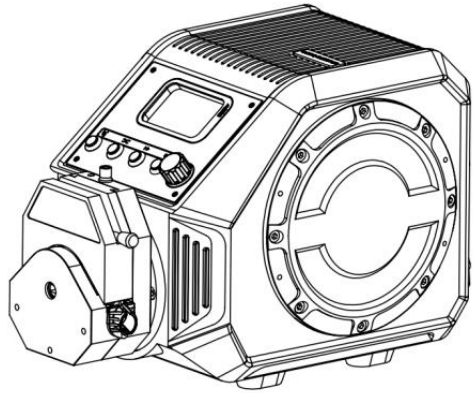
# Shenchen Precision Pump
# Manual of ExD Series



Baoding Shenchen Precision Pump Co., Ltd.

**Note:**

- Please read the manual carefully before operating the product. This safety information should be read in conjunction with the rest of the operator's manual.
- Please read and understand the contents of this manual carefully and use it according to the specified methods.

**Warning:**

| | |
|---|---|
| ⚠ | When used in an explosive environment, professionals are required to wire and energize according to the requirements of the national explosion-proof directive.<br>Basic work on pump transport, installation, start-up, maintenance and repairs must only be carried out by qualified personnel. |
| ⚠ | The customer's power socket must have a ground wire and reliable grounding. The customer must ensure that the cables and cable connectors meet explosion-proof requirements. |
| ⚠ | It is not allowed to arbitrarily change the components or parts that affect the explosion-proof structure and explosion-proof performance. |
| ⚠ | This product is not allowed to be put into water for operation. |

| | |
|---|---|
|  | If the automatic restart function is enabled, it may cause the system to start running immediately after power-on. The automatic restart function only applies to transfer mode. If the automatic restart function is enabled, a ⚠ will be displayed in the upper left corner of the screen. |
|  | The tubing may have cracks due to wear, causing liquid to overflow from the tubing, which may cause harm to human health and equipment. Therefore, it is necessary to regularly inspect and replace the tubing in a timely manner. |
|  | There are moving parts of the pump head inner, before opening the upper block, it must be carried out according to the following requirements:<br>1) Ensure that the pump is disconnected from the main power supply.<br>2) Ensure there is no pressure in tubing.<br>3) Ensure that fluid in the tubing can drain to a suitable vessel, container or drain. |
|  | The overall weight of the pump is greater than 30kg (depending on the pump head). Lifting operations should be carried out in accordance with standard health and safety guidelines. |
|  | Pay attention to electrical safety |
|  | It is strictly forbidden to open the rear flange with power on. It is strictly forbidden to connect wires with power on. |

Table of Contents

## 1. Overview of Explosion Proof Peristaltic Pump Products

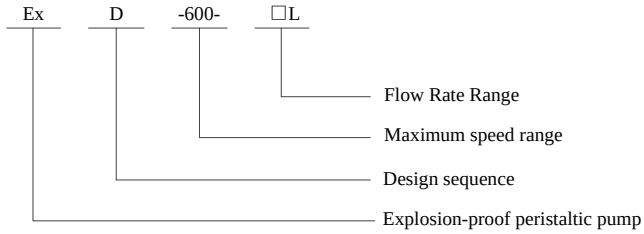
**1.1** Explosion proof peristaltic pump of ExD series are suitable for AC220V ± 10% (50/60Hz) power supply, and the maximum rated current is 1.37A. Its maximum surface temperature is 70℃.

It is applicable to industrial enterprises in explosive gas environment and combustible dust environment, (IIA, IIB, IIC class, Zone 1, Zone 2 hazardous locations, Locations in Zone 21 and Zone 22 in explosive gas environments of Group T1-T4 or in non-coal mine dust combustible dust environments).

In line with EN IEC 60079-0: 2018+A11:2024, EN IEC60079-1: 2014+A11:2024, EN IEC 60079-31: 2018.

In line with IEC61000-6-2: 2016, IEC 61000-6-4: 2018, IEC61000-3-2: 2020, IEC61000-3-3: 2017 standard requirements, to ensure the electromagnetic compatibility and safety performance of the product under various working conditions.

**1.2** The explosion proof peristaltic pump model is as follows:




**1.3** Explosion proof peristaltic pump can reliably work under the flowing conditions:

(1) Normal working atmospheric pressure range of pump: 86kPa~106kPa.

(2) The ambient temperature is 0℃~+40℃.

(3) The relative humidity of the surrounding air is not more than 90% (+20℃).

(4) The installation inclination from the vertical plane shall not exceed 15°.

(5) In the environment without damaging the insulation gas or steam.

(6) In places without significant shaking and shock vibration.

(7) Places that can prevent water dripping.

(8) The pollution level of the surrounding environment is level 3.

**1.4 Structure Description**

(1) The shell material of explosion proof peristaltic pump is cast aluminum.

(2) Explosion proof peristaltic pump has internal and external grounding bolts and grounding marks.

(3) The explosion-proof peristaltic pump uses natural cooling of the shell to dissipate heat.

**2. Explosion-proof Points**

**2.1** When the explosion proof peristaltic pump is designed, it is fully considered that when the explosive mixture invades its interior and explodes for some reason, the purpose of not causing the explosion of the explosive mixture outside the control cabinet, starting from the key conditions such as the strength of the shell and the joint surface gap between the parts that make up the shell, the length and the restricted surface are not allowed to reach dangerous temperatures, to ensure the flameproof performance. And measures to increase the sealing ring to prevent combustible dust from entering the interior of the shell and to limit the surface temperature to ensure the anti-dust ignition performance.

**2.2** To ensure the flameproof performance of the flameproof enclosure, the fastening bolts used for connection must be equipped with elastic washers to prevent them from loosening..

**2.3** The internal and external grounding of the explosion proof peristaltic pump is an important measure to prevent electric leakage sparks and ensure safety. It is set at the obvious place of the explosion proof peristaltic pump and has a grounding mark.

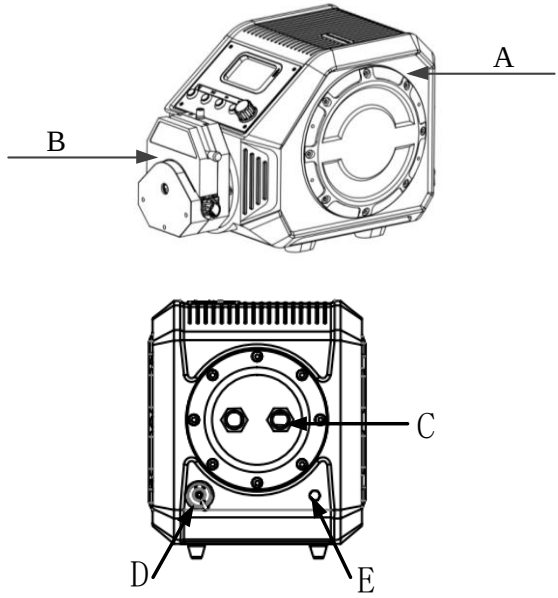
**2.4** The explosion proof peristaltic pump housing can only be opened after power failure.

**2.5** End users need to have cable glands, cables, etc. that meet explosion-proof standards.

**2.6** To eliminate or prevent electrostatic charges, wipe the surface with a damp cloth

only.

