

# Shenchen Precision Pump Manual of LabN Series





### **Important Information**

Please read the manual carefully before operating the product.



### **Warning**

Tubing may have crack due to wear. It results in the overflow of fluid from tubing. In that time human body and instruments may be damaged. So user must check usually and change tubing in time.

Connect directly the power line to the wall socket, and avoid using the extense electric line.

If the power line or plug had wear and other damage, please hold the plug to unplug it, not hold the line.

If following situations happened, please turn off the electric power and unplug the plug, holding the plug and not the line.

1. Fluid splash on the pump.
2. You think the pump need to maintain or amend.

The user's power socket must have ground wire, and have reliable grounding.

Note: When connect external control or foot pedal switch, must turn off the pump.

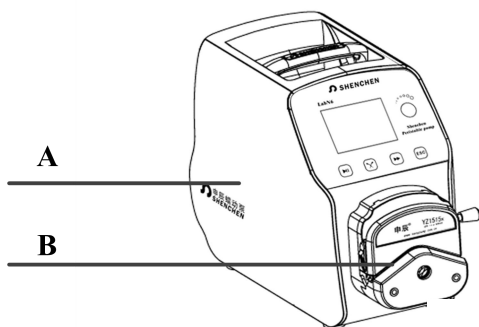
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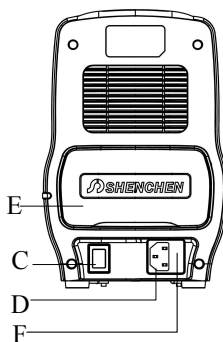
## LabN Series Product Introduction

LabN series pump with ABS engineering plastic housing, streamlined body design, more fashion sense. 3.2 inch LCD screen; Multiple external control for selection, support RS232/RS485 communication, standard MODBUS protocol(RTU mode), meeting different industrial sites equipment request.

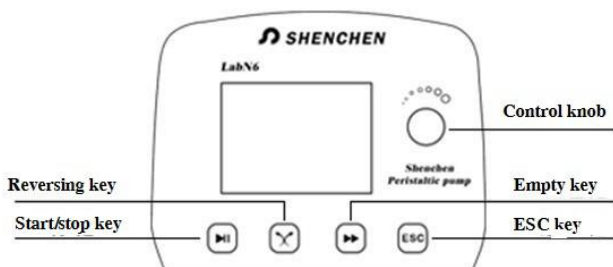
## LabN Series Product Appearance



- A—Drive
- B—Pump head
- C—Power Switch
- D—Power Socket
- E—External Control Port
- F—Inner fuse



## LabN Series Keypad Instruction



**Start/stop key:** Press this button, the pump start running. Press this button again, pump stop running.

**Reversing key:** Press the key each time, the pump will change running direction.

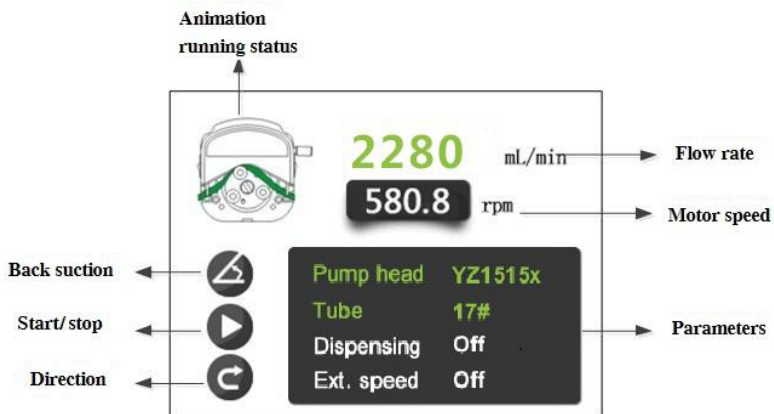
**Empty key:** In stop status or running status under transmission mode, press this key, the pump will run at full speed, can be used for cleaning the tubing and fast filling.

**Control knob:** Spin the control knob, you can adjust the motor speed or flow rate. The flow rate and motor will change in the same time. In the stop mode, press this knob, and enter the menu, press the knob to set the parameters.

