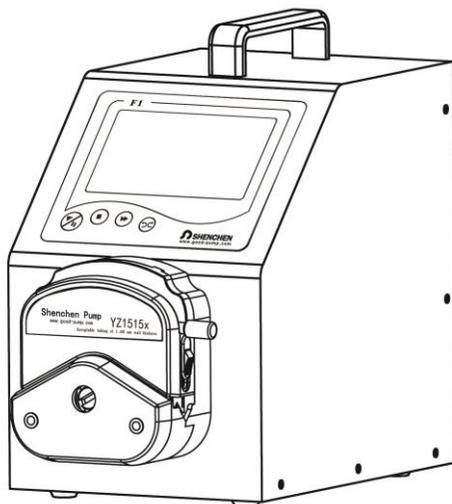# Shenchen Precision Pump Manual of F series

Baoding Shenchen Precision Pump Co.,Ltd.

⚠ 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

1. F Series Product Introduction

F series of peristaltic pump, with 4.3 inch color touch screen control, graphical interface, animation display working status, with the screen display filling parameters and system settings, attention to user experience, suitable for pollution-free, high-precision filling liquid, filling accuracy up to 0.5 %-1%.

2. F Series Product Appearance
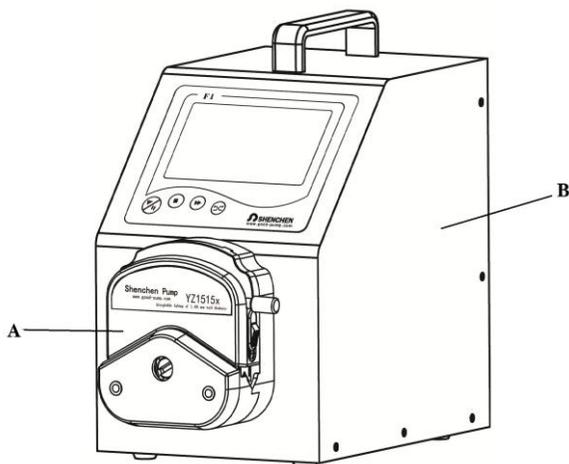
A——Pump Head
B——Drive
C——Power Switch
D——Power Socket
E——External Control Input Port
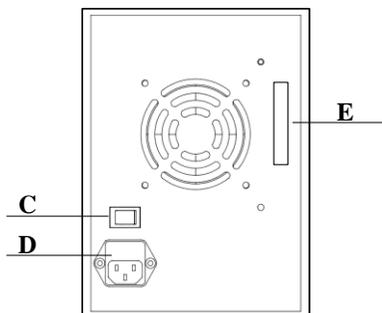
3.   F Series Keypad Instruction

```
                              ┌──────────────┐
                              │    MAIN       │
                              └──────────────┘
   ┌────────────┬──────────────┬──────────────┬──────────────┬──────────────┬──────────────┐
┌───────────┐ ┌───────────┐ ┌───────────┐ ┌───────────┐ ┌───────────┐ ┌───────────┐
│System Set │ │Calibration│ │Monitoring │ │Disp. Vol. │ │Disp. Time │ │Pause Time │
└───────────┘ └───────────┘ └───────────┘ └───────────┘ └───────────┘ └───────────┘
   ┌──────────┬──────────────┬──────────────┐
┌───────────┐ ┌───────────┐ ┌───────────┐ ┌───────────┐
│PumpHead   │ │Suck-Back  │ │Common     │ │Date       │
│&Tube      │ │Angle      │ │Mode       │ │&Time      │
└───────────┘ └───────────┘ └───────────┘ └───────────┘
                              ┌───────────┐
                              │Add        │
                              │Mode       │
                              └───────────┘
```
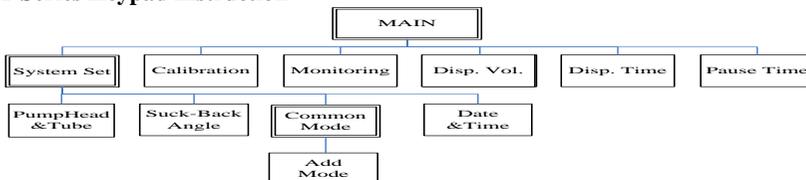
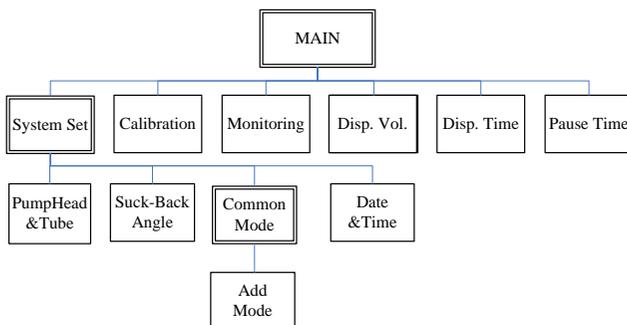➤   **Run/Pause Button：In dispensing mode**, after setting the dispensing data,
     press run/pause button, the pump start work; press run/pause button again,
     pause the current working. After press the run/pause button, except calibration
     and monitor button all other buttons on main interface become gray, can not be
     used.

