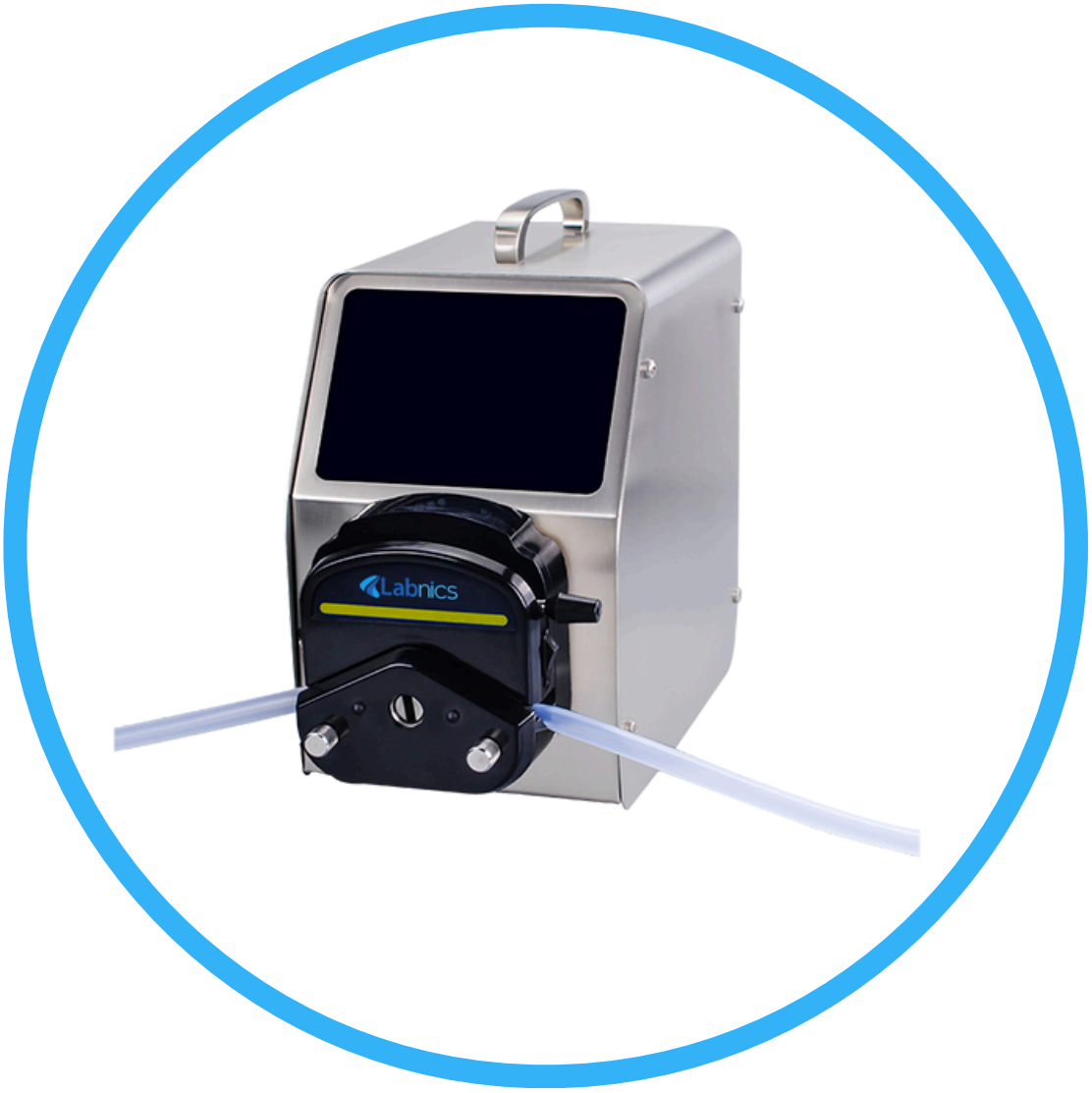

Peristaltic Pump

NPP-202

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Index

1. Safety Measures

1.1 Safety Warning

1) Before any cleaning or maintenance work, cut off the power supply.
2) The tube may have cracks due to wear and tear, causing the 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!
3) Connect the power cord directly to the wall outlet and avoid using extension cords.
4) If the power cord or plug is frayed or otherwise damaged, unplug the power plug (hold the plug in your hand, not the power cord).
5) If the following situations occur, turn off the power and unplug the power plug (hold the plug instead of the power cord):
   - Fluid is spilled on the machine.
   - When the machine needs maintenance or repair.
6) The power supply must have a reliable grounding.
7) 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.