## 3. Product Appearance




A——Drive

B——Pump Head

C——Gland Head

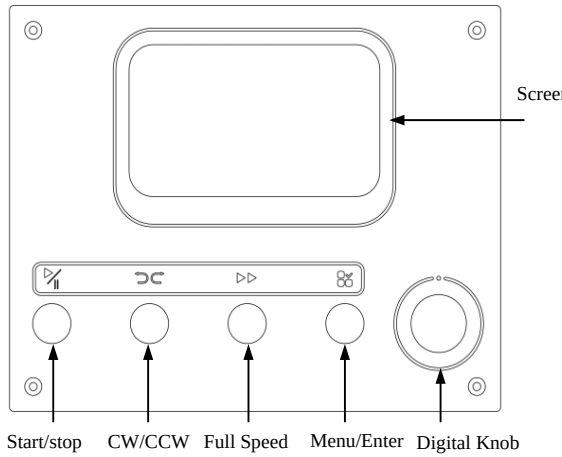
D——Power Supply Switch

E——Ground Terminal

Explosion proof peristaltic pump is the explosion-proof product with high IP rate. The shell is made of cast aluminum. 4.3 inch LCD screen. It can meet different applications with variety of external control method for optional, supporting RS485 communication and standard MODBUS communication protocol (RTU mode).

The diameter of the communication cable is 9.5-16 mm.

## 4. Keypad Instruction



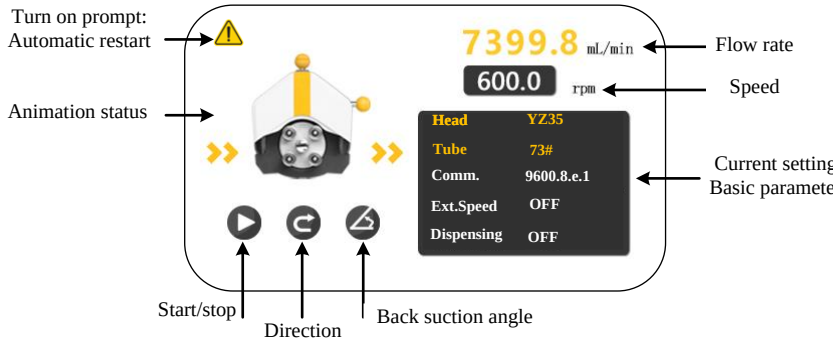

- **Start/stop**: Click **Start/stop** button, the peristaltic pump will run at current speed, click **Start/stop** button again, the peristaltic pump will stop running; When under dispensing mode, click **Start/stop** button, the peristaltic pump will run according to dispensing parameters. Click **Start/stop** button again, the pump stops dispensing running.
- **CW/CCW**: Each time you press the **CW/CCW** key, the operation direction of pumps will be changed once. The direction could be changed at status of transferring running or stopping; The direction can't be changed at the status of dispensing running, reversing is only possible in the stopped state.
- **Full speed**: Press **Full speed** button at status of stopping or transferring mode in operation, the peristaltic pump will run at current direction and with the highest speed. That could be used to clean tubing or fast filling liquids; At dispensing operation, this button is unavailable.
- **Knob**: In main interface, rotate **Knob** to adjust speed and the flow rate will change accordingly. The speed cannot be adjusted when the dispensing mode is on; At off status, rotate **Knob** to choose relative items in **Menu Selecting**

**Interface**.

- **Menu (Enter button)**: When the main interface stops running, press this button enter to menu selecting interface, and in this interface, rotate **Knob** to select items, then click **Menu (Enter)** button to enter this item.

## 5. Interface Instruction

### 5.1 Main Interface Structure Diagram




- **Animation status**: Display current run/stop status and run direction.
- **Start/stop, direction**: Indicate current operation status.

 and  : Clockwise operation status.

 and  : Counterclockwise operation status.

 : Stop status.

 : Indicates the interval time run period under the dispensing run.

- **Back suction angle**:  means that the current parameters is set back

suction angle, and this icon will be displayed in main interface. If you don not set back suction angle (the angle is 0), then the icon will not be displayed.

- **Flow rate**: Under transferring mode, this area will display the water flow rate at speed of current pump head and tubing corresponding. Under dispensing mode, this area will display filling liquid volume.
- **Motor speed**: Under transferring mode, this area will display current motor speed, you can adjust it by rotating knob; Under dispensing mode, this area will display speed under current dispensing parameters, the speed can not be changed by rotating knob.
- **Basic parameters**: Displaying the parameters of current setting for the pump.
- **Turn on promote for automatic restart:** When the automatic restart function is turned on, this icon is displayed here. When this function is off, no icon is displayed. Default is off.

| Icon | Tips | Method to remove the prompt | Special Instructions |
|---|---|---|---|
| ⚠ | Automatic restart is enabled | Enter the external control settings interface to turn off this function. | |

### 5.2 Setting Menu Selecting Interface


**Operation steps:**

**a.** In main interface, press **Menu** button enter to menu selecting interface;

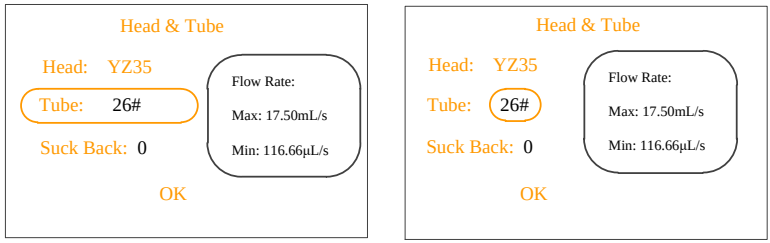
**b.** Rotate **Knob**, select parameters you need;

**c.** Press **Menu** button enter to next level interface and set parameters;

**d.** Select **ESC**, and press **Menu** button to back to main operation interface;

**e.** In this interface, in addition to the menu button, other buttons do not work.

### 5.2.1 Interface of pump head and tubing




(1) (2)

**Operation steps:**

**a.** In selecting pump head and tubing interface, when in (1) status, rotate **Knob** button, the cursor can move up or down, so you can select pump head, tubing size or back suction angle.

**b.** In (1) status, press **Menu** button to switch to (2) status.

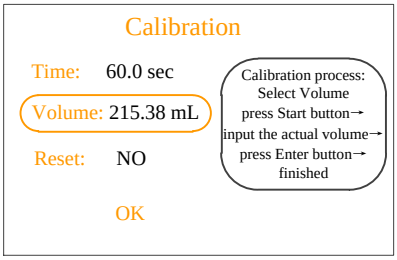
**c.** In (2) status, rotate **Knob** button to select pump head and tubing size.

**d.** In (2) status, press **Menu** button to go back to (1) status, and confirm the input value.

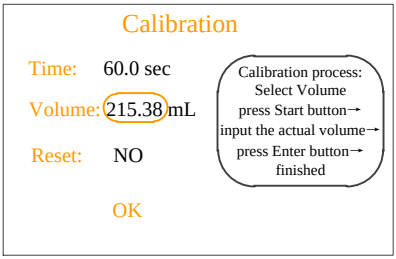
**e.** Rotate **Knob**, move the cursor to **OK**, then press **Menu** button return to previous level.

### 5.2.2 Calibration Interface

In menu interface, select the calibration tab, click **Menu** button to enter to flow rate calibration interface.




(1)




(2)

**Operation steps of transferring mode:**

**a.** Enter to this interface under transferring mode, the test time is default to 60 seconds, the actual liquid volume is default to volume according to current setting.

**b.** When in (1) status, move the cursor to Volume, and then press **Start/stop** button, the motor starts running, the calibration starts up. The countdown is displayed at Time.

**c.** After the countdown, the cursor will directly move Volume, and then you can rotate knob to input the actual volume.

**d.** After input, press **Menu** button to confirm input value, a dialog displaying "Calibration finished" will pop up in this interface, that means calibration has been completed. Press **Menu** button again, return to Calibration interface.

**e.** Reset function: Select **Yes**, then press **Menu** button, a dialog displaying "Reset finished" will pop up in this interface, then can restore calibration factor.

**f.** After calibration, back to main interface, the speed does not change, and the flow rate changes according to the actual value from calibration. For example: If the speed is 100rpm, the original corresponding flow rate is 20mL/min, the actual liquid volume tested in 60 seconds is 22mL, after performing

calibration, the speed displays 100rpm in main interface, the flow is 22mL/min.

