Instructions for Speed switch
ZAXDH-F-S v2.0

Zax Technology Co., Ltd

1. Overviews

By detecting the real-time speed of the driven roller of the belt conveyor, the slip detector can determine whether there is a belt slip fault, and issue two-level alarm signals in a timely manner according to speed changes, so as to avoid the expansion of losses and accidents. This product adopts advanced ARM processor technology and embedded control principles, featuring stable performance, powerful functions and high protection level.

2. Characteristic

2.1. Split design, flexible and convenient to install.

2.2. A display composed of 3 LED nixie tubes shows the operating status of the conveyor in real-time.

2.3. Advanced sensor technology, with an ultra-long detection distance of 20mm.

2.4. Non-contact, no vulnerable components, long service life.

2.5. High-precision 4-20mA analog output.

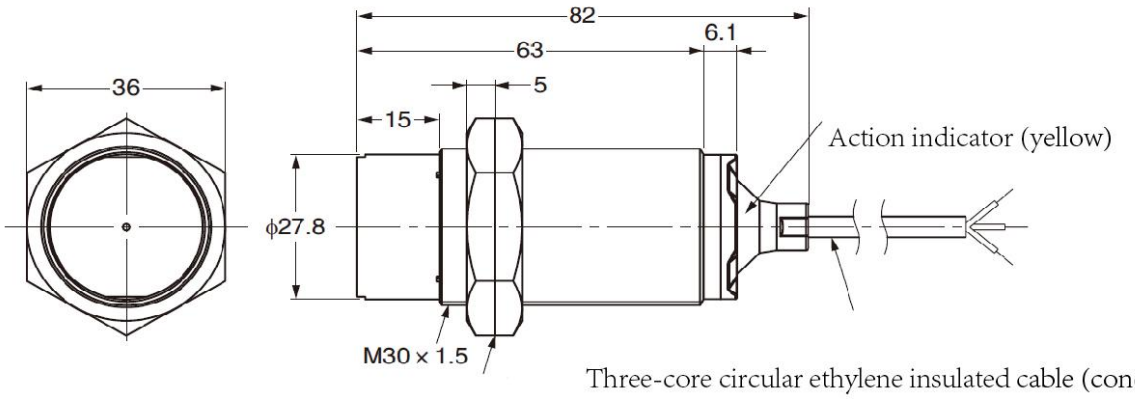
2.6. Uses high contact capacity relay output.

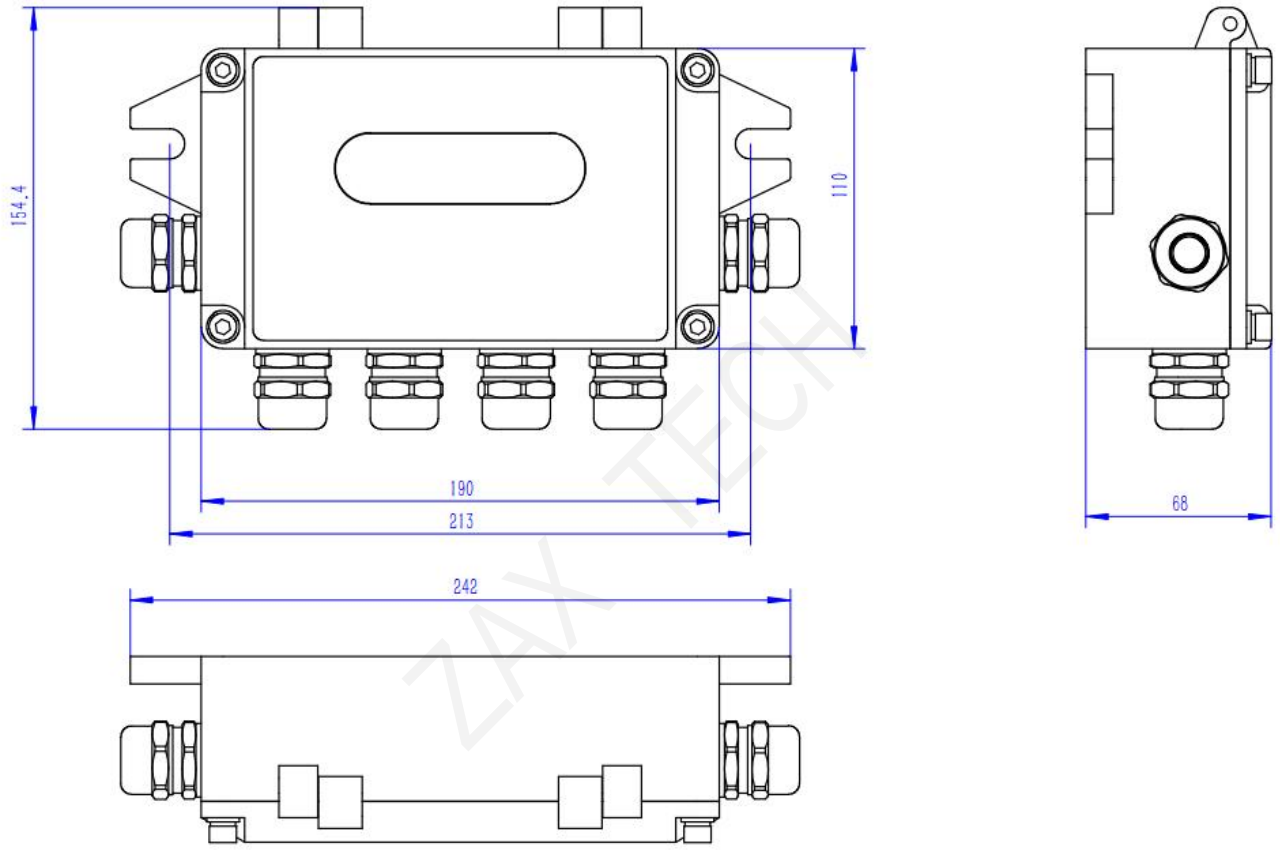
2.7. It has a built-in Bluetooth module, allowing users to modify parameters such as alarm points, alarm delay, and start-up delay through a mobile app.

