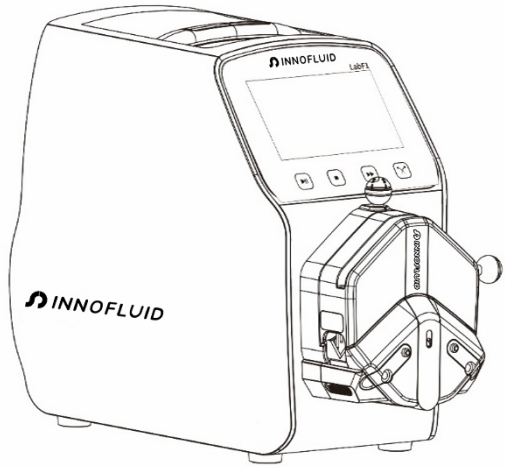
Manual of LabF-Series



Innofluid Co., Ltd.

Note:

- Please read the manual carefully before operating the product.

Warning:

- Connect the power cord to the wall socket directly and avoid using an extension electric wire.
- If the power cord or plug had wear and other damage, please disconnect the plug. (Hold the plug instead of the wire)
- If the following situations happen, please turn off the power supply and disconnect the plug. (Hold the plug instead of the wire)
  1. Fluid splash on the pump.
  2. You think the pump needs maintenance or repair.
- The user's power socket must have ground wire and reliable grounding.

Note: The foot pedal switch and other external control plugs must be connected or disconnected in the power-off status to prevent the external control interface from being burned.

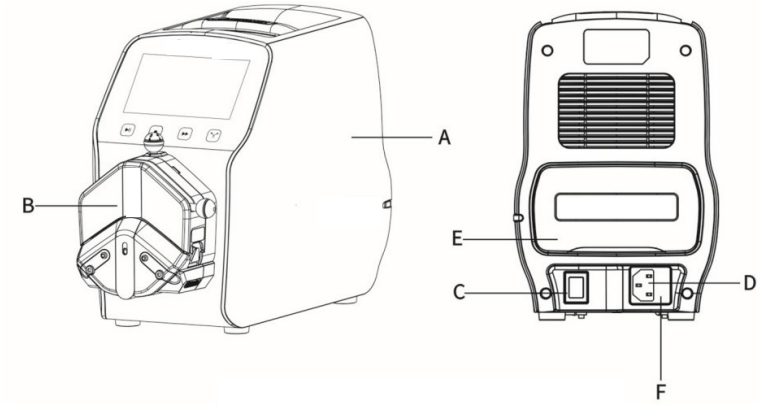
Catalogue

1. Product Introduction

LabF-series peristaltic pump, with 4.3-inch color touch screen control, graphical interface, animation shows working state. Filling data and system settings parameters are displayed on the same screen. Suitable for non-pollution and high precision liquid filling. The filling accuracy can reach 0.5%~1%. It can load different pump heads.

The Lab-series includes: LabF1, LabF3, LabF6, LabF1-II, LabF3-II, LabF1-III, LabF3-III and LabF6-III.

2. Product Appearance



A - Pump Head

B - Drive

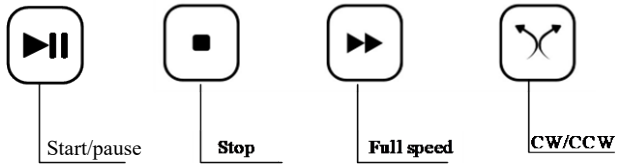
C - Power Switch

D - Power Socket

E - External Control Input Port

F - Built-in Fuse

3. Keyboard Instruction



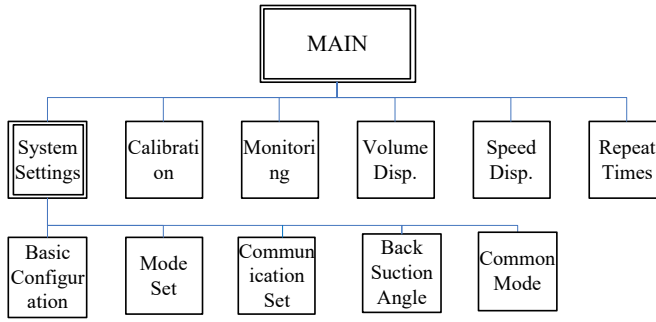
Start/pause button: In dispensing mode, after setting the dispensing data, press start/pause button, the pump will start working according to setting parameters; Press start/pause button again, pause the current working. After pressing the start/pause button, **in volume dispensing**, except calibration and monitor button all other buttons on main interface become gray and cannot be used. **In speed dispensing**, only the calibration button is available. When used for transmission, click the start/pause button and the device will run. There is no pause function currently.

Stop Button: Press stop button, pump stops working. The forbidden status button in main interface becomes available. Keep pressing the button and turn on the pump power supply, that will initialize the pump, and all parameters are restored to factory settings.

Full Speed Button: Keep pressing this button when the pump stops working or in transmission mode, it will work with maximum speed. This function can be used for washing tube or fast fill liquid.

CW/CCW Button: In stop state or transmission mode, press this button once, the motor running direction will be changed.

