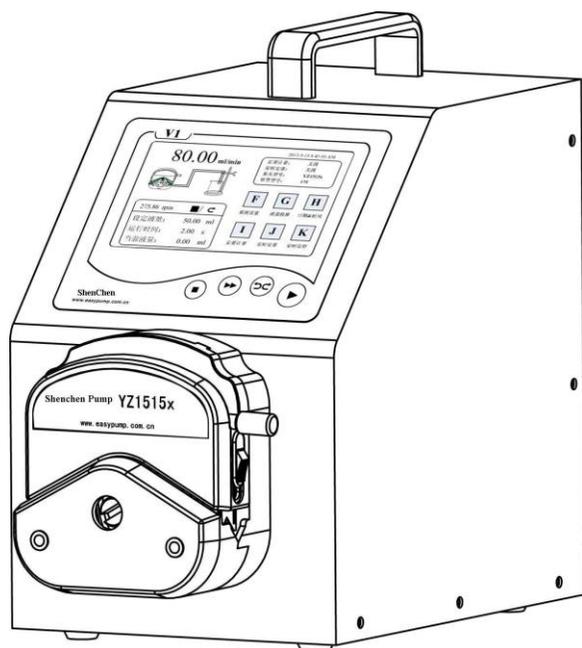


# Shenchen Precision Pump Manual of V Series





## **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 customer's electrical outlet must be grounded and reliably grounded

Note: Must be loaded and unloaded in the power state foot switch and other external control plug to prevent burned external control interface

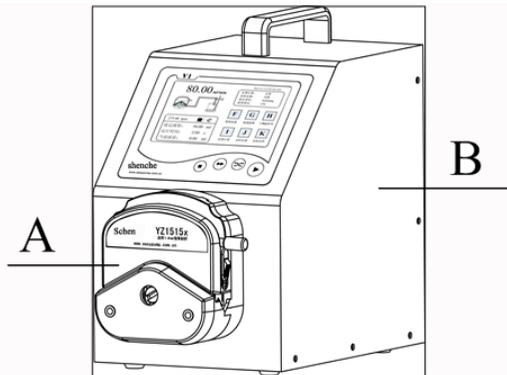
# Catalogue

1. V Series Product Introduction:.....	-1-
2. V Series Product Appearance.....	-1-
3. V Series Keypad Instruction.....	- 2-
4. V Series Operation Interface .....	- 2 -
5. The Main function of the operation process.....	-14-
6. External control interface description.....	-16-
7. V Series Technical Specifications.....	-21-
8. Vseries of main functions and features.....	-22-
9. Product size chart.....	-23-
10. Product Maintenance.....	-25-
11. Warranty and after-sales service.....	-26-

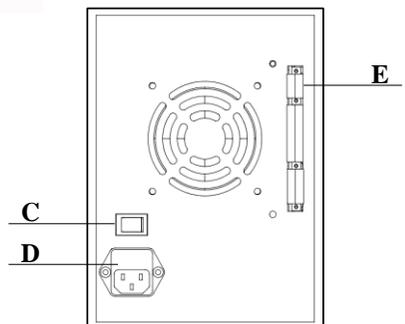
### 1. V Series Product Introduction:

V Series flow rate metering intelligent peristaltic pump, with 4.3-inch color touch screen control, Dynamic display the working status, flow rate data, set parameters, the system configuration with the screen display. With intelligent calibration and on-line micro adjusting function, three kinds of working modes: fix volume metering, fix volume and fix time dispensing ,timer start and stop; can install a variety of pump head; a variety of external control methods at your choice; suit for a variety of pump head. Widely used in laboratory, equipment, industrial production.