**g.** Rotate **Knob**, move the cursor to **OK**, then press **Menu** button return to previous level.

If you know the actual filling volume in 60s, then you can skip step b and directly select the actual liquid volume column, press **Menu** button to select actual volume, and then rotate knob to set the actual liquid volume. Finally, complete calibration according to step d.

If you need to change the test time, you can move cursor to Time under (1) status, then press **Menu** button, the 60 is selected, then you can change time by rotating knob. After change, press **Menu** button, the cursor turns to selecting all state. Next, move cursor to Volume by rotating knob, set according to step b.

**Operation steps of dispensing mode:**

**a.** Enter to this interface under dispensing mode, the test time and actual volume are default to value of current dispensing parameters.

**b.** When in (1) status, cursor of selecting all moves to Volume, and then press **Start/stop** button, the motor will run and calibration will start. The countdown is displayed at Time.

**c.** After countdown, the cursor directly jump to Volume, then you can rotate knob to input the actual volume.

**d.** After input, press **Menu** button to confirm input value, a dialog displaying "Calibration finished" will pop up in this interface, that means calibration has been completed. Press **Menu** button again, return to Calibration interface.

**e.** Reset function: Select **Yes**, then press **Menu** button, a dialog displaying "Reset finished" will pop up in this interface, then can restore calibration factor.

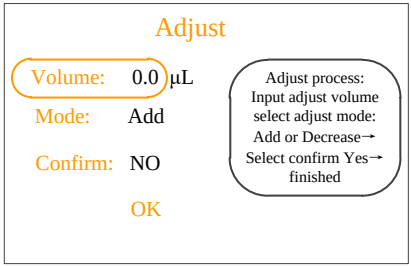
**f.** Rotate **Knob**, move the cursor to **OK**, then press **Menu** button return to previous level.

If you know the actual dispensing volume, then you can skip step b and directly select the actual liquid volume column, press **Menu** button to select actual volume,

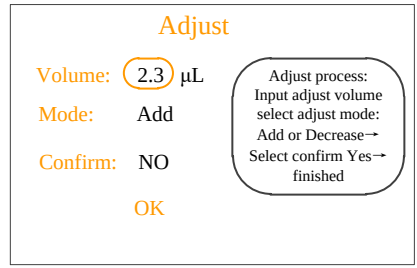
and then rotate knob to set the actual liquid volume. Finally, complete calibration according to step d.

### 5.2.3 Micro Adjustment Interface

In Menu interface, select **Adjust** tab, click **Menu** button enter to micro-adjust calibration interface.




(1)

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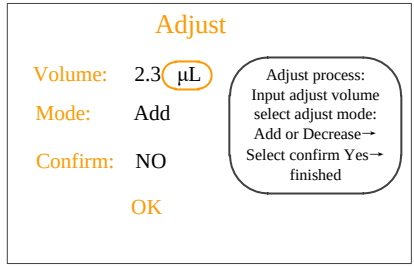



(3)

**Operation steps:**

**a.** After enter to this interface, cursor of selecting all selects the Volume, then press **Menu** button to enter to (2) interface.

**b.** When in (2) status, select the cursor to Volume value, next you can input micro-adjustment value by rotating knob. Finally, press **Menu** button, return to (3) status.

**c.** When in (3) status, select the cursor to volume unit, rotate knob to switch unit.

Finally, press **Menu** button, return to (1) status.

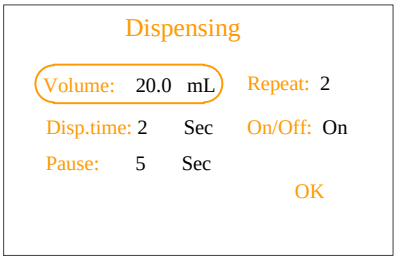
**d.** When in (1) status, move the cursor to Mode by rotating knob, then press **Menu** button, finally, Add or Decrease. For example, micro-adjustment volume is 2.3μL, then you should select Add, that means adding 2.3μL to the current actual filling volume to reach the required liquid volume. The same way for Decrease.

**e.** Move cursor to Confirm by rotating knob, press **Menu** button, select Yes by rotating knob; Click **Menu** button, a dialog displaying "Calibration finished" will pop up. If you select NO, then you do not do any operations.

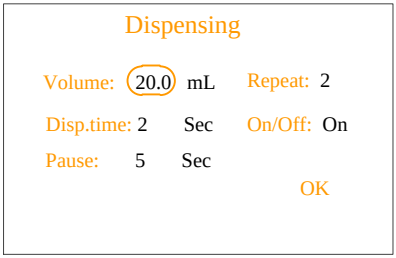
**f.** Rotate **Knob**, move the cursor to **OK**, then press **Menu** button return to previous level.

### 5.2.4 Volume Dispensing Interface

In menu interface, select Disp. tab, click **Menu** button enter to dispensing interface.




(1)

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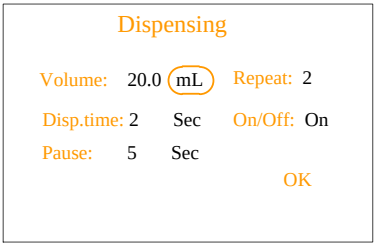



(3)

**Operation steps:**

**a.** When in (1) status, rotate Knob to move cursor up and down. Then you can select dispensing volume, running time, pause time, repeat numbers and the on/off of liquid dispensing.

**b.** When in (1) status, press **Menu** button to go to (2) status.

**c.** When in (2) status, rotate Knob to select Volume, Disp.Time, Pause, Repeat, On/Off.

**d.** When in (2) status, press **Menu** button to go to (3) status, rotate **Knob** to change the units of volume and time.

The range of dispensing volume is 0.1-9999, the volume unit is mL/L;

The range of running time is 0.1-9999, the time unit is sec/min/hour;

The range of pause time is 0.1-9999, the time unit is sec/min/hour;

The range of repeat numbers is 1-9999, 0 means unlimited.

**e.** When in (3) status, press [**Menu**] button to (1) status, at this time, ensure the input value.

**f.** Rotate **Knob**, move the cursor to **OK**, then press **Menu** button return to previous level.

**Note:**

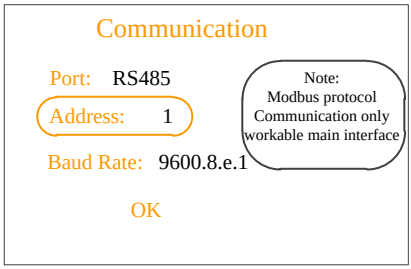
**(1) After Dispensing turning on, if only 1 repetition is set, the pump will stop automatically after reaching the set time, if the number of repetitions is set, then the next dispensing will start automatically after the pause timer ends.**

**(2) After Dispensing turning on, the function of external control seed is unavailable.**

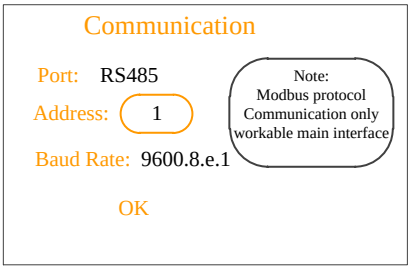
**(3) When the calculated value of the input parameter exceeds the calculation range, a prompt will be displayed at the bottom of the screen, and move the cursor to the time setting.**

### 5.2.5 Communication Setting Interface

In Menu interface, select Comm. tab and click **Menu** button to enter to communication interface.




(1)




(2)

**Operation steps:**

**The communication of serial port is all the on status. Do not set On/Off.**

**a.** In communication setting interface, press **Menu** button to select address, when in (1) status, rotate **Knob** button to select address or baud rate.

