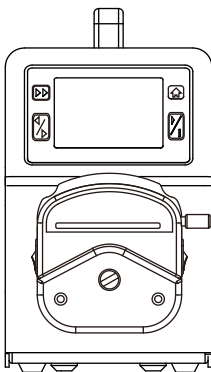


PRODUCT OPERATION MANUAL



NEXT 100FC 300FC 600FC

//Thank you for choosing the peristaltic pump, please read this manual carefully
before use to ensure correct operation, use effect and product maintenance.//

V1.1

• Important information •

- Please read this operation manual carefully before using the product!
- The contents of this operation manual are for reference only.
- The company reserves the right to change the product (design or specification) without prior notice.
- If you need the latest version of this manual, please contact the company or an authorized distributor.

• Safety warning •

- Before any cleaning or maintenance work, be sure to cut off the power supply.
- The tube may have cracks due to wear and tear, causing liquid to overflow from the tube, which may cause harm to the human body and equipment, so check it frequently and replace the tube in time!
- Please connect the power cord directly to the wall outlet, and avoid using extension cords.
- If the power cord or plug is frayed or otherwise damaged, please unplug the power plug (hold the plug in your hand, not the power cord).
- If the following situations occur, turn off the power and unplug the power plug (hold the plug instead of the power cord):
 1. Fluid is spilled on the machine.
 2. You think this machine needs maintenance or repair.
- The power supply must have a reliable grounding.
- The foot switch or other external control plug must be installed and unloaded when the power is off to prevent the external control interface from being burned.

QUICK INSTALLATION OPERATION

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PART 1 Matters needing attention

>>Matters needing attention

Please read the operating instruction manual carefully before operating this equipment.

◆ **Safety:**

The staff responsible for the installation or maintenance of this equipment should have the experience and ability to carry out related work.

This product is not applicable to the ATEX explosion-proof directive and cannot be used in flammable and explosive environments.

When pumping dangerous liquids, please follow safety precautions.

Please determine whether you need to wear personal protective equipment when operating the pump in accordance with the nature of the transfer fluid and industry specifications.

Non-professionals should not install this pump with other equipment to reduce safety risks.

For hazardous fluids, a dedicated operation process must be specified to prevent personal injury.

The power plug can disconnect the power supply and drive in an emergency. Do not place the pump in a workplace where it is difficult to cut off the power supply, which is conducive to emergency stop operations.

◆ **Tube:**

In the event of a tube failure, ensure that the fluid in the pump tube of the pump head can be discharged to a suitable container or drain.

In the event of a pipe failure, make sure that the fluid in the pump head pump pipe can be discharged to a suitable container or drain pipe.

A ruptured tube may cause fluid to splash. Please take appropriate protective measures.

When disassembling the tube, it is necessary to drain the medium and cut off the power supply to ensure that the pipeline is pressure-free.

Ensure that the chemicals to be handled are compatible with the pump head, tubes and Accessories.

◆ **Rollor :**

Do not touch the rollers while the pump is running.

Keep the rollers clean and dry to reduce tube wear.

Do not lubricate the pump head rollers by yourself. Improper operation may cause the tube to run out or the pump head shell to corrode.

◆ **Drive:**

There are no user-serviceable parts in the pump.

The power socket on the back of the driver is equipped with a user-replaceable built-in fuse. Only products of the same category can be used to replace the fuse.

The surface of the driver and the pump head are not resistant to organic solvents and strong corrosive fluids. If the liquid is splashed or accumulated, please remove and clean it in time.

PART 2 Unboxing

>>Unboxing

2.1 Unpacking inspection

Confirm that the pump is packaged in good condition. Please check the packing list, when unpacking, check the product model and the number of accessories, and check whether the parts are damaged during transportation. If you have any questions, please contact us immediately.

The packing list is sent with the goods, and the actual delivery content is subject to the list.

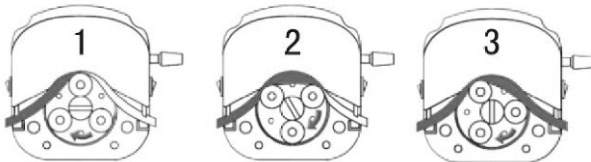
2.2 Product storage

This product can be stored for a long time, but before putting it into operation, please confirm that the drive, pump head or tubes and other accessories can be used normally. The tubes are commonly used consumables. Pay special attention to the use time and expiration date.

PART 3 Product description

>>Product description

3.1 Principle of Peristaltic Pump Operation



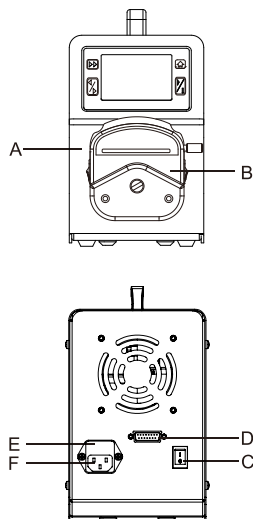
- ◆ The peristaltic pump uses the rotor to alternately squeeze and release the tube to transfer fluid, just like squeezing a tube full of fluid with a finger. As the finger slides forward, when a negative pressure is formed in the tube, the liquid flows with it.

3.2 Product features

- *Touch screen operation: 3.5-inch color LCD display in Chinese and English, intelligent operation;
- *Data storage: 8 groups of filling data can be stored for users;
- *Suckback function: can effectively prevent liquid from dripping and ensure transmission accuracy;
- *Full speed function: can quickly clean, fill and empty the tube;
- *Flow calibration: multiple calibrations can be performed to reduce flow rate error and ensure flow accuracy;
- *External control: support Modbus protocol, analog control, support customization;
- *Stable operation, high transmission accuracy and wide flow range;
- * It is suitable for a variety of pump heads, which can be matched and customized.