4. Operation Interface Composition



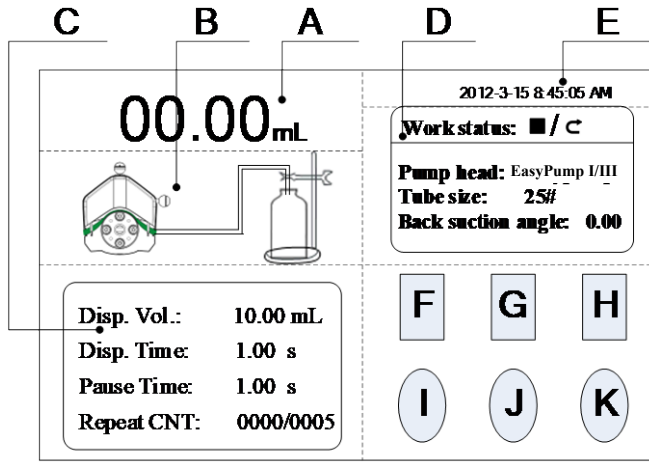
LabF-Series Operation Interface Instruction

4.1 Booting Interface

After power on the system, click anywhere or wait for 2.5 seconds it will enter the English main interface automatically.

4.2 Main Interface

Main interface composition as below:



A. **Real-time Display Volume:** Select the specific mode and display content from the mode settings in the system settings. **In transferring mode**, display motor speed or flow rate, change motor speed or flow rate by clicking A area directly. **In dispensing mode**, if it is volume dispensing, then display filling volume or total filling numbers, display the current value in real time after starting the operation. **In speed dispensing mode**, display the current motor speed or total filling numbers.

B. **Real-time Dynamic Display:** Display the dispensing and transferring state in real time, animation shows monitor result. Click pump head to display the SN code and version of this pump.

C. **Real-time Parameter Display**

1) **In dispensing mode:** Display dispensing volume (Dis. Volume mode) or dispensing speed (Dis. Speed mode), current dispensing time count-down, current pause time count-down, and copy numbers.

2) **In transferring mode:** Displays the total volume of the current transfer, and current working time. The total transferring volume maximum is 9999L. The current working time maximum is 9999 hours. When each of them reaches the limit, both data will be back to zero. Also, you can set the data back to zero in the system setting.

D. **Setting Parameter Display:** This area displays the current working state, pump head, tubing size and other parameters.

E. **Date and Time Display:** Display the current date and time, click it and you can revise it.

F. **System Settings Button:** Press this button to enter system settings interface, including: basic configuration, mode setting, communication setting, back-suction angle, and common mode.

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

H. **Real-time Monitor Button:** Press this button enter monitor interface, you can

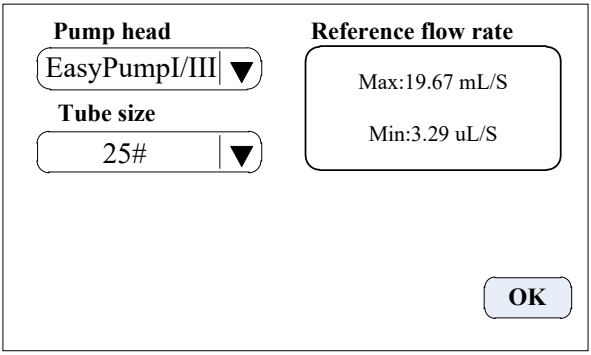
check the current settings of flow rate, motor speed and dispensing efficiency here. The monitor button is forbidden to use in the dispensing mode of the speed dispensing.

I. **Volume Dispensing Button:** Press this button to enter the volume setting interface. If in transferring mode, it is forbidden.

J. **Speed Dispensing Button:** Press this button, and the numerical keyboard comes out, input the dispensing speed here. If in transferring mode, it is forbidden.

K. **Copy Numbers Button:** Press this button, and the numerical keyboard comes out, input the copy numbers. If input '0', the copy number is unlimited. In transferring mode, it is forbidden.

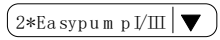
4.3 Basic Configuration Interface as Below



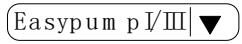
In the main interface, click **System settings** button, click the **Basic Configuration** button, enter basic configuration interface. Click pump head, tubing size to select correct pump head model and tubing size. Reference flow-rate area displays the maximum and minimum flow rate of current pump head and tubing.

Note that: When the pump comes with two pump heads, the output of two pump heads are connected to one channel with Y-type connector, then you will need to choose 2* pump head model; if the two pump heads use as two channels, then you need to choose single pump head model number.

For example, the pump comes with two EasyPumpI, and output connect with Y-type connector to one channel, then when choose pump head need to select 2*EasypumpI, as in below picture:

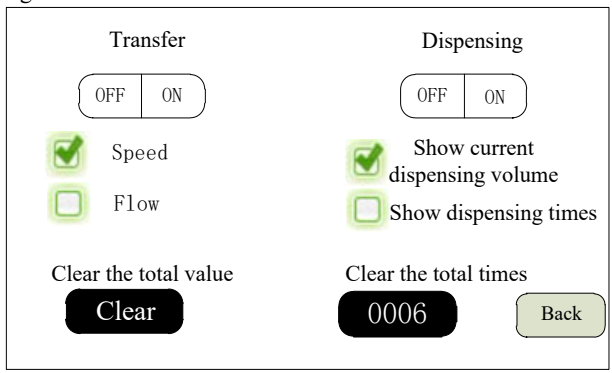


In other cases, such as: the pump comes with one pump head EasypumpI, or with two EasypumpI use as two channels, or with 3 or 4 EasypumpI pump heads, need to select single pump head EasypumpI, as in below picture:



4.4 Mode Setting Interface

Mode Setting Interface as below:

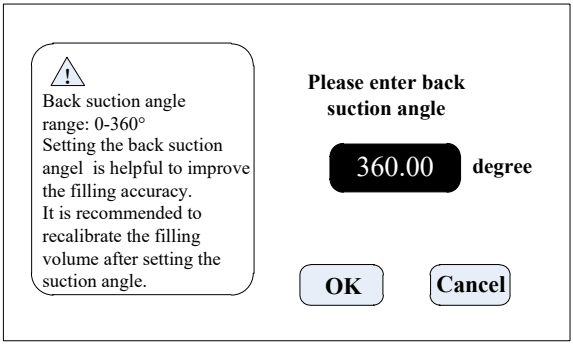


Users can choose transferring mode or dispensing mode freely according to demands.