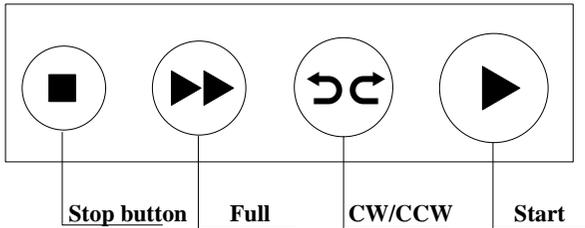
### 2. V Series Product Appearance



- A**——Pump Head
- B**——Drive
- C**——Power Switch
- D**——Power Port
- E**——External Control Input Port



### 3. V Series Keypad Instruction



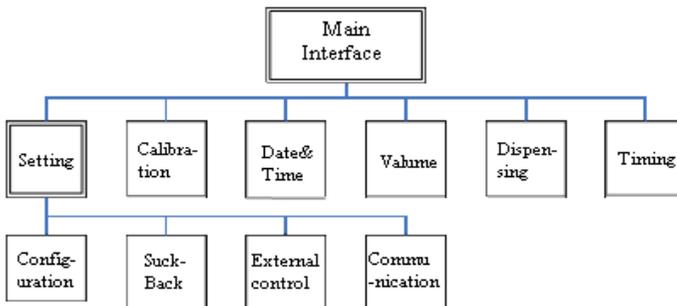
**Stop Button:** Press stop button, stop working. Forbidden buttons can be used on the main interface.

**Full Speed 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 metering function or fixed time and volume dispensing function, this button does not work.

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

### 4. V Series Operation Interface :



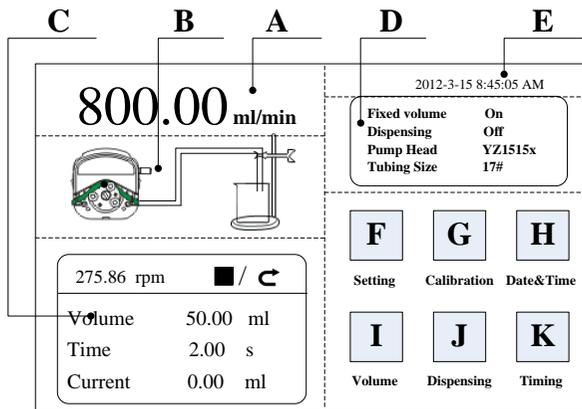
## V Series Operation Interface Instruction

### 4.1. 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.

### 4.2. Main Interface:

Main Interface Composition as below:



**A. Speed/Flow Rate Display:** Under the flow rate mode, display the current setting flow rate, the motor speed display at the C frame. Under the rotating speed mode, display the current setting speed, flow rate display 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.

**B. Real-time Dynamic Display:** Real-time display of the current operating status, animation shows the results

**C. 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.

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

**E. 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.

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

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

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

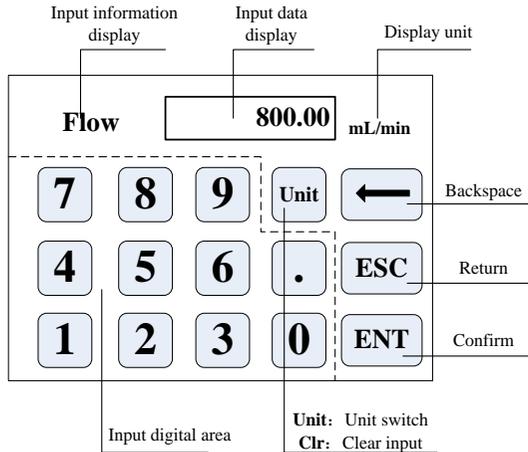
**I. Fixed Volume Measuring Button:** Click this button, enter the fixed volume measuring interface.

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

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

### 4.3. 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 previous interface.**

**ENT Button:** Confirm the current input.

#### 4.4 Basic Configuration Interface:

The basic configuration interface:

<b>Pump Head</b> <input type="text" value="YZ1515x"/> ▼	<b>Reference Flow Rate</b> <input type="text" value="Max:17.00 ml/sec"/> <input type="text" value="Min:28.33 ul/sec"/>
<b>Tubing Size</b> <input type="text" value="25#"/> ▼	
<b>Flow Rate</b> <b>Rotation Speed</b> <input type="checkbox"/> OFF <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF <input type="checkbox"/> ON	<input type="button" value="OK"/> <input type="button" value="Cancel"/>