3. Parameter table

Ambient temperature	-40℃~80℃
Relative humidity	0~95%
Atmospheric pressure	80 kPa ~110kPa
Working voltage	AC220V 50/60HZ
Power consumption of the whole machine	15W
Output mode and quantity	2 × SPDT
Contact rating	AC250V 3A DC30V 3A
Optimum detection distance of sensor head	10mm
Alarm threshold value	Alarm1 ： Speed reduction10% Alarm2 ： Speed reduction50%
Start delay	30 S
Protection level	IP67
Display mode	3-digit LED nixie tube, indicator light
Analog quantity mode	4~20 mA
analog precision	0.1%
Analog load capacity	300 Ω

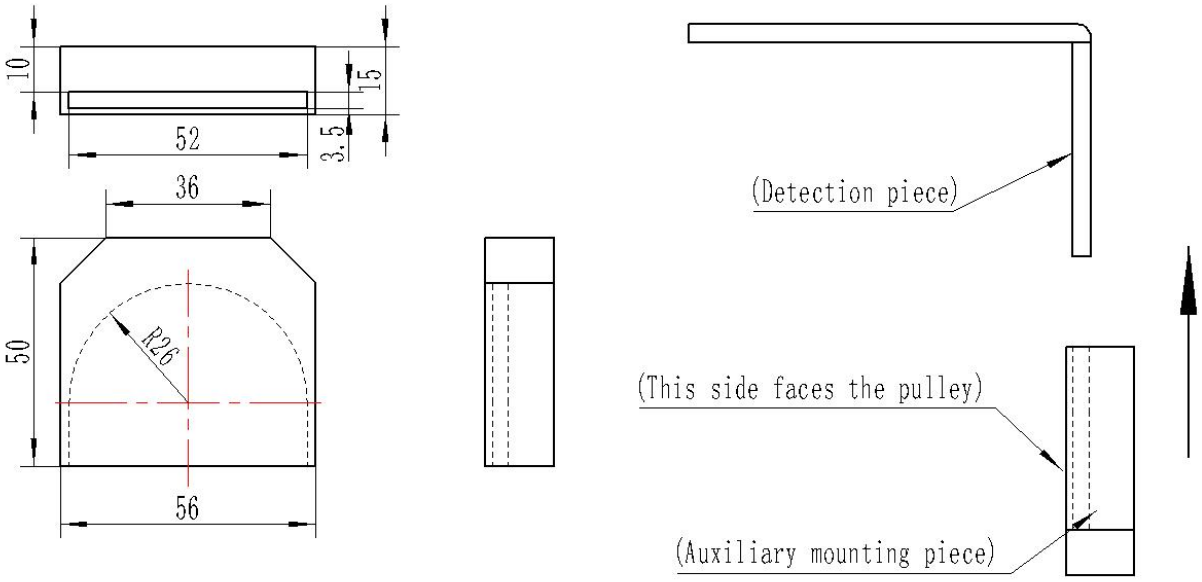
4. Structure features and main dimensions



