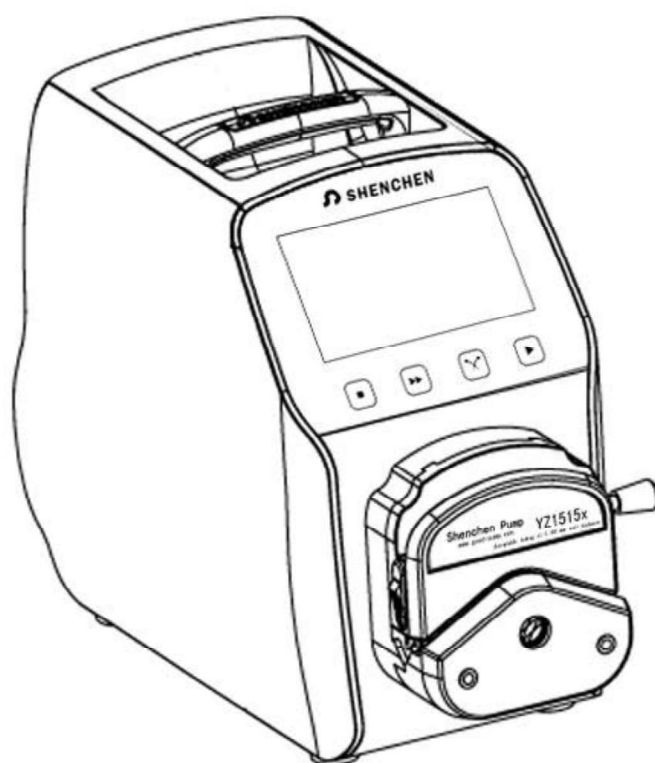


Shenchen Precision Pump Manual of LabV Series





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

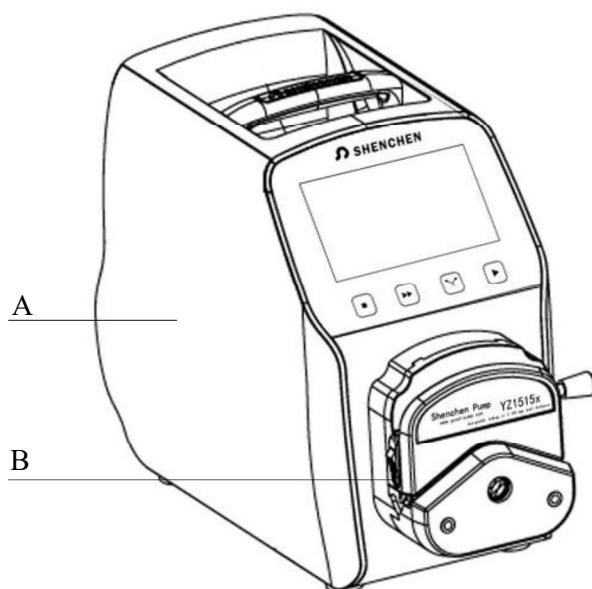
Catalogue

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LabV Series Product Introduction:

4.3 inch color touch screen control; dynamic display working status; flow data, setted parameters and system settings displays in the same screen. Intelligent calibration and online micro adjusting function; three measurement mode; fixed volume measurement, fixed time and volume, timer start and stop. It can load different pump head. It is the ideal choice for laboratory, industrial production and equipment supporting.

The pump can load different pump head: YZ1515x, YZ2515x easy load pump head; MC series multichannel pump head(MC1-MC12);SN series standard pump head (SN15,SN25).

LabV Series Product Appearance

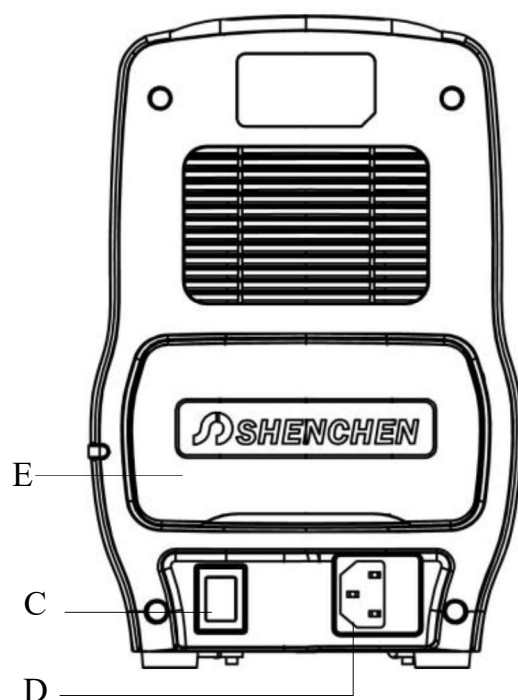
A——Drive

B——Pump Head

C——Power Switch

D——Power Port

E——External Control Input Port



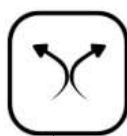
LabV Series Keyboard Instruction



Stop Button



Full Button



CW/CCW Button



Start Button

Stop Button: Press stop button, stop working. Forbidden buttons can be used on the main interface.

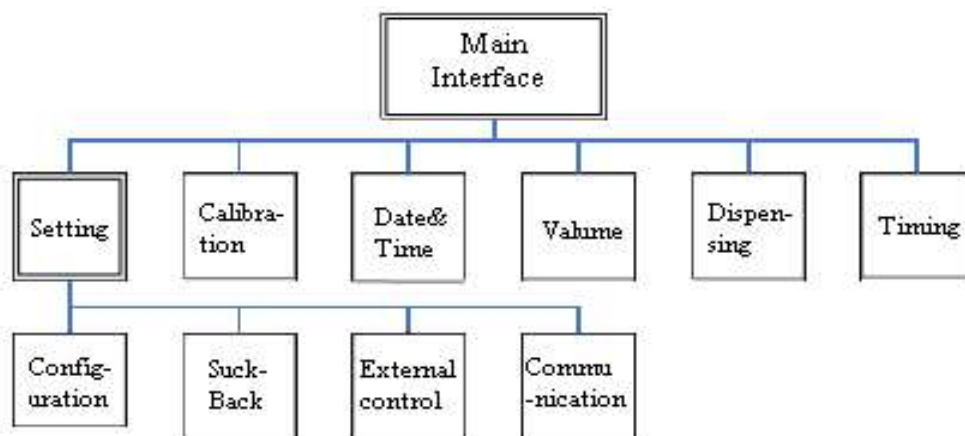
Full Button: When stop state or transferring state, press this button, the pump will running with highest speed. This button can be used for wash tube or fast filling

liquid.

