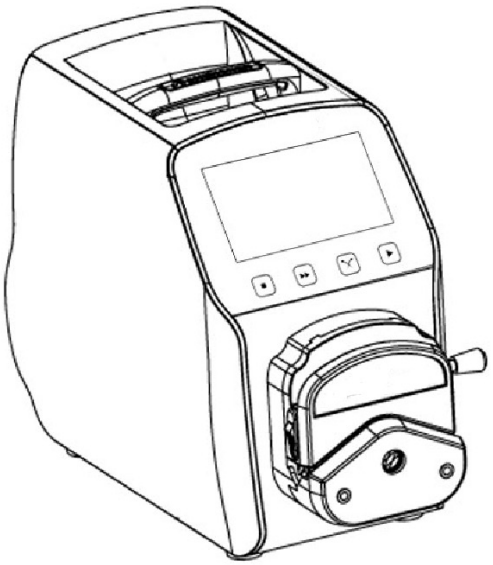
BINACA PUMPS

Precision Peristaltic Pump

5000 Series Manual

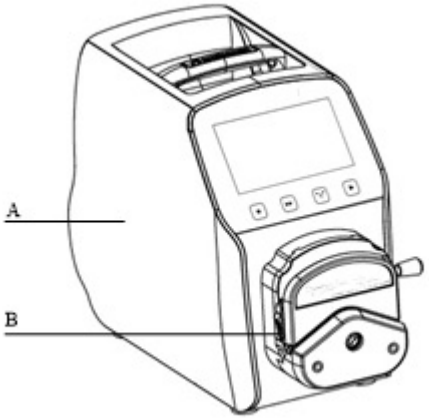


5000 Series Pumps

Series 5000 Peristaltic Pumps are suitable for optimum and precision filling applications for pharmaceutical, biotech, and the food and beverage industry. These Peristaltic Pumps have flow rates up to 12000 mL/min. All models accept continuous tubing to prevent cross contamination.

- 4.3 inch Color Touch Screen Control
- Dynamic Display Working Status
- Flow Data, Parameters and System Settings Displayed on the Screen
- Intelligent Calibration and Online Micro Adjusting Function
- Three Measurement Modes - Fixed Volume Measurement, Fixed Time and Volume, Timer Start and Stop
- Can load different pump heads - YZ1515x, YZ2515x Easy Load Pump Head; MC Series Multi-Channel Pump Head (MC1-MC12); SN Series Standard Pump Head (SN15,SN25)

5000 Series Product Appearance



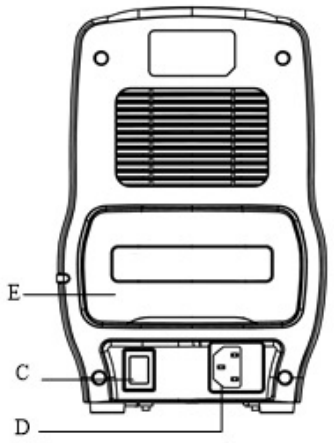
A——Drive

B——Pump Head

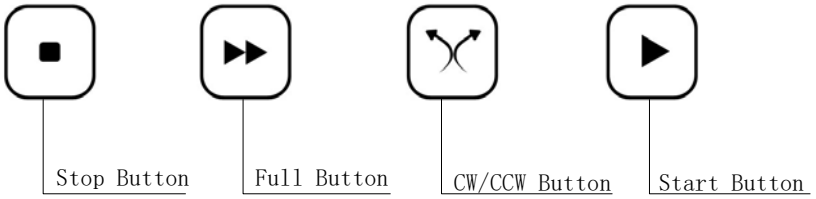
C——Power Switch

D——Power Port

E——External Control Input Port



5000 Series Keyboard Instruction

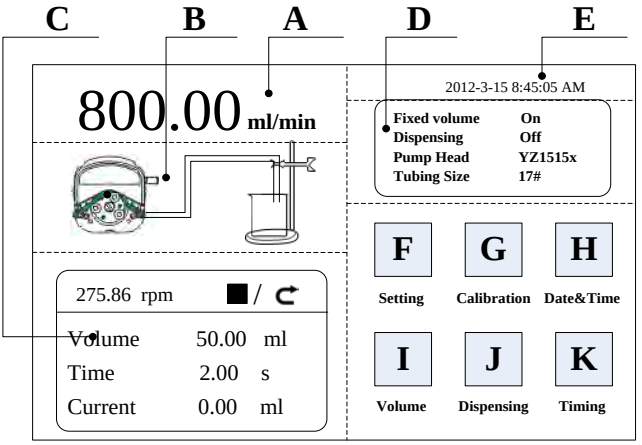


Stop Button	Press this button to stop the pump.
Full Button	Press this button to allow the pump to operate at the highest speed (when in stop-state or transferring-state).
CW/CCW Button	Press this button to reverse the transfer direction.
Start Button	Press this button to start the pump.

