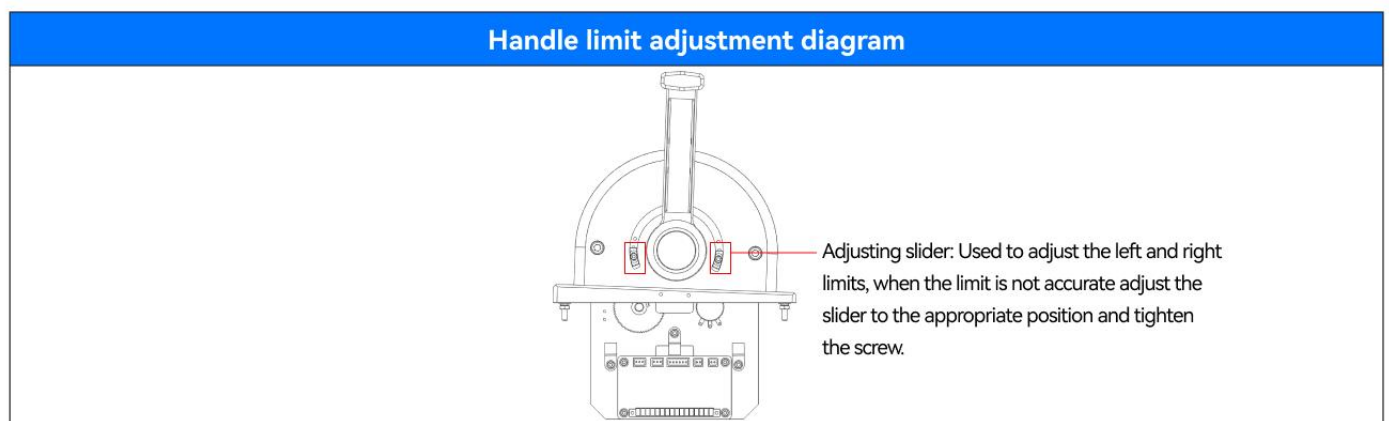


Figure 4.2

4 Instructions and precautions for use

4.3 Matters needing attention

1. If it is not used according to the requirements, 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 $0 \sim 5K$, please stop using immediately; When the output value between terminals 1 and 2 cannot be continuously changed, stop using it in time.

Method of stopping the service: Disconnect the external power supply.

3. According to the characteristics of the accessories used in this product, the instantaneous input voltage shall not exceed 20% of the range specified at any time. Avoid excessive instantaneous current and burning accessories.

5 Fault analysis and elimination

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

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, there is a change in propulsion damping, which can not be used normally or seriously affect the operation, and we will maintain it 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

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 it back and forth regularly, repeat about 10 times, and the cycle is 2 to 3 weeks. It can ensure smooth promotion 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 handle cannot position itself at zero position. Contact our after-sales engineer.
2. The use process should be smooth and uniform, to avoid rapid pushing and pulling, the speed is too fast to form an impact and 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 cause 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

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

9.1 Phone number of the after-sales engineer

Contact: Mr.Xu

Tel: 18067343163

9.2 Company information

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