CW/CCW Button: Press this button, the motor will change running direction. When the pump working with fixed volume measurement function or fixed time and volume function, this button does not work.

Start Button: Press this button, the motor start running. When fixed volume measurement function or fixed time and volume function turn on, press this button, the pump will start work with the function.

LabV Series Operation Interface Structure:



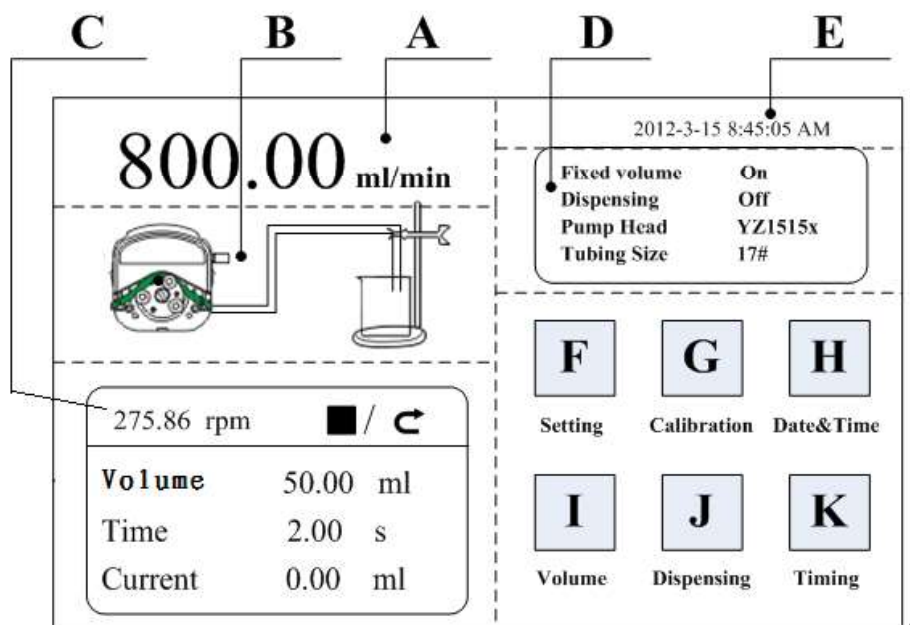
LabV Series Operation Interface Instruction

1. Boot Interface:

After power on the system, enter the welcome interface, choose system language, Chinese/English. If do not choose, it will enter the English main interface after 2.5 seconds automatically.

2. Main Interface:

Main Interface Composition as below:



Speed/Flow Rate Display: In the flow rate mode, display the current flow rate, the motor speed is displayed at the C frame. In the rotating speed mode, display the current set up speed, flow rate is displayed at the C frame. Click A to amend the flow rate or speed. When fixed time and volume function turn on, A is forbidden, not allowed to amend the flow rate or speed.

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

Real-time Parameter Display: Display the current running state and set up parameter. When the fixed volume measurement turn on, display the fixed volume measurement parameter; when the fixed time and volume function turn on, display the fixed time and volume parameter. When these two functions turn off, display the parameter is all 0.

Set Parameter Display: Display the fixed volume measurement, fixed time and volume state information, the model of pump head and tube size.

Date and Time Display: Display the current data and time, you can change it in the system setting. When it display an alarm clock on the right side, it means the timer

start and stop function is turn on.

System Setting Button: Click this button, set up other parameters.

Flow Calibration Button: Click this button enter the flow rate calibration interface.

Date & Time Button: Click this button enter set up current date and time interface.

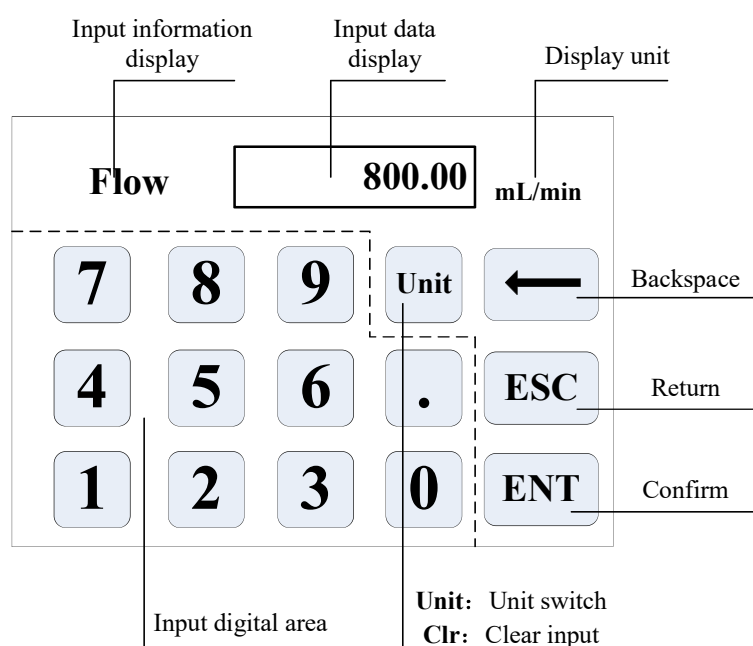
Fixed Volume Measurement Button: Click this button, enter the fixed volume measurement interface.

Fixed Time and Volume Button: Click this button, enter fixed time and volume interface.

Timer Start and Stop Button: Click this button, enter timer start and stop interface.

3. Numeric Keypad Input Interface:

Numeric keypad input interface as below:



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

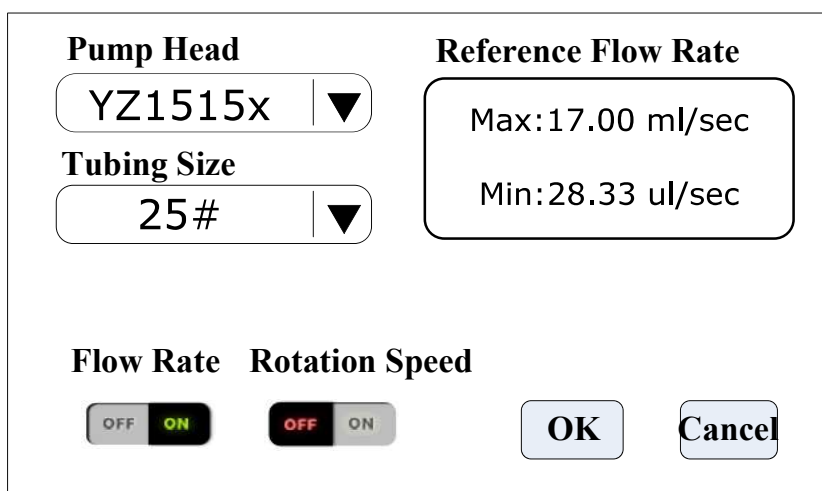
Backspace Button: Delete an input digital.