5000 Series Operation Interface Instruction

1. **Main Interface**

When power is ON, the screen will be displayed as below, see next page for further descriptions.



A. **Speed/Flow Rate Display:** Under the flow rate mode, system settings will be displayed. Under the rotating speed mode, flow rate will be displayed.

B. **Real-time Dynamic Display：** Display the current running state.

C. **Real-time Parameter Display：**

I. **Fixed Volume Mode (ON) –** Enter the Volume Desired. Screen will display Volume Entered, Flow Rate, Volume in Real-Time, Run Time

II. **Dispensing Mode (ON) –** Enter the Volume Desired and Run Time. If Run Time is too short, warning will display until the correct combination is entered. NOTE: Extend the Run Time. Screen will display RPM, Flow Rate, Volume Entered, Run Time (time it will take to dispense), Times (number of times)

D. **Set Parameter Display：** Displays the Fixed Volume Measurement, Fixed Time and Volume State information, the Model of Pump Head and Tube Size.

E. **Date and Time Display：** Displays the Current Date and Time, you can change it in the system setting. When it displays an alarm clock on the right side, it means the Timer Start and Stop function is on.

F. **System Setting Button：** Click this button to enter the System Settings. **(See Section 1 below)**

G. **Flow Calibration Button：** Click this button to enter the Flow Rate Calibration interface. **(See Section 2 below)**

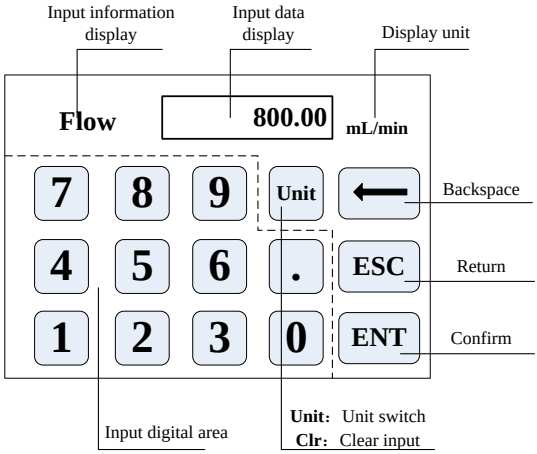
H. **Date & Time Button：** Click this button to enter the Current Date and Time interface. **(See Section 3 below)**

I. **Volume Button:** Click this button to enter the Fixed Volume Measurement interface. **(See Section 4 below)**

J. **Dispensing Button:** Click this button to enter the Fixed Time and Volume interface. **(See Section 5 below)**

K. **Timer Start and Stop Button:** Click this button to enter the Timer Start and Stop interface. **(See Section 6 below)**

2. Numeric Keypad Input Interface



Input Information Display: The information displayed is the current operation object.

Input Data Display: Display the current input data, range is 0.01-9999.

Unit Display: Display input units when input flow rate or volume.

Input Digital Area: Numeric keypad.

Unit/Clear Button: When input flow rate or volume, this button is unit switch, you can choose different unit. When it is Clear, you can clear the current input data.

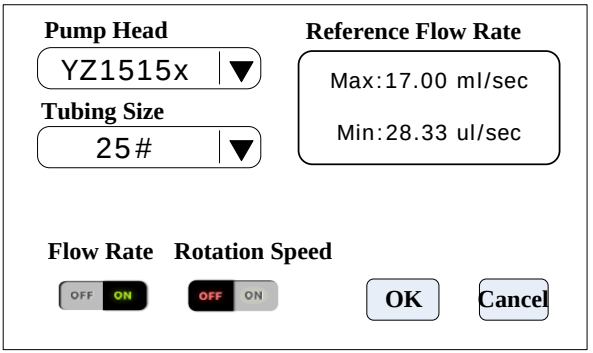
Backspace Button: Delete an input digital.

ESC Button: Cancel the current input, back to previous interface.