**b.** When in (1) status, press **Menu** button to switch to (2) status.

**c.** When in (1) status, rotate **Knob** button, move cursor to **OK**, and then press **Menu** button to return to **Menu Selecting Interface**

**d.** When in (2) status, rotate **Knob** button to select address (01-32) or baud rate: 9600.8.e.1/9600.8.n.1/19200.8.e.1/19200.8.n.1.

**e.** When in (2) status, press **Menu** button to return to (1) status, and confirm the selected item.

This product supports Modbus communication protocol——**RTU mode** and communication interface RS485;

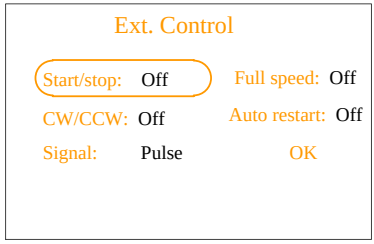
Note: After finishing setting, only in main interface, the pump can receive communication signal control, the communication control is invalid in other setting interface.

**Baud rate representative meaning:**

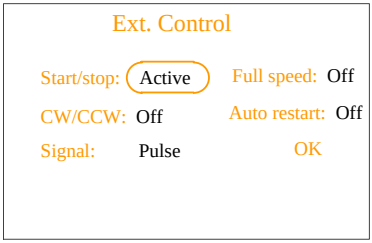
| Symbol | Baud Rate | Data bit | Stop bit | Check Digit |
|---|---|---|---|---|
| 9600.8.e.1 | 9600 | 8 | 1 | Even parity |
| 9600.8.n.1 | 9600 | 8 | 1 | No parity |
| 19200.8.e.1 | 19200 | 8 | 1 | Even parity |
| 19200.8.n.1 | 19200 | 8 | 1 | No parity |

### 5.2.6 External control start/stop and direction interface

In Menu interface, select Ext. Control tab, click **Menu** button to enter to external control interface.




(1)




(2)

**Operation steps:**

**a.** In this interface, press **Menu** button to select external control start/stop, when in (1) status, rotate **Knob** button to select external control start/stop, external control direction, external control full speed or signal types.

**b.** When in (1) status, press **Menu** button to back to (2) status.

**c.** When in (2) status, rotary **Knob** button to choose external control start/stop: off/ active/ passive; External control direction: on/ off; External control full speed: On/Off; Signal type: level/pulse (The corresponding internal control button does not work in level mode).

**d.** When in (2) status, press **Menu** button to return to (1) status, and confirm the selected item.

**e.** When in (1) status, rotate **Knob**, move the cursor to **OK**, then press **Menu** button return to **Menu selecting interface**.

**Note**:

**(1)** External control pump to start/stop, direction and full speed is default to active signal.

**(2)** When external control start/stop signal is passive signal, it is foot pedal function, and you need to connect to foot pedal interface.

**(3)** The signal of external control pump to start/stop and direction are divide into two methods: Level and pulse. For the specific interface, please refer to the description of the external control interface; each external control mode is set independently, and only when the corresponding external control function is turned on will it work.

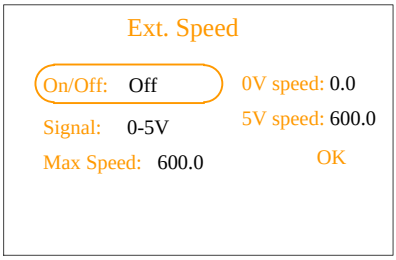
**(4)** Auto restart function: After turn on this function, when the pump is running at transferring mode, when the pump is powered off suddenly and then powered on again, the pump will start to run according to the original set parameters.

After turn off this function, when the pump is running at transferring mode, when the pump is powered off and then powered again, the pump is in stop status, and no self-start event will occur.

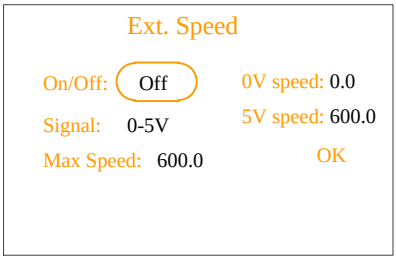
| Notice | |
|---|---|
| ⚠ | If the automatic restart function is enabled, it may cause the system to start running immediately after power-on. The automatic restart function only applies to transfer mode. If the automatic restart function is enabled, a ⚠ will be displayed in the upper left corner of the screen. |

### 5.2.7 External control speed interface

In menu interface, select Speed tag, click **Menu** button to enter to the interface of external control speed regulation.




(1)




(2)

**Operation steps:**

**a.** In external control speed interface, when in (1) status, rotate **Knob** button, make the cursor up and down to select external control speed, signal and maximum speed.

**b.** When in (1) status, press **Menu** button to switch to (2) status.

**c.** When in (2) status, rotate **Knob** button to select external control speed: on/off or select signal type: 0-5V/0-10V/4-20mA or select maximum speed.

**d.** When in (2) status, press **Menu** button to return to (1) status, and confirm the selected item.

**e.** When in (1) status, rotate **Knob** button to select that 0V corresponds to speed 0 or 5V corresponds to speed 600. The corresponding speed can be set arbitrarily within the specified speed range of the purchased model, and the peristaltic pump will automatically create a linear relationship between the analog values.

**f.** When in (2) status, press **Menu** button to return to (1) status, and confirm the selected item.

**g.** When in (1) status, rotate **Knob**, move the cursor to **OK**, then press **Menu** button return to **Menu selecting interface**.

**Note**:

**(1)** According to input signal of external terminal to select analog signal, 0-5V, 0-10V, 4-20mA; The external control speed can set the pump maximum speed, when the maximum speed is 600rpm, there are a liner ship between analog signal voltage range and motor speed.

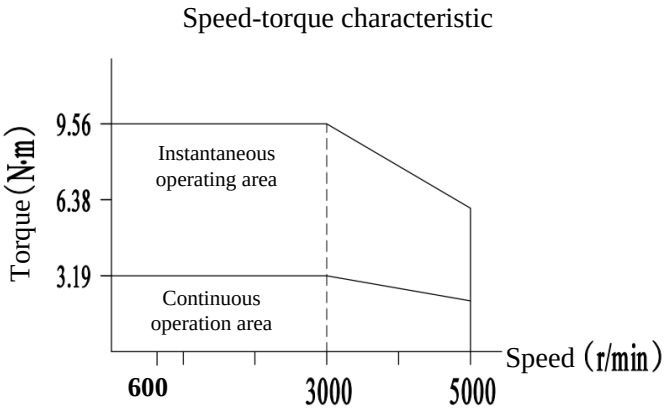
**(2)** If highest speed is not 600rpm, motor speed will be limited by analog signal, if motor speed and analog signal reach the given highest speed according to corresponding proportional relationship, then if increase analog signal, motor will running at given highest speed, not increase with analog signal. For example, suppose 0V correspond 0rpm, 5V correspond 600rpm (2.5Vshold correspond 300rpm), set highest speed 300rpm, if external input analog signal is 2.5V, then motor speed is 300rpm, if input signal beyond 2.5V, motor speed keeps 300rpm not change.