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

ENT Button: Confirm the current input.

4. The Basic Configuration Interface:

The basic configuration interface:



The screenshot shows a configuration window with the following elements:

- Pump Head:** A dropdown menu currently showing 'YZ1515x'.
- Tubing Size:** A dropdown menu currently showing '25#'.
- Reference Flow Rate:** A box displaying 'Max:17.00 ml/sec' and 'Min:28.33 ul/sec'.
- Flow Rate / Rotation Speed:** Two toggle switches. The 'Flow Rate' switch is currently 'ON' (green), and the 'Rotation Speed' switch is currently 'OFF' (red).
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.

Click the pump head and tubing size to choose the pump head and tubing.

Reference flow rate display the max. and min. flow rate with the current pump head and tubing.

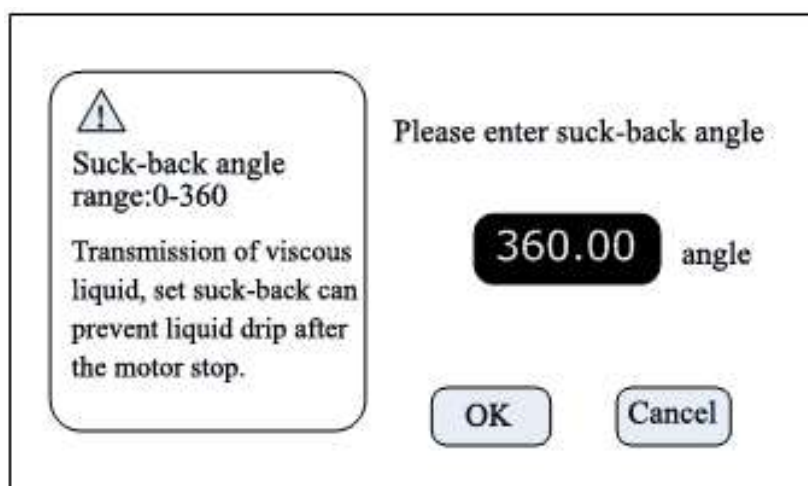
Click the flow rate mode or rotating speed mode button to choose the working mode.

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.

Click the confirm button back to the main interface.

5. Back Suction Angle Interface:

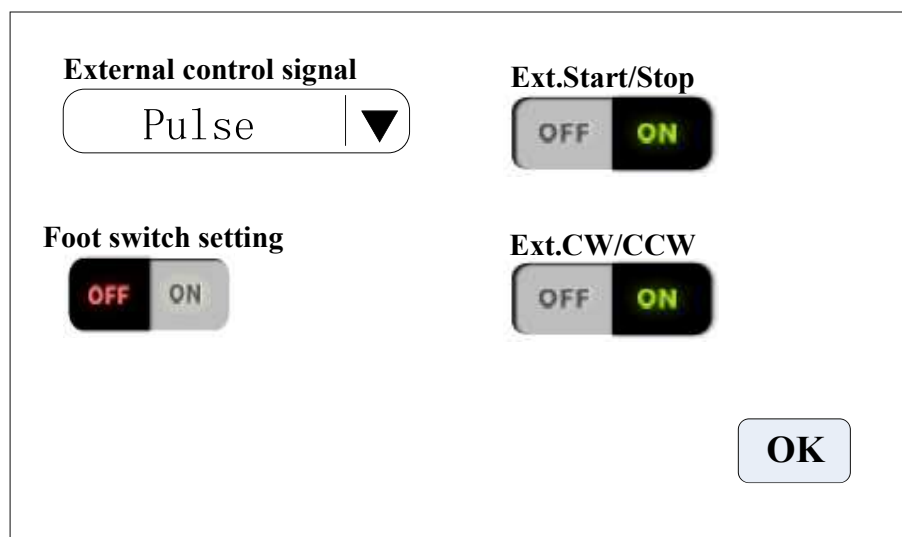
The back suction angle interface as below:



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 angle when motor stop running, except **dispensing** is **ON**.

6. External Setting Interface:

External Setting Interface as below:



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

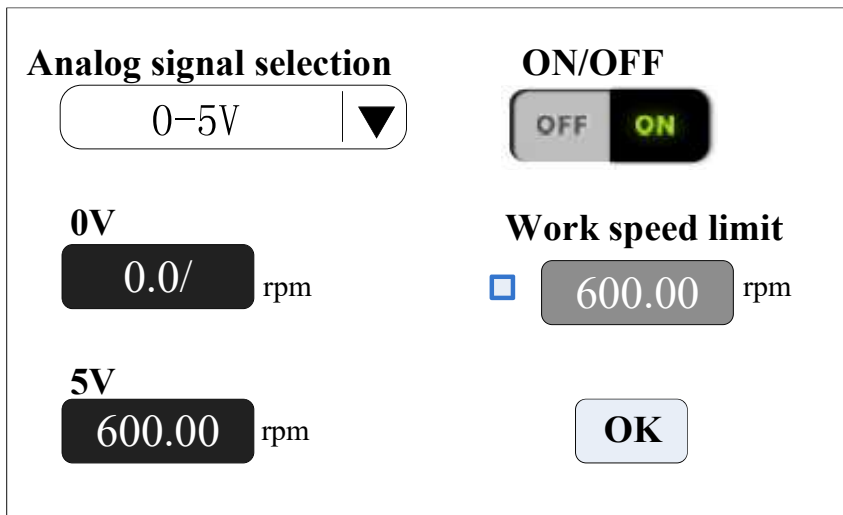
A. External control of the motor start-stop and reserving signal is divided into two kinds : level mode and pulse mode, Specific interface, see details in describes

external control interface .