3.3 Product structure

· Drive



- A: Drive B: Pump head C: Power switch D: External interface
E: Fuse F: Power socket

· Pump head/tube selection and reference flow

【Digital speed type peristaltic pump-FC series can match the pump head】

Flow unit: (ml/min) Tube model (ID*Wall thickness) mm

 YZ1515x	Model	Max Speed	13# (0.8*1.6)	14# (1.6*1.6)	19# (2.4*1.6)	16# (3.1*1.6)	25# (4.8*1.6)	17# (6.4*1.6)	18# (7.9*1.6)
	BT100FC	100rpm	7	27	51	82	170	290	380
	BT300FC	300rpm	21	81	153	246	510	870	1140
	BT600FC	600rpm	42	162	306	492	1020	1740	2280
 TX315	BT100FC	100rpm	7	26	56	99	208	350	480
	BT300FC	300rpm	21	77	168	293	659	1050	1440
	BT600FC	400rpm	28	106	227	399	830	1400	1930
 YZ2515x	Model	Max Speed	15# (4.8*2.4)			24# (6.4*2.4)			
	BT100FC	100rpm	170			290			
	BT300FC	300rpm	510			870			
	BT600FC	600rpm	1020			1740			
 TX325	BT100FC	100rpm	180			300			
	BT300FC	300rpm	600			980			
	BT600FC	400rpm	760			1230			
 DG	Model	Max Speed	0.5*0.8	1*1	2*1	3*1	2.4*0.8		
	BT100FC	100rpm (10)	1.5	4	13	27	17		
		100rpm (6)	2	6	19	36	24		

(The flow is for reference only, please refer to the actual flow)

3.4 Technical parameter

Drive type	BT100FC	BT300FC	BT600FC
Max speed	100rpm (Reversible)	300rpm (Reversible)	600rpm (Reversible)
Speed resolution	0.1rpm	0.1rpm	0.1rpm
Max flow	480ml/min	1440ml/min	2280ml/min
Display mode	LCD(EN and CN)		
Speed control mode	Touch screen + keypad		
Power supply	AC220V±10% (Standard) or AC110V±10% (optional)		
Return suction angle	10°~720°(0° is no return suction)		
Return suction speed	10-100rpm	10-300rpm	10-300rpm
Power	<22W	<35W	<50W
External control interface	DB-15		
External control method	Start control/direction control/speed control(0-5V, 0-10V, 4-20mA optional) RS485 serial communication		
Ambient temperature	0°C-40°C		
Drive size	212x139x240	212x139x240	212x139x240
Drive weight	4.64kg	4.64kg	4.94kg
Protection level	IP31(Indoor use, avoid long-term exposure to ultraviolet rays)		

PART 4 Product installation

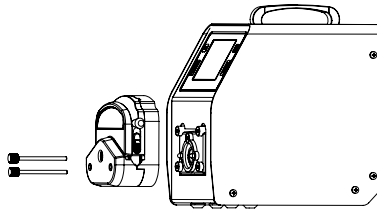
>> Product installation

4.1 Pump head/pump tube installation

 Before performing any loading, unloading or maintenance activities, be sure to disconnect the pump from the main power supply.

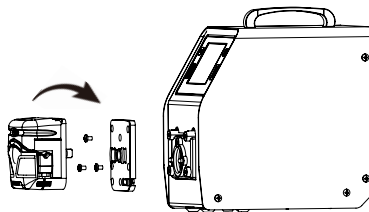
FC pump head installation diagram:

YZ1515x(YZ2515x)

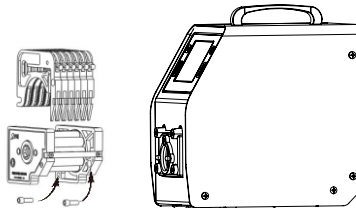


TX315(TX325)

Turn clockwise to buckle on the connecting plate

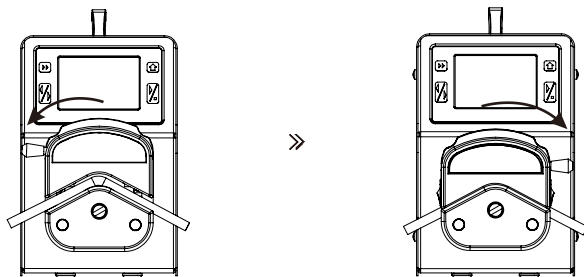


DG series pump head

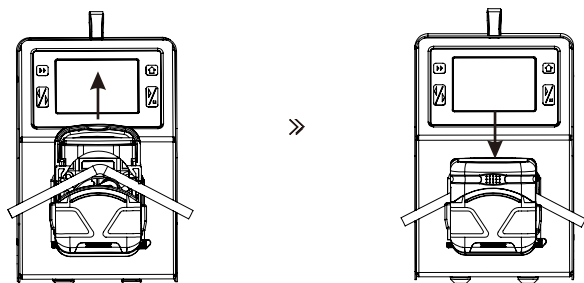


FC pump tube installation diagram:

YZ1515x(YZ2515x)



TX315(TX325)



DG series pump head



4.2 Installation suggestions and precautions

Installation suggestions

>> Application accessories such as foot switch, countersunk head, check valve, filling nozzle, connector, etc. can be selected according to actual conditions.