## 6. Technical Parameters

| | | | |
|---|---|---|---|
| Model | ExD-600-3L, ExD-600-6L, ExD-600-12L | Speed range | 0.1-600rpm |
| | ExD-300-18L, ExD-300-30L | Speed range | 0.1-300rpm |
| Speed resolution | 0. 1rpm | | |
| Power supply | AC220V±10%, 50/60Hz | | |
| Operation method | Mechanical keypad and digital speed control knob | | |
| Rated power | 300W | | |
| Display method | 4.3 inch LCD screen | | |
| Communication interface | RS485, support Modbus protocol (RTU mode) | | |
| External control speed signal | 0-5V, 0-10V and 4-20mA for optional | | |
| Start/stop and direction signal | Passive switch signal, like: foot pedal switch;<br>Active switch signal: 5V/12V/24V for optional | | |

| | | |
|---|---|---|
| Relative humidity | <90% | |
| Temperature | 0-40℃ | |
| IP rate | IP66 | |
| Dimension (L×W×H) | ExD-600-3L | 514*285*335 (mm) |
| | ExD-600-6L | 511*285*335 (mm) |
| | ExD-600-12L | 530*285*335 (mm) |
| | ExD-300-18L | 568*285*335 (mm) |
| | ExD-300-30L | 604*285*335 (mm) |

Motor torque curve diagram




The motor allows 3 times instantaneous overload for a duration of 0.3 seconds, and an overload alarm will be triggered after exceeding 0.3 seconds. Method for removing alarm signals: Power off and shut down, reduce the load, and then re-power on. The motor will resume normal operation.

The maximum operating temperature of the drive should be below 105 ℃. If it exceeds 105 ℃, overheating protection will be applied and the motor will stop

rotating. Method to remove overheating protection: Strengthen heat dissipation conditions; Reduce load.

The motor is a servo motor that is maintenance free.

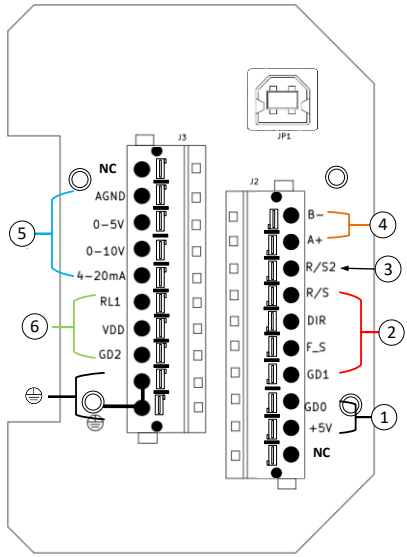
## 7. Main Function and Features

- IP66.
- 4.3 inch true color LCD screen.
- Explosion-proof mechanical keypad control, menu interface, convenient for users setting the parameters.
- Explosion-proof digital rotary knob.
- Dispensing function, the time range is 0.1s-9999 hours.
- Various external control functions, support 0-5V, 0-10V, 4-20mA analog signal control speed.
- Power down memory function, store parameters in time, safe and reliable.
- Fast fluid-filled function, not only can clean the tubing, but also fill liquid into the tubing.
- High torque and low power loss.

## 8. External Control Interface Instruction

| Notice | |
|---|---|
| ⚠ | The correct signal must be provided to the pins as indicated in the instructions, and the signal value must not exceed the specified range. If the wrong pins are connected, the external control interface may be burned, causing permanent damage |
| ⚠ | The analog speed control signal must be isolated from the main power supply. Please use an independent shielded grounded input line. It is recommended to comply with EMC requirements. |
| ⚠ | Make sure that the pins at the ends of multiple cables do not overlap each other, otherwise the external control interface may burn out and cause permanent damage. |

| | |
|---|---|
| ⚠ | Cables that meet explosion-proof requirements must be used. When installing the explosion-proof stuffing box, the cross-sectional area of the stuffing should not be less than 20% of the inner diameter of the stuffing sleeve, and the spacing between the wires should not be less than 1mm. |
| ⚠ | Make sure the rear flange is installed correctly. Otherwise, the explosion-proof requirements may be affected. |
| ⚠ | Pay attention to electrical safety. |
| ⚠ | It is strictly forbidden to open the rear flange with power on. It is strictly forbidden to connect wires with power on. |




① **Internal isolated 5VDC output**

+5V: Internal isolated 5V output positive pole.

GD0: Internal isolated 5V output negative pole.

② **The input port of external control start/stop, direction, full speed signal:** Active signal input (5-24V universal)

GD1: The negative terminal and common terminal of active signal input.

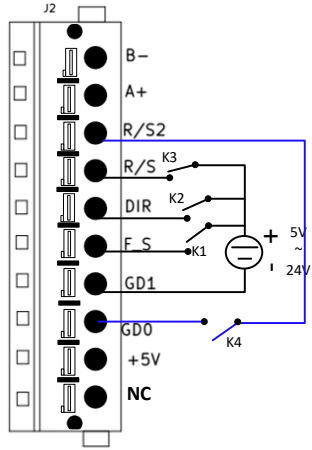
F_S: The input port of external full speed signal.

DIR: The input port of external direction signal.

R/S: The input port of external start/stop signal.

| Notice | |
|---|---|
| ⚠ | The active voltage signal is 5-24V and must not exceed this range. |

③ R/S2: This port can be connected with passive switch or foot pedal switch. Set the validity of the input port in external control setting interface--foot pedal switch option.




④ **RS485 communication port**:

A+: RS485 A+ port

B-: RS485 B- port

⑤ **The input port of analog signal:** In external control setting interface to select external control speed regulation signal, and then turn on external control function, control motor speed from 0rpm to maximum speed through controlling analog signal

**4-20mA:** 4-20mA current signal input port

**0-5V:** 0V-5V voltage signal input port

**0-10V:** 0V-10V voltage signal input port

**AGND:** The negative port of analog signal

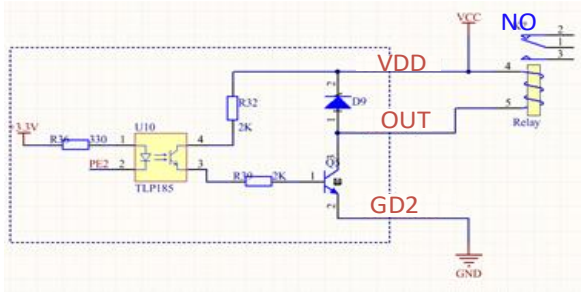
Note: Please do not connect 0-10V signal with 0-5V terminal or 4-20mA input terminal. This is forbidden. Wrong connection will damage the pump.

⑥ **The output port of motor running status:** Output motor running status.

RL1: The output port OUT of running status.

VDD: Power supply positive (VDD) of running status. Power supply of 5-24V is acceptable.

GD2: Power supply negative (GD2) of running status.




If connect with relays, when the motor runs, NO connect; when the motor stops running, the NO disconnect.

| Notice | |
|---|---|
| ⚠ | The external control line must use a data cable with a shielding layer, and the shielding layer must be grounded. |

## 9. Precautions for Explosion-proof Pumps

### 9.1 Preparations before installation

**9.1.1** Before unpacking the explosion proof peristaltic pump, check whether the packaging is intact. After unpacking, carefully remove the sundries and dust from the explosion proof peristaltic pump.

**9.1.2** The following inspections must be carried out before installation, if the requirements are not met, it is not allowed to use.

**a.** Whether there is an explosion-proof certificate number and an explosion-proof mark.

**b.** Whether the model specifications meet the requirements of the equipment used.

**c.** Whether all the fastening bolts have been tightened, whether the spring washers are missing, and whether the connection between the parts of the explosion-proof enclosure is proper.

**d.** Whether all explosion-proof parts have cracks and defects that affect explosion-proof performance.

**e.** Knobs and buttons, whether the operation lever is flexible.

### 9.2 Connection and Adjustment

**9.2.1** Must be connected according to the corresponding symbols marked in the junction box.

**9.2.2** When the explosion-proof stuffing box is installed, the cross-sectional area of the stuffing is not less than 20% of the inner diameter of the stuffing sleeve, and the distance between the lines is not less than 1mm.

**9.2.3** The inner and outer grounding bolts should be reliably grounded.

**9.2.4** After the wiring is completed, check whether there are sundries and dust in the box.

**9.3** It is not allowed to change the components or components that affect the explosion-proof structure and explosion-proof performance.