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

7. External Speed Control Setting Interface:

External Speed Control Setting Interface as below:



Analog signal selection
0-5V ▼

ON/OFF
OFF ON

0V
0.0/ rpm

5V
600.00 rpm

Work speed limit
☒ 600.00 rpm

OK

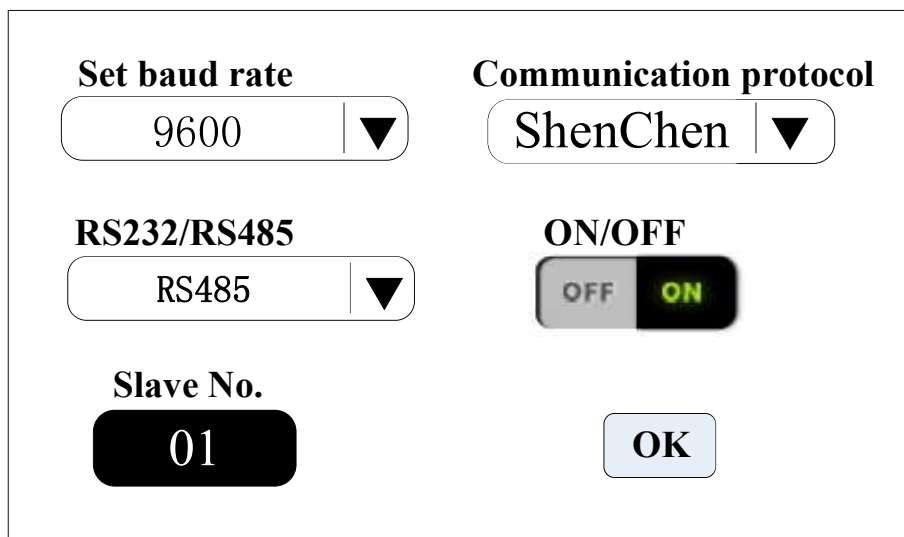
Click **Setting** button in the main interface, then click **External Speed Control** button to enter External Speed Control Settings interface.

Please choose simulated speed setting signal according to the input signal of external port, 0-5V、0-10V、4-20mA, three simulated speed setting signal are optional, the voltage range of simulated speed setting signal and motor speed are of linear relation(upper limit of working speed is closed).

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 exceed 2.5V, motor speed maintain 300 rpm.

8. Communication Setting Interface:

Communication Setting Interface as below:



The screenshot shows the Communication Setting Interface with the following elements:

- Set baud rate:** A dropdown menu showing '9600' with a downward arrow.
- Communication protocol:** A dropdown menu showing 'ShenChen' with a downward arrow.
- RS232/RS485:** A dropdown menu showing 'RS485' with a downward arrow.
- ON/OFF:** A toggle switch currently set to 'ON' (indicated by a green light).
- Slave No.:** A black button with the white text '01'.
- OK:** A light blue button with the black text 'OK'.

Click **Setting** button in the main interface, then click **Communication** button to enter Communications Settings interface.

This pump support MODBUS--RTU Mode. Please select baud rates and communication interface (RS485/RS232). Click **Slave No.** button to enter peristaltic pump address No.(range:1-32), select communication enable is **ON**. Then this pump can be communication with master, receiving master signal.

NOTE: Peristaltic pump only under communication control when in the main interface, it's out of communication control when in other interface.

9. Flow Rate Calibration Interface:

Flow Rate Calibration Interface as below:

FixedVolume	Actual Vol. 0.0000ml	Volume adjust +0.0000ml
Volume 10.00 ml	Test	Add
Run Time 1.00 s	CAL	Dec
	Reset	Esc

The top left corner display the function, when fixed volume measurement turn on, display fixed volume; when fixed time and volume turn on, display fixed time and volume. Others display transferring mode.

If fixed time and volume turn 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.

Before the pump working, need to calibrate the flow rate to ensure the transferring or dispensing accuracy

Process as below:

- Confirm the running time, if fixed time and volume function, the running time is set up time, unable to change.
- Click **Start** button to test, countdown display the run time, it will stop automatically, and display numerical keyboard, input the actual volume, then it will ask whether continue test (suggest more than 3 times), choose **Yes**, the pump will test again, choose **No**, back to the calibration interface.
- After click the **Start** button, during the pump running, you can click the **Stop** button to stop the test.
- After finish the tests, the actual volume area display 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:

Flow Rate Transferring Mode: If the actual flow rate is big or small than the set up flow rate, you can micro adjust the flow rate online without affect the product line.

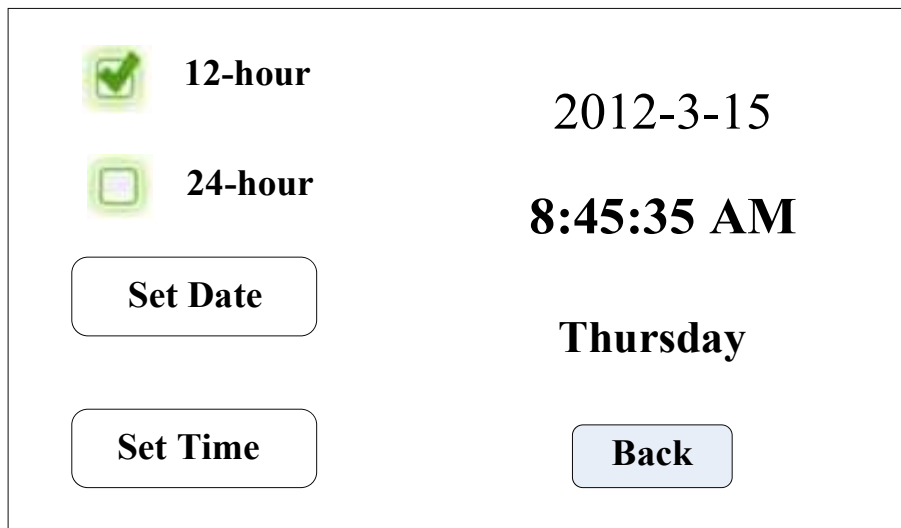
Fixed Time and Volume Mode: If the dispensing volume is big or small than the set up volume, you can micro adjust the volume online, no need to stop the pump.

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.

10. Date & Time Interface:

Setting Date & Time Interface as below:



The screenshot shows a date and time setting interface. On the left, there are two radio button options: '12-hour' (selected with a green checkmark icon) and '24-hour' (unselected with a green square icon). Below these are two buttons: 'Set Date' and 'Set Time'. On the right side, the date '2012-3-15' is displayed at the top, followed by the time '8:45:35 AM' in a larger font, and the day 'Thursday' below it. At the bottom right, there is a 'Back' button.

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.

Click **Set Date** button, come out the **Set year** numeric keypad, the range of the year is **1970-2099**. After set up the year, then set the month and date.

Click **Set Time** button, come out the numeric keypad, set the hour, minute and second.

