SHANBEI
HID TECHNOLOGY

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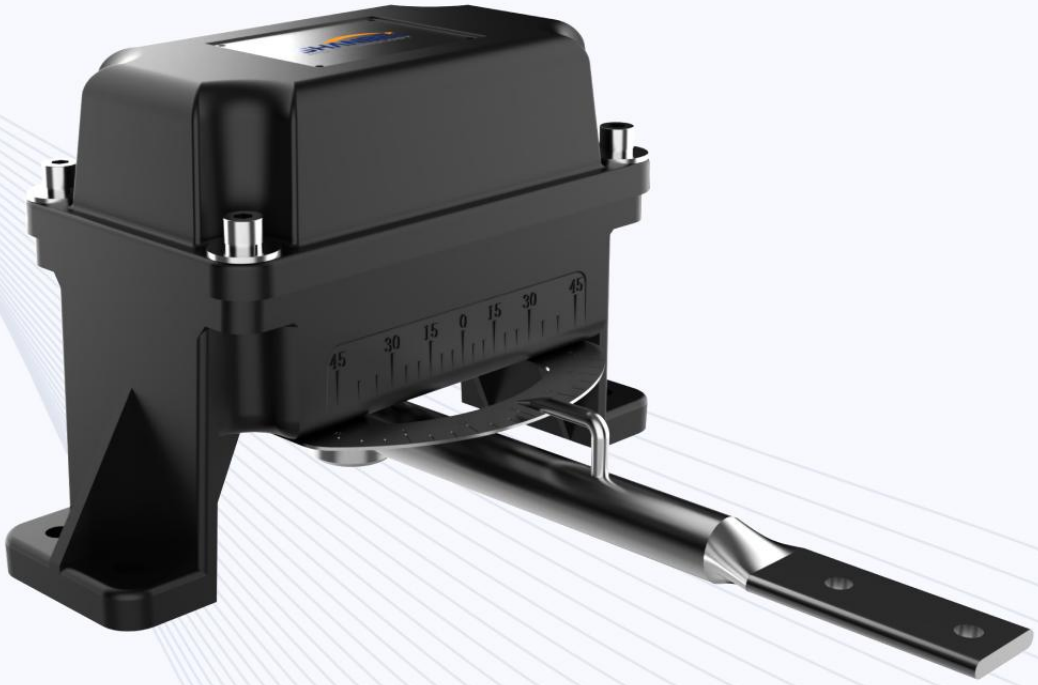
WSS-R270

Multi-potentiometer type rudder angle feedback

User manual



Ningbo SHANBEI Technology Co.,Ltd

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.

Copyright

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.

Contents

1 Introduction

1.1 Overview

The WSS-R270 rudder Angle feedback is installed in the rudder compartment and is used to convert the mechanical Angle of the rudder into an electrical or digital signal in real time and transmit it to the receiving module, such as the rudder Angle indicator and the rudder Angle distributor. The product uses standard potentiometer output, CAN also use digital CAN bus output, has the advantages of long communication distance, strong anti-interference ability. The product adopts the lever transmission structure to ensure the reliability of the steering gear transmission. The internal gear transmission and double support structure effectively eliminate the external vibration of the steering gear and improve the working life of the sensor. The multi-potentiometer design improves the redundancy reliability of the product.

Base customization item		
Output signal	P	Potentiometer direct output (default)
	C	Digital bus output, including 1 CAN and 1 RS422
Potentiometer specifications	1	1KΩ
	2	2KΩ
	5	5KΩ (default)
Sensor configuration	1	Single potentiometer single connection
	2	Single potentiometer double
	3	Dual potentiometer single link (default)
	4	Double potentiometer double
With limit switch	1	No (default)
	2	Yes, one for port and one for starboard 35 degrees
	3	Yes, one at 45 degrees left and one at starboard
	9	Other, custom

Table 1.1

1.2 Product appearance

Product appearance drawing


Figure 1.1

1 Introduction

1.3 Product composition

Number	Name	Quantity
1	Rudder Angle feedback	1
2	Dial rod, threaded connection rod, installation base plate and other accessories	1
3	Certificate of conformity	1
4	Warranty card	1
5	specification	1