>> For the size and selection of the tube, please refer to 3.3 Product Structure • Pump head/tube selection and reference flow Related Content.

>> For pump head models and options, please refer to 3.3 Product Structure • Pump Head/tube Selection and Reference Flow Related Contents.

① Before cleaning, maintaining and installing the equipment, be sure to disconnect the control power supply.

② The driver should be placed on a flat and rigid surface.

③ The ambient temperature of the pump should not exceed 104° F (40° C), and air circulation should be ensured to ensure the heat dissipation of the pump.

④ The start-stop key (shortcut key) on the operation panel can quickly change the direction and control the start-stop, but it is recommended to install an emergency stop device on the main circuit of the power supply to ensure higher safety.

⑤ Make sure that the inner wall of the tube is clean and free of foreign matter before use. The shorter the pipeline, the better, and the suction and lift should not be too long.

⑥ Determine the running direction of the pump (forward and reverse) according to the specific location of the fluid placement and supporting machinery on site, which is conducive to later operation.

⑦ In order to meet the requirements of flow and flow rate, a peristaltic pump tube with matching diameter is required.

⑧ The pump itself has self-priming characteristics, which can effectively prevent the backflow of liquid. Generally, there is no need to install valves at the outlet and inlet of the tube. You can also install a one-way valve in the pipeline according to actual needs to avoid fluid leakage when the pump head and tube fail.

Precautions

• The diameter of the pipeline at the inlet is not less than the inner diameter of the pump tube, and a delivery pipe with a diameter $\geq$ the inner diameter of the pump tube should be selected.

- When transferring viscous liquids, it is necessary to maintain a low speed operation to improve the filling efficiency. It is recommended to connect a flexible tube no less than 1 meter between the inlet and the outlet to reduce the pulse and reduce the pulse loss.
- Try to put the pump at the same level or a lower level of the liquid to be transferred to improve the transfer efficiency of the pump.
- To replace a new tube or liquid, re-calibrate the liquid volume to ensure the accuracy of liquid transmission.
- When the peristaltic pump is running, all valves in the pipeline must be opened normally.
- Control wires and power wires are not allowed to have sharp bends, and it is not recommended to bundle them together.
- This product cannot be used for the transmission of any chemical substances incompatible with the pump head and tube.

PART 5 Product operation

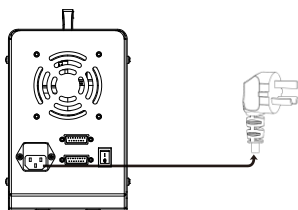
>>Product operation

5.1 Line connection

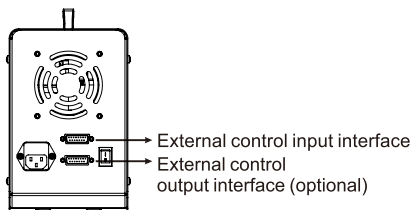
Power connection:

-  AC220V $\pm$ 10% (standard) power supply or AC110V $\pm$ 10% (optional) power supply.
-  Ensure that all power supplies are matched to equipment power and are well grounded.
-  The position of the pump should ensure that it is convenient to disconnect the power supply when operating the equipment.

Power supply wiring diagram:



External control wiring diagram:



Note: For the specific external control input/output interface definition, please refer to "5.5 External Control Operation" for details

5.2 Power-on

·Power-on inspection

- ① Check whether the pump pipe has been installed correctly, and whether the tube inlet pipe and outlet pipe have been correctly connected.
- ② Check whether it is connected to a matching power supply.
- ③ Check whether the peristaltic pump has been installed according to "4.2 Installation suggestions and precautions".

After the pump is turned on, the LCD display is powered on to enter the main interface, and you can start specific settings and operations.

·The default factory settings for the first boot

Factory setting: FC series peristaltic pump, the pump head model/tube model has been set before leaving the factory, subject to the actual product purchased. If multiple types of tubes are needed, the model set is the tube with the largest diameter.

After the pump is turned on, it starts to run with the default set value, and all operating parameters can be changed by touch screen operation (see 5.4 Menu Function Operation)

Note: It supports communication in advance, and the factory settings can be adjusted according to user needs.

5.3 Operation panel and display

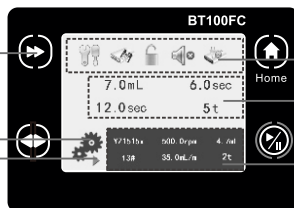
·Operation panel

① Shortcut key area
(key operation)

⑤ Image indication:

Running animation (display)

Direction/full speed indication (display)



② Graphic menu area (touch screen operation)

③ Filling parameter input area
(touch screen operation)

• Filling Volume • Pause time
• Filling Time • Filling Number

④ Status parameter display area (display)

• Pump Head Model • Speed • Filling Volume
• Pump Tubing Model • Flow • Filling Number

(1) Shortcut key area



Full Speed——Quickly empty and clean the tube, turn it at full speed after opening, and then press to restore the original state.



HOME——In other operation interfaces, press and quickly return to the main interface.



Direction——Change the direction of drive rotation, ◀ means counterclockwise rotation and ▶ means clockwise rotation.



Start & Stop——Each time it is pressed, the start/stop state is changed.

(2) Graphic menu area



- ① **Set** : Function operation main menu, peristaltic pump can be set accordingly.
- ② **Data** : Save new data quickly and apply saved data.
- ③ **Lock** Lock screen, unable to touch screen operation Unlock, touch screen operation.
- ④ **Voice** : Voice mode, Silent mode.
- ⑤ **Remote**: Pump operation, Remote operation, 485 communication connection.