**ESC key:** In menu interface, press this button, then return to up one level.

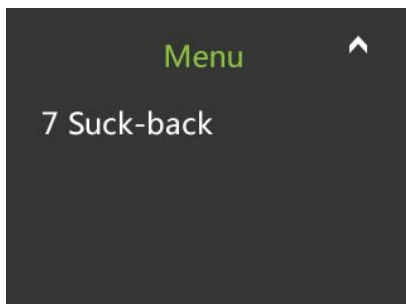
## LabN Series Operation Interface Instruction

### 1. Booting interface:



### 2. Setting Interface as below:

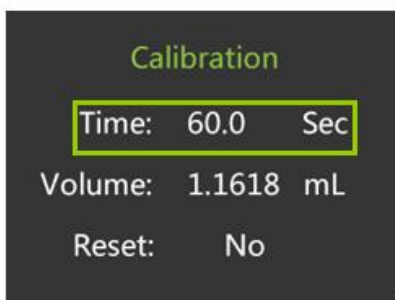




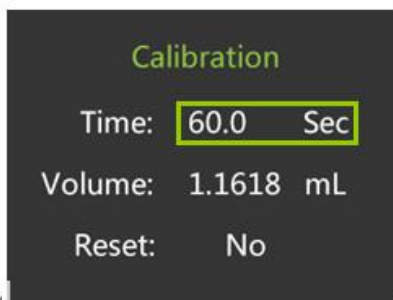
**Steps:**

- a. Press [Knob] in the main interface to enter the menu selection interface, press again to select the setting parameters.
- b. Rotate [Knob] to move up and down to select the parameter to be set.
- c. Press [Knob] to enter the next level interface setting parameters.
- d. Press [ESC] to return to the main running interface.
- e. Press other buttons to expire

**1). Calibration interface**



(1)



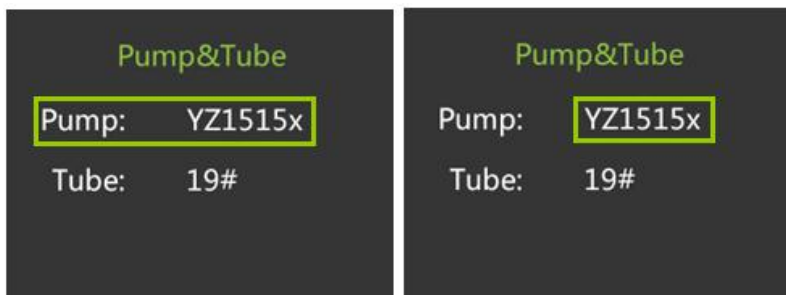
(2)

**Steps:**

- a. After entering this interface, the test time defaults to 60 seconds, and the actual liquid volume defaults to the liquid volume displayed according to the current set flow rate.

- b. Press the [Knob] key to select the test time. In the (1) state, turn the [knob], move the cursor to the actual liquid volume line, and then press the [Start] button to start the motor and start the calibration. A countdown is displayed at the test time.
- c. You can also switch to the (2) state by pressing the [Knob] key in the (1) state and the [Knob] key in the (2) state to set the test time.
- d. After the countdown is over, the cursor jumps directly to the actual liquid volume, and the rotary knob enters the actual liquid volume.
- e. You can also select the actual liquid volume column and press the [Knob] key to set the actual liquid volume.
- f. After the entry is completed, press the [Knob] key to confirm the entry. The “Calibration Completed” dialog box will pop up and the calibration can be completed. Press the [Knob] key again to return to the calibration screen.
- g. Restore calibration function: Select [Yes], press [Knob], the interface will pop up the “Resume Calibration Completed” dialog box to restore the calibration coefficient.

## 2) Choose pump head & tubes



(1)

(2)

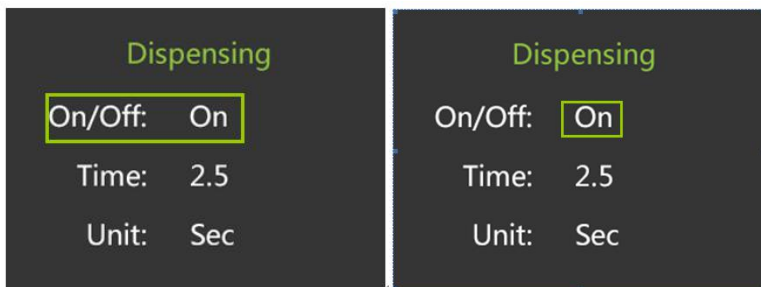
### Steps:

- a. Select the pump head model by pressing the [knob] on the pump head hose interface. In the (1) state, turn the [knob] key to move the cursor up and down to select the pump head model or hose model.