ENT Button: Confirm the current input.

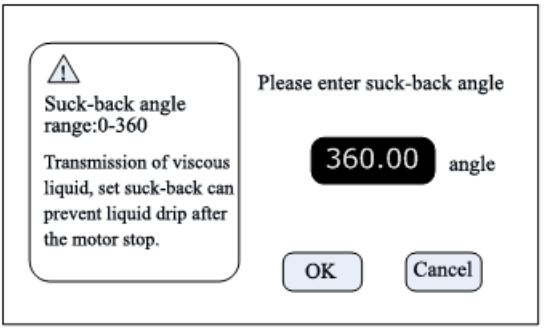
Section 1: SYSTEM SETTING

The basic configuration interface:



1. Click the pump head and tubing size to choose the pump head and tubing.
2. Reference flow rate displays the max. and min. flow rate with the current pump head and tubing.
3. Click the flow rate mode or rotating speed mode button to choose the working mode. When you choose the flow rate mode, the flow rate is adjustable - the speed will change with the flow rate. When you choose the rotating speed mode, the speed is adjustable - the flow rate will change with the rotating speed.
4. Click the confirm button back to the main interface.

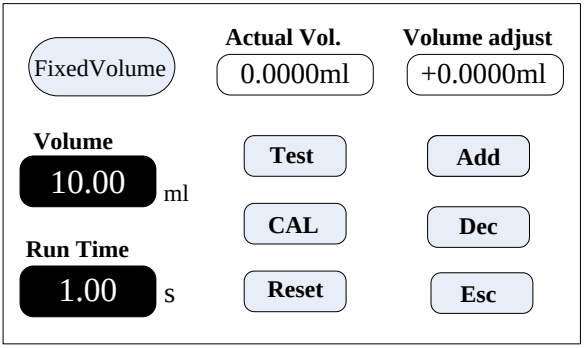
The back suction angle interface:



Click the **Setting** button in the main interface, then click **Suck-Back** button to enter the back suction angle setting interface. Click **angle** button, enter suck-back angle then click **ENT**. This can set all suck-back angles when motor stops running, except when **dispensing** is **ON**.

Section 2: FLOW CALIBRATION

Flow Rate Calibration Interface



- The top left corner displays the function, when fixed volume measurement is turned on, displays fixed volume; when fixed time and volume is turned on, displays fixed time and volume. Others display transferring mode.
- If fixed time and volume are turned on, the target volume and running time is set up parameter, unable to amend. Other modes, the running time is 60s, you can click the run time button to amend the running time.
- **NOTE: Before use, you need to calibrate the flow rate to ensure the transferring or dispensing accuracy.**

Procedure:

A. Confirm the running time, if fixed time and volume function, the running time is set up time, unable to change.

B. Click **Start** button to test, countdown displays the run time, it will stop automatically, and display numerical keyboard, input the actual volume, then it will ask whether to continue test (suggest more than 3 times), choose **Yes**, the pump will test again, choose **No**, back to the calibration interface.

C. After clicking the **Start** button, during the pump running, you can click the **Stop** button to stop the test.

D. After the tests are finished, the actual volume area displays the average data, click the **CAL** button, the calibration is finished. Now the request flow rate or volume is close to theoretical data.

E. If request higher accuracy, you can click **Add** and **Dec** button to micro adjust the flow rate, to reach high accuracy transferring and dispensing.

F. Click **Cancel** button, cancel the test data, the actual volume return to 0.

Online Micro Adjust Volume Process:

A. **Flow Rate Transferring Mode:** If the actual flow rate is bigger or smaller than the setup flow rate, you can micro adjust the flow rate online without affect the product line.

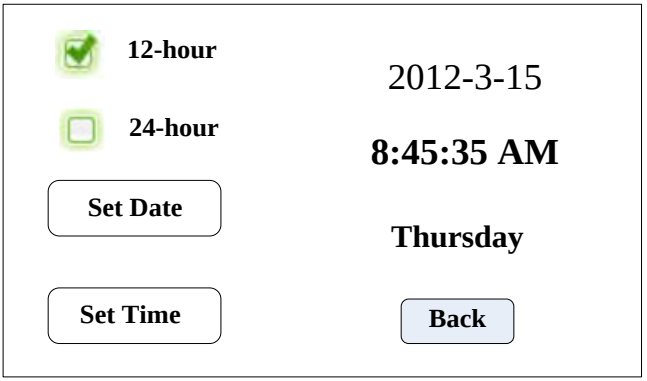
B. **Fixed Time and Volume Mode**: If the dispensing volume is bigger or smaller than the setup volume, you can micro adjust the volume online, no need to stop the pump.