     In transferring mode, press run/pause button, pump start working, now it do
     not have pause function.(In system setting interface, users can select working
     mode: dispensing mode or transferring mode.)

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

➤   **Full Speed Button**: Press this button at the stop state, the filling unit will
     running with 400rpm. This button is for washing tube and filling liquid
     rapidly.

➤   **CW/CCW Button:** Press this button, the motor will change running direction.

4. F Series Interface Composition

```
                        ┌──────────┐
                        │   MAIN   │
                        └──────────┘
   ┌──────────┬──────────┬──────────┬──────────┬──────────┐
┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐
│System Set│ │Calibration│ │Monitoring│ │Disp. Vol.│ │Disp. Time│ │Pause Time│
└──────────┘ └──────────┘ └──────────┘ └──────────┘ └──────────┘ └──────────┘
   ┌──────────┬──────────┬──────────┐
┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐
│PumpHead  │ │Suck-Back │ │Common    │ │Date      │
│&Tube     │ │Angle     │ │Mode      │ │&Time     │
└──────────┘ └──────────┘ └──────────┘ └──────────┘
                        ┌──────────┐
                        │Add       │
                        │Mode      │
                        └──────────┘
```

F Series Operation Interface Instruction:

4.1.Booting Interface：

After power on the system, enter the welcome interface, Click anywhere or wait

for 2.5 seconds, the system will automatically enter the English main interface.

4.2.Main Interface：

Main Interface Composition as below:
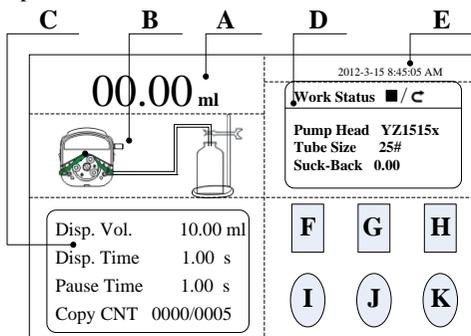
A. **Real-time Display Volume:** Select the specific mode and display
   content in the system setting interface. **In transfering mode,** display the
   speed or flow rate in real time, you can modify the motor speed or flow
   rate by directly clicking on A area. **In dispensing mode**, display
   dispensing volume or current total dispensing numbers.

B. **Real-time Dynamic Display:** Display the dispensing and transferring
   state and monitor result

C. **Real-time Parameter Display**
   In dispensing mode: Display dispensing parameters, include dispensing
   volume, current dispensing time count down,   current pause time count
   down, copy numbers.
   In transferring mode: Display the current transferring total volume,
   and current working time. The total transferring volume maximum is
   9999L. The current working time maximum is 9999 hour. Each one of it

reach the limit, both data will back to zero. Also can set the data back to zero in the system setting.

D.   Set Parameter Display: This area display current working state, pump head, tubing size and suck-back angle

E.   Date and Time Display: Display the current date and time, can amend it in system settings

F.   System Setting Button: Press this button enter system setting interface, include set the pump head and tube size, set the suck-back angle, set common mode, set current date and time.

G.   Flow Calibration Button: Press this button enter calibration interface.

H.   Real-time Monitor Button: Press this button enter monitor interface, you can check the flow rate, motor speed and dispensing efficiency here.