Table 1.2

1.4 Product size drawing

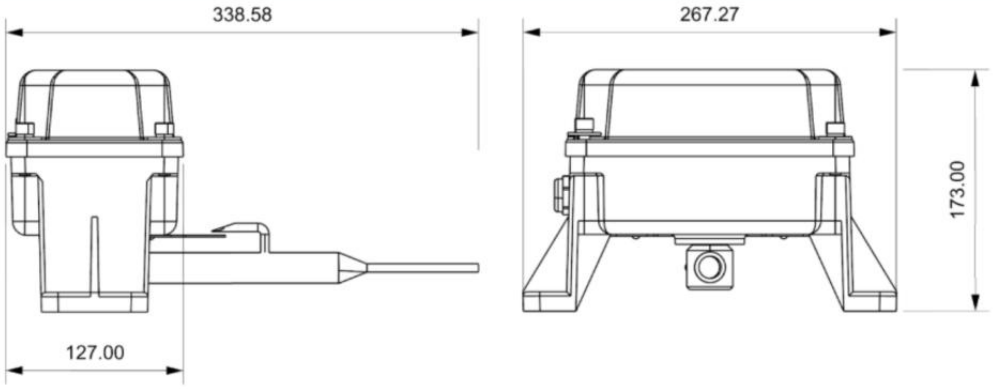
Outline dimensional drawing


Figure 1.2

1.5 Product wiring diagram

Open the top cover, and connect the cable to the terminal board through the waterproof connector hole. Cord end terminals are recommended. If it is a single potentiometer, use one connector hole, if it is a double potentiometer, use two connector holes. Please connect according to the order model according to the definition in the following table, other models can refer to:

1. Dual potentiometer output integrated limit switch, feedback with 2 potentiometers and 2 limit switches, as defined in Table 1.3 and 1.4.

PIN	Definition	Function
1	1# potentiometer P1	1# potentiometer output
2	1# potentiometer P2	
3	1# potentiometer P3	
4	Null	
5	Null	
6	2# potentiometer P1	2# potentiometer output
7	2# potentiometer P2	
8	2# potentiometer P3	

Table 1.3

1 Introduction

PIN	Definition	Function
9	1# COM	Left 35/45 degree limit output, normally on/ normally off signal
10	1# NC	
11	1# NO	
12	Null	
13	Null	
14	2# COM	Right 35/45 degree limit output, normally on/ normally off signal
15	2# NC	
16	2# NO	

Table 1.4

2. Single potentiometer digital bus output type, feedback inside with 1 potentiometer and 1 PCB board, as defined in Table 1.5.

PIN	Definition	Function
1	CANH	1# potentiometer CAN signal output
2	CANL	
3	+24V	Feedback power supply
4	GND	
5	NC1	Left limit normally closed contact output
6	COM	
7	NC2	Right limit normally closed contact output
8	COM	
9	CANH	2# Potentiometer CAN signal output (if not, empty)
10	CANHL	
11	+24V	2# Feedback power supply (if not available, empty)
12	GND	
13	RS422+	Rudder Angle signal RS422 output
14	RS422-	
15	+24V	Power output
16	GND	

Table 1.5

2 Technical parameter

2.1 Product basic parameter

Supply voltage	18~32VDC
Rotation range	±45°
Power dissipation	<1W
Precision	0.2°
Dimension	268*127*173mm (excluding rod)
Weight	2.2kg
Signal output	Potentiometer、CAN、RS422
Class of protection	IP56
Transmission mode	Gear drive
Cable length	Do not contain

Table 2.1

2.2 Standard version product technical description

1. The feedback shell is made of ABS engineering plastic, the main shaft is made of stainless steel, and the internal transmission is made of copper gear;
2. Resistance tolerance of potentiometer ±10%, independent linear tolerance 1.0%;
3. Output mode: direct potentiometer linear output, linear relationship with the scale, the theoretical output is shown in the figure below, the actual output is seen in the product factory inspection report.