11. Fixed Volume Measurement Interface:

Fixed Volume Measurement Interface as below:

Fixed volume <div style="border: 1px solid black; padding: 2px; display: inline-block;"> OFF ON </div>	Volume <div style="border: 1px solid black; padding: 2px; display: inline-block; font-size: 1.2em;"> 600.00 </div> mL
<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: left;"> Fixed volume function turned on, flow rate is 800.00mL/min Finished need 0.75 minutes. </div>	
<div style="border: 1px solid black; padding: 5px 10px; background-color: #e0e0e0;">OK</div>	

After turn on this function, the peristaltic pump will measure the volume automatically, when the volume reach set up volume, the pump will stop working automatically. The flow rate can be changed during the pump 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 display the needed time to finish the volume with set up flow rate. The maximum time is 9999min, when more than 9999min, the system will warn.

12. Dispensing Interface:

Dispensing Interface as below:

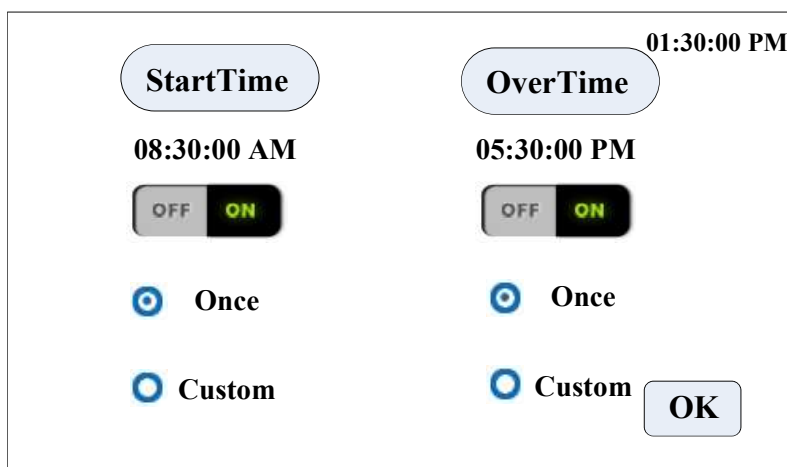
Dispensing <div style="border: 1px solid black; padding: 2px; display: inline-block;"> OFF ON </div>	Runing time <div style="border: 1px solid black; padding: 2px; display: inline-block; font-size: 1.2em;"> 1.00 </div> s	Run times <div style="border: 1px solid black; padding: 2px; display: inline-block; font-size: 1.2em;"> 0002 </div>
Volume <div style="border: 1px solid black; padding: 2px; display: inline-block; font-size: 1.2em;"> 5.00 </div> mL	Suspend time <div style="border: 1px solid black; padding: 2px; display: inline-block; font-size: 1.2em;"> 1.00 </div> s	
<div style="border: 1px solid black; padding: 5px 10px; background-color: #e0e0e0;">OK</div>		
<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: left;"> Fixed time and volume function turned off, flow rate is 300.00mL/min speedis 103.44rpm </div>		

After turn on this function, the pump will enter dispensing mode.

Peristaltic pump transfer fixed volume in fixed time, transfer number of times is the run times, click suspend time button then input suspend time, prompt box display current diameter, after click the OK button, click the start button, the pump begin dispensing according to the diameter.

13. Fixed Time and Volume Interface:

Fixed time and volume Interface as below:

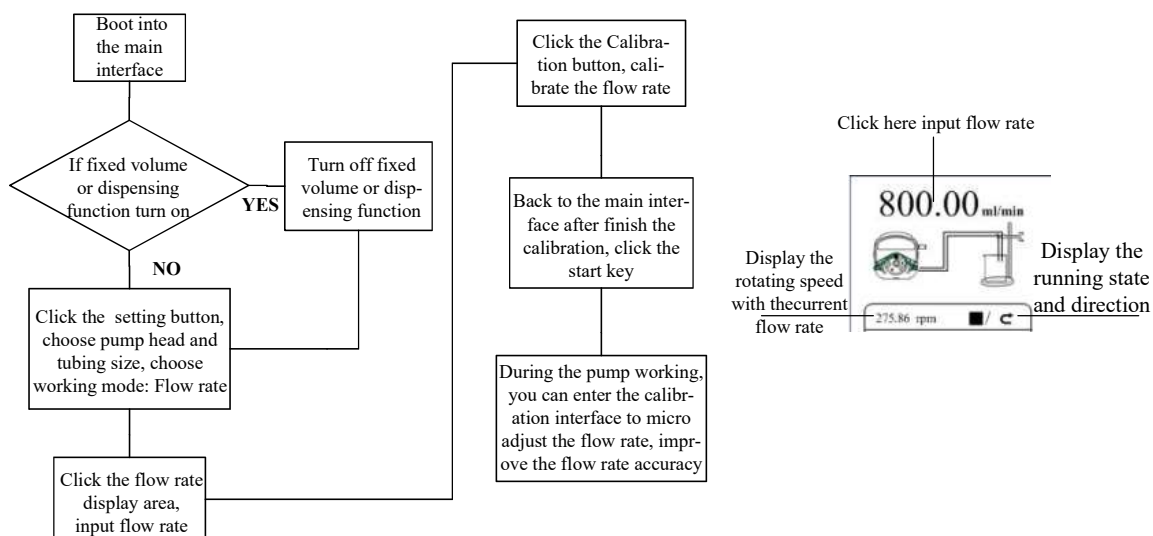


After turn on this function, the pump will enter dispensing mode.

Peristaltic pump transfer fixed volume in fixed time, transfer number of times is the repetition times, click interval time, input interval time, prompt box display current diameter, after click the enter button, click the start button, the pump begin dispensing according to the diameter.