In dispensing mode, choose displaying filling volume or copy numbers in main interface. The current total number of dispensing can be cleared manually, and it will be cleared automatically after the maximum count reaches 9999 times.

In transferring mode, choose display motor speed or flow rate; click “Clear” button, you can manually clear the total amount of transmission. And the total running time will be cleared together.

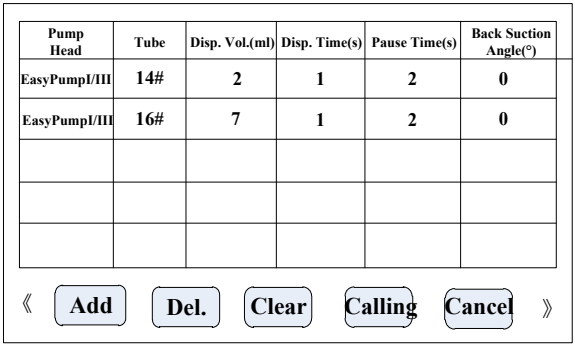
4.5 Back Suction Angle Setting Interface



Click the **System Settings** button on the main interface, click **Back Suction Angle** button, enter back suction angle setting interface. Click **Set back suction angle** button, the numerical keyboard will come out, input the back suction angle and click **OK** button, Click **OK** button back to the system settings interface.

The back suction angle range is 0-360°.

4.6 Common Mode Interface



Click **the System Settings** button in main interface, click **Common Mode** button (it is forbidden to use in dispensing speed mode), enter common mode interface.

Add button: Click this button to increase one common mode. In dispensing mode, click **Add** button, and out comes a window asking whether to add the current setting

into common mode. Click '**Yes**', then add this mode into common mode. Maximum you can save 60 common modes.

Delete button: Choose one common mode, click **Delete** button, then you can delete this mode.

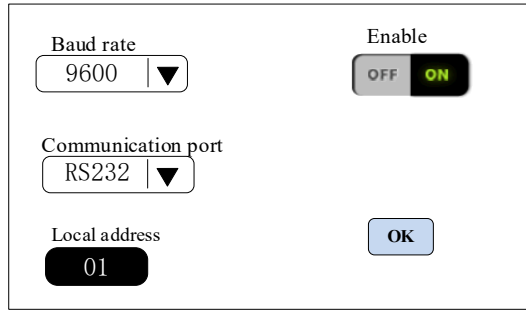
Clear button: Click this button, come out a window asking whether to clear all data, click '**Yes**', to clear all modes.

Calling button: Select one common mode, click the **Calling** button, then go back to the main interface. The dispensing parameters is the one mode you have just selected.

Cancel button: Click this button back to main interface.

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

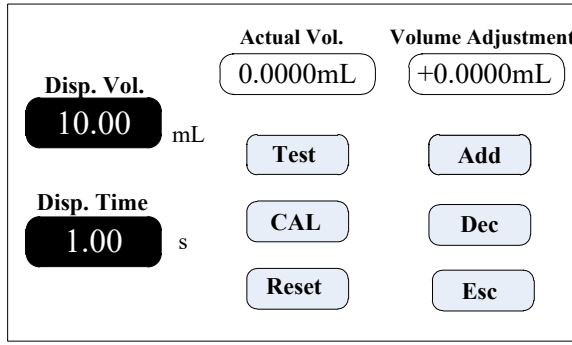
4.7 Communication Setting Interface



Users can select baud rate and communication interface RS232/RS485. Local address can be any number between 1 and 32.

For other parameters, please see the protocols for the detailed instruction.

4.8 Flow Rate Calibration Interface



In volume dispensing mode, calibration interface data: **dispensing volume** and **dispensing time** (When in speed dispensing mode, here it shows the **Disp.speed** and **Disp.time**) is the data that was set in the main interface before.

In transferring mode, **dispensing volume** is current flow rate refers to dispensing time. Click **Dispensing time** to change the calibration volume.

Calibration process as below: Confirm dispensing volume and time.

Click **the Test** button to start the test, and it displays a countdown of **dispensing time**. It will stop automatically, and the numerical keyboard will come out, so you can input the actual dispensing volume. After inputting the actual dispensing volume, it will ask whether to continue the test (suggested no. is 3 times), choose '**YES**', and it will test again; choose '**NO**', and you go back to the calibration interface.

After several tests, the actual dispensing volume display area display the average volume, click the **Calibration** button, and it display calibration is successful.

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

Click **Reset** button, to restore to the factory default calibration parameters.

Online Micro Adjust Dispensing Volume Process:

If the dispensing volume is not correct during work, this function can micro-adjust the volume online, without affecting the production line.

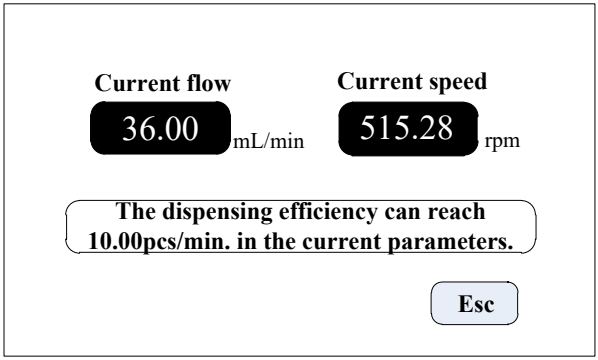
Click the **Calibration** button on the main interface to enter the flow calibration interface. Now only the **Add**, **Dec** and **Esc** button can be used, all other buttons are forbidden. Click **Add** or **Dec** button to adjust the dispensing volume.