C. **Fixed Volume Measurement Mode:** Do not support online micro adjust function.

1. Click the Calibration button from the main interface, enter the flow rate calibration interface.
2. Now only the **Add**, **Dec** and **Esc** button is usable, other buttons are forbidden.
3. Click **Add** or **Dec** button to adjust the flow rate or volume.

Section 3: DATE AND TIME

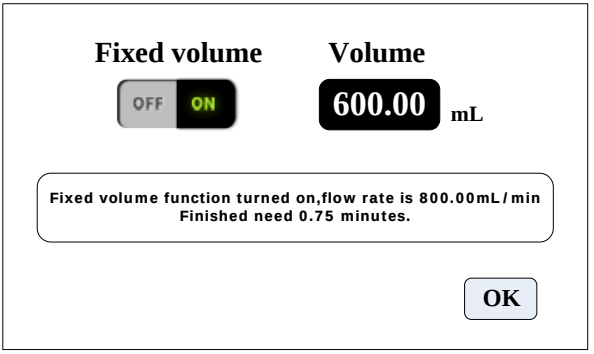
Date & Time Interface:



1. Click the **System Setting** button from the main interface, click **Date** and **Time** button, enter date and time setting interface. The date and time will display on the top right corner of main interface.
2. Click **Set Date** button, come out the **Set year** numeric keypad, the range of the year is **1970-2099**. After you setup the year, then setup the month and date.
3. Click **Set Time** button, use the numeric keypad to set the hour, minute and second.

Section 4: VOLUME

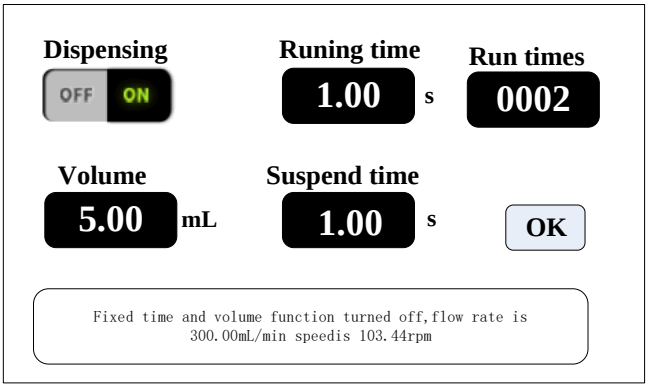
Fixed Volume Measurement Interface



- After turning on this function, the peristaltic pump will measure the volume automatically, when the volume reaches setup volume, the pump will stop working automatically. The flow rate can be changed while the pump is working.
- Click the **Fixed Volume** button, set **ON** to turn on this function. Click **Set Volume**, to input volume, the unit can be mL or L, range is 0.01mL to 9999L. The prompting frame displays the needed time to finish the volume with the setup flow rate. The maximum time is 9999min, when more than 9999min, the system will warn.

Section 5: DISPENSING

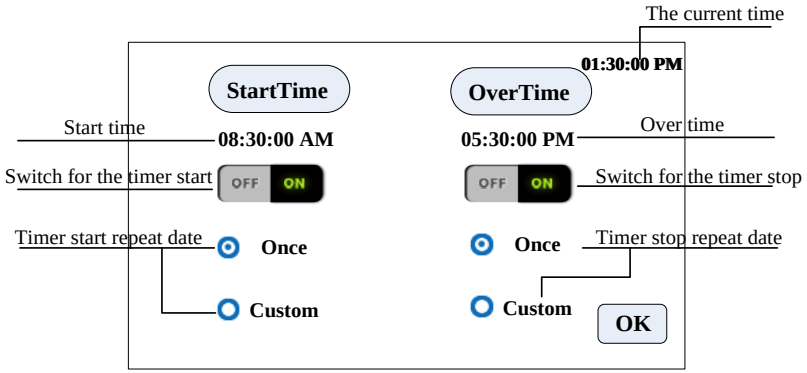
Dispensing Interface:



- By pressing the display button, the dispensing parameter will display as above.
- Peristaltic pump transfers fixed volume in fixed time, transfer number of times is the run times, click suspend time button then input suspend time, after click the OK button, click the start button, the pump begins dispensing according to the parameters.