- b. In the (1) state, press the [Knob] key to switch to the (2) state.
- c. In the (2) state, turn the [Knob] key to select the pump head hose model.
- e. In the (2) state, press the [Knob] or [ESC] key to return to the (1) state and determine the input value.

### 3). Dispensing interface



(1)

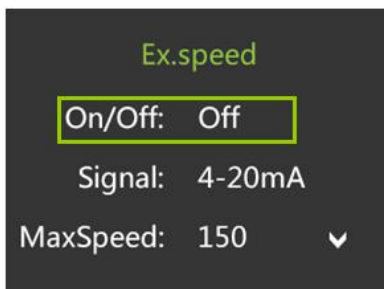
(2)

Steps:

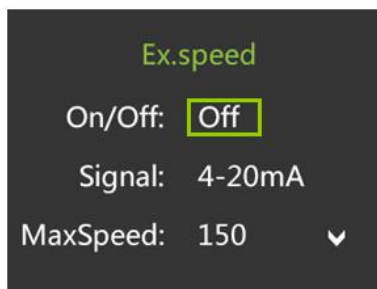
- a. Press [Knob] on the timing assignment interface to select the timing assignment. In the (1) state, turn the [Knob] key up and down to select the timing assignment, timing time or time unit.
- b. In the (1) state, press the [Knob] key to the (2) state.
- c. In the (1) state, press the [ESC] key to return to the [Menu Selection Screen].
- e. In the (2) state, turn the [Knob] key to select the timing assignment on/off or set the timing time (timing time setting range 0.1-9999s), or time unit second/minute/hour.
- f. In the (2) state, press the [Knob] or [ESC] key to return to the (1) state and determine the input value.

**After the dispensing function is turned on, the pump will automatically stop after finish the set time.**

4) External control speed interface:



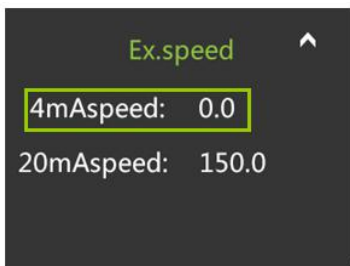
(1)



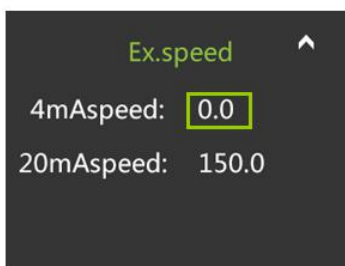
(2)

Operation steps:

- a. Press [Knob] on the external control speed control interface to select the external control speed. In the (1) state, turn the [Knob] key to move up and down to select the external control speed, signal type or maximum speed.
- b. In the (1) state, press the [knob] key to the (2) state.
- c. In the (1) state, press the [ESC] key to return to the [Menu Selection Screen]
- d. In the (2) state, turn the [Knob] key to select the external control speed control on/off or select the signal type: 0-5V/0-10V/4-20mA or select the maximum speed.
- e. In the (2) state, press the [Knob] key or [ESC] to return to the (1) state and confirm the selected item.
- f. In the (1) state, turn the [Knob] key clockwise to enter the external control speed customization interface, as shown below:



(1)



(2)

- g. In the (1) state, turn the [Knob] key to select (4mA corresponding speed: 0) or (20mA corresponding speed: 600).
- h. In the (1) state, press the [Knob] key to the (2) state.
- i. In the (1) state, press the [ESC] key to return to the [Setup Menu Selection Screen]
- j. In the (2) state, turn the [Knob] key to set the corresponding speed for each part.
- k. In the (2) state, press the [Knob] key or the [ESC] key to return to the (1) state and confirm the selected item.

**Choose analog speed control signal according to the external port's input signal, 0-5V, 0-10V, 4-20mA three kinds optional; External control speed governing can set highest speed of the pump, when the highest speed is 600 rpm, analog signal voltage range and motor speed keep linear relationship.**

**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 0Vcorrespond 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.**

**5) External control start/stop, reversing interface:**



**(1)**



**(2)**

**Operation steps:**

- a. In the (1) state, turn the [Knob] key to select the external control start/stopper external control commutation or signal type
- b. In the (1) state, press the [knob] key to the (2) state.
- c. In the (1) state, press the [ESC] key to return to the [Menu Selection Screen]
- d. In the (2) state, turn the [Knob] key to select the external control start/stop on/off or external control commutation on/off or select the signal type: level/pulse (the corresponding internal control button in level mode does not effect)
- e. In the (2) state, press the [ESC] key or the [Knob] key to return to the (1) state and confirm the selected item.