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

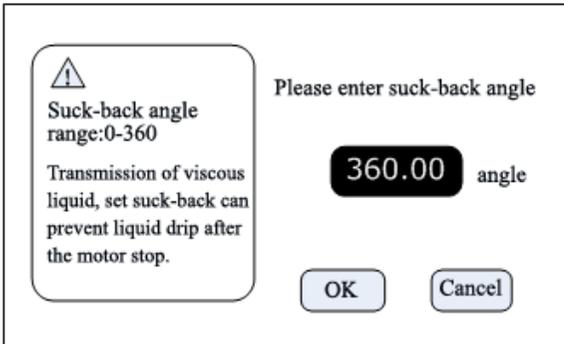
Reference flow rate display the max. and min. flow rate with the current pump head and tubing.

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.

#### 4.5 Back Suction Angle Interface:

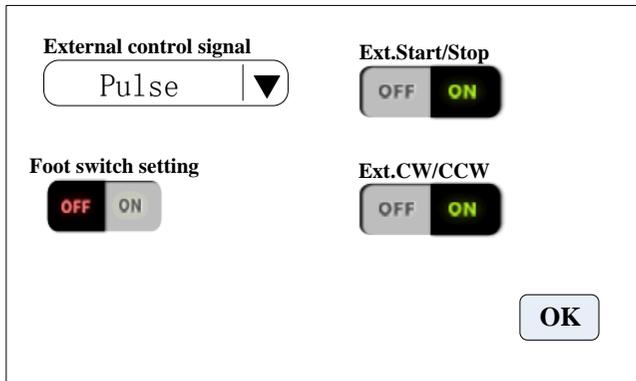
The back suction angle interface as below:



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**.

#### 4.6. External Control Setting Interface:

External Control Setting Interface as below:



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

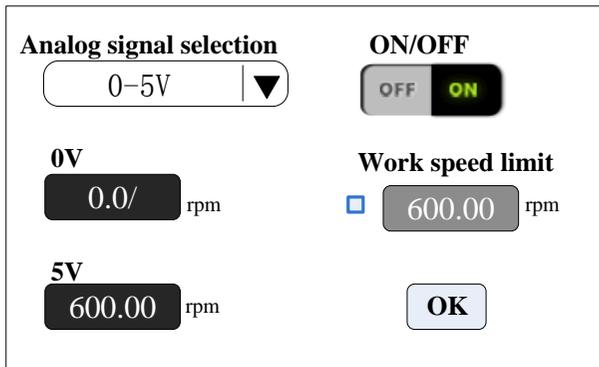
- A. External control of the motor start-stop and reserving signal is divided into two kinds : level mode and pulse mode, Specific interface, see details in

describes external control interface .

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

#### 4.7. External Speed Control Setting Interface:

External Speed Control Setting Interface as below:



The screenshot shows a control interface with the following elements:

- Analog signal selection:** A dropdown menu currently showing "0-5V".
- ON/OFF:** A toggle switch currently in the "ON" position.
- 0V:** A speed setting field showing "0.0/" followed by "rpm".
- 5V:** A speed setting field showing "600.00" followed by "rpm".
- Work speed limit:** A checkbox (unchecked) followed by a speed setting field showing "600.00" followed by "rpm".
- OK:** A button to confirm the settings.

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 0 V corresponding 0 rpm, 5 V 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.

#### 4.8. Communication Setting Interface:

Communication Setting Interface as below:

<b>Set baud rate</b> <input type="text" value="9600"/> ▼	<b>Communication protocol</b> <input type="text" value="ShenChen"/> ▼
<b>RS232/RS485</b> <input type="text" value="RS485"/> ▼	<b>ON/OFF</b> <input checked="" type="checkbox"/> OFF <input checked="" type="checkbox"/> ON
<b>Slave No.</b> <input type="text" value="01"/>	<input type="button" value="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.