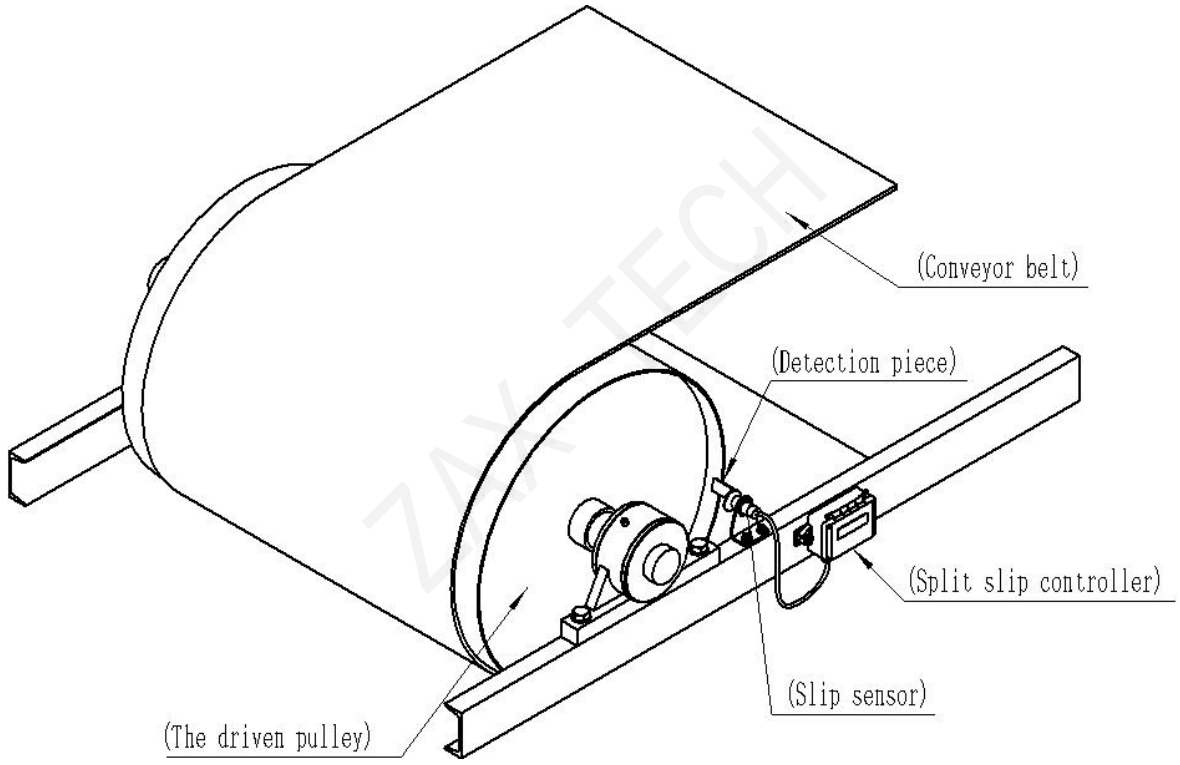


Appearance size chart(Units: mm)

5. Installation indication



(Auxiliary mounting piece)



Installation indication

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6. Installation instructions

6.1. Safety precautions：

6.1.1. Do not operate with electricity when installing this equipment.

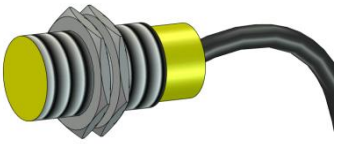
6.1.2. Do not operate with electricity when installing this equipment.

6.1.3. The grounding terminal of the shell must be grounded; otherwise, the slip detector will lack protection such as lightning protection and surge protection, which will reduce its service life.

6.2. Prepare materials:

6.2.1.Install the bracket

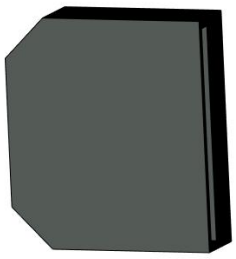
6.2.1. skid sensor



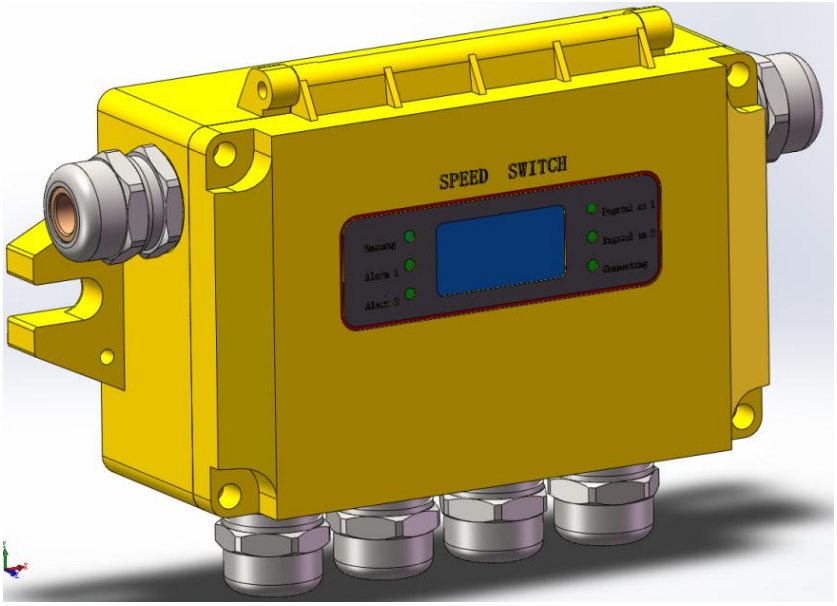
6.2.2.2 sets of fasteners (M10×35)