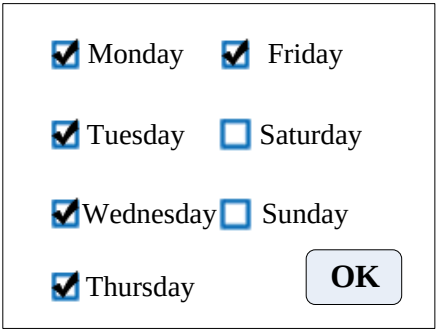
Section 6: TIMER START AND STOP

Timer Start And Stop Function



Click **Start Time**, set the start time is 8:30 a.m., turn the button to **ON.**

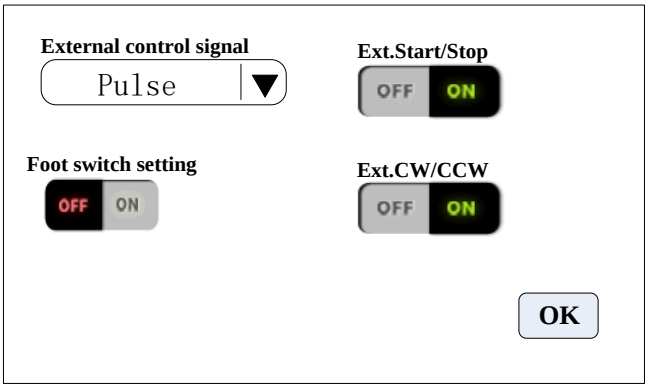
Click **Custom**, come out the repeat date window, as below:



Timer stop setting process is same with the timer start.

Section 7: EXTERNAL SETTING INTERFACE

The External Setting Interface:

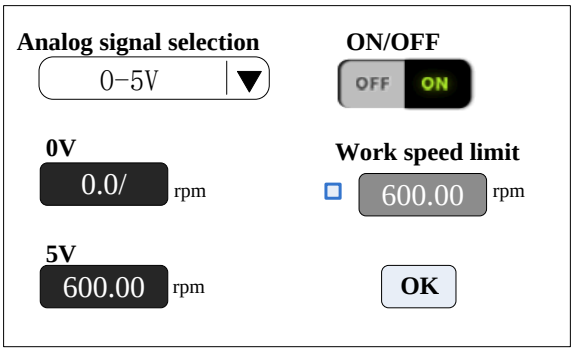


Click **Setting** button in the main interface, then click **External control** to enter **External Settings** interface.

A. External control of the motor start-stop and reserving signal is divided into two kinds: Level Mode and Pulse Mode.

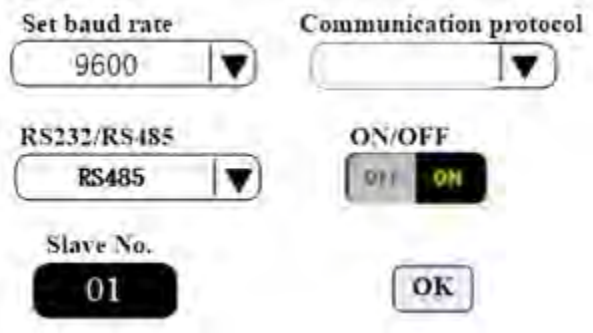
B. Various independent external control mode setting switch works only when the corresponding external control function is turned on.

External Speed Control Setting Interface:



1. Click **Setting** button in the main interface, then click **External Speed Control** button to enter External Speed Control Settings interface.
2. Please choose simulated speed setting signal according to the input signal of external port, 0-5V, 0-10V, 4-20mA, three simulated speed setting signals are optional, the voltage range of simulated speed setting signal and motor speed are of linear relation (upper limit of working speed is closed).
3. When open, the working speed upper limit, the motor speed is limited. For example, assume 0V corresponding 0 rpm, 5V corresponding 600 rpm (2.5V should corresponding 300 rpm). Set working speed upper limit to be 300 rpm, if the external input simulated signal is 2.5V, the motor speed is 300 rpm, if the input signal exceeds 2.5V, motor speed maintains 300 rpm.

Communication Setting Interface:



1. Click **Setting** button in the main interface, then click **Communication** button to enter Communications Settings interface.
2. This pump supports MODBUS-RTU Mode. Please select baud rates and communication interface (RS485/RS232). Click **Slave No.** button to enter peristaltic pump address Number (range:1-32), select communication enable is **ON**. Then this pump can communicate with the master, receiving master signal.
3. **NOTE**: Peristaltic pump only under communication control when in the main interface, it's out of communication control when in the other interface.