(3) Filling parameter input area

① Mode 1: Filling mode(default mode)

7.0mL	6.0sec	• Filling Volume (μL/mL/L) • Pause time (sec/min) • Filling Time (sec/min) • Filling Number (t)
12.0sec	5t	

Filling Time: Real-time countdown display Pause time: Real-time countdown display

② Mode 2: Transmission mode

12.0 mL/min	+	-	• Flow:(μL/min)(mL/min)(L/min) • Flow+ Flow-:(Flow+ -Real-time adjustable)

(4)Status parameter display area

① Filling mode

YZ1515x	500.0rpm	4.7mL	• Pump Head Model • Speed(rpm) • Filling Volume(μL/mL/L) • Pump Tubing Midel • Flow(μL/m)(mL/m)(L/m) • Filling Number(t)
13#	35.0mL/m	2t	

Speed: The system automatically displays according to the flow

Filling Volume: Real-time display of filling liquid volume, Do not accumulate by Filling Number.

Flow: The system automatically displays according to the filling volume and filling time.

Filling Number: Real-time update number display, Accumulate according to Filling Number.

Note: After each start, until it stops automatically, it is a complete filling cycle; manual stop will end immediately.

②Transmission mode

YZ1515x	171.4rpm	58.6s
13#	11.9mL/m	11.7mL

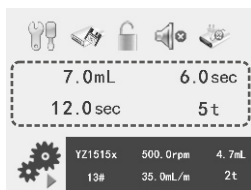
• Pump Head Model • Speed (rpm) • Timing (sec)
• Pump Tubing Midel • Flow(μL/m) (mL/m)(L/m) • Flow volume(μL/mL/L)

Note: Each start and stop is a complete timing and Flow volume display. After stopping and then turning on, the display will start again.

(5) Image indication

- ① Running animation  , Display the running status of the pump: display  rotation when running; display  no rotation when stopped.
- ② Direction/full speed indication,  -Clockwise,  -Counterclockwise,  Full speed-clockwise,  Full speed-Clockwise-counterclockwise.

5.4 Menu function operation



Unit Setup Instructions

• μL/mL/L • sec/min
• sec/min • t

Note: Click the unit to switch

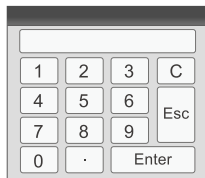
• Filling parameter setting instructions

Filling volume——Required liquid volume per bottle

Filling time——Time required to complete Filling Volume

Pause time——Filling pause time

Filling number——Total number of bottles to be filled



Filling volume setting

- ① Main interface → click the filling amount value, display the keypad → input the value (as shown in the figure)
- ② C-Clear Exit-Exit without saving Confirm-Save the value and exit
- ③ Input range of filling volume: 0.001mL-9999L, this value is the pump limit
- ④ Note: Please set the liter/ml on the main interface, the pump does not support the setting when it is running



Filling time setting

- ① Main interface → click the filling time value, display the keypad → input the value (as shown in the figure)
- ② C-Clear Exit-Exit without saving Confirm-Save the value and exit
- ③ The input range of filling time: 0.1s-9999m, this value is the pump limit
- ④ **Note:** Please set the liter/ml on the main interface, the pump does not support the setting when it is running



Pause time setting

- ① Main interface → click the stop time value, display the keypad → enter the value (as shown in the figure)
- ② C-Clear Exit-Exit without saving Confirm-Save the value and exit
- ③ Input range of stop time: 0.1s-9999m, this value is the pump limit
- ④ **Note:** Please set the liter/ml on the main interface, the pump does not support the setting when it is running



Copy number setting

- ① Main interface → click the number of filling times to display the keypad → input the value (as shown in the figure)
- ② C-Clear Exit-Exit without saving Confirm-Save the value and exit
- ③ Input range of filling times: 0-9999 times, this value is the pump limit
- ④ **Note:** Please set the liter/ml on the main interface, the pump does not support the setting when it is running

Note:

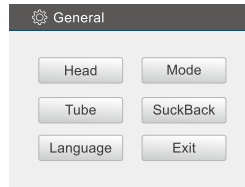
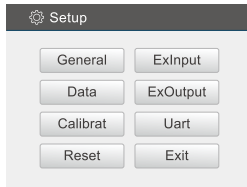
When filling, Filling time and Pause time, with countdown display function on the main interface;

When filling, Status parameter display area-Filling volume and Filling number are updated and displayed in real time.

·System setting instructions

*Main interface → Click  → Click **General** → Enter the general setting options interface (as follows):





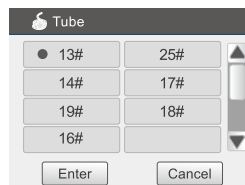
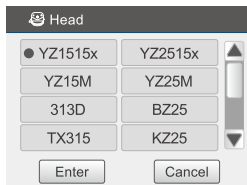
Head Select the current use of the pump head models.

Main interface → Click → **General** → Click **Head** → You can roll the rolling bar to view all the pump head information → Click to select the pump head model → Click to **Enter** storage or click **Cancel** and not save it.

Tube Select the current use of the pump tubing models.

Main interface → Click → **General** → Click **Tube** → You can roll the rolling bar to view all the tube information → Click to select the tube model → Click to **Enter** storage or click **Cancel** and not save it.

Note: If you only replace the tube, you do not need to select the pump head model again.



Choose a different type of pump head, and the matching tube model will automatically change to provide options.