6.2.2. Detection strip

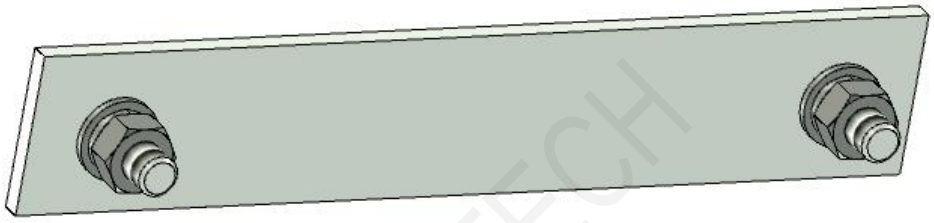
6.2.3. Auxiliary mounting block



6.2.4. Split slipping controller

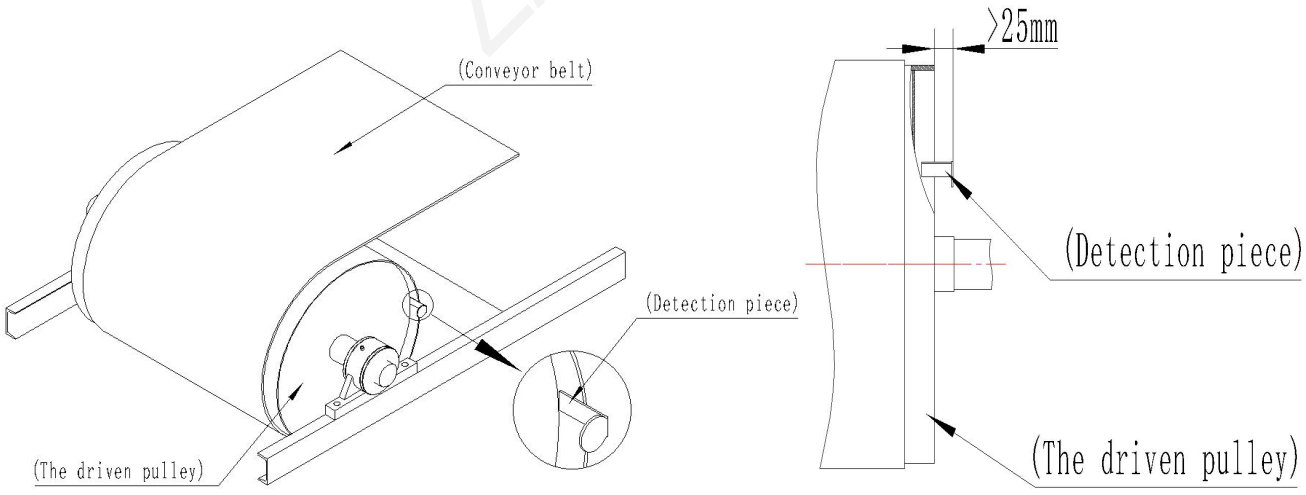


6.2.5. Controller mounting bracket

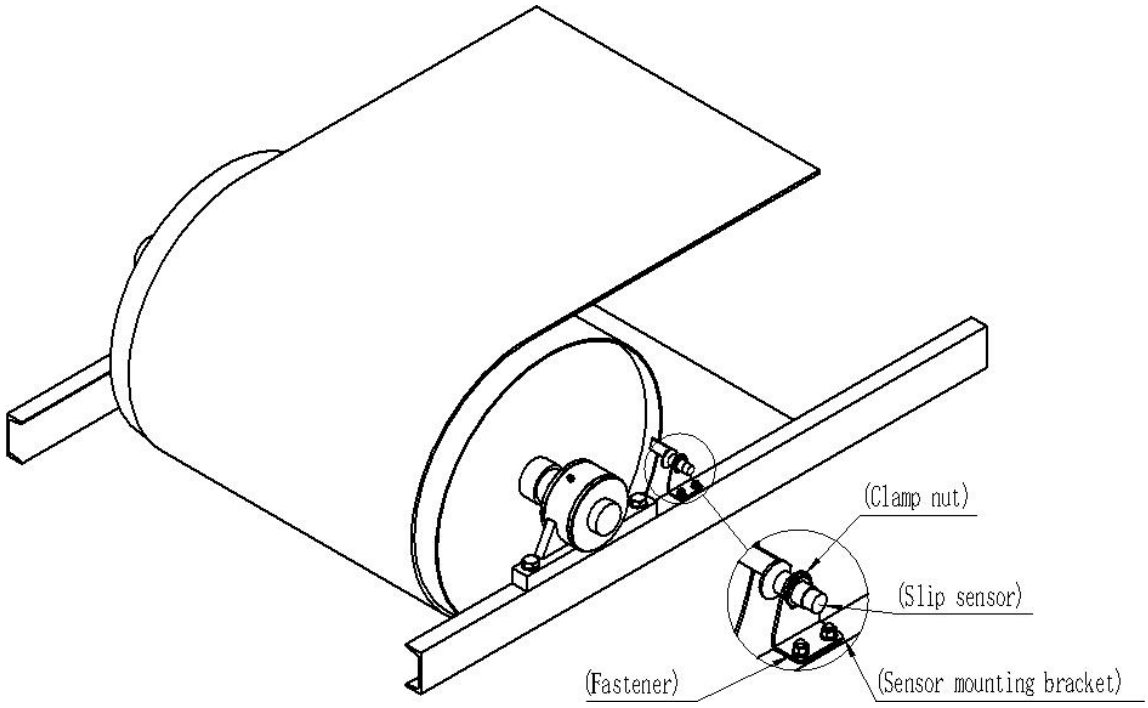


6.3. Installation steps：

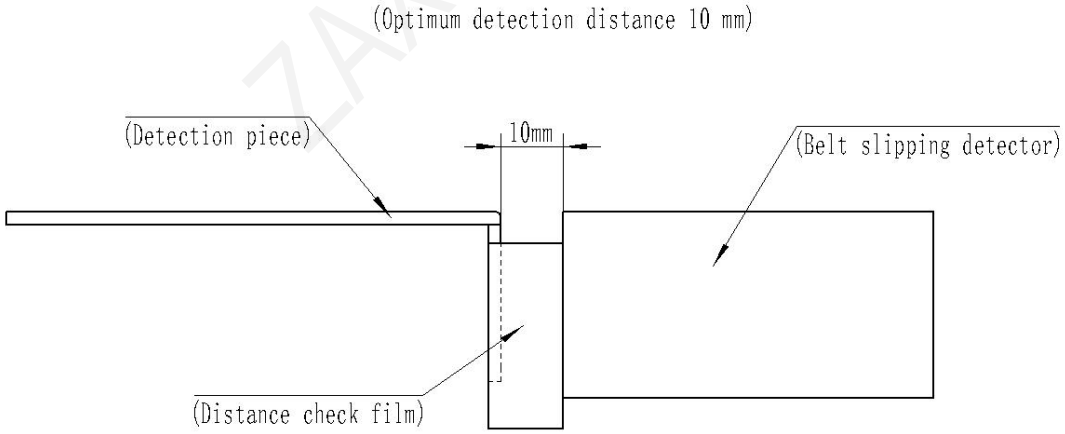
6.3.1. Weld the detection piece onto the driven roller, and the distance from the edge of the detection piece to the edge of the driven roller should be greater than 25mm.