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

Note: Dispensing mode - in the speed dispensing mode, you can only make online micro-adjustments, if you click the Add button, the speed adds 1 rpm, if you click the Dec button, the speed reduces 1rpm.

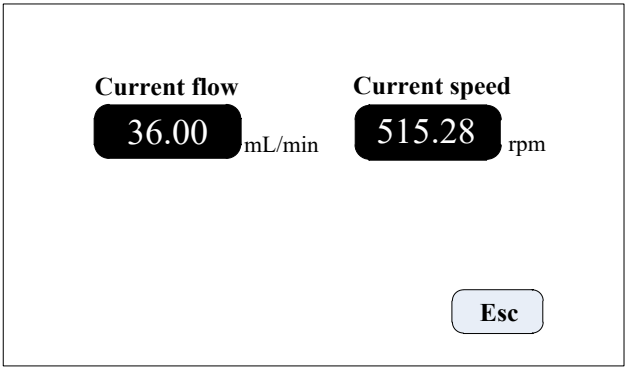
4.9 Real-time Monitor Interface

In dispensing mode, the monitor interface is as below:



Click **Monitoring** button in main interface to enter the monitor interface, check the current flow rate, motor speed and dispensing efficiency. (In speed dispensing mode, it is forbidden)

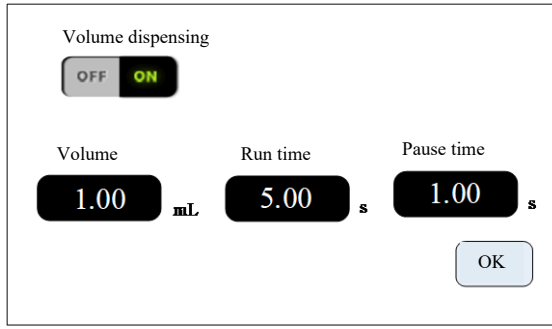
In transferring mode, the monitor interface is as below:



Click **Monitoring** button in main interface, enter the monitor interface, check the current flow rate and motor speed.

4.10 Volume Dispensing Interface

In Volume Dispensing mode, the monitor interface is as below:

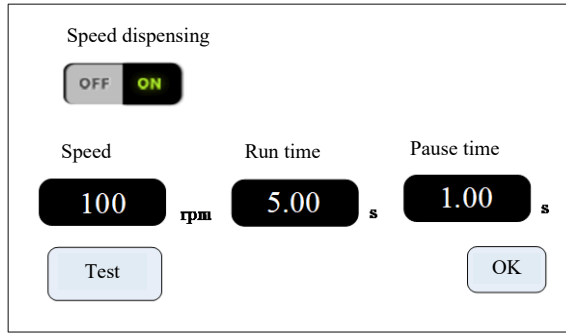


Click the **Volume dispensing** button on the main interface to enter the dispensing volume setting interface.

First, turn on the volume dispensing function, then enter other parameters. After the parameter is entered, click the **OK** button to return to the main interface.

4.11 Speed Dispensing Interface

In Speed Dispensing mode, the monitor interface is as below:



Click the **Speed dispensing** button on the main interface to enter the dispensing Speed setting interface.

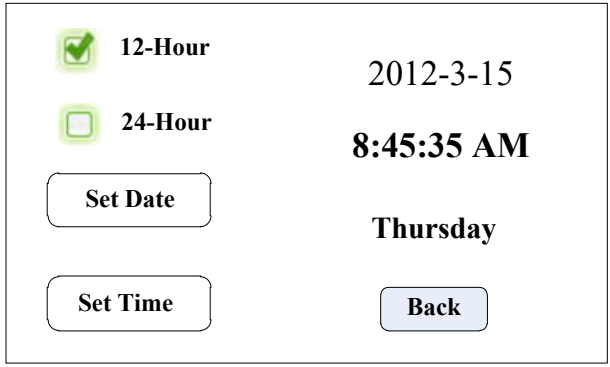
First, turn on the Speed Dispensing function, then enter other parameters. After the speed and run time parameter is entered, click the **Test** button, and the machine will run once according to the setting motor speed and run time.

Click the OK button to return to the main interface.

Note: Volume Dispensing mode and Speed Dispensing mode, only one of them can be effective at the same time. When one working mode is enabled, the other will automatically become invalid.

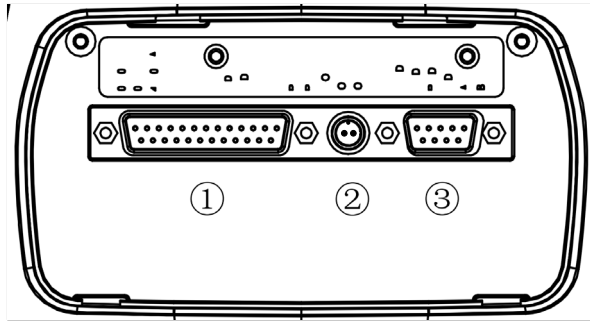
4.12 Date and Time Setting Interface

Click **Date and Time** display on the top right corner, to enter the date and time setting. The interface is as below:

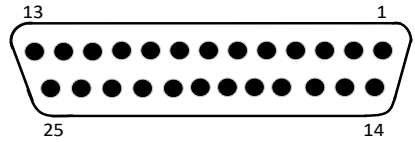


Click the **Set Date** button, the numerical keyboard comes out, input the **Year**, the setting year range is 1970-2099. After inputting the year, click confirm to set the month and day. Click **Set Time** button, and the numerical keyboard comes out, input the hour, minute and second in sequence.