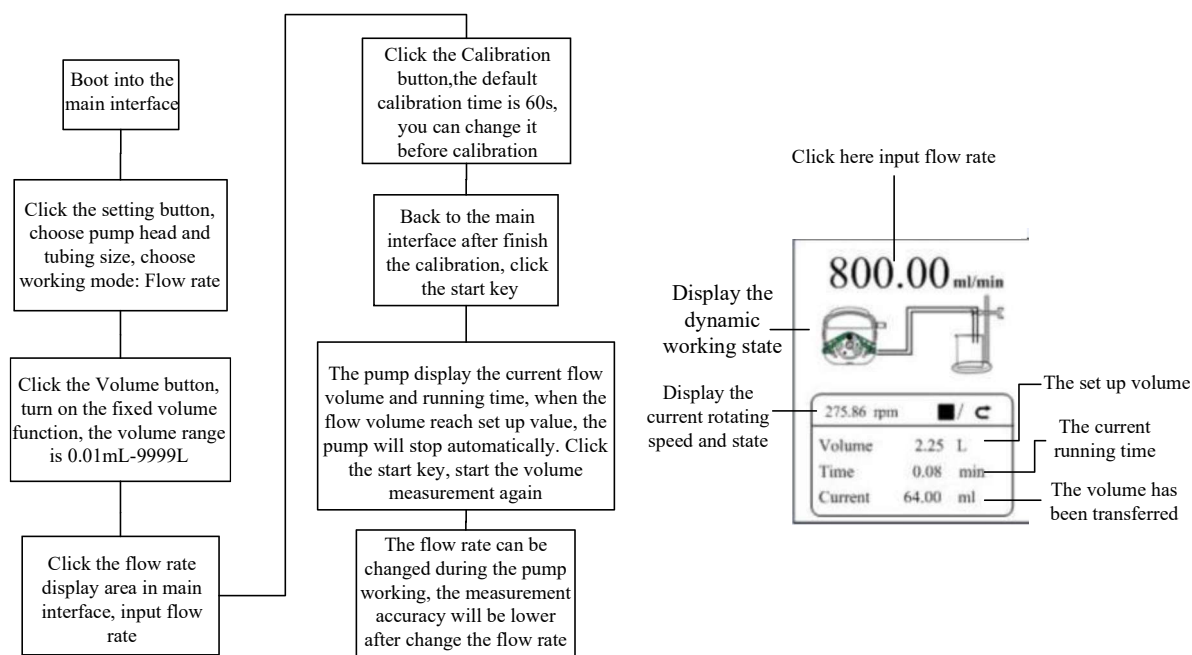
Main Functions Operation Process

1. Flow Rate Transferring Function



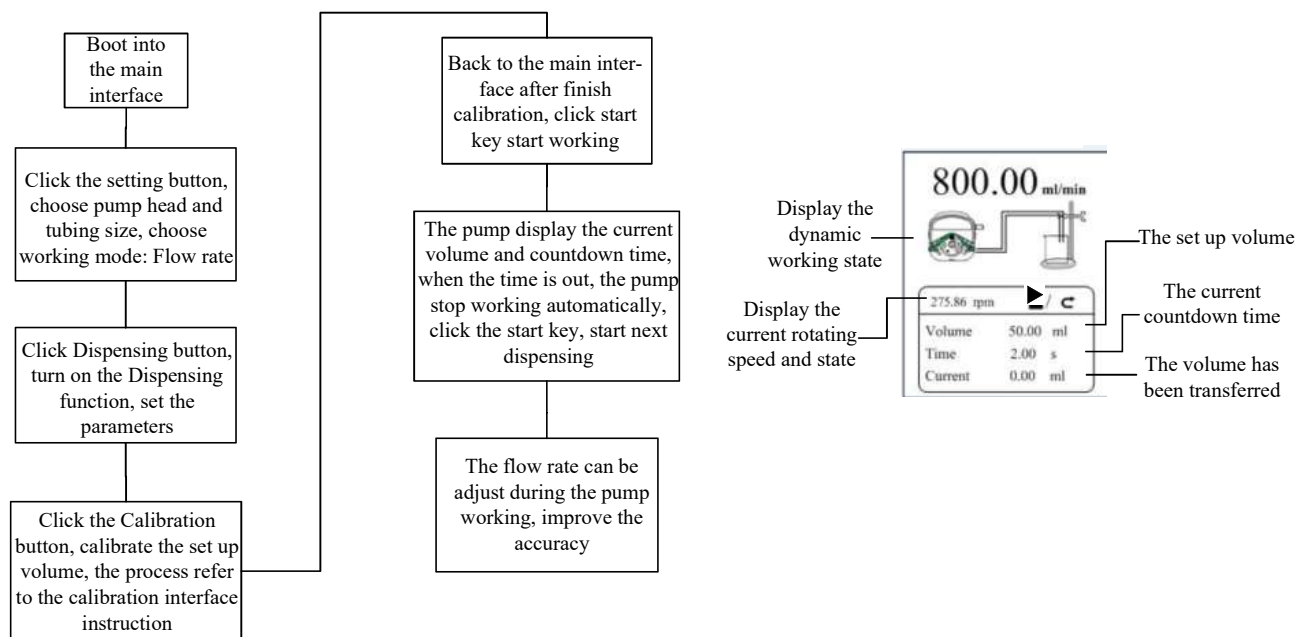
Note: Flow rate calibration process please refer the flow rate calibration interface instruction.

2. Fixed Volume Measurement Function



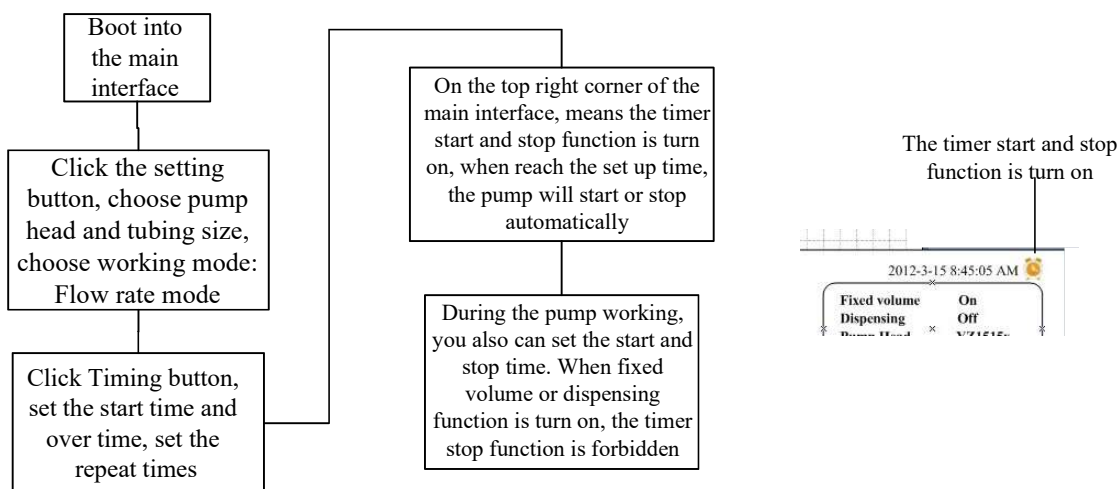
Note: Flow rate calibration process please refer the flow rate calibration interface instruction.