#### 4.9 Flow Rate Calibration Interface:

Flow Rate Calibration Interface as below:

FixedVolume	<b>Actual Vol.</b> 0.0000ml	<b>Volume adjust</b> +0.0000ml
<b>Volume</b> 10.00 ml	Test	Add
<b>Run Time</b> 1.00 s	CAL	Dec
	Cancel	Esc

The top left corner display the function, when fixed volume measuring turn on, display fixed volume; when fixed time and volume dispensing 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:**

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

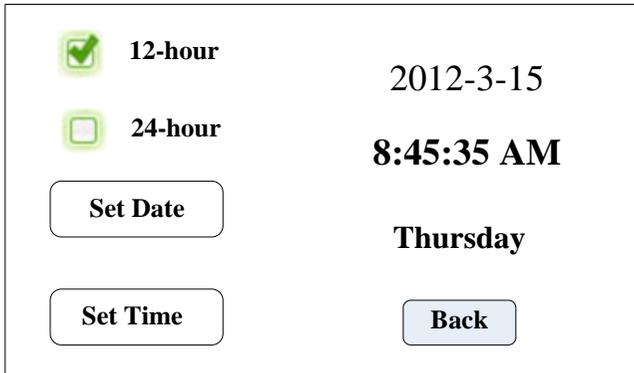
**Fixed Time and Volume Mode:** If the dispensing volume is big or small than the set up volume, you can micro adjust the volume online, no need to stop the pump.

**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.

#### 4.10 Date & Time Interface:

Setting Date & Time Interface as below:



<input checked="" type="checkbox"/> <b>12-hour</b>	2012-3-15
<input type="checkbox"/> <b>24-hour</b>	<b>8:45:35 AM</b>
<b>Set Date</b>	<b>Thursday</b>
<b>Set Time</b>	<b>Back</b>

Click the **System Setting** button from the main interface, click **Date** and **Time**

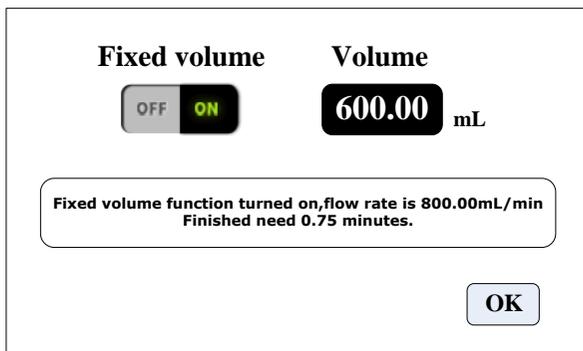
button, enter date and time setting interface. The date and time will display on the top right corner of main interface.

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.

#### 4.11 Fixed Volume Measuring Interface:

Fixed Volume Measurement Interface as below:



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.

#### 4.12 Fix Time and Fix Volume Dispensing Interface:

Dispensing Interface as below:

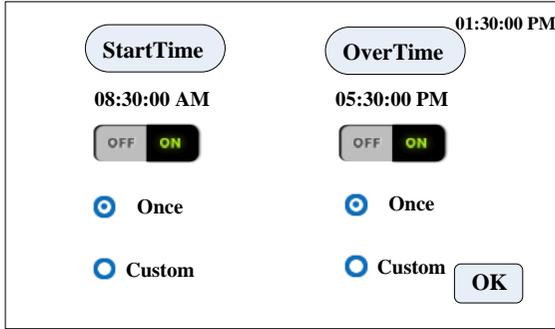
<b>Dispensing</b> <input type="checkbox"/> OFF <input checked="" type="checkbox"/> ON	<b>Runing time</b> <b>1.00</b> s	<b>Run times</b> <b>0002</b>
<b>Volume</b> <b>5.00</b> mL	<b>Suspend time</b> <b>1.00</b> s	<input type="button" value="OK"/>
Fixed time and volume function turned off, flow rate is 300.00mL/min speedis 103.44rpm		

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.