6.3.2. As shown in the figure, install the slip sensor on the transport rack and fix it with fasteners.



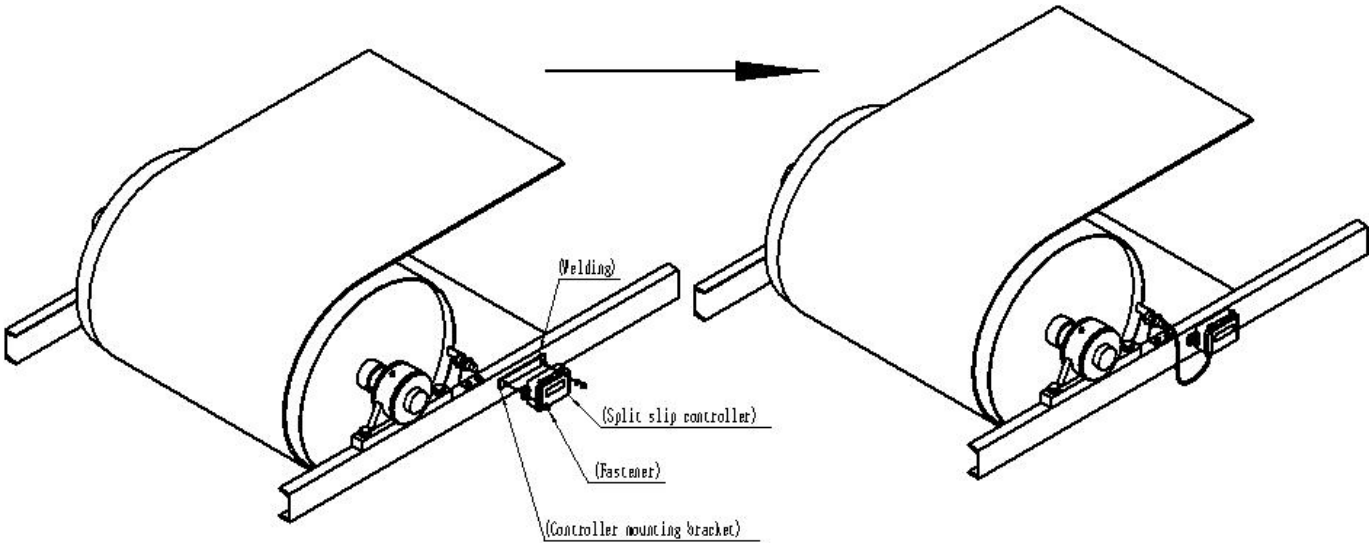
6.3.3. Put the auxiliary mounting block on the detection piece, adjust the position of the slip sensor so that its sensing area is completely attached to the auxiliary mounting block, and then fix the sensor with fasteners. After the installation is completed, remove the auxiliary mounting block. At this time, the optimal detection distance between the sensor's sensing area and the detection piece is 10mm.