I.   Dispensing Volume Button: Press this button, the numerical keyboard come out,   input the dispensing volume here

J.   Time Button: Press this button, the numerical keyboard come out, input the filling time. Click confirm, it will ask whether continue to input the pause time, choose 'YES', you can input the pause time, choose 'NO', back to the main interface

K.   Copy Numbers Button: Press this button, the numerical keyboard come out, input the copy numbers. If input '0', the copy number is unlimited

4.3. Basic Configuration Interface：

On the main interface, click **System Setting** button, click **Configuration** button, enter Configuration interface.

Click Pump Head, Tube Size drop-down menu choose pump head and tube.

Reference flow rate display the minimum and maximum flow rate of the pump head and tube.
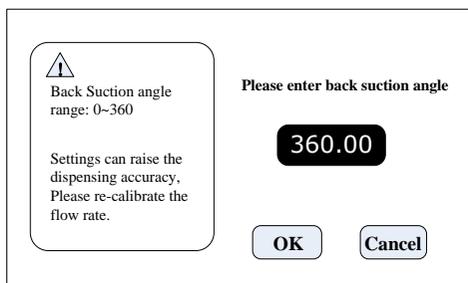
4.4. Mode Setting Interface

In main interface click ' System setting' button, click' Mode setting' button, enter mode setting interface. Users can choose transferring mode or dispensing mode freely. According with user's request, in transferring mode, can choose display motor speed or flow rate; in dispensing mode, can choose display filling volume or copy numbers. The display mode decide the content display in A area of main interface, can display current dispense volume or total numbers. Maximum dispense numbers is 9999, manual reset.

4.5 Back Suction Angle Setting Interface

Back suction angle setting interface as below：

⚠

Back Suction angle
range: 0~360

Settings can raise the
dispensing accuracy,
Please re-calibrate the
flow rate.

Please enter back suction angle

360.00

OK   Cancel

Click the **System Setting** button on the main interface, click **Suck-back** Angle button, enter suck-back angle setting interface. Click **Set Suck-back Angle** button, the numerical keyboard will come out, input the suck-back angle and click '**Confirm**' button, all the filling unit will work with this angle. Click '**Cancel**' button back to the system setting interface.

4.6.Common Mode Interface

Common Mode Interface as below：：

PumpHead	Tube	Disp. Vol.	Disp. Time	Pause Time	Suck-Back
YZ1515x	**14#**	**2**	**1**	**2**	**0**
YZ1515x	**16#**	**7**	**1**	**2**	**0**

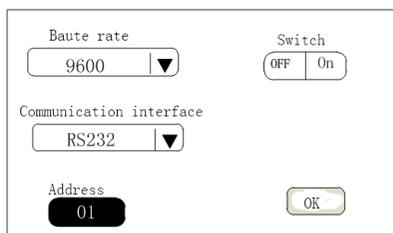《   Add   Dec.   Clear   OK   Cancel   》

Click **System Setting** button on the main interface, click **Common Mode** button, enter choose common mode interface.

➢ **Add Button:** Click this button to add one common mode, in dispensing mode .click **ADD** button to pop up and dialog box to ask if to add the curent setting to common mode.Clike **YES** to add this mode. It can totally save 60 modes.

➢ **Delete Button**：Choose one common button, click **Delete** button**,** it will ask whether

delete, click '**YES**', then you can delete this mode.

➢ **Clear Button**：Click this button, it will ask whether clear all data, click '**YES**', then

empty all the common mode.

➢ **Selecting Button:** Choose one of the common mode, click '**OK**' button, then it will

back to the main interface. The filling parameter is same as the one you chose

from the common mode.

➢ **Cancel Button:** Click this button back to the system setting interface**.**

➢ **Page Up/Down Button:** Can check previous page or next page common mode.

4.7 Communication Settings Interface

The communication setting interface as below;

Click '**System Setting**' button in main interface, click '**Communication setting**'

button,enter communication setting interface. Users can select baud rate and

communication interface RS232/RS485. Local address can be any number between

1 and 32.