### 4.13 Timer Start And Stop Interface:

**Timer Start And Stop** Interface as below:

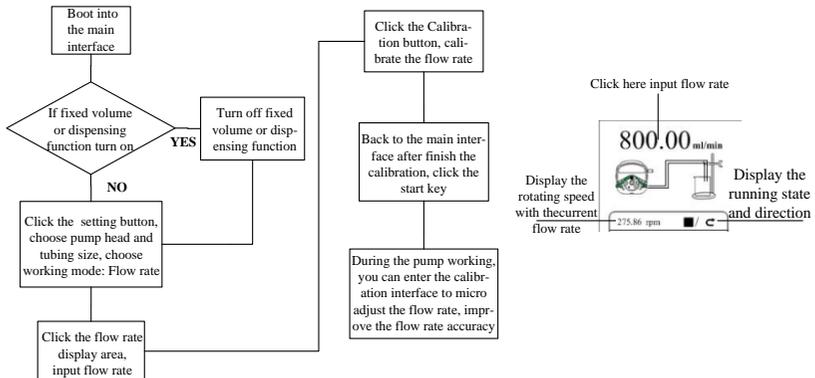


This function can be set pump start, stop time. The current time automatically reaches the set time to start or stop the motor.

When the quantitative measurement or quantitative open time, the end of the timer function is disabled.

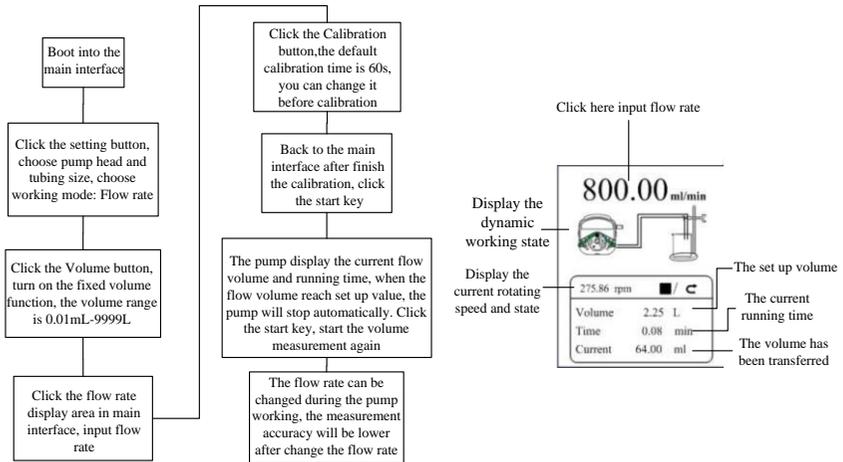
## 5. The Main Functions Of The Operation Process

### 5.1 Flow Rate Transferring Function



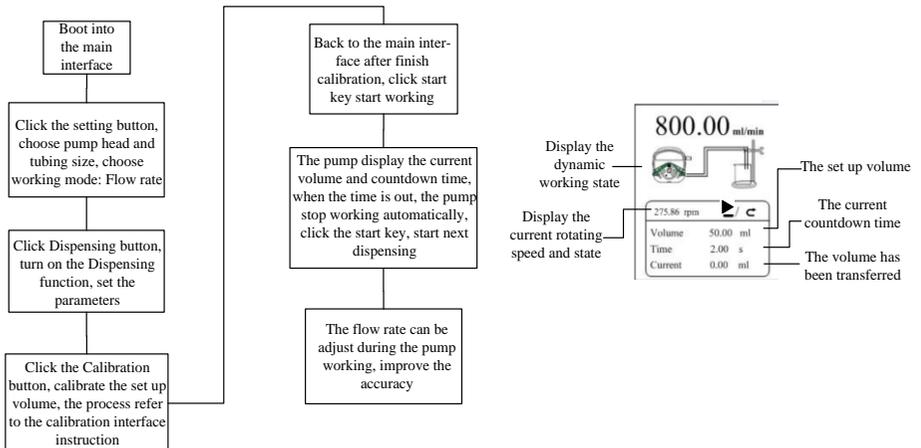
**Note: Flow rate calibration process please refer the flow rate calibration interface instruction.**