Theoretical resistance output curve

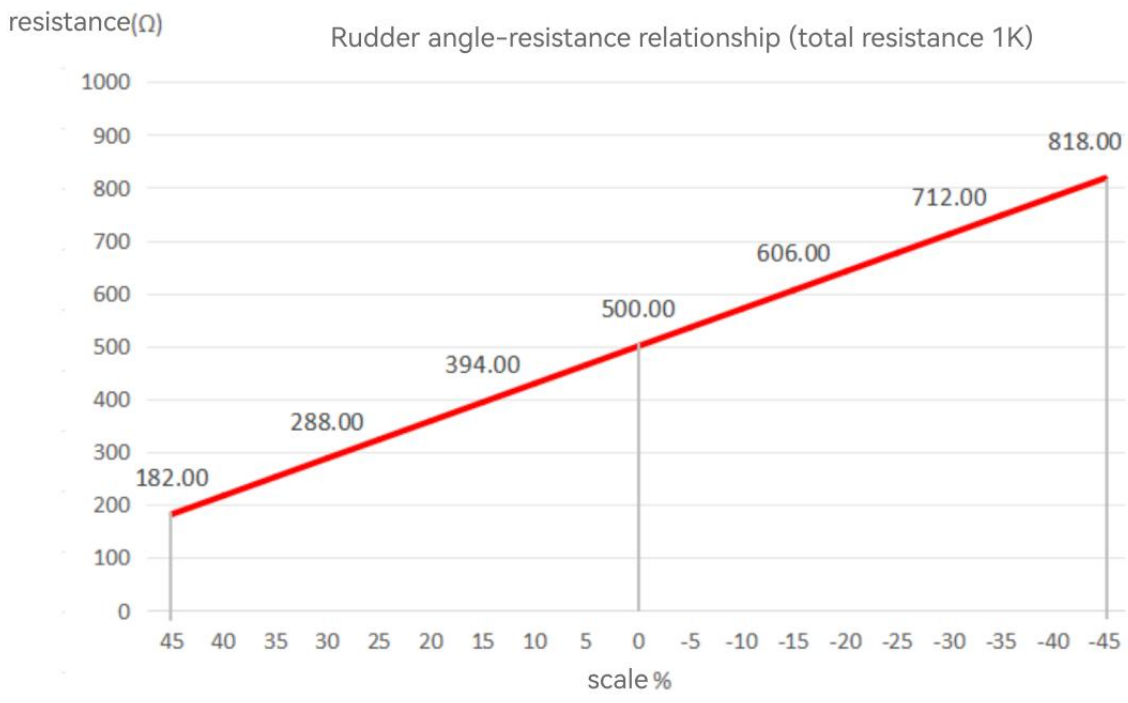


Figure 2.1

2 Technical parameter

2.3 Bus output communication protocol

1. The format of can is standard frame, baud rate: 100K;
buff [0] 8 bits higher after 10x Angle enlargement;
buff [1] Low 8 bits after 10x Angle enlargement; Tape symbol
For example: left rudder 36.3° : 0xfe; 0x95
Right rudder 15.7° : 0x00; 0x9d
2. The format of RS422 is $AGRSA,XXXR*hh<CR><LF>, where XXX is the value after the current Angle is expanded by 10 times, which can be compared with the display value of the digital tube; R is the right rudder Angle, L is the left rudder Angle.

3 Installation instructions

The rudder Angle feedback should be flexibly installed according to the type of steering gear, fixed with M8 triple combination screws and nuts, and connected with a threaded rod to form a parallelogram connecting rod structure to ensure that the rotation Angle of the rudder is equal to the rotation Angle of the feedback rod.

1. Installation of tilting cylinder steering gear rudder Angle feedback device: tilting cylinder steering gear rudder Angle feedback device is suitable for installation on the front and rear side of the rudder rod, please adjust according to the specific layout and position space of the rudder engine room. First, straighten the rudder and keep the rudder Angle in the middle. Refer to Figure 3.1, the distance between the center of the tiller and the center of the feedback device is AC=BD, the length is about 500MM, and the length of AB=CD is about 150MM, forming a parallelateral ABCD, otherwise the linear error of the rudder Angle feedback is large and the left and right are asymmetrical.