5. External Control Interface Instruction



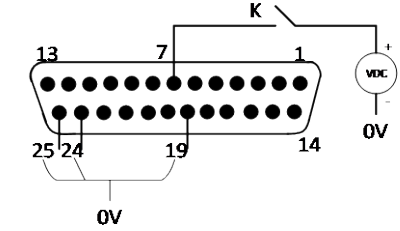
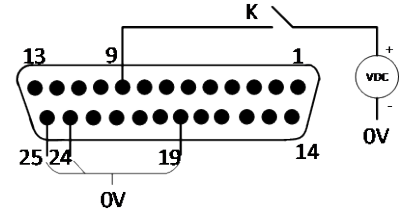
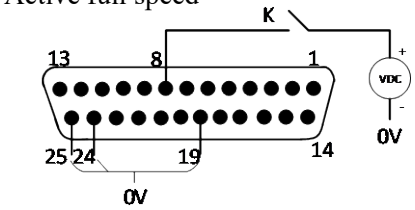
① DB25 external control connector instruction

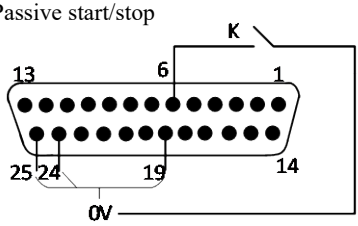
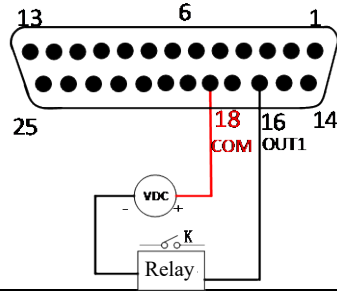


Pin	Pin Definition	Explanation	Note
1	/	/	/
2	/	/	
3	/	/	
4	/	/	
5	/	/	/
6	R/S1	External control start/stop signal with passive signal input	The passive switch or foot pedal switch can be connected with the terminal. Set the validity of this input in external setting interface-foot pedal option.
7	R/S2	External start/stop signal input	Active signal 5-24VDC input
8	NC	External full speed signal input	Active signal 5-24VDC input

			(Port of handheld dispenser provided by our company)
9	CW/CCW	External direction signal input	Active signal 5-24VDC input
10	/	/	/
11	/	/	/
12	/	/	/
13	/	/	/
14	/	/	/
15	/	/	/
16	OUT1	Operating status output terminal 1	Port of handheld dispenser provided by our company
17	OUT2	Operating status output terminal 2	/
18	COM	Provides voltage for logic outputs	Port of handheld dispenser provided by our company
19	GD2	Output ground	Port of handheld dispenser provided by our company
20	/	/	/
21	/	/	/
22	/	/	/
23	+5V	Internal 5V output positive terminal	Port of handheld dispenser provided by our company
24	GD1	Internal 5V output negative terminal	
25	0V	Connected internally to GD1 and GD2	

External control wiring and function description

<table>
<tr><th>Signal and wiring</th><th colspan="2">Function description</th></tr>
<tr><td>Active start/stop
 
</td><td>Short circuited K then disconnect, the motor starts running. Short circuited and disconnect again, motor stops running.</td><td rowspan="3">The wiring here is an external active signal, and customers can choose to use the+5V output from pin 23 for their own use.</td></tr>
<tr><td>Active direction
 
</td><td>Short circuited and then disconnect K once, the motor changes working direction once.</td></tr>
<tr><td>Active full speed
 
</td><td>Short circuited K, the motor will run with full speed; Disconnect it, the motor stops.</td></tr>
</table>

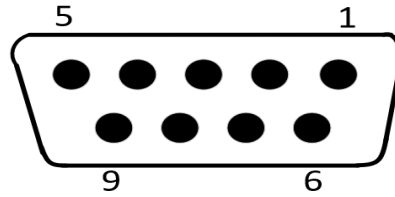
Passive start/stop 	Short circuited K then disconnect, the motor starts running; short circuit K and disconnect again, motor stops running.
Operation status output 	If connect with relays, when the motor runs, K connect; when the motor stops running, the K disconnect.

② XS6 Connector

Pin	Pin Definition	Explanation	Note
1	R/S1	External control start/stop signal with passive signal input	The passive switch or foot pedal switch can be connected with the terminal. Set the validity of this input in external setting interface- foot

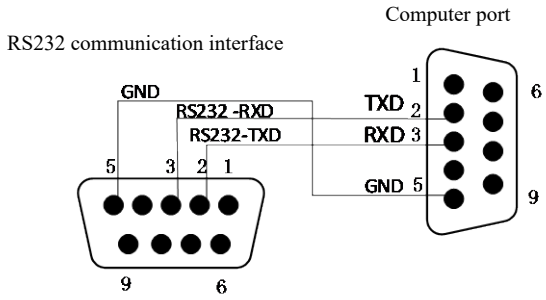
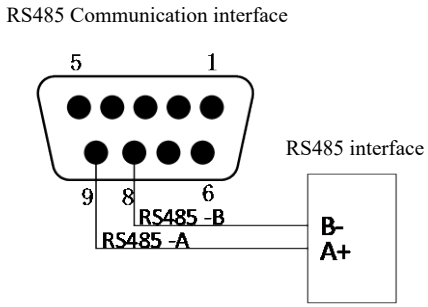
			pedal option.
2	GD1	Internal 5V output negative terminal	/

③ DB9 Connector



Pin	Pin Definition	Explanation	Note
1	/	/	/
2	RS232-TXD	Signal sent from the host computer, received by the peristaltic pump input terminal	Choose RS232 in the Communication setting interface, this terminal is active.
3	RS232-RXD	Signal sent from the peristaltic pump, received by the host computer input terminal	
4	/	/	/
5	GND	Communication ground port	
6	/	/	/
7	GND1	RS485 signal ground	
8	RS485-B	Connect RS485 B- terminal	Choose RS485 in the communication setting interface, this terminal is active.
9	RS485-A	Connect RS485 A+ terminal	

Communication line and function description

Signal and wiring	Function description
	RS232 communication interface: Choose RS232 in the Communication setting interface, this terminal is active.
	RS485 Communication Interface: Choose RS485 in the Communication setting interface, this terminal is active.