3. Dispensing

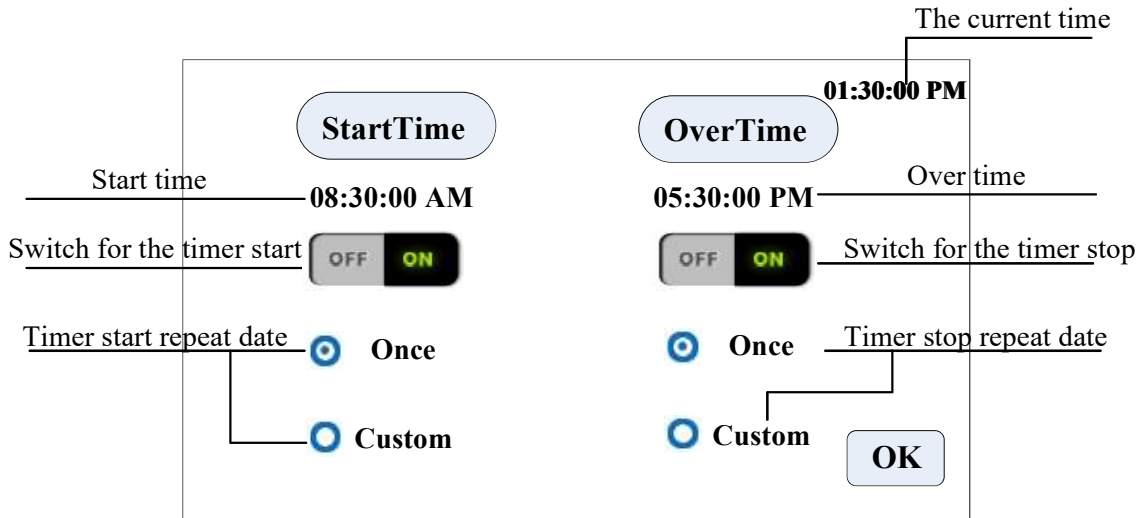


Note: Flow rate calibration process please refer the flow rate calibration interface instruction.

4. Timer Start And Stop Function

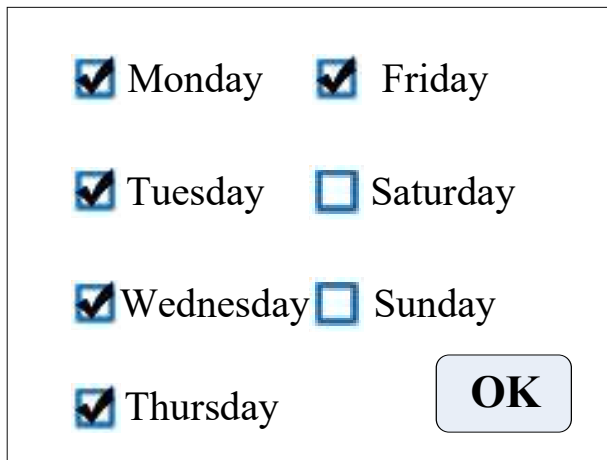


Under the flow rate transferring mode, set the pump start at 8:30 a.m. from Monday to Friday, stop at 5:30 p.m., the process as below:



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.

LabV Series Technical Specification

Speed range	LabV1: 0.1-150rpm	Power supply	AC220V±10%, 50Hz/60Hz(standard)
	LabV3: 0.1-350rpm		AC110V±10%, 50Hz/60Hz(optional)
	LabV6: 0.1-600rpm	Power consumption	<50W
Speed resolution	0.01rpm	Temperature	0-40℃
Flow rate resolution	0.01	Relative humidity	<80%
Operation mode	Touch screen and membrane keypad	Dimensions (L*W*H)	213*152*235mm
Display	4.3 inch true color display screen	Weight	5.02Kg
External control	TTL level	Protection rating	IP31

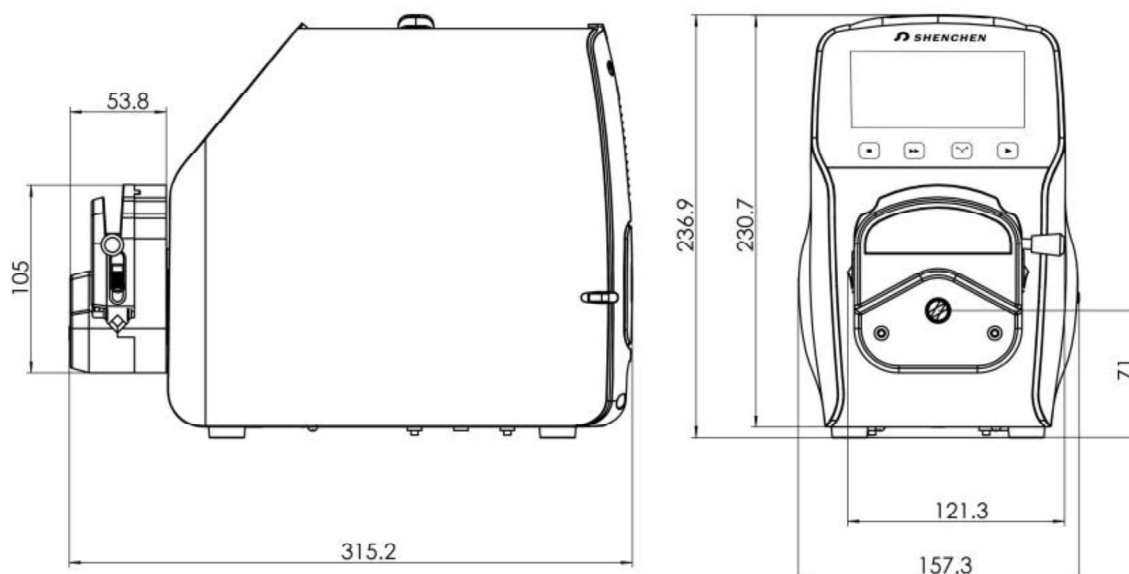
LabV Series Function and Features

- 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.