4.8 Flow Calibration Interface

Flow Calibration Interface as below：

Click ' **Calibration**' button in main interface, enter flow rate calibration interface. In dispensing mode, calibration interface data: dispensing volume and dispensing time is the data set in main interface before. **In transferring mode**, dispensing volume is current flow rate refer to dispensing time. Click ' **Dispensing time**' to change the calibration volume.

Calibration process as below:

A. Confirm dispensing volume and time.

B. Click **Start** button to start the test, display countdown dispensing time, it will stop automatically, and the numerical keyboard come out, you can input the actual dispensing volume. After input the actual dispensing volume, it will ask whether continue test (suggest 3 times), choose '**YES**', it will test again; choose '**NO**', back to the calibration interface.

C. After several tests, actual dispensing volume display area display the average volume, click '**Calibration**' button, display calibrate successful.

D. If request higher accuracy, you can use the adjust function, click '**Add**' or '**Dec**' button, micro adjust the dispensing volume, meet high accuracy dispensing.

Online Micro Adjust Dispensing Volume Process：

If the dispensing volume is not correct during working, this function can micro adjust the volume online without affect the production line.

A) Click the Calibration button on the main interface, enter flow calibration interface.

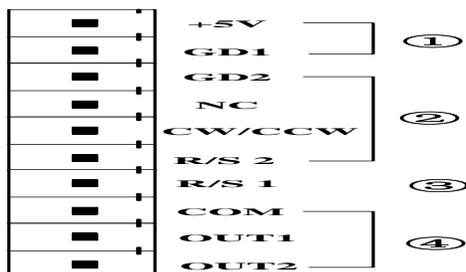B) Now only the 'Add', 'Dec' and 'Esc' button can be used, other button is

forbidden.

C) Click Add or Dec button to adjust the dispensing volume.

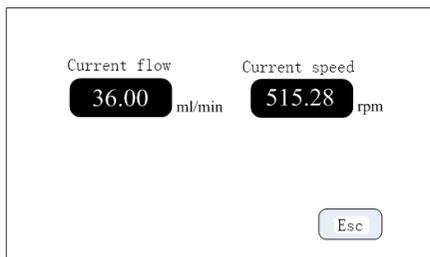**Click 'Reset' button, the data back to factory default data.**

4.9. Real-time Monitor Interface

A. Dispensing model Monitor Interface as below：

Click Monitor button on the main interface to enter the monitor interface, check the current flow rate, motor speed and dispensing efficiency.

B. Transferring mode monitoring interface as shown below

From the main interface, click the monitor button to enter the monitoring interface, can check the current flow rate and motor speed.

4.10. Date and Time Setting Interface

Date and Time Setting Interface as below：

Click **Date and Time** display in the main interface, enter the date and time setting interface.

Click **Set Date** button, the numerical keyboard come out, input the **Year,** setting year range is 1970-2099. After input the year, click confirm to set the month and day. Click **Set Time** button, the numerical keyboard come out, input the hour, minute and second.

5. **External Control Interface Instruction**

External Control Interface Instruction:
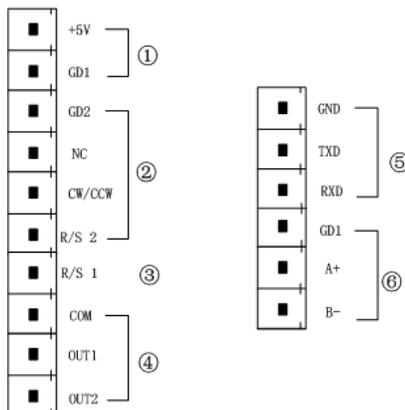
1)   Interior +5VDC output

2)   External control direction, start/stop signal input port: Active signal input (5

VDC)

If need change to 24VDC or 12VDC 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**
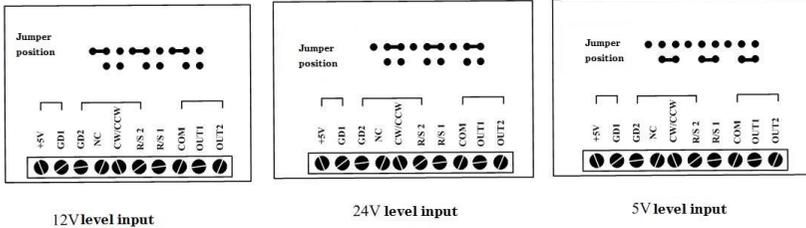
The signal recognition is rising edge effective, the minimum duration of the high

level is 200ms.