## 10. Mark

**10.1** Each explosion-proof peristaltic pump is equipped with a product nameplate on the driver. The nameplate is as follows (taking ExD-600-12L as an example):

| Explosion Proof Peristaltic Pump CE 1282 | |
|---|---|
| Model: ExD-600-12L | Rated Voltage:AC220V±10% |
| Rated Power: 300W | IP Rate:IP66 |
| Ambient Temperature:0-40℃ | Rated Speed: 600rpm |
| Serial No.: | Year of Construction: |
| ATEX Certificate No: ECM 24 ATEX-B TQ39 | |
| Ex II2G Ex db IIC T4 Gb Ex II2D Ex tb IIIC T130°C Db | |
| Manufacturer Name: Baoding Shenchen Precision Pump Co.,Ltd | |
| Manufacturer Address:No. 103, Building 2, Zhidian Industrial Park,Fuxing East Road 999，Baoding, China. | |
| Warning:Caution for open cover with power on | |

## 11. Wiring Instruction

Important note: When peristaltic pump leaving factory, there are two cable sealing joints on the rear flange plate. As the following Figure 1 shows:

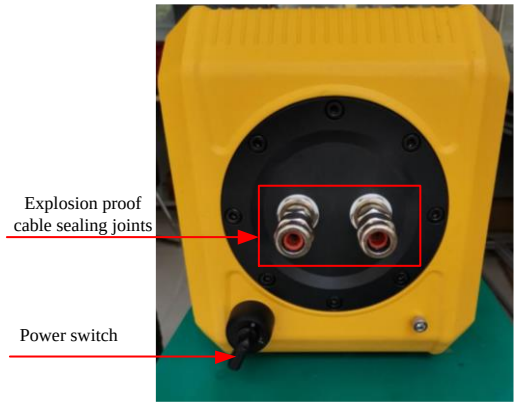



Figure 1

The left joint is used to connect with power cord, the right joint is used to connect with external control wire. Before users use it, professional personnel must carry out

wiring operations in accordance with relevant explosion proof standards in order to use it normally. Otherwise, the product will lose its explosion proof and high IP protection functions.

Note: When the explosion proof peristaltic pump leaves the factory, the rear flange plate is equipped with cable sealing joints for armored cable. The outer diameter of armored cable is 8-12mm, please select the cable that matches it. Cables with other diameters cannot be installed correctly.

If users only need to connect power cord and don't need connect external control wiring, then the right side cable sealing joint is needed to changed to sealing part comes with the pump, in order to ensure the functions of and high IP protection for the peristaltic pump. As the following Figure 2 shows:

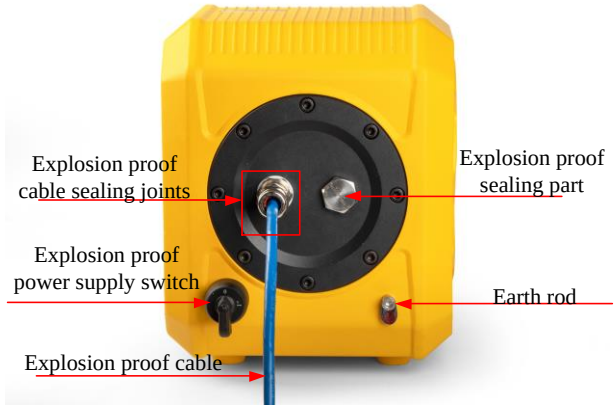



Figure 2

**11.1** Disassemble explosion proof cable sealing joints

(1) Firstly, remove the 8 pieces M8x20 screws and spring washers on the rear flange plate with 6x85 Allen wrench to disassemble the rear flange plate of peristaltic pump, be careful not to damage the O-ring (as Figure 4 shows) on the rear flange, as the following Figure 3 and Figure 4 shows:

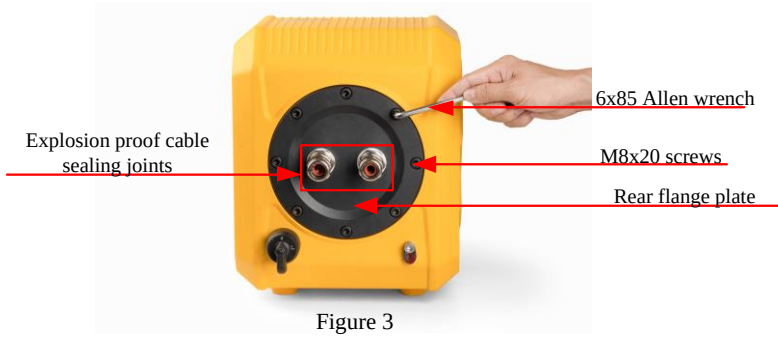



Figure 3

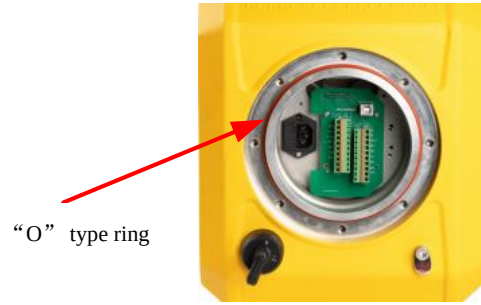



Figure 4

(2) Remove the two locking nuts inside the rear flange that fasten the sealing cable joint by an open-ended wrench, as the following Figure 5 shows:

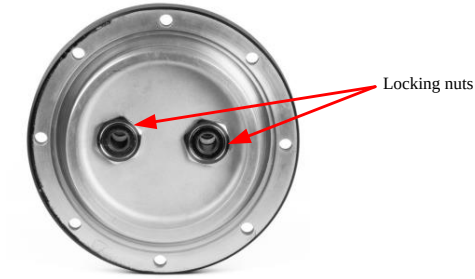



Figure 5

(3) Remove the two cable sealing joints from rear flange plate by an open-ended wrench, as the following Figure 6 shows:

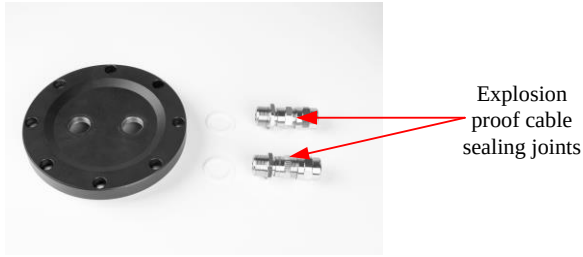



Figure 6

(4) Install an explosion proof sealing part in the threaded hole on the right side of the rear flange, tighten it, and compress 1/3 of the sealing rubber ring to ensure the sealing performance, as shown in the following Figure 7:

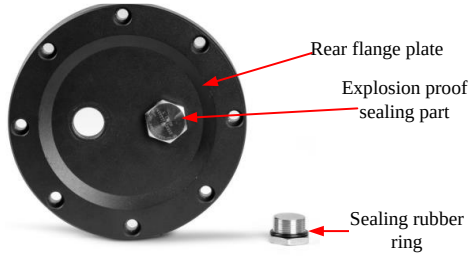



Figure 7

**11.2** Connecting explosion-proof cables

(1) All parts of cable sealing joint are disassembled as shown in the Figure 8:

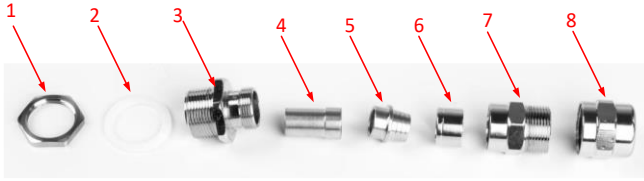



Figure 8

(2) According to the wiring requirements of the explosion proof peristaltic pump, peel off the appropriate length of cable outer sheath to expose the metal armor layer. Leave an appropriate length of armor layer, cut off excess parts, and treat the cable. If it is a strip armor layer, separate the strip armor layer and use scissors to cut it into several small strips. As shown in the following Figure 9. If the metal armor layer is wire or mesh armor layer, the same treatment shall be applied.