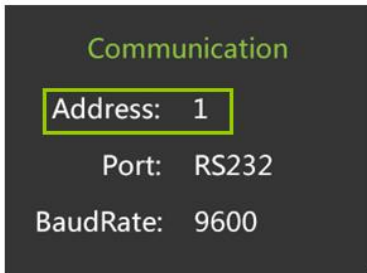
**External control motor start/stop, reversing signal divide into active signal and passive signal;**

**External control motor start/stop, reversing mode divide into: level mode and pulse mode, specific port see external control port description.**

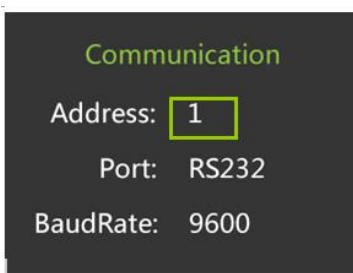
**Open the timing test function, external control start/stop is valid under pulse mode, and invalid under level mode.**

**Each external control mode set open/close separately, only when corresponding external control function open it can be work.**

#### 6).Communication setting interface



(1)



(2)

#### **Operation steps:**

Serial communication is always on and the On/Off option is not set.

- a. In the (1) state, turn the [Knob] key to select the local address or connect

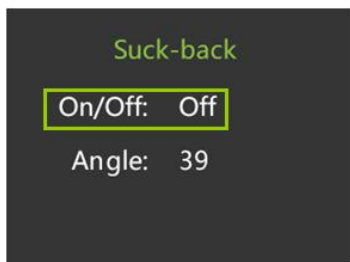
Port selection or baud rate.

- b. In the (1) state, press the [knob] key to the (2) state.
- c. In the (1) state, press the [ESC] key to return to the [Menu Selection Screen]
- e. In the (2) state, turn the [Knob] key to select the local address (01-32) or the interface to select RS232/RS485 or baud rate selection: 2400/4800/9600/19200
- f. In the (2) state, press the [ESC] key or the [Knob] key to return to the (1) state and determine the selected item.

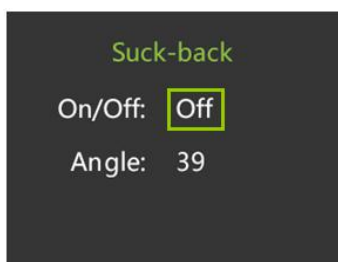
This product support Modbus communication protocol-RTU mode, communication port RS485 or RS232, Baud rate 9600.

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

### 7). Back suction angle interface



(1)



(2)

### Operation steps:

- a. In the (1) state, turn the [Knob] key to select the suction angle or angle setting.
- b. In the (1) state, press the [knob] key to the (2) state.
- c. In the (1) state, press the [ESC] key to return to the [Menu Selection Screen]
- d. In the (2) state, turn the [Knob] key to select the timing suction angle to open/close or set the suction angle value (the suction angle setting range is 0-360 degrees).
- e. In the (2) state, press the [ESC] key or the [Knob] key to return to the (1) state and

determine the input value.

### LabN Series Technical Specification

Speed range	LabN1: 0.1-150rpm	Power supply	AC220V±10%, 50Hz/60Hz(standard)
	LabN3: 0.1-350rpm		AC110V±10%, 50Hz/60Hz(optional)
	LabN6: 0.1-600rpm	Power consumption	<50W
Speed resolution	0.1rpm	Temperature	0-40℃
		Relative humidity	<80%
Control method	Membrane keypad	Dimension (L*W*H)	315.2*157.3*236.9mm
Display	3.2 inch LCD screen	Weight	4.4Kg
External Speed control	0-5V,0-10V,4-20mA for option	IP	IP31