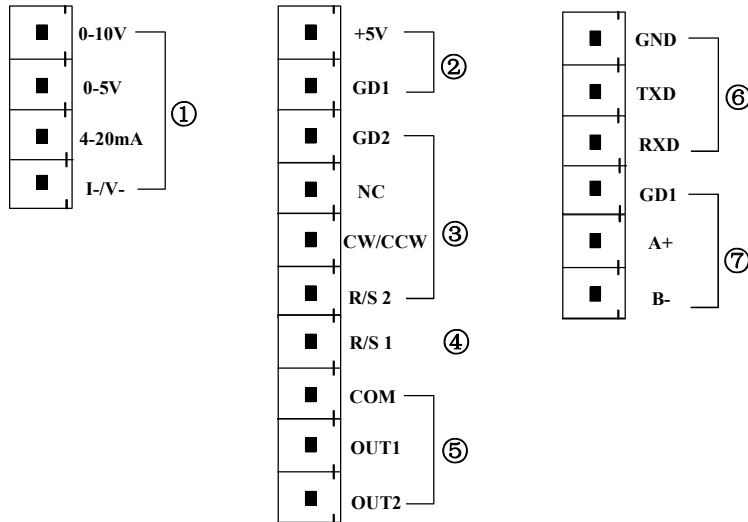
- Fixed time and volume function: After turn on this function, the peristaltic pump will transfer fixed volume within set time. It is Suitable for liquid dispensing in laboratory and industrial production.
- Timer start and stop function: Can set the pump start and stop time freely, reach automation 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:

External control interface as below:



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.

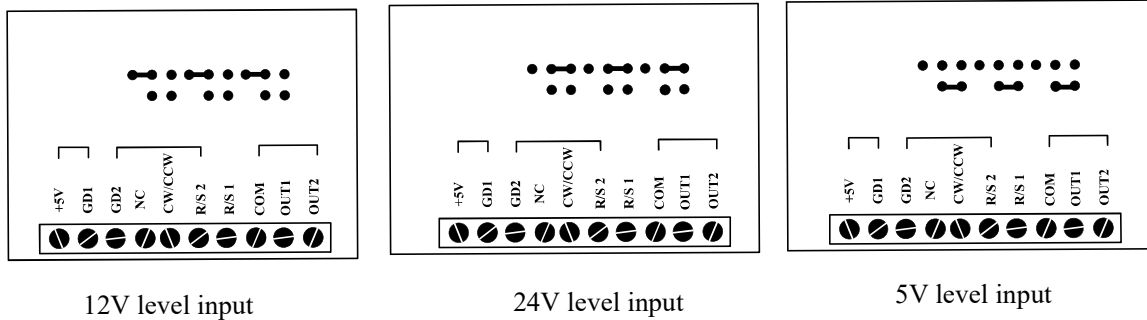
I_/V_: Analog signal negative terminal.

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 :



GD2: External control signal common input terminal.

NC: Null.

CW/CCW: External control direction signal input

Pulse mode: the direction change once when receive one pulse signal (**rising edge effectively**) .

Level mode: when high level the pump clockwise running,when low level; the pump counterclockwise running.

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

Pulse mode: the pump working status change once when receive one pulse signal (**rising edge effectively**) .

Level mode: when high level, the pump running; when low level the pump stop running.

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.

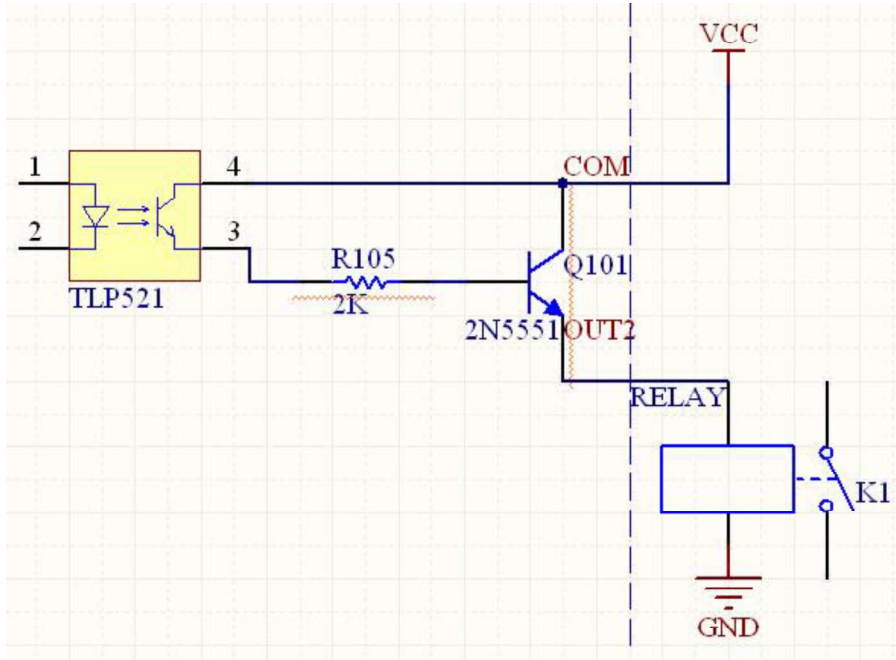
Pulse mode: R/S 1 short connect with GD1 and then disconnect, the pump start running. Short connect and disconnect again, the pump stop running.

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

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.

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.

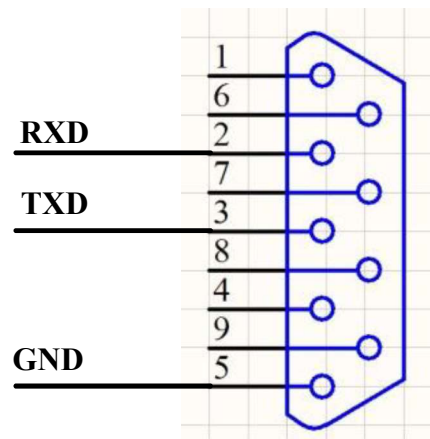
⑥. **RS232 Communication** : Choose RS232 in the Communication setting interface, this terminal is active.

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 pump is not working, please loose the cartridges of pressing the tubing for avoiding changing the shape of tubing because of longtime extrusion.

Keep the rollers of pump head clean and dry, otherwise it can quicken the tubing wearing, reduce the useful life of tubing and lead the rollers to damage in earlier.

Pump head can not resist super corrosive liquid. Please pay attention to it when it is using.

Keep the rollers of pump head clean and dry. If the surface of rollers is not clean, it can quicken the tubing wearing, and reduce the useful life of tubing. If liquid were on the rollers, please dry it. Longtime moisture can damage the rollers.

Warranty and After Service

We support 3 years warranty (not including tubing). During the warranty, the products are damaged because of users' wrong operation or other human damages, our company do not responsibility for warranty. Beyond the warranty, we only charge the cost of maintenance. Refer to all maintenance including in and beyond the warranty, we do not bear any freight charges because of maintenance.