Thread the processed cables through parts 8, 7, 6, and 5 in sequence, with a sealing ring installed in part 8 and placed on the cable sheath, as the following Figure 9 shows:

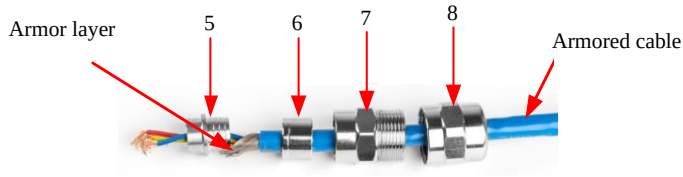



Figure 9

(3) Install parts 2 and 3 into the threaded hole on the left side of the rear flange. Place part 2 between part 3 and the rear flange, tighten part 3 with a wrench, place part 4 into part 3, and thread the cable cables that have threaded parts 5, 6, 7, and 8 through parts 4, 3, and 2. As shown in the following Figure 10:

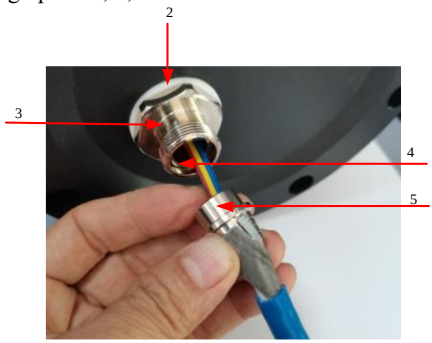



Figure 10

(4) Wrap the armor layer around the conical surface of part 5, and fit part 6 onto part 5 to press down on the armor layer. As shown in the following Figure 11:

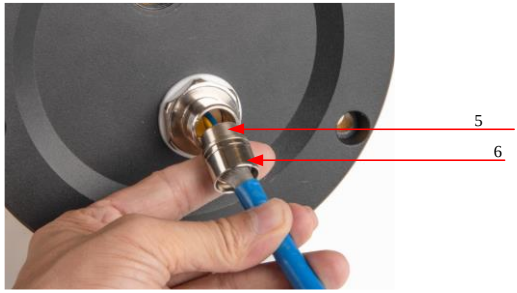



Figure 11

(5) Press parts 5, 6, and the cable onto part 4, so that part 6 is tightly pressed onto the metal armor layer and the cone of part 5, and part 4 is securely connected to part 5. Tighten part 7 onto part 3. As shown in the following Figure 12:


Figure 12

(6) Tighten part 8 onto part 7 so that the sealing ring in part 8 fits tightly onto the outer sheath of the cable. As shown in the following Figure 13.

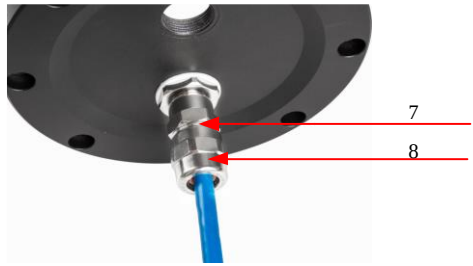



Figure 13

(7) Please select the filling that meets the relevant standards of the local country, mix it evenly to the filling required for on-site installation, and then add the filler to the gap of the cable core wire, that is, around the core wire, fill the inner diameter of part 4, and also add an appropriate amount of filler to the cavity of part 5. Tighten the locking nut. Before filling with filler, the cable should be wiped clean, and after filling with filler, excess filler on the parts should be wiped clean. As shown in the following Figure 14:

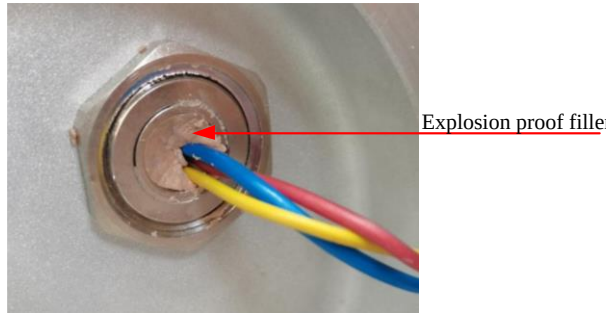



Figure 14

(8) After the installation of the cable sealing joint, it should be ensured that the filling sleeve is filled with filling without bubbles or other phenomena to avoid affecting its performance. The schematic diagram of the sealed joint of the encapsulated cable is shown as Figure 15:

Note: The explosion proof filler shall be cured according to relevant requirements, and the next operation shall be carried out after curing and drying.

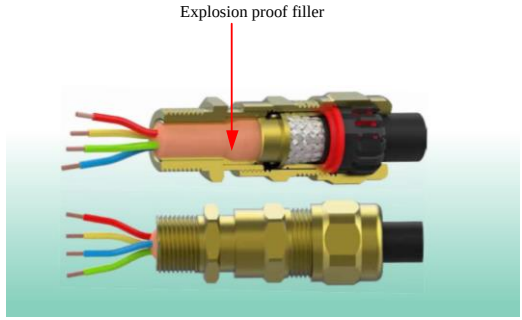
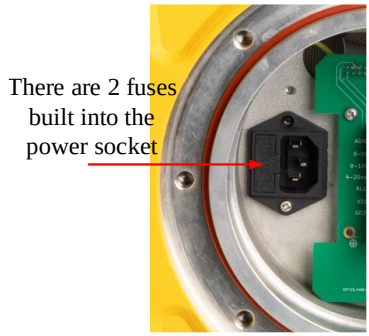



Figure 15

**11.3** Connect the power connector

There are 2 fuses built into the power socket, the fuses are rated at 10 amps and rated at 250 volts.




1) The power plug is shown in the following Figure 16:

Figure 16

2) The disassembled plug is shown in the following Figure 17:

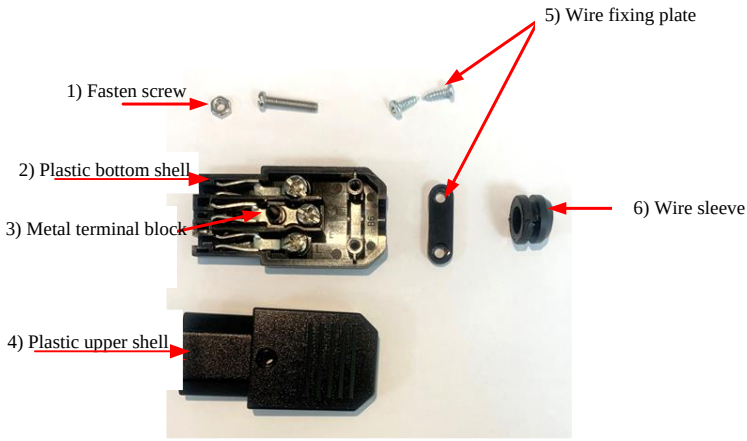



Figure 17

3) After stripping the cable out of the harness, strip the outer skin of the cable out of a 15mm copper core. And put on a protective **Wire sleeve.**

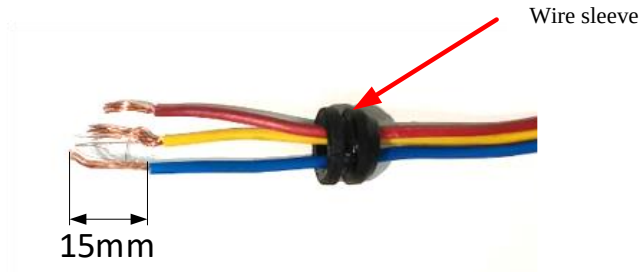



Figure 18

4) Connect the copper core wire to the metal terminal block. Pay special attention to the grounding terminal in the middle. And assemble the metal terminals into the plastic bottom shell.