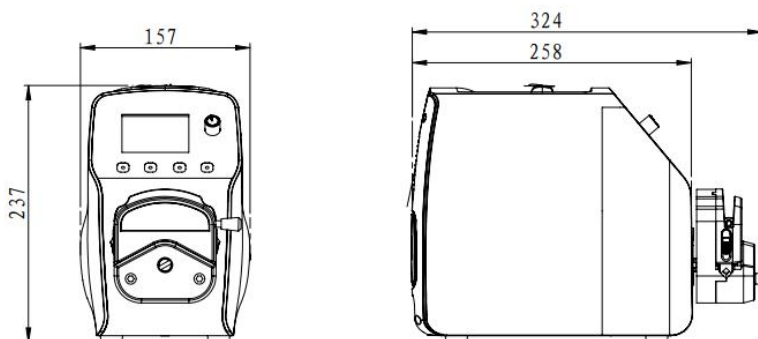
### LabN Series Main Functions & Features

- 3.2 inch big screen LCD display working parameters in real time
- Super silent drive setting, precise control, low vibration and low noise.
- Mechanical keypad and digital knob control, convenient for users setting the parameters.
- Timing function, the time range is 0.1s-9999 hours, can be used for simple dispensing function.
- 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.
- Strong anti-jamming feature, wide voltage design, suitable for complex power

supply environment.

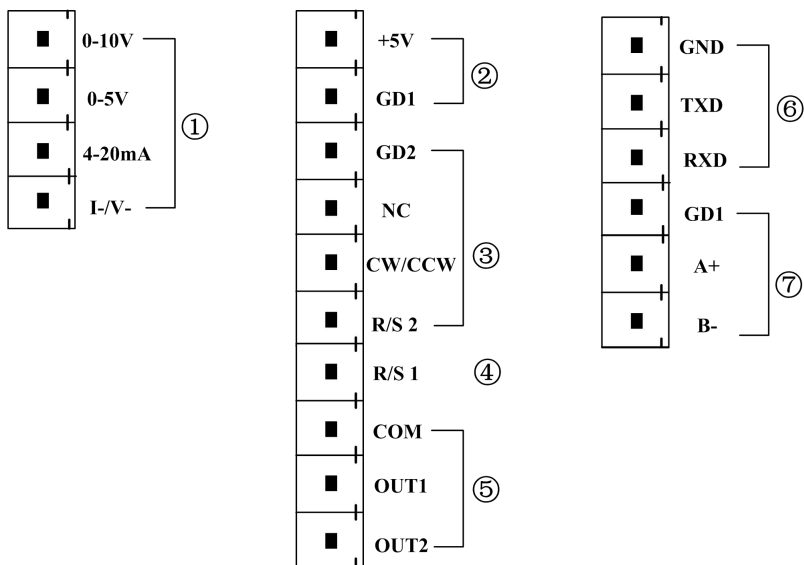
- Fast fluid-filled function, not only can clean the tubing, but also fill liquid into the tubing.
- High torque and low power loss, it can load several pump heads or multichannel pump head, meet different application requests.

**Product Dimension: unit (mm)**



### External Control Instruction

External control port as below picture:



①. Analog signal input terminal: **External control setting interface, choose the 'Analog Signal' and turn on the 'Ext. Speed'. Control the motor speed from 0 rpm to 600rpm through analog signal.**

0-10V: **0V to 10V voltage signal input terminal.**

0-5V: **0V to 5V voltage signal input terminal.**

4-20mA: **4mA to 20mA current signal input terminal.**

I\_/V\_: **Analog signal negative terminal.**

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

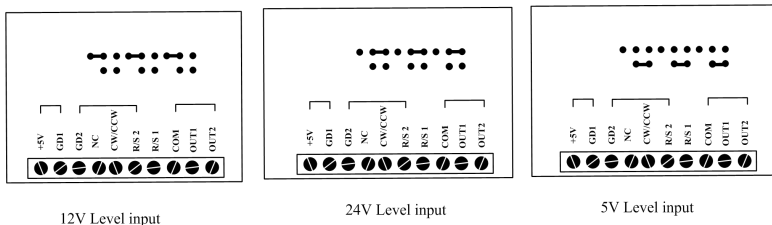
②. Internal isolation 5VDC output



③. External control start/stop, cw/ccw signal input terminal:

**Active signal input.**

If need change to 12VDC or 24VDC input, please open the controller housing, and change the jumper connection on the external control board as below :