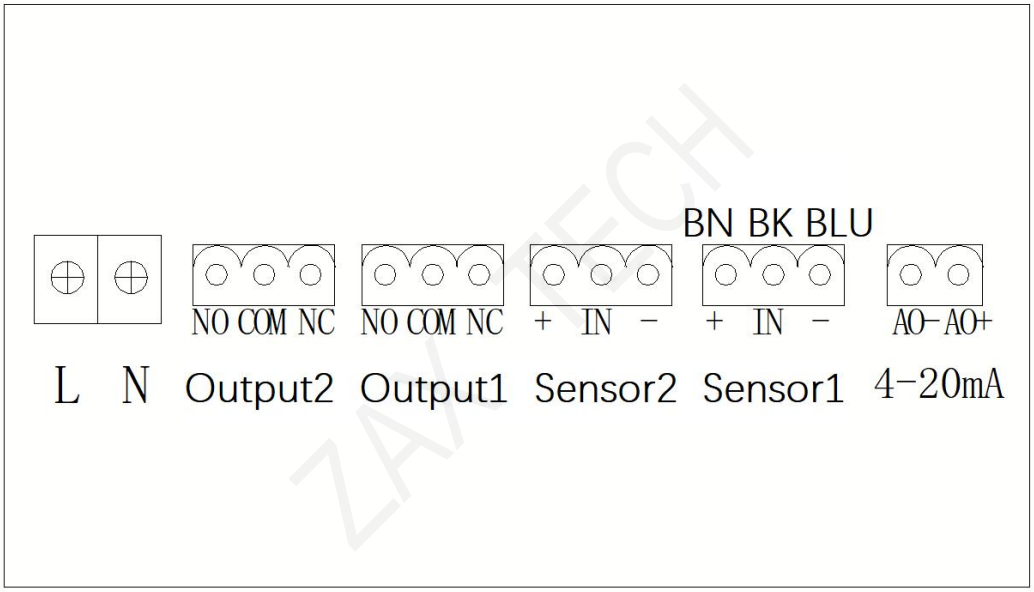
(Remove the "distance check film"after installation)

The sensor should be installed on the frame near the end face of the driven roller. Each slip detector is equipped with a detection piece when leaving the factory, which must be installed at the corresponding detection position of the roller (only one detection piece can be installed at the detection position). The distance between the sensor and the detection piece should be kept as close to 10mm as possible to ensure accurate detection.

6.3.4. As shown in the figure, install the split slip controller on the transport rack and fasten it with fasteners.



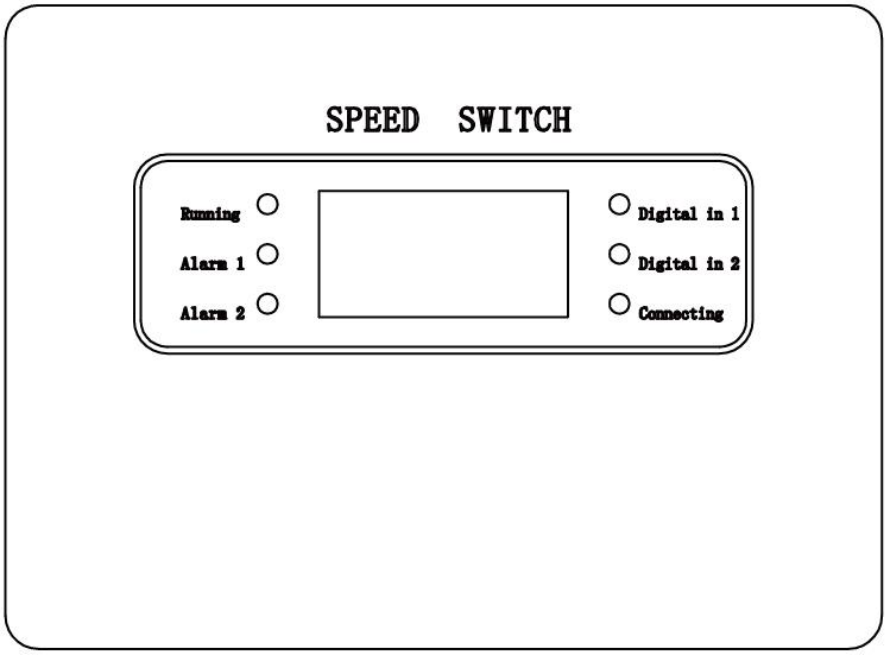
6.4. Wiring principle



Wiring Schematic Diagram of Slip Detector

The power terminal is connected to the power input. Output 1 is a light alarm for slippage, and Output 2 is a heavy alarm for slippage. For Sensor 1 input terminal: the "+" terminal is connected to the brown wire, the "IN" terminal is connected to the black wire, and the "-" terminal is connected to the blue wire. When connecting the passive dry contact signal of belt operation, connect the "IN" and "-" terminals of Sensor 2 input.

6.5. Definition of indicator light



6.5.1. Operation: Blinks in learning mode, remains on after learning is completed.

6.5.2. Alarm 1: Light slip alarm indication.

6.5.3. Alarm 2: Re-slip alarm indication.

6.5.4. Signal 1: The detection sensor input status shows that when a detection piece is sensed, the indicator light turns on.

6.5.5. Signal 2: Belt operation feedback signal display. When the passive node of the belt operation is closed, the indicator light is on.

6.5.6. Connection: Lights up when Bluetooth is connected, otherwise turns off.

6.6. Meaning of 4-20mA analog output signal.

The 4-20mA analog signal represents the change in belt speed. 4mA indicates the shutdown or slip alarm state, 12mA indicates the 100% belt speed operation state, and 20mA indicates the 200% belt speed operation.