1.2 Matters needing attention

1.2.1 Safety

- When pumping dangerous liquids, follow safety precautions.
- Determine whether you need to wear personal protective equipment when operating the pump under 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, otherwise, it will affect the emergency stop operation.

1.2.2 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.
- A ruptured tube may cause fluid to splash. 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.

1.2.3 Roller

- 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 headshell to corrode.

1.2.4 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, remove and clean it in time.
- After the pump enters the external control mode. The external control icon in the upper right corner of the LCD screen lights up, and the pump can realize start&stop/direction/speed control in the external control mode.

1.3 Installation Instructions

- Before cleaning, maintaining, and installing the equipment, be sure to disconnect the control power supply.
- The driver should be placed on a flat and rigid surface.
- 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.
- 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.
- Ensure 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.
- 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.
- To meet the requirements of flow and flow rate, a peristaltic pump tube with a matching diameter is required.
- 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. The user 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.

1.4 Installation 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 ≥ 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.

2. Introduction

Peristaltic Pump NPP-202 is a positive pressure pump that is designed for efficient fluid distribution or fluid transfer in a uniform and controlled manner. The stainless-steel rotor housing material is resistant to corrosion and rust, thereby extending its operating life with easy cleaning. The PPS (Polyphenylene sulphide ether) pump head displays excellent resistance to high temperature, strong chemical, organic solvent and other corrosive liquid, effectively reducing the customers' cost in maintaining and repairing.

3. Features

- ✓ Intelligent peristaltic pump with 4 work mode i.e. transfer /timer /quantitative/timing quantitative
- ✓ Can be connected with multiple pump heads to meet different demands of flow rates
- ✓ LCD touch screen control, easy to operate and supports RS485 interface
- ✓ Stores up to 9 sets data and analogue quantity control with foot switch control
- ✓ Memory function in case of power failure and auto-restart on power resumes
- ✓ Equipped with flow calibration function for higher precision transmission fluid

4. Specifications

Model No.	NPP-202
Speed	0.1 – 600 rpm, reversible
Flow rate	0.007 – 2280 ml/min
Speed resolution	0.1 rpm
Flow accuracy	< 0.5%
Filing time range	0.1 sec – 9999 min
Halt time range	0.1 sec – 9999 min
Suckback Angle	10°-720° (1°stepping)
Motor type	Stepper motor
Working temperature	0°C ~ 40°C
Relative humiditiy	< 80%, no condensation
Rated motor power	< 50 W
IP rating	IP 31
Power supply	AC 110/220 V ± 10%, 50/60Hz
Dimension (L × W × H)	212 × 135 × 240 mm
Weight	5 kg

5. Applications

Employed in transfer of high pressure or viscous fluids in tangential filtration systems.

6. Instrument Introduction

Instrument Structure:

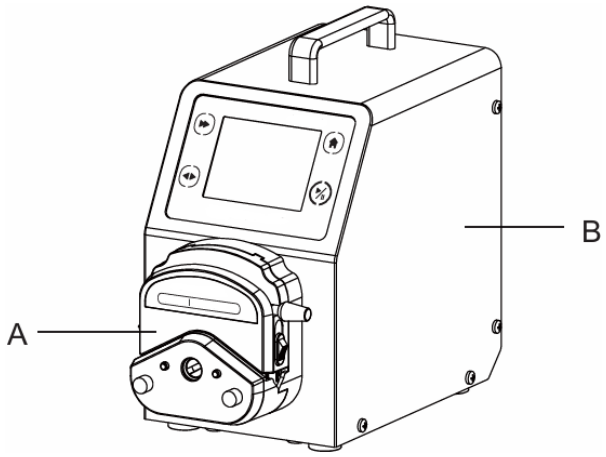

Figure-1

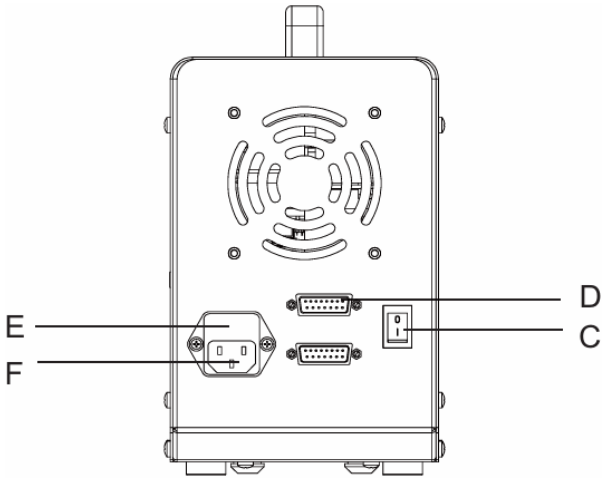

Figure-2

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

7. Installation

7.1 Unboxing

7.1.1 Unpacking inspection

Confirm that the pump is packaged in good condition. Check the instrument when unpacking, check the product model and the number of accessories, and check whether the parts are damaged during transportation.