EXInput-External control input Select External control input parameters

Main interface → Click → **ExInput** → External control input option interface:

- ① **External control** → Click ☐ to start, or switch by clicking "Disable/Enable" on the right side, and click OKSave to exit or click Exit to return without saving.
- ② **Start and stop** → Click ☐ to start, or click "disable/rising edge/falling edge/level" on the right to switch, click to confirm to save and exit or click to exit to return without saving.
- ③ **Direction** → Click ☐ to start, or by clicking "disable/high level/low level" on the right side, click to confirm to save and exit or click to exit to return without saving.
- ④ **Speed** → Click ☐ to start, or by clicking "Disable/0-5V/0-10V/0-20mA/0-10KHz" on the right side, click Confirm to save and exit or click Exit to return without saving.

ExOutput-External control output

Select External control output parameters

Main interface→Click  → **ExOutput**→External control output option interface:

- ① **Start and stop** → Click ☐ to start, or click "disable/enable" on the right to switch, click to confirm to save and exit, or click to exit to return without saving.
- ② **Direction**→Click ☐ to turn it on, or switch by clicking "disable/rising edge/falling edge/level" on the right, click to confirm to save and exit or click to exit to return without saving.
- ③ **Speed**→Click ☐ to turn it on, or switch it by clicking "Disable/0-5V/0-10V/0-20mA/0-10KHz" on the right, click Confirm to save and exit or click Exit to return without saving.

Uart-Communication Settings

Select the pump communication parameters

Main interface→Click  →Click **Uart**

- ① **Communication mode** → Click the switch of "disable/enable" to enable and disable the function.
- ② **Local address** → Click the number to display the small keyboard, enter the local address (default 1).
- ③ **Baud rate** → Click the number, switch the baud rate (2400/4800/9600/115200)
- ④ After setting, click OK to save or click Exit to return without saving.

-FC pump also has 485 serial communication bus interfaces to be connected to the host computer (computer, PLC, SCM).

-PC can simultaneously connect up to 30 devices with 485 serial communication bus interface functions; when using with multiple devices to communicate with the host computer, it must know the machine number for each device, this device ID is the only number that should be connected together, and each machine number of the devices is not the same.

-The factory default value for each pump is "1" ; it could be reset by remote controlling through the host computer or by manually changing from the setting menu.

-Change the following steps: Set up—Uart—Address

Suck Back

Select Suck-back parameters

Main interface→Click  →system→Click **Suck Back**→Small keyboard input suck back angle

(10-720deg) /Small keyboard input suck back speed

BT100FC: (10-100rpm)
BT300FC: (10-300rpm)
BT600FC: (10-300rpm)

→Click Enter, save and exit;Click Cancel, exit without saving.

Note : Fillingmode. Pause time should be greater than the suck back time.

Language Choose Chinese/English

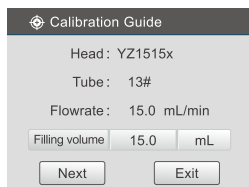
Main interface → Click  → **General** → Click **Language** → Chinese/English Click **Enter**, save and exit; Click **Cancel**, exit without saving. (Note: language customization is available)

*After completing the required system settings, return to the previous menu or exit to the main interface to perform other operations.

· Calibration Guide

FC series peristaltic pumps have the function of flow calibration, which can achieve high-precision dispensing. When a new hose is replaced, the external conditions change or other conditions cause the flow value to deviate, it is necessary to calibrate the flow to meet the user's requirements for flow accuracy.

(1) Main interface → Click  → Click **Calibrat** → Keyboard input calibration value → Click **Next** to enter the calibration interface (or Click **Exit** to return to the previous menu) .



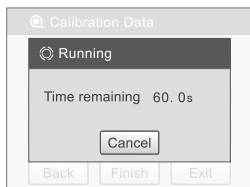
- Tube: Automatically display the tube model currently in use
- Flowrate: Automatically display the flow rate generated when filling volume and filling time
- Filling volume: The initial default value is the filling volume displayed on the main interface (Can be input and adjusted according to actual needs)

Note: If the amount of liquid to be calibrated is very large and the required time is long, the set value can be reduced according to the filling situation.

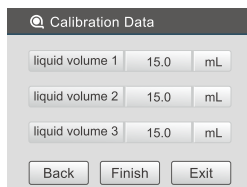
(2) Measured liquid value interface:

① Press the start/stop button to start the transmission and display the remaining time. When the remaining time is 0, it will automatically stop and return to the calibration interface (if you need to stop, press cancel and return to the calibration interface, this calibration is invalid).

② Complete 3 times of calibration → input the actual measured value on the keypad → press Next → click Finish, save the result to complete the calibration (or press Return to return to the calibration interface, this time the result is invalid).



Countdown interface

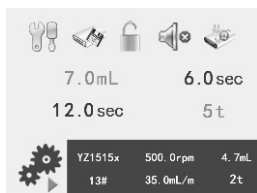


Calibration Data interface

· Mode selection instructions

FC series peristaltic pump has two working modes: Filling mode、Transmission mode

*Main interface→Click  →Click **General**→Select **Filling/Transmission** (Or click **Exit** to return to the previous menu)



Filling mode main interface



Transmission mode main interface

· Data operation instructions

FC series peristaltic pump can realize user data storage function: save 8 groups of filling data.

Click the data shortcut  on the main interface to enter the data operation interface.Or -Main interface→Click  →Click **Data**, enter the data operation interface.