Note: 1) No matter if you choose RS232 or RS485, the communication protocol is standard MODBUS protocol.

2) Whether to choose RS232 or RS485, communication must be enabled in the main interface.

It should be noted that: when leaving the factory, the external control interface will be plugged with terminals. If you need to use other external control equipment of our company, such as a foot pedal, hand-held dispensers, etc., please unplug the terminals first, and then plug the external control equipment.

6. Technical Specification

<table>
<tr><td>Dispensing Volume Range</td><td colspan="2">0.1-9999.99ml</td><td>Power Supply</td><td>AC 220V±10% 50Hz/60Hz(standard) AC 110V±10% 50Hz/60Hz(optional)</td></tr>
<tr><td>Dispensing Time Range</td><td colspan="2">0.1-9999.99s</td><td>External Control</td><td>Switch signal</td></tr>
<tr><td>Pause Time Range</td><td colspan="2">0.1-9999.99s</td><td>Communication Interface</td><td>RS232/RS485</td></tr>
<tr><td>Volume Resolution</td><td colspan="2">0.01ml</td><td>Temperature</td><td>0-40℃</td></tr>
<tr><td>Time Resolution</td><td colspan="2">0.01s</td><td>Relative Humidity</td><td><80%</td></tr>
<tr><td>Dispensing Numbers Range</td><td colspan="2">1-9999, 0 is unlimited</td><td>Output Interface</td><td>Output motor working status (Open-Collector output)</td></tr>
<tr><td>Back Suction Angle</td><td colspan="2">0-360°</td><td>IP Rate</td><td>IP31</td></tr>
<tr><td rowspan="3">Speed Range</td><td>LabF1, LabF1-II, LabF1-III</td><td colspan="3">0.1-150rpm</td></tr>
<tr><td>LabF3, LabF3-II, LabF3-III</td><td colspan="3">0.1-350rpm</td></tr>
<tr><td>LabF6, LabF6-III</td><td colspan="3">0.1-600rpm</td></tr>
<tr><td rowspan="2">Power Consumption</td><td>LabF1, LabF1-II, LabF3, LabF3-II, LabF6</td><td colspan="3"><50W</td></tr>
<tr><td>LabF1-III, LabF3-III, LabF6-III</td><td colspan="3"><80W</td></tr>
</table>

Motor	LabF1, LabF1-II, LabF3, LabF3-II, LabF6	Stepper motor
	LabF1-III, LabF3-III, LabF6-III	Closed-loop stepper motor

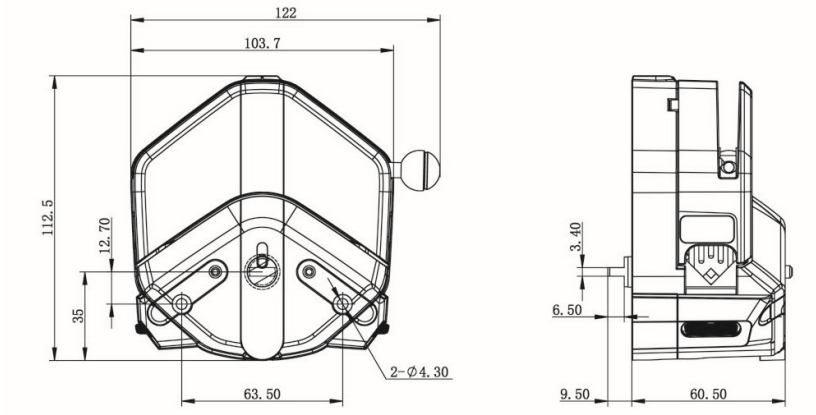
7. Main Functions and Features

- Accurate angle control technology, high precision filling.
- Color touch-screen control, with animated display of filling state. The filling parameters and system settings are displayed at the same screen.
- Intelligent calibration function, it will calibrate the filling volume before production to ensure the filling accuracy.
- Online micro adjusting function, makes it convenient to micro-adjust the filling unit during production progress. It can avoid filling errors because of tubing fatigue and elasticity decreased.
- The pump can store 60 commonly used filing modes, save users setting time, and improve work efficiency.
- Back suction angle setting, to avoid liquid drop-off when the pump stops working.
- External control of the start and stop functions, allowing unified control by the host computer when operating in a filling line.
- Fast filling liquid function, which not only can wash the tubing, but also can fill liquid in the tubing.
- Support RS232/RS485 communication protocol.
- ABS engineering plastic housing, resist corrosion, anti-static protective coating.