Load impedance: The analog output signal of this device can adapt to a load impedance of 0-300Ω. If the line is too long, or if it is installed together with high-voltage lines such as power lines, shielded wires must be used, and the shielding layer must be grounded.

6.7. If you need to adjust the factory parameters or functions, you can set the device on-site by installing our company's parameter setting tool APP and connecting via Bluetooth. The parameters that can be set are shown in the table below.

Default Parameter Setting Table for Skid Detector	
1、equipment ID	1
2、Bluetooth address	0
4、Display mode	rotational speed
5、Drum diameter	0
6、Running mode	Learning mode
7、Standard speed	0
8、Run feedback enabled	Disable
9、Power-on delay	30
10、Number of study times	10
11、Time-limited study	30
12、Self-reset time	0
13、Downtime judgment time	10
14、Learning error	5
15、Output 1 Under-speed Threshold	10
16、Output 1 Over-speed Threshold	0
17、Output 1 Alarm Delay	3
18、Output 1: Power failure alarm function	Disable
19、Output 2 under-speed threshold	50
20、Output 2 over-speed threshold	0
21、Output 2 alarm delay	3
22、Output 2: Power failure alarm function	Disable

7. Working principle

The tail of the rear cavity of the detector is equipped with a display panel, which consists of a three-digit nixie tube and 6 LED indicator lights. It can display information such as alarm indicators and power indicators.

The principle that the driven roller and the conveyor belt run at the same speed is used to detect the rotational speed of the driven roller. A detection plate is installed on the inner end face of the driven roller, and the detector detects the rotational speed of the roller. When slipping occurs between the conveyor belt and the main roller, the rotational speed drops below the alarm point, and the device sends out a switch signal. Users can use this signal as an alarm or interlock signal to stop the upper conveyor or the discharge port from feeding materials to this conveyor.

Workflow: After the slip detector is powered on, it starts to determine the operating status of the conveyor belt. If the conveyor belt is in a normal operating state, the slip detector will automatically learn the standard speed of the conveyor belt after a start-up delay (default 30 seconds), which takes about 30 seconds (the learning time is related to the running speed of the conveyor belt; the faster the speed, the shorter the time). After the learning is completed, the result will be stored as a standard value, and then real-time speed detection of the conveyor belt will start, with comparison made against the standard value. When the operating speed of the conveyor drops by 10% compared to the standard value, Alarm 1 relay will act,

and the Alarm 1 indicator light will turn on; when the operating speed of the conveyor drops by 50% compared to the standard value, Alarm 2 relay will act, and the Alarm 2 indicator light will turn on; when the conveyor stops running, both Alarm 1 relay and Alarm 2 relay will act simultaneously, and both Alarm 1 indicator light and Alarm 2 indicator light will turn on at the same time.

The default "self-reset time" is 0. In this state, when the slip detector detects that the conveyor has stopped, Alarm 1 and Alarm 2 will output continuously. Only when the slip detector detects the conveyor starting again will the Alarm 1 and Alarm 2 relays of the slip detector be immediately deactivated. After the slip detector is powered on, if the belt does not run and the start-up delay of 30 seconds is exceeded, the slip detector will alarm (learning unsuccessful), with both the Alarm 1 relay and Alarm 2 relay activating simultaneously, and both the Alarm 1 indicator light and Alarm 2 indicator light turning on at the same time.

If the "self-reset time" is not 0, in this state, after the slip detector detects that the conveyor has stopped, alarm 1 and alarm 2 will be automatically released and the indicator light will go off after a delay of the set number of seconds. After the slip detector is powered on, it will only enter the self-learning state when a pulse is detected; if no pulse is detected, the slip detector will remain in the waiting state.