## 5.2 Fixed Volume Measurement Function



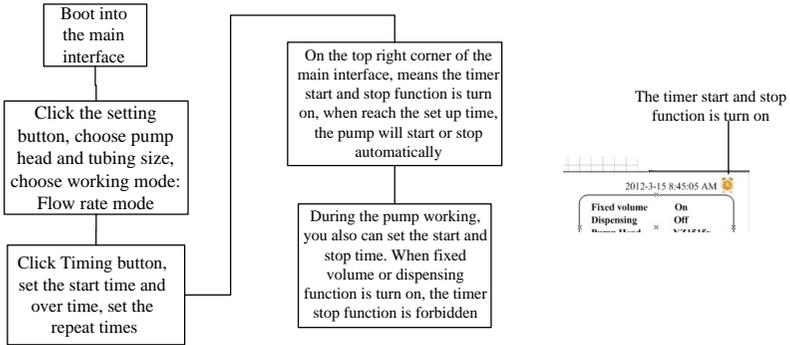
**Note: Flow rate calibration process please refer the flow rate calibration interface instruction.**

## 5.3 Dispensing

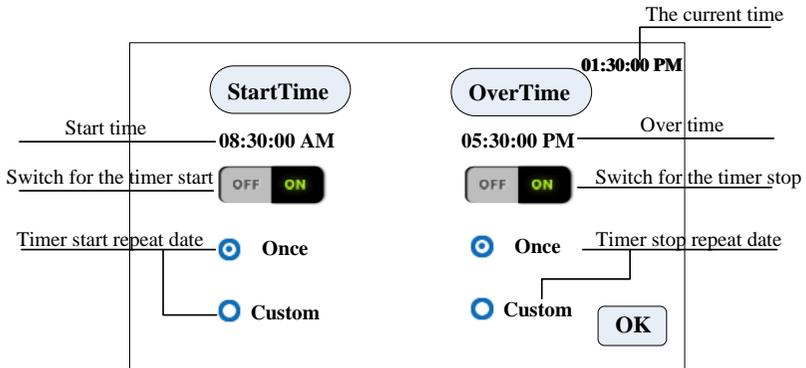


**Note: Flow rate calibration process please refer the flow rate calibration interface instruction.**

### 5.4 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**.

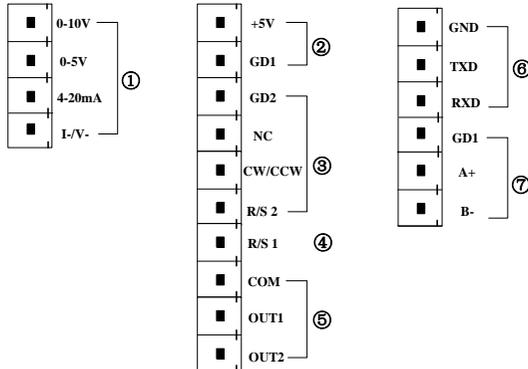
Click **Custom**, come out the repeat date window, as below:

<input checked="" type="checkbox"/> Monday	<input checked="" type="checkbox"/> Friday
<input checked="" type="checkbox"/> Tuesday	<input type="checkbox"/> Saturday
<input checked="" type="checkbox"/> Wednesday	<input type="checkbox"/> Sunday
<input checked="" type="checkbox"/> Thursday	<input type="button" value="OK"/>

Timer stop setting process is same with the timer start.

## 6. External Control Interface Description

External control interface as shown 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.

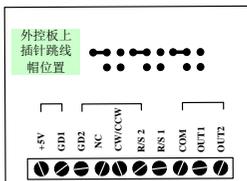
**I\_/V\_:** Analog signal negative terminal.