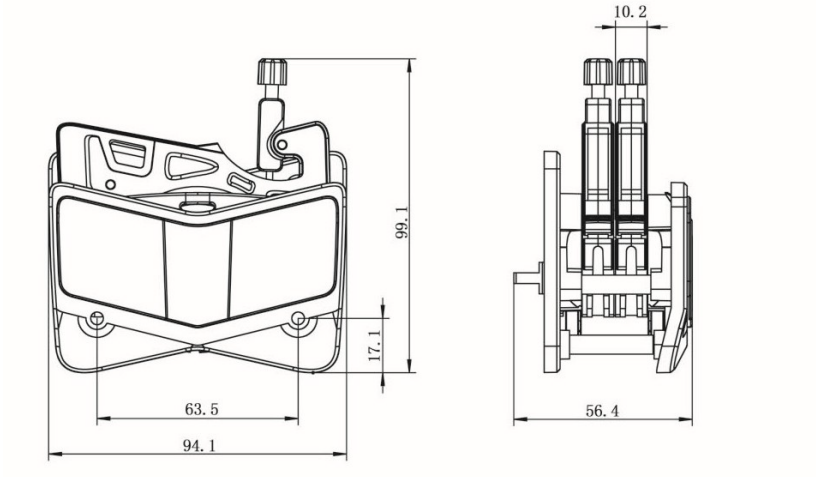
8. Dimension Drawing

Unit: (mm)