No.	Head	Tube	Vol	Copy	Time	Interval
1	YZ1515x	13#	7.0mL	5	12.0s	6.0s
2						
3						
4						
5						
6						
7						
8						

1 is a set of saved filling data:

- Head: The currently set pump head model
- Tube: The currently set tube model model
- Vol: Filling Volume display
- Copy: Filling Number display
- Time: Filling Time display
- Interval: Pause time display

- ① Select a group of data → Click **Del** → **Yes** → Complete data deletion
- ② Select a location → Click **Save** → **Yes** → Complete the storage of the currently used filling data. (This group of filling data is stored in the selected location. If there is data in this location, the original data will be overwritten).
- ③ Select a set of data → Click **Use** → Enter the main interface automatically
- ④ Click **Exit** → Automatically return to the main interface

5.5 External control operation

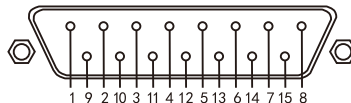


Please provide the correct signal to the pin, do not exceed the specified range of the signal value, and do not connect the power supply voltage to other pins to avoid permanent damage.



Make sure that the end of the multi-strand cable is fastened with a cable tie to prevent the risk of electric shock.

· DB15 The external control interface sketch



The external control interface sketch

Drive external control interface (DB-15 description)

1. The using method of the external interface

- (A) Start/Stop wire and Ground wire connect or shut, control the start and stop of the pump.
 (B) Direction wire and Ground wire connect or shut, control the running direction of the pump.
 (C) Between Speed wire and Ground wire, join up 0-5V, 0-10V, 4-20mA, 0-10kHz, etc. controlling wire signal.

2. External control output port provides optional

3. Description of Outer Space Interface (DB-15)

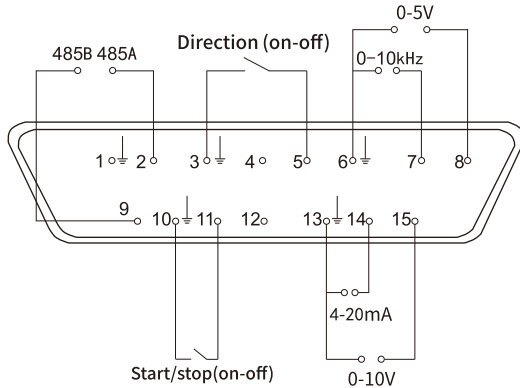
*The 15-pin interface on the back of the machine is the controlling interface to operate the machine through the external signals.
 Firstly prepare a DB15 connector (with holes) and various colors signal wires, then open the 15-pin interface, weld on the signal wires according to the below sheet, and fix the wires together using the clip on the interface, you may inject some glue to reinforce these wires; and at last install the shell and screws.

• External control input

-External control input interface definition

PIN	1	2	3	4	5	6	7	8
DEFINITION	E-c Ground	485 interface A	E-c Ground		Direction	E-c Ground	0-10kHz Input	0-5V Input

9	10	11	12	13	14	15
485 interface B	E-c Ground	Start /stop 1	E-c Enable	E-c Ground	4-20mA Input	0-10V Input



1、3、6、10、13 are all E-c Ground

External control input (FC) wiring diagram

【External control input line color function definition】

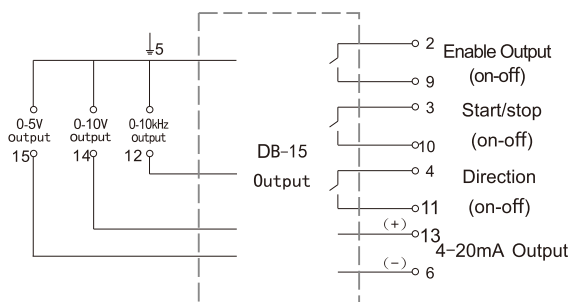
Serial number	Function	Corresponding function of wire
1	485 communication	brown---485A blue---485B
2	start/stop	brown---start/stop blue---E-c Ground
3	start/stop、direction	brown---E-c Enable gray---start/stop blue---direction black---E-c Ground
4	start/stop、analog input: (0-10kHz / 0-5V / 0-10V / 4-20mA)	brown---E-c Enable gray---start/stop blue--- 0-10kHz/0-5V/0-10V/4-20mA black---E-c Ground
5	start/stop、direction、analog input: (0-10kHz / 0-5V / 0-10V / 4-20mA)	brown---E-c Enable gray---start/stop blue--- direction two-color---0-10kHz/0-5V/0-10V/4-20mA black---E-c Ground
6	start/stop、direction、analog input (0-10kHz / 0-5V / 0-10V / 4-20mA) 、485 communication	brown---E-c Enable gray---start/stop blue--- direction yellow---0-10kHz/0-5V/0-10V/4-20mA green---485A red---485B black---E-c Ground
7	start/stop、485 communication	brown---E-c Enable two-color---start/stop blue--- 485A gray---485B black---E-c Ground
8	start/stop、direction、485 communication	yellow---E-c Enable green---start/stop red--- direction blue---485A gray---485B black---E-c Ground

- **External control output**

-External control output interface definition:

PIN	1	2	3	4	5	6	7	8
DEFINITION	//	Enable output B	Start-stop output B	Direction output B	E-c Ground	4-20mA output negative	E-c Ground	E-c Ground

9	10	11	12	13	14	15
Enable output A	Start-stop output A	Direction output A	0-10kHz output	4-20mA output positive	0-10V output	0-5V output