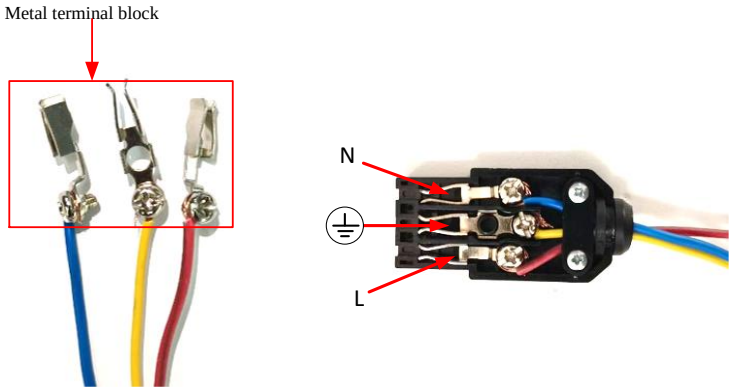



Figure 19

5) Install the plastic upper shell onto the plastic lower shell and secure with fastening screws. As shown in the following Figure 20:

Figure 20

6) Insert the connected cable plug into the corresponding socket on the housing, as shown in the following Figure 21:

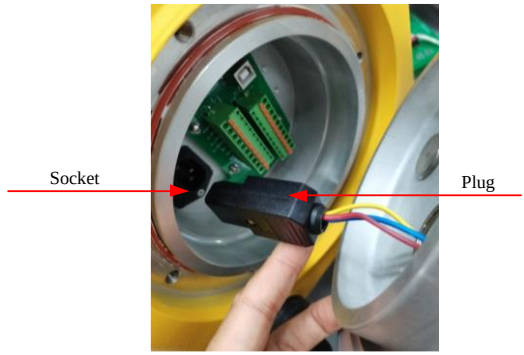



Figure 21

7) Then install the rear flange plate to peristaltic pump, tighten with 8 sets of M8x20 screws and spring washers. Wiring completed. As shown in the following Figure 22:

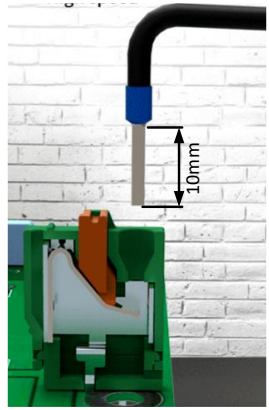
Figure 22

**11.4** Connect the external control line

The external control wiring method refers to **Connecting explosion-proof cables.** The difference is that install the external control wiring on right sealing cable joint which is on the rear flange plate.

(1) Peel off the cable and expose a 10mm long copper core. Press the red pressing end of the wiring terminal with a flat screwdriver, insert the wire end into the wiring hole, and then release the screwdriver. The wire end has been crimped

properly.



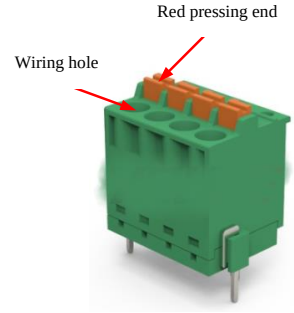




Figure 23

Figure 24

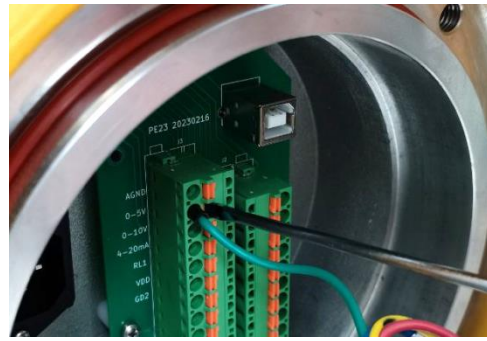



Figure 25

Figure 26

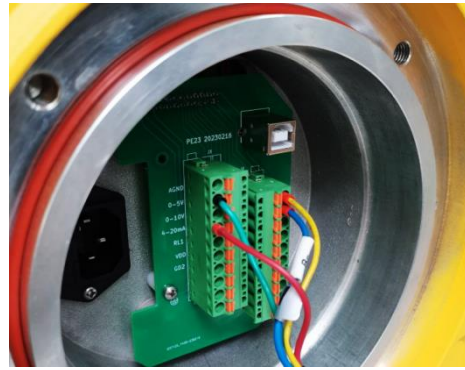


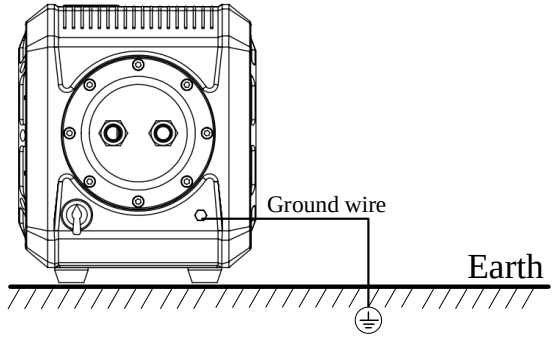
Figure 27

(2) Connect the external control wire terminal at the rear of the peristaltic pump housing, and finally install the rear flange plate. After connecting the power cord and external control cable, it is shown in the following Figure 28

Figure 28

**11.5** Grounding post wiring instructions

The grounding post is connected to the ground in the form of single-point grounding, and the cross-sectional area of the wire should not be less than 0.75 square millimeters. The wiring diagram is as follows:



## 12. Product Storage and Maintenance

**12.1** Explosion proof peristaltic pumps should be kept dry during storage, avoid dropping and avoiding sharp changes in ambient temperature;

**12.2** It should not be piled too high during storage and transportation, so as not to affect ventilation and damage the package of the lower explosion-proof pump.

**12.3** The explosion proof peristaltic pump shall be inspected and cleaned regularly during use. The shell shall not accumulate dust and sundries, and the explosion-proof pump shall not be cleaned by spraying with faucet.

**12.4** When disassembling the explosion proof peristaltic pump, pay attention to protect the flameproof surface from damage and rust. The flameproof surface shall be coated with anti-rust grease during assembly.

**12.5** The maintenance and commissioning of explosion proof peristaltic pump must be carried out in a safe place under the condition of power failure.

**12.6** When the pump is not working, loosen the pressure block that presses the hose to avoid plastic deformation of the hose due to long time squeezing.

**12.7** The drive surface and pump head are not resistant to ultra-strong corrosive liquid, so special attention should be paid when using.

**12.8** The roller of the pump should be kept clean and dry. If the surface of the roller is not clean, the abrasion of the hose will be increased, the service life of the hose will be shortened and the roller will be damaged prematurely.

**12.9** If there is liquid on the roller, wipe it with a cloth as soon as possible. If it is soaked for a long time, the roller will be damaged.

**12.10** The manufacturer shall be contacted for the maintenance of the flameproof surface, and the user cannot repair or reconstruct the flameproof surface.

**12.11** Fasteners with yield strength ≥ 640MPa shall be used.

## 13. Warranty and After Service

We support 3 years warranty for the pumps, subject to the exceptions below. Our company shall not be liable for any loss, damage, or expense directly or indirectly related to or arising out of the use of its products. This warranty does not obligate our company to bear any costs of removal, installation, transportation, or other charges which may arise in connection with a warranty claim.

If the pump fails during the warranty period, after confirmation by our technical department, we will provide spare parts free of charge. Customers will need to bear the shipping cost.

**Exceptions:**

- The warranty shall not apply to repairs or service necessitated by normal wear and tear or for lack of reasonable and proper maintenance.
- All tubing and pumping accessories as consumable items are excluded.
- Electrical surge as a cause of failure is excluded.
- Chemical attack is excluded.
- Improper operation or man-made damage as a cause of failure is excluded.

MADE IN CHINA
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