GD2：The common port of the external control signal input.

NC：External control full speed signal input (full speed with high level signal, stop

with low level signal).

CW/CCW：External control direction signal input (signal rising edge effective.)

R/S 2: External control start signal input (signal rising edge effective).

3)   R/S 1 :External control start/stop signal input port: Passive signal input

This port can be connected to a passive switch or a foot switch. Set the validity of

this input in the external control setting interface - foot switch option.

External control diagram as below:
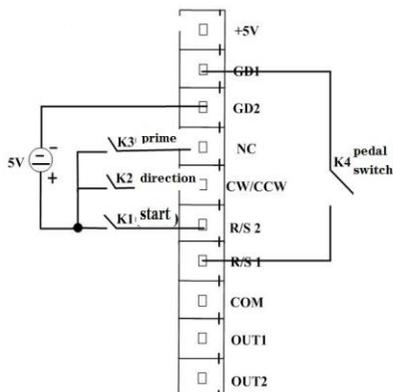
A. Disconnect K1 after short connect, the motor start working, disconnect
    again after short connect , pump pause working.
B. Short connect K3, the pump working with full speed. Disconnect, pump
    back to previous working status.
C. Each time disconnect K2 after short connect, the motor change working
    direction.
D. Disconnect K4 after short connect, the motor start working. Disconnect
    again after short connect, the motor stop working.

4)   Motor working status output.
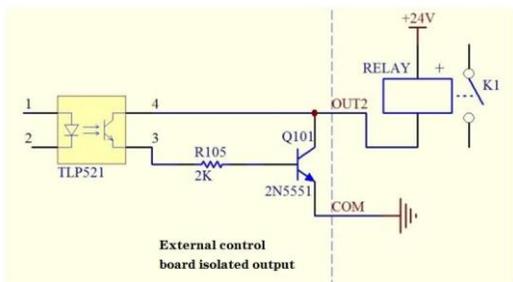
If it is an external relay, when the motor is running, K1 is closed, and when it
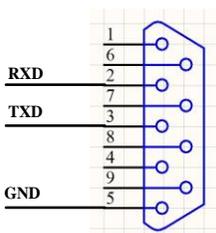stops, K1 is disconnected.

5) **RS232 communication port**: Select RS232 in the communication setting
interface, this port is valid.

GND: Communication ground terminal.

TXD: Master sending, peristaltic pump receive signal terminal.

RXD: Peristaltic pump sending, master receive signal terminal.

RS232 connection wiring diagramme as below:

6) RS485 communication port: Select RS485 in the communication setting
interface, this port is valid.

GD1:RS485 ground wire.

A+:connect with RS485 A+.

B-: connect with RS485 B-.

Note:A. Choose RS232 or RS485, the communication protocol is both
standard MODBUS protocol.

   B. Only when the pump in main interface, RS232 and RS485
   communication is workable.

## 6. F Series Technical Specification

| Dispensing Volume Range	0.1-9999.99ml	Power supply	AC 220V±10% 50Hz/60Hz （standard） AC 110V±10% 50Hz/60Hz （option）
Dispensing Time Range	0.5-9999.99s	External Control	Start/Stop signal
Pause Time Range	0.5-9999.99s	Communicatio n	RS232/RS485
Dispensing Volume Resolution	0.01ml	Temperature	0-40℃
Time Resolution	0.01s	Relative Humidity	<80%
Dispensing Numbers Range	1-9999，0 is unlimited.	Output	Output motor speed (Open collector output)
Back suction angel	0-360 °	IP rate	IP31
Motor speed	F1	1-150rpm	
	F3	1-350rpm	
	F6，F6-3L，F6-6L，F6-12L	1-600rpm	
Power consumption	F1/F3/F6	<50W	
	F6-3L	<80W	
	F6-6L	<180W	
	F6-12L	<300W	
Motor type	F1/F3/F6	Stepper motor	
	F6-3L/F6-6L/F6-12L	Servo motor	

7. F Series Function and Features

➢ Accurate angle control technology for high precision filling.

➢ Color screen touch control, friendly interface, animation display filling status, same screen display filling parameters and system settings.