Swing cylinder steering gear installation procedure diagram

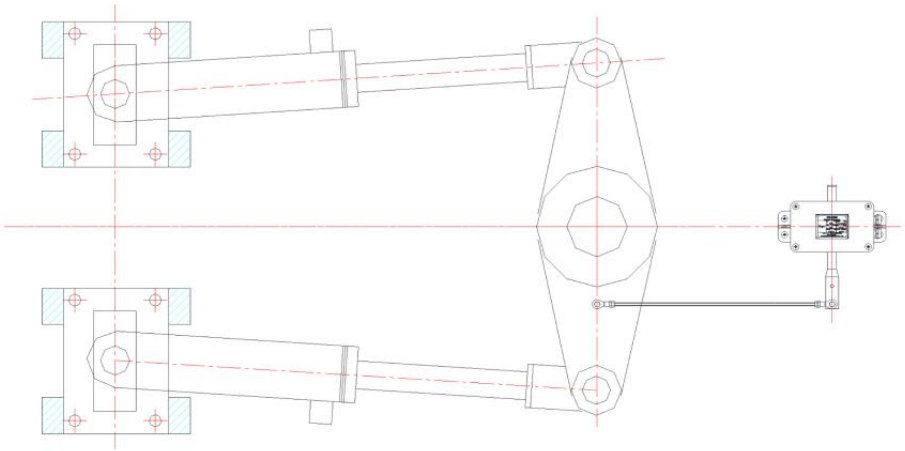


Figure 3.1

2. Installation of tilting fork steering gear rudder Angle feedback device: tilting fork steering gear rudder Angle feedback device is suitable for installation on the left and right sides of the rudder rod, please adjust according to the specific layout of the rudder engine room and position space. First, straighten the rudder and keep the rudder Angle in the middle. Refer to Figure 3.2, the distance between the center of the tiller and the center of the feedback device is AC=BD, the length is about 500MM, and the length of AB=CD is about 150MM, forming a parallelogram ABCD. Otherwise, the linear error of the rudder Angle feedback is large and the left and right are asymmetrical.

Fork steering gear installation procedure diagram

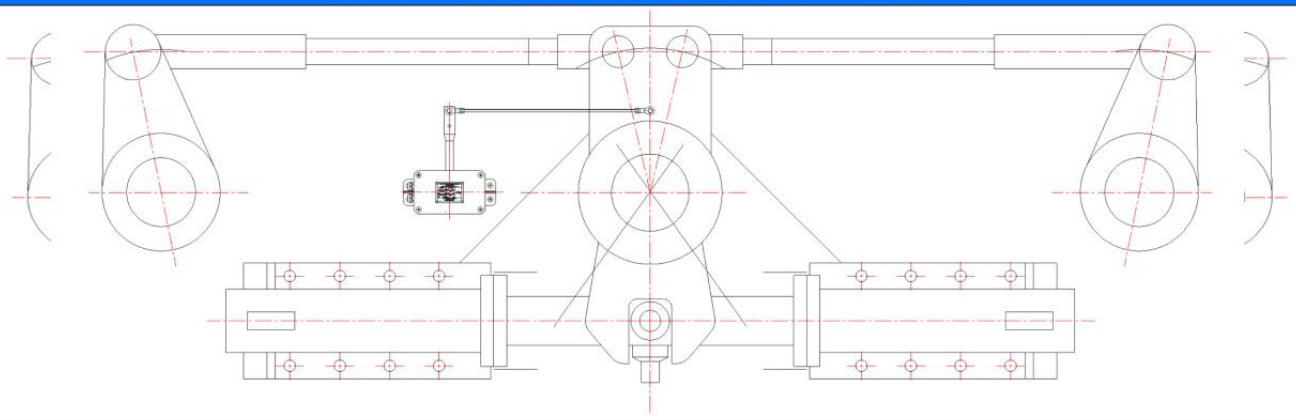


Figure 3.2

4 Instructions and precautions for use

4.1 Instructions for use

1. After installation, check whether the protection is reliable. If only one waterproof joint is used, the other should be kept sealed.
2. Switch on the power supply, manually hit the rudder, compare the rudder Angle feedback value and the scale value of the hydraulic steering machine, and constantly adjust the extension length of the dial rod and the length of the connecting rod to ensure 1 to 1 transmission.

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.

6 Safety protection and accident handling

6.1 Safety protection devices and precautions

1. The important position of this product has been tightened seal processing at the factory, shall not be disassembled without permission, if the seal is damaged, any product quality problems are borne by the buyer.
2. Once the product fails to operate normally, please stop using and disconnect the power supply immediately, and contact our after-sales service engineer for a solution.

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. Regularly check the lubrication of fisheye bearings and other parts, and apply appropriate grease.

7.2 Operation precautions

1. Stop using the device when there is a problem. Contact our after-sales engineer.
2. 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

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.

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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