**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.

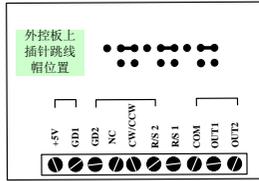
②. **Internal isolation 5VDC output**

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

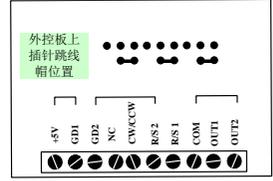
**If need change to 12VDC or 24VDC input, please open the controller housing, and change the jumper connection on the external control board as below :**



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

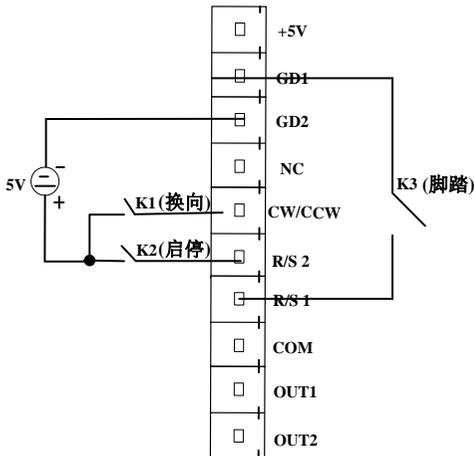
**R/S 2:** External control start/stop signal input

**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:**

**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.**

The external control wiring diagram is as follows



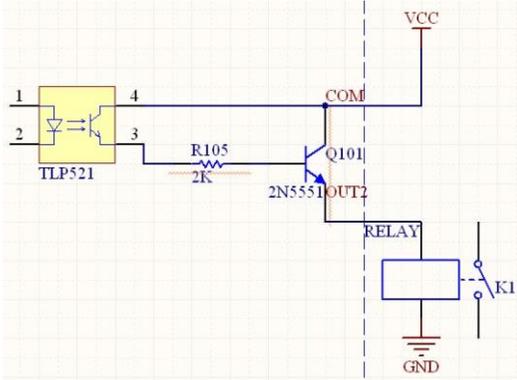
A. In pulse mode, the K2 is short and then disconnected, the motor is activated, and the motor is disconnected after a short time. In the level mode, the motor starts and the motor stops running after the motor starts.

B. In pulse mode, the motor will change once every time that K1 is short and then disconnects. In the level mode, the motor runs clockwise after the short of K1, and the motor runs counter clockwise.

C. In pulse mode, the K3 is short and then disconnected, the motor starts, and the motor is disconnected after a short time. In the level mode, after the K3 is short, the motor starts and the motor stops running.

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.

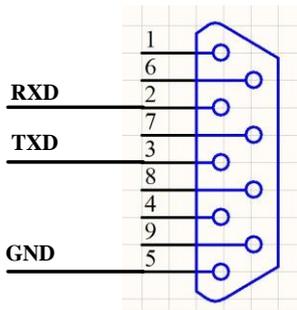
⑥. **RS232 Communication** : Choose RS232 in the Communication setting interface, this terminal is active.

**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.

### 7. V Series Technical specifications

Flow rate resolution	0.01ml/min	Power supply	AC 220V±10% 50Hz/60Hz(standard) AC 110V±10% 50Hz/60Hz (optional)
Operation mode	Touch screen and mechanical keypad	External control	TTL level
Temperature	0-40℃	Relative humidity	<80%
Communication interface	RS232/RS485	Output Interface	Output motor working status (open-collector-output)
Back suction angle	0-360 °	Protection rating	IP31
Motor Speed range	V1	0.1-150rpm	
	V3	0.1-350rpm	
	V6, V6-3L, V6-6L, V6-12L	0.1-600rpm	
Power consumption	V1/V3/V6	<50W	
	V6-3L	<80W	
	V6-6L	<180W	
	V6-12L	<300W	

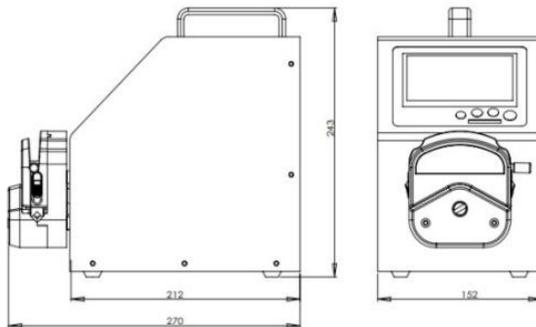
Motor type	V1/V3/V6	Stepper Motor
	V6-3L/V6-6L/V6-12L	Servo Motor