5、 7、 8 are all E-c Ground

External control output (FC) wiring diagram

【External control output line color function definition】

Serial number	Function	Corresponding function of wire
1	start-stop output	brown---Start-stop output A blue---Start-stop output B
2	4-20mA output	brown---4-20mA output positive blue---4-20mA output negative
3	0-5V/0-10V/0-10kHz output	brown---0-5V/0-10V/0-10kHz output blue---E-c Ground
4	start-stop, 4-20mA output	brown---Start-stop output A blue---Start-stop output B gray---4-20mA output positive black---4-20mA output negative
5	start-stop, 0-5V/0-10V/ 0-10kHz output	brown---Start-stop output A blue---Start-stop output B gray---0-5V/0-10V/0-10kHz output black---E-c Ground
6	direction output	brown---Direction output A blue---Direction output B
7	enable output	brown---Direction output A blue---Direction output B

Note: When the external control input/output is analog control speed, there will be some deviation due to different signal source types. If it affects normal use, please contact the dealer or the company!

• Foot switch operating instructions

Foot switch and Hand held dispensing controller are options. These devices only control the start and stop status of the pump, and the running speed and direction are set through the operation panel.

The foot switch is connected to the DB-15 external control interface of the peristaltic pump. Under external control, the start-stop key and the full-speed key are invalid. The HOME key, arrow keys, and touch screen settings are used normally.

Operation setting:

(1) Main interface → Click  → Click **ExInput** → ① Click  to start the External control.



→ ② Click  to start and stop to turn on, click "Level/Pulse" on the right to switch the signal type.

→ ③ After the setting is completed, exit to the main interface step by step.

The main interface  is displayed as , the setting is successful, and the external control mode is entered.

* Filling mode: It is recommended to use the **Pulse** signal. Press once to complete the entire filling cycle (Set filling numbers) and automatically stop after completion. Press again to restart and stop.

* Transmission mode: **Level** signal, Continue to press to continue to run, release it to stop. **Pulse** signal, Press to start, press again to stop.

*Accessories

The following accessories are products selected by customers. If you want to know more or need to buy, please contact the company.

Accessories	Image	Features
Flat mouth Filling nozzle		Connecting tube, precise filling
Closing-type Filling nozzle		Connecting tube, precise filling, splash proof
Foot switch		Control peristaltic pump start and stop
Check valve		Connecting tube, Prevent backflow of transferred liquid
Countersunk		Connecting tube, Prevent the tube from sucking the bottom
Filling stand		Fixed tube or filling nozzle
Measuring cup		Used for volume measurement of liquids
Straight connector		Connect tube system (2 tubes)
Y-type tee connector		Connect tube system (3 tubes)
T-type External connector		Connect tube systems (3 tubes)

PART 6 Troubleshooting and maintenance

>> Troubleshooting and maintenance

Note: There are no parts in the pump that can be repaired by the user. If you need repairs, please contact the dealer or the company!

6.1 Troubleshooting

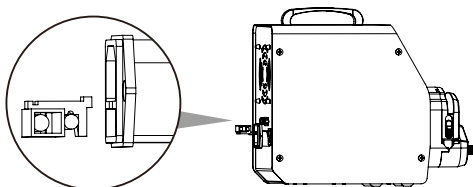
*No response at boot	>>If a circuit protection device is installed, confirm that the circuit has not tripped >>Confirm that the power plug is inserted into a working socket >>Check whether the power cord is firmly inserted >>Check whether the fuse at the power interface is blown
*The fan and display screen are normal, but cannot be started	>> Check if the device is in external control mode >>Check if the keys are working
*The pump is turned on and the pump head cannot run	>>Check if the coupling is damaged >>After cutting off the power, manually check whether the pump head is rotating normally
* Low or no flow when the pump is running	>>Check whether the material supply is normal >>Check if the pipe is entangled or blocked >>Check that all valves are open >>Check if the tube is in the middle of the roller >>Check whether the tube is cracked or damaged >>Check the running direction >>Check whether the pump head roller can rotate flexibly
*Pump cannot be controlled in external control mode	>> Check the upper right corner of the LCD, the external control icon  is displayed as  >> Check whether the external control settings are correctly connected >> Check if the signal source is normal

6.2 Product maintenance

Warning: Before attempting any maintenance, be sure to cut off the power to the pump.

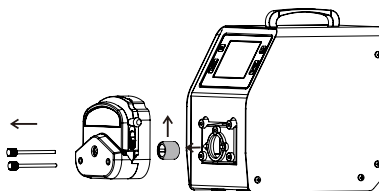
• Replace the fuse

- ① Place the power switch in the "off" position ("I" On, "O" Off)
- ② Disconnect the AC power input cord from the outlet.
- ③ Take out the spare built-in fuse from the power socket of the pump.
- ④ Replace the original fuse.



• Replace the pump head coupling

- ① Place the power switch in the "off" position ("I" On, "O" Off)
- ② Disconnect the AC power input cord from the outlet.
- ③ Remove the tube pump head and take out the coupling.
- ④ Install a new coupling, install the pump head and pump tube.



• Basic maintenance and cleaning

Basic maintenance

- ① Open the pump head when it is not working to avoid tube deformation caused by prolonged extrusion.
- ② Keep the pump head rollers clean and dry to prevent surface damage and reduce tube wear; if there is splashing liquid, please wipe it dry as soon as possible.
- ③ Check the wear of the tube regularly and replace it in time to prevent leakage.