5000 Series Technical Specification

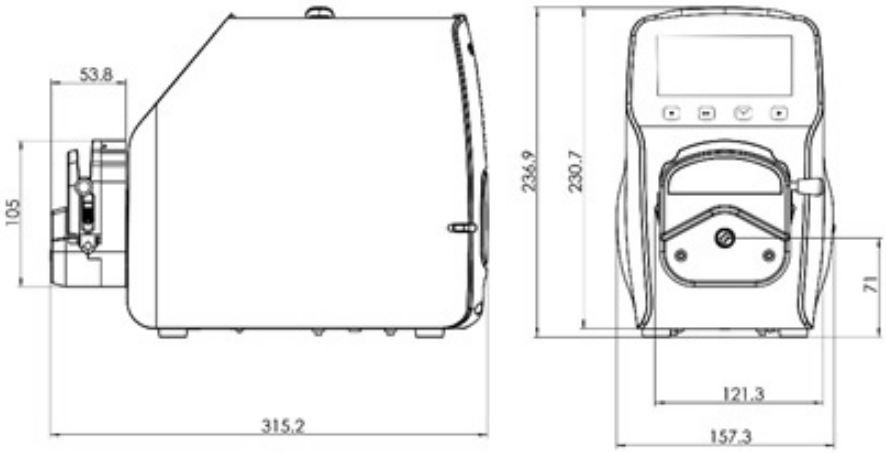
<table>
<tr><td rowspan="3">Speed range</td><td>5001: 0.1-150rpm</td><td rowspan="2">Power supply</td><td>AC220V±10%，
50Hz/60Hz(standard)</td></tr>
<tr><td>5003: 0.1-350rpm</td><td>AC110V±10%，
50Hz/60Hz(optional</td></tr>
<tr><td>5006: 0.1-600rpm</td><td>Power consumption</td><td><50W</td></tr>
<tr><td>Speed resolution</td><td>0.01rpm</td><td>Temperature</td><td>0-40℃</td></tr>
<tr><td>Flow rate resolution</td><td>0.01</td><td>Relative humidity</td><td><80%</td></tr>
<tr><td>Operation mode</td><td>Touch screen and mechanical keypad</td><td>Dimensions (L*W*H)</td><td>213*152*235mm</td></tr>
<tr><td>Display</td><td>4.3 inch true color display screen</td><td>Weight</td><td>5.02Kg</td></tr>
<tr><td>External control</td><td>TTL level</td><td>Protection rating</td><td>IP31</td></tr>
</table>

5000 Series Function and Features

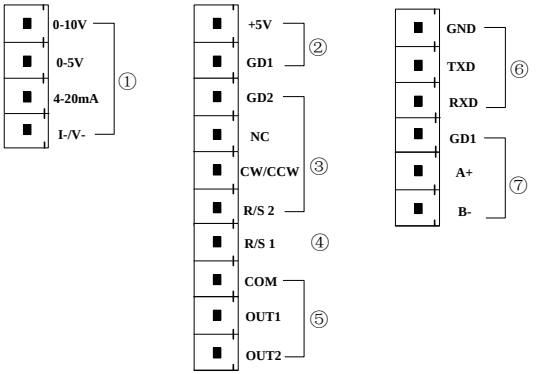
- 4.3 inch color touch screen control, dynamic display working status, the flow volume and motor speed display in the same screen.
- Intelligent calibration function, it can calibrate the flow rate and dispensing volume, ensure the flow accuracy, suitable for high accuracy transferring liquid.
- On-line micro adjusting function, it can adjust the flow rate during production progress, to avoid the filling errors because of tubing fatigue and elasticity decreased.
- Accurate angle control technology, reach high precision dispensing and measurement.
- Fixed volume measurement function: After turn on this function, the peristaltic pump will measure the liquid volume automatically, it will stop automatically after the volume reaches the set value. During this process, the volume can be changed. It is suitable for laboratory liquid dosing and chemical reaction process.