## 8. V Series Main Function and Features

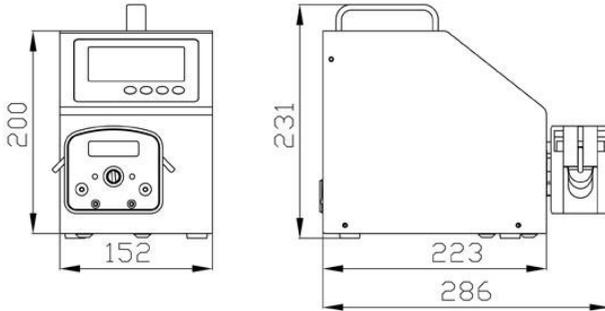
- 4.3 inch color touch screen control, dynamic display working status, the flow volume and motor speed display in the same screen.
- Intelligent calibration function, it can calibrate the flow rate and dispensing volume, ensure the flow accuracy, suitable for high accuracy transferring liquid.
- On-line 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 shell, anti-corrosion, meet industrial requirements.  
Anti-interference, can shield the interference signal.

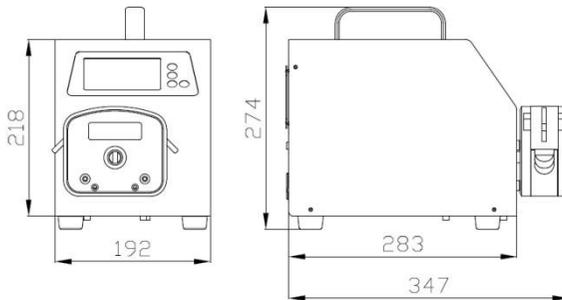
### 9. Product Dimension (mm):V1/V3/V6 product dimension



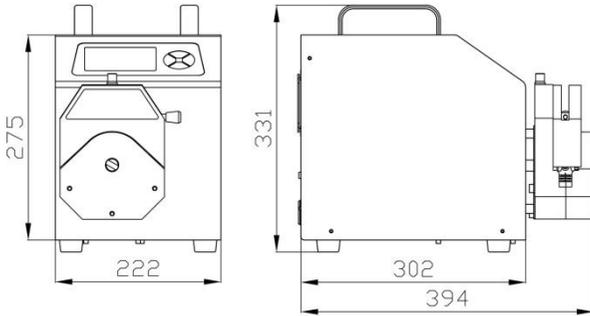
V6-3L Product dimension (mm)



V6-6L Product dimension (mm)



V6-12L Product Dimension (mm)



## 10. Maintenance

- In the pump is not working, the card will be pressed to release the hose to avoid prolonged squeezing the hose to produce plastic deformation.
- Pump head not resist of Super corrosive liquid, use should pay special attention。
- Pump rollers should be kept clean and dry. If the roller surface is not clean, it will increase the hose wear and tear, reduce hose life and lead to premature damage to the wheel.
- If there is liquid on it, wipe it off with cloth as soon as possible. If it is wet for a long time, it will cause damage to the roller.

## 11. Warranty and After-sales Service

- Product warranty for 3 year (excluding pump tube), during the warranty period as a result of improper operation or man-made damage, the Company is not responsible for the warranty. Over warranty repairs, only charge maintenance costs.
- This manual is prepared according to the products produced at the time of publication. As the products are continuously improved, the products produced after the publication may differ from the contents in the book, and are subject to change without further notice.
- Special Statement: This manual can not be used as the basis for any request to our company.
- The explanation of this manual is in Baoding Shenchen Pump Co., Ltd.
- Although make every effort, but negligence is inevitable, we sincerely welcome the masses of users criticism and correction.

MADE IN CHINA

**Baoding Shenchen Precision Pump Co., Ltd.**

Address: No. 103, Building 2, Pivot Industrial Park, Baoding, China.

Tel: 86-312-6780681, 6780636

Fax: 86-312-6780636

Website: [www.good-pump.com](http://www.good-pump.com)

Email: [info@good-pump.com](mailto:info@good-pump.com)