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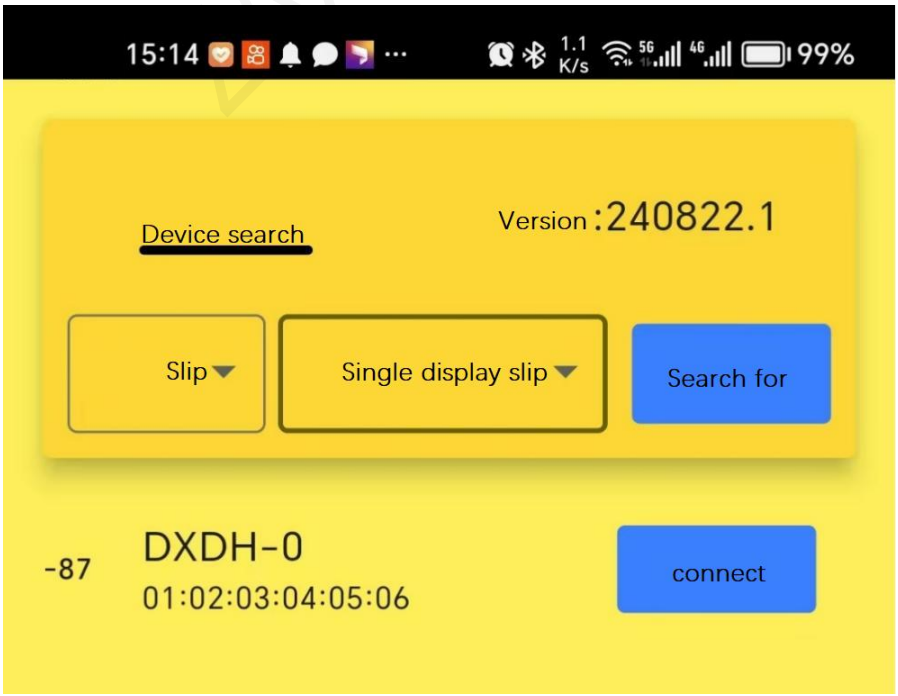
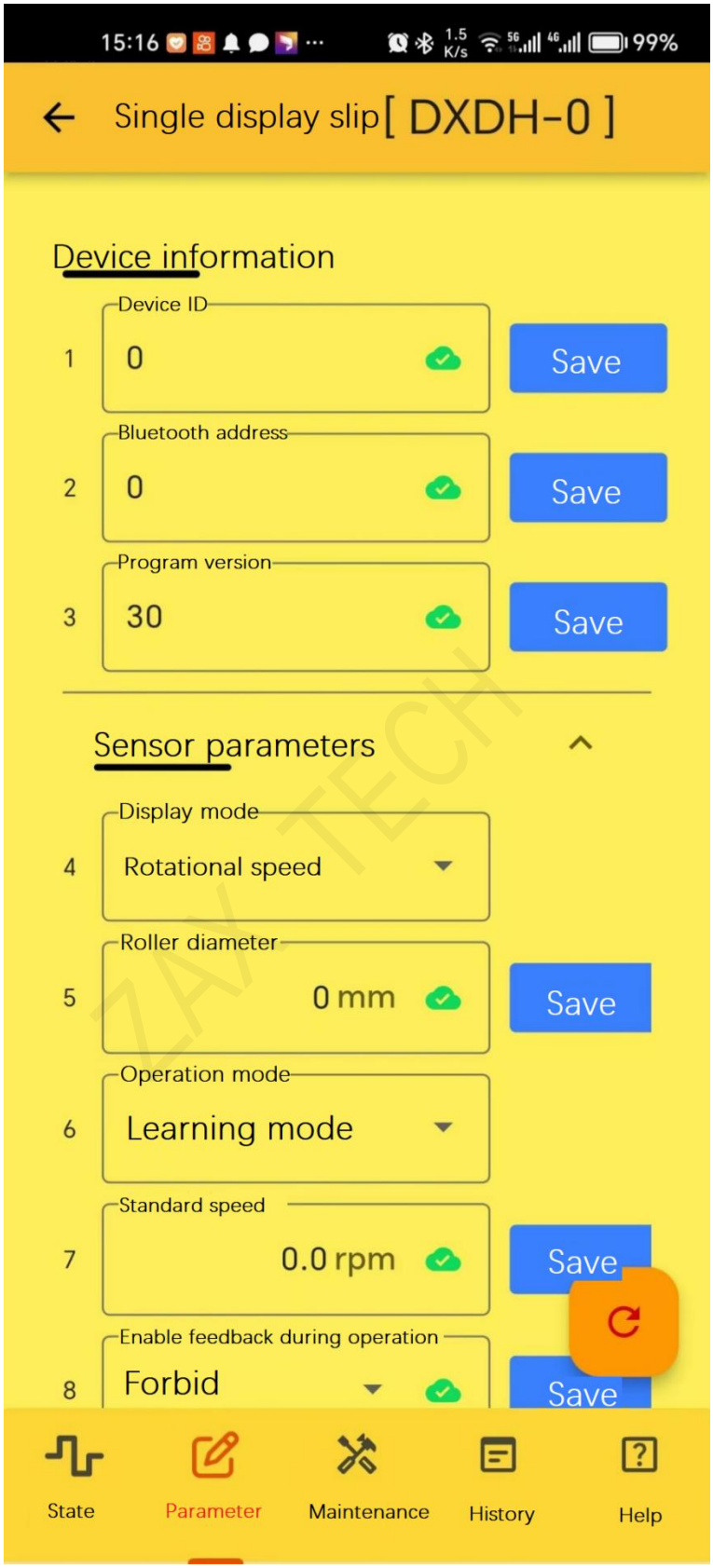
8. Parameter setting tool APP

8.1. First, contact the company, download the software installation package at the designated location, and install it (the APP only supports the Android system).;

8.2. Turn on the Bluetooth and location functions on your mobile phone. After entering the homepage of the software, select "Slipping" in the first drop-down box, select "Only display slipping" in the second drop-down box, and click the search button; select DXDH-0 and click the connect button.



8.3. Click the parameter button below to enter the parameter setting interface, click the parameter you want to modify to make changes, and after modification, click the save button on the right.



8.4. After modifying the parameters, scroll down to the bottom and click the "Save and Restart" button to complete the parameter modification.

8.5. The meaning of APP parameters can be understood by clicking the help button.

9. maintenance

9.1. Frequently check whether the distance between the sensor and the detection plate is normal.；

9.2. Check if the detector mounting bracket is firm and reliable.