- Fixed time and volume function: After turn on this function, the peristaltic pump will transfer fixed volume within set time. It is Suitable for liquid dispensing in laboratory and industrial production.
- Timer start and stop function: Can set the pump start and stop time freely, reach automation control.
- Load-shedding memory function, store the running parameters in time, safe and reliable.
- Fast fluid-filled function, can wash the tubing and also fill fluid into the tubing.
- High torque and low power loss, it can load several pump heads or multichannel pump head, meet different application requests.
- External control start and stop, convenient for equipment supporting.
- 304 stainless steel housing, resist corrosion, no rust.

Product Dimension (mm)



External Control Interface Instruction



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.

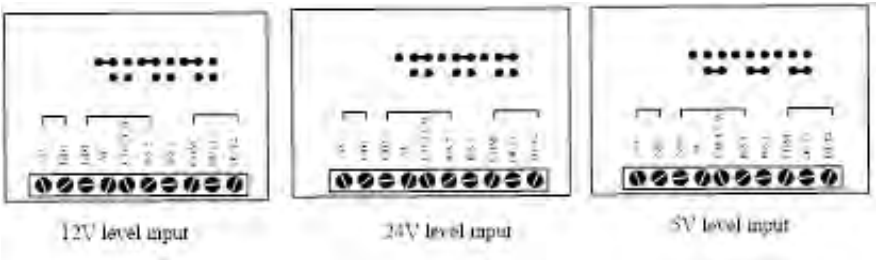
Notice: Please do not connect 0-10V signal connect to 0-5V terminal or 4-20mA terminal. This is forbidden. Wrong connection will damage the pump.

② **Internal isolation 5VDC output**

③ **External control start/stop, CW/CCW signal input terminal:**

Active signal input.

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



GD2: External control signal common input terminal.

NC: Null.

CW/CCW: External control direction signal input

Pulse mode: the direction changes once when one pulse signal is received **(rising edge effectively).**

Level mode: when at a High Level – the pump runs clockwise, when at a Low Level - the pump runs counterclockwise

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

Pulse mode: the direction changes once when one pulse signal is received **(rising edge effectively)**.

Level mode: when at a High Level – the pump runs clockwise, when at a Low Level - the pump runs counterclockwise

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

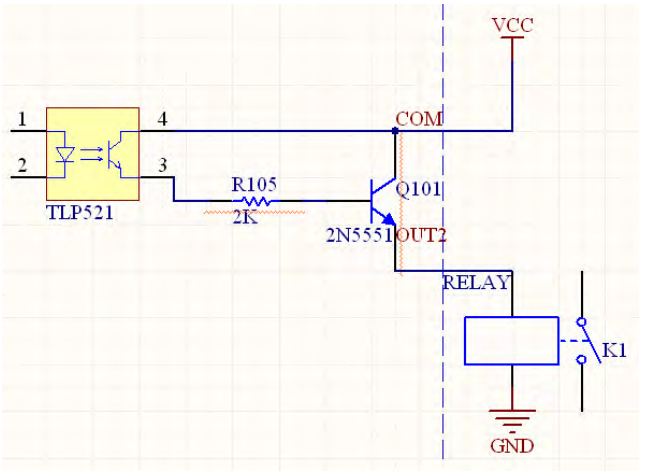
④ **R/S 1 External control signal input terminal**: Passive signal input.

Pulse mode: R/S 1 short connect with GD1 and then disconnect, the pump will start running. Short connect and disconnect again, the pump will stop running.

Level mode: R/S 1 short connect with GD1, the pump will start running; when disconnect, the pump will stop running.

This terminal can connect with the passive switch and foot pedal. In the external control setting interface, you can select the foot pedal option.

⑤ **The motor working status output terminal:**



If connect with relays, when the motor running, K1 connect; when the motor stops running, the K1 disconnects.

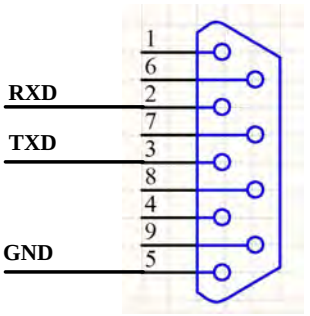
⑥ **RS232 Communication :** Choose RS232 in the communication setting interface, this terminal is active.

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 pump is not in use, loosen the cartridge to avoid damage to the tube. Keep the rollers of the pump head clean and dry. Make sure pump head & rollers do not come in contact with any corrosive liquid.

Warranty and After Service

This pump comes with a one year warranty. The warranty does not include the tubing. Misuse of this product by the user will void the warranty.

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