12V Level input

24V Level input

5V Level input

**GD2: External control signal common input terminal.**

**NC: Null.**

**CW/CCW: External control direction signal input**

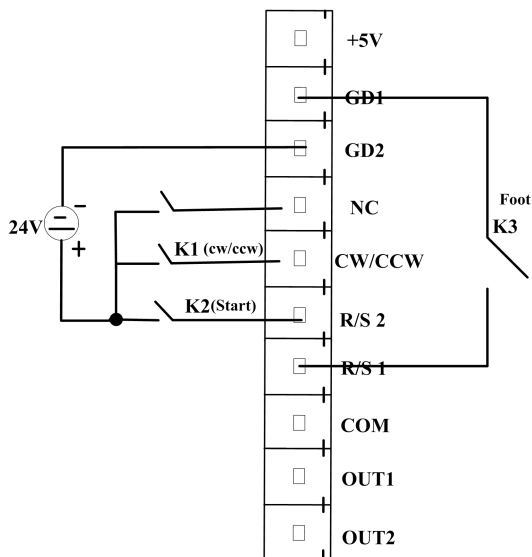
**R/S 2: External control start/stop signal input**

Set up the external control mode in the setting interface, turn on the correspond external control function, external control signal is active.

④.R/S 1 External control signal input terminal: **Passive signal input.**

This terminal can connect with passive switch and foot pedal. In the external control setting interface to set the active of this terminal, the foot pedal option.

External control wiring:



a. In pulse mode, disconnect K2 after short connection, the motor start working. Disconnect again after short connection, the motor stop working.

In level mode, short connect K2, the motor start working. Disconnect K2, the motor stop working.

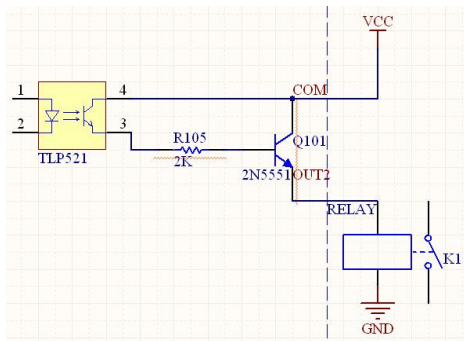
b. In pulse mode, every time disconnect the K1 after short connection, the motor change working direction. When short connect K1, the motor clockwise running. Disconnect K1, the motor counterclockwise running.

c. In pulse mode, disconnect K2 after short connection, the motor start working. Disconnect again after short connection, the motor stop working.

d. In level mode, short connect K2, the motor start working. Disconnect K2, the motor stop working.

⑤. The motor working status output terminal:

**Output motor working status as below:**



**If connect with relays, when the motor running, K1 connect; when the motor stop running, the K1 disconnect.**

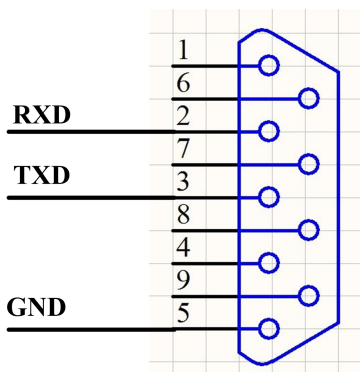
⑥. RS232 Communication : **Choose RS232 in the Communication setting interface, this terminal is active.**

**GND: Communication ground terminal.**

**TXD: Master sending, peristaltic pump receive signal terminal.**

**RXD: Peristaltic pump sending, master receive signal terminal.**

RS232 Communication Interface Connection Diagram as below:



⑦.RS485 Communication Interface: **Choose RS485 in the communication setting interface, this terminal is active.**

GD1: **RS485 signal interface**

A+: **Connect RS485 A+ terminal**

B-: **Connect RS485 B- terminal**

Instruction: **No matter choose RS232 or RS485, the communication protocol is standard MODBUS protocol.**



**Maintenance**

- When the pump is not working, loosen the tubing, avoid the tubing get plastic deformation because of long time pressure.
- The pump drive and pump head do not resist strong corrosive liquids, please pay attention to this when use the pump.
- Keep the pump head rollers clean and dry. If the rollers is not clean, it will increase the tubing wearing, shorten the tubing life and make the rollers damage very soon.
- If there is liquid drop on the rollers, clean it as soon as possible.

### **Warranty and After Sales Service**

We support **three years** warranty (do not include tubing). During the warranty, the pump is damaged by wrong operation or man-made sabotage, our company do not responsible for warranty. If the product out of warranty, we only charge cost for the replacement parts and shipping cost



MADE IN CHINA

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