➢ Intelligent calibration function to calibrate the filling volume before production to ensure filling accuracy.

➢ Online fine-tuning function makes it easy for you to fine-tune in real time during production to prevent hose fatigue and elasticity from reducing errors.

➢ 60 common filling modes can be stored, saving users time setting parameters and improving work efficiency.

➢ Back suction angle setting to avoid liquid dripping during shutdown.

➢ External control start and stop function, realize unified control of upper computer when supporting filling line.

➢ Quick filling function, you can clean the hose or fill the pipeline with liquid.

➢ Support RS232/RS485communication.

➢ 304 stainless steel casing, anti-corrosion, no rust, in line with pharmaceutical GMP requirements.
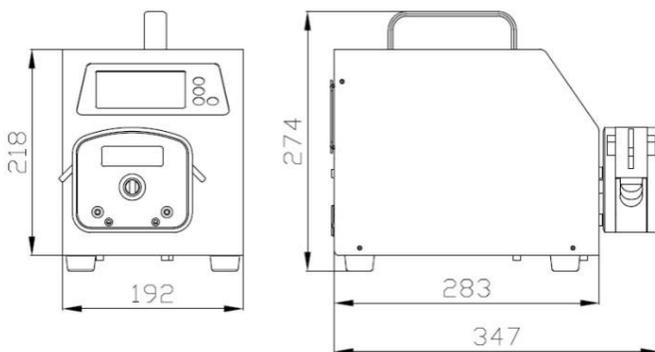
8. Product Dimension (Unit: mm)
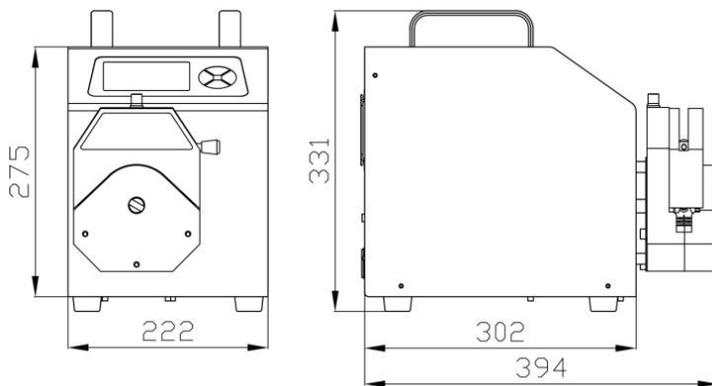
F1/F3/F6 dimension drawing as below:
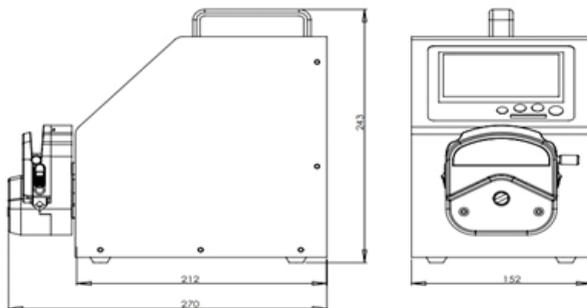
F6-3L dimension drawing as below:
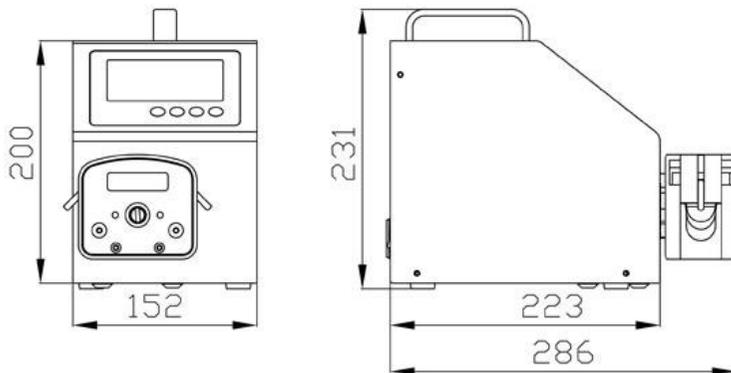
F6-6L dimension drawing as below:

F6-12L dimension drawing as below:

9. 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.

10. 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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