- ④ The pump head roller does not need to add lubricating oil, and improper operation may cause the tube to shift or corrode.
- ⑤ Not used to deal with chemical substances incompatible with the pump head or tube.
- ⑥ The pump head is not resistant to organic solvents and strong corrosive liquids. Please deal with it in time if there is effusion.
- ⑦ Please be aware of the storage recommendations and the expiration date of the tube so that it can be used normally after long-term storage.
- ⑧ Built-in fuse, pump head shaft and other replaceable accessories, need to be installed under the guidance of professionals.
- ⑨ It is recommended that the working environment temperature be between 0-40°C.

Note: There are no parts in the pump that can be repaired by the user. If you need repairs, please contact the dealer or the company!

Cleaning

Warning: Before attempting any maintenance, be sure to cut off the power to the pump. When there are stubborn stains on the pump housing, please use a mild detergent to scrub the surface. Do not immerse the pump in liquid or use too much liquid to clean it.

6.3 Warranty information

• Warranty commitment

- ① The product is guaranteed for one year (consumables such as tubes are not included in the warranty). If there is a failure during the warranty period, you can enjoy free repair and replacement of parts; if it is damaged by man, it is not covered by the warranty.
- ② If the warranty period is exceeded, only the cost will be charged when repairing.
- ③ There are no parts in the pump that can be repaired by the user. If you need repairs, please contact the dealer or the company!

Note: The company does not guarantee the applicability of all its products, and any employee or distributor has no right to change or violate the above warranty clauses; The company is only responsible for repairing, replacing or replacing products in accordance with the actual situation and reasonable compliance requirements.

• Relevant details

① The company will not be responsible for any direct or indirect losses caused by external reasons such as operating errors or human negligence that are not the product's own quality problems.

Direct loss: products, supporting machinery, working environment, surrounding buildings, etc.

Indirect loss: labor loss, profit loss, etc.

② The company will not be responsible for the transportation damage caused by the returned products and accessories during the return journey.

③ In any case, the compensation cost received by the customer shall not exceed the actual payment price.

• Non-warranty scope

The following conditions are not included in the free maintenance of the warranty:

① The product has exceeded the warranty period.

② Product failure caused by abuse, misuse or accidental damage by the company's judgment.

③ Product problems caused by ultraviolet rays or direct light.

④ It is not the damage caused by after-sales personnel in the repair or disassembly process.

⑤ Damage caused by chemical erosion or long-term improper maintenance.

⑥ Product failure caused by force majeure factors such as natural disasters.

⑦ The operator fails to follow the corresponding operation suggestions and requirements, improper loading and unloading, improper maintenance, and improper operation.

⑧ Failures or damages that are not caused by the quality of the product itself.

Note: The company reserves the right to modify the above terms at any time.

6.4 Return information

① If there is a product that needs to be returned/repared, please contact the sales, distributor or the company according to the delivery related process to quickly solve the after-sales problems such as return, replacement, and repair.

② If there is no special agreement or written instructions, please return and exchange the goods within the specified time.

③ When applying for after-sales service, please provide a clear reason for the return, specific information about the contacted substances, and responsible for the cleaning of the product (especially products that have been exposed to toxic chemical substances or harmful substances to the human body)

④ When returning the product to the factory, please pay attention to the packaging specifications to prevent damage to the pump during transportation; The company will not be responsible for product damage caused by improper packaging and will not be included in the warranty.

***Disclaimer**

- The content of this operation manual is for reference only.
- The company reserves the right to change the product (Design or specification) without prior notice.
- We formulate the information in this document from a correct perspective, but the company will not be responsible for any errors.
- If you need the latest version of the operation manual, please contact the company.
- The company will not be responsible for any loss caused by non-product quality problems or human errors.

Warning :

- This product cannot be used with equipment that has problems.
- This product is not designed to be used in hazardous work areas, and is not suitable for flammable and explosive environments, including but not limited to the normal transmission of flammable liquids.

Appendix 1:1 comparison table of tube size

>>1:1 comparison table of tube size

Micro flow tube

Tube		0.5×0.8	1×1	2×1	3×1	2.4×0.8	3.2×0.8
Tube section (1:1)							
Wall thickness (mm)		0.8	1	1	1	0.8	0.8
Inside diameter (mm)		0.5	1	2	3	2.4	3.2
Pressure (Mpa)	Continuous	0.1					
	Interval	0.1					

Basic flow tube

Tube		13#	14#	19#	16#	25#	17#	18#
Tube section (1:1)								
Wall thickness (mm)								
Inside diameter (mm)		0.8	1.6	2.4	8.6	4.8	6.4	7.9
Pressure (Mpa)	Continuous	0.17				0.14	0.1	0.07
	Interval	0.27				0.24	0.14	0.1

Tube		15#	24#	35#	36#
Tube section (1:1)					
Wall thickness (mm)		2.4			
Inside diameter (mm)		4.8	6.4	7.9	9.6
Pressure (Mpa)	Continuous	0.17		0.14	
	Interval	0.27		0.24	

Industrial tube

Tube		73#	82#
Tube section (1:1)			
Wall thickness (mm)		3.3	
Inside diameter (mm)		9.6	12.7
Pressure (Mpa)	Continuous	0.17	0.1
	Interval	0.27	0.1

Tube		86#	90#
Tube section (1:1)			
Wall thickness (mm)		6.3	
Inside diameter (mm)		9.5	19
Pressure (Mpa)	Continuous	0.14	
	Interval	0.14	

Tube		88#	92#
Tube section (1:1)			
Wall thickness (mm)		4.8	
Inside diameter (mm)		12.7	25.4
Pressure (Mpa)	Continuous	0.14	
	Interval	0.14	