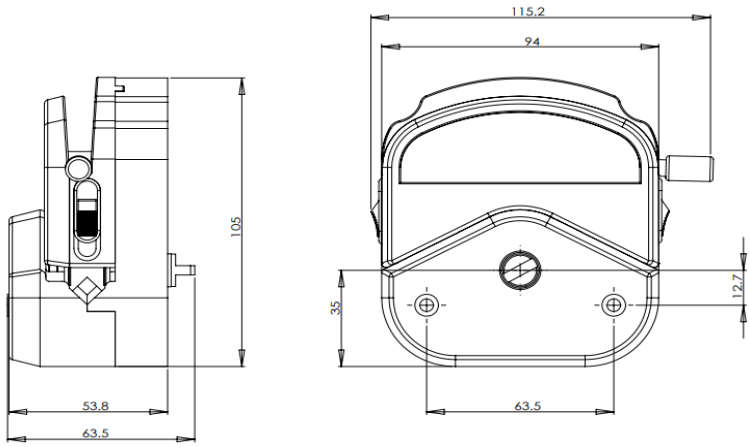
8.1 Single Pump Head



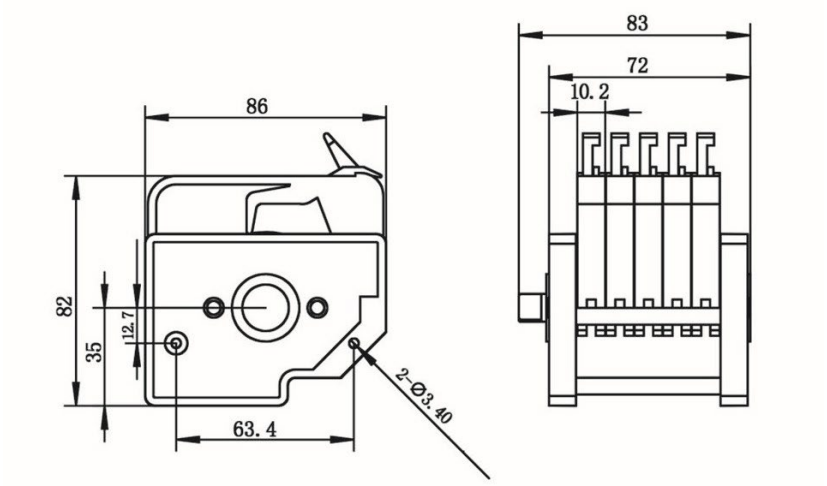
EasyPump Pump Head



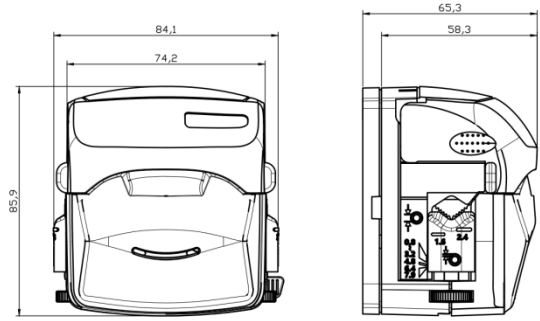
AMC2 Pump Head



YZ1515x Pump Head

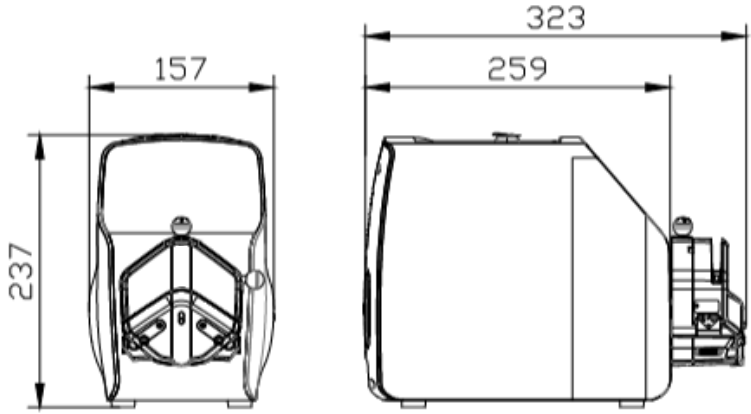


MC Pump Head



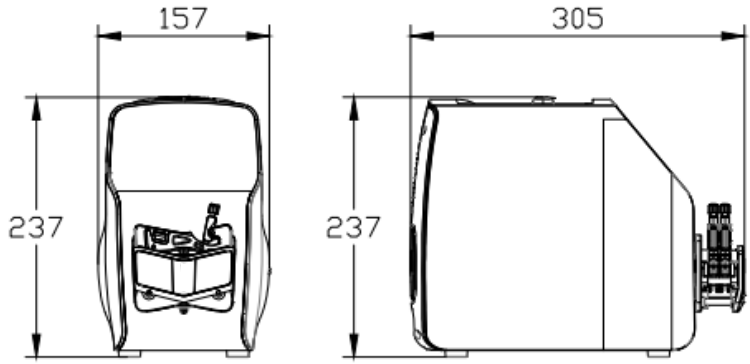
KD15 Pump Head

8.2 LabF Series Product



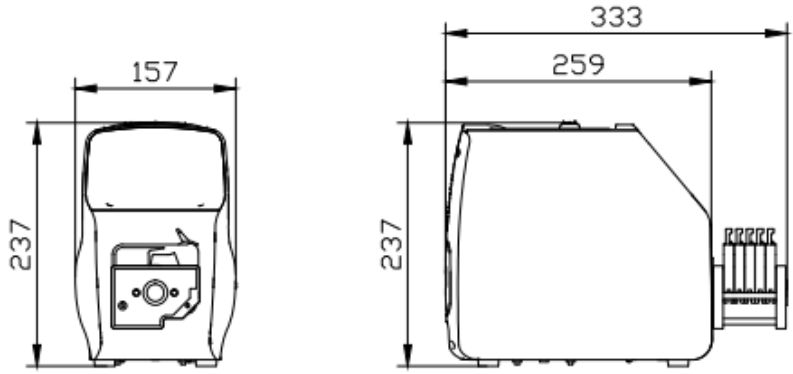
LabF + EasyPump Head

Note: For each additional pump head in series, the longitudinal dimension shall be increased by 61mm.



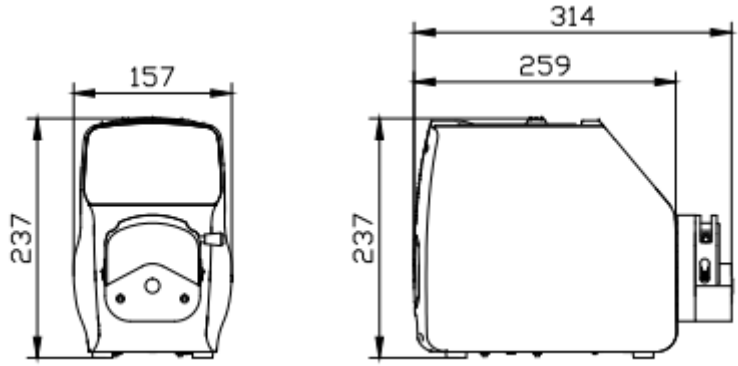
LabF + AMC Pump Head

Note: For each additional channel, the longitudinal dimension shall be increased by 10mm.



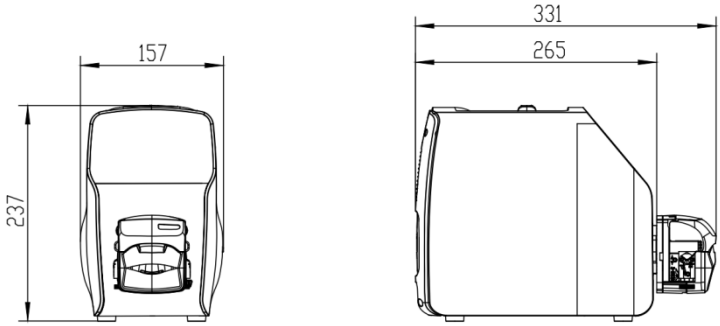
LabF + MC Pump Head

Note: For each additional channel, the longitudinal dimension shall be increased by 10mm.



LabF + YZ1515X Pump Head

Note: For each additional pump head in series, the longitudinal dimension shall be increased by 55mm.



Note: For each additional pump head in series, the longitudinal dimension shall be increased by 63mm.

9. Maintenance

9.1 Check the running status of machine before starting it, normal operation can be put into use.

9.2 Check for leakage and correct any faults that may occur.

9.3 Clean up any liquid overflow from the pump promptly.

9.4 If liquid splashes on the pump, please turn off the power supply and unplug the power socket (hold the socket, not the power cord). Check if any liquid has entered the machine. If it has, please contact the manufacturer.

9.5 The foot pedal switch and other external control plugs must be connected or disconnected in the power-off status to prevent the external control interface from being burned.

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

9.7 This product has no waterproof measures. Please take protective measures when using in water environment.

9.8 This product does not have special certification such as medical certification. When it needs to be used in special fields such as medical and military, please self-certify.

9.9 If the pump is not used for a long time, please clean it and keep it in dry and ventilated environment.

9.10 The company shall not bear the direct and indirect losses caused by the malfunction or improper operation of this product.

10. Warranty and After-sales Service

We support 3 years warranty for the pumps, subject to the exceptions below. Our company shall not be liable for any loss, damage, or expense directly or indirectly related to or arising out of the use of its products. This warranty does not obligate our company to bear any costs of removal, installation, transportation, or other charges which may arise in connection with a warranty claim.

If the pump fails during the warranty period, after confirmation by our technical department, we will provide spare parts free of charge. Customers will need to bear the shipping cost.

Exceptions:

- The warranty shall not apply to repairs or service necessitated by normal wear and tear or for lack of reasonable and proper maintenance.
- All tubing and pumping accessories as consumable items are excluded.
- Electrical surge as a cause of failure is excluded.
- Chemical attacks are excluded.
- Improper operation or man-made damage as a cause of failure is excluded.

Innofluid Co., Ltd.
Add: Building 10, No. 860, Xinyang Road, Lingang New Area, Pilot Free Trade Zone, Shanghai, China.
Manufacturer: Baoding Shenchen Precision Pump Co., Ltd.
Tel: 0086-312-5958380
Fax: 0086-312-6780636
Website: www.innofluid.com
Email: info@innofluid.com
MADE IN CHINA