7.1.2 Product storage

This product can be stored for a long time, but before putting it into operation, confirm that the drive, pump head tubes, and other accessories can be used normally. The tubes are commonly used consumables.

7.2 Product Installation

Pump head/pump tube installation

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

7.2.1 Pump head installation diagram

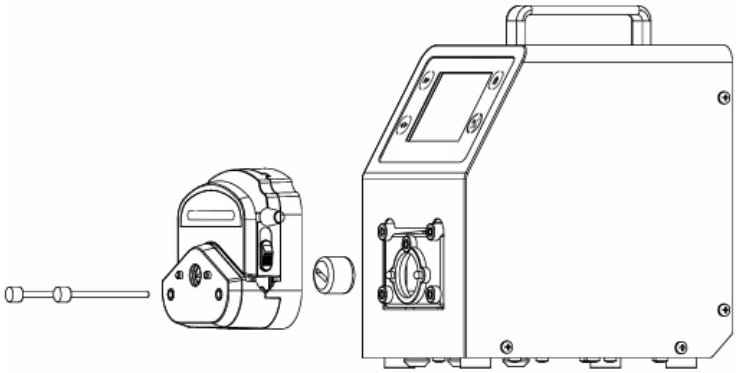

Figure-3

7.2.2 Pump tube installation diagram

Figure-4

7.3 Line connection

Power connection:

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

Power supply wiring diagram:

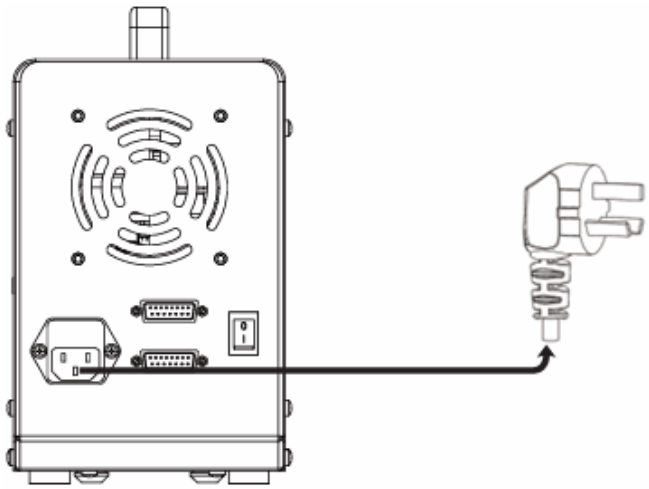

Figure-5

External control wiring diagram:

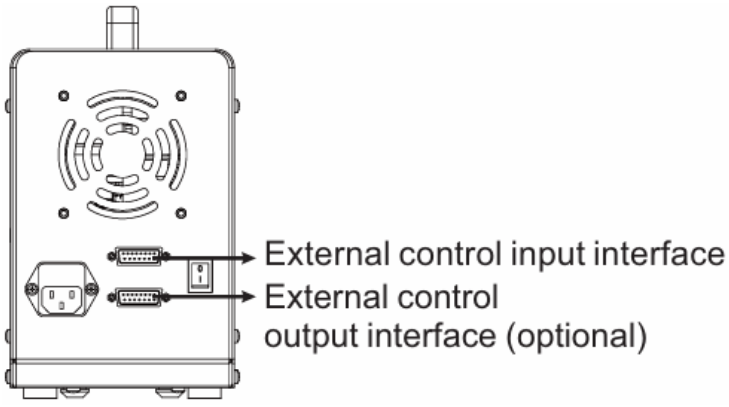

Figure-6

8. Operations

8.1 Power-on

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

8.1.2 The default factory settings for the first boot

Factory setting: The NPP-202 peristaltic pump, the pump head model/tube model has been set before leaving the factory. 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 (refer to **8.3 Menu Function Operation**)

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

8.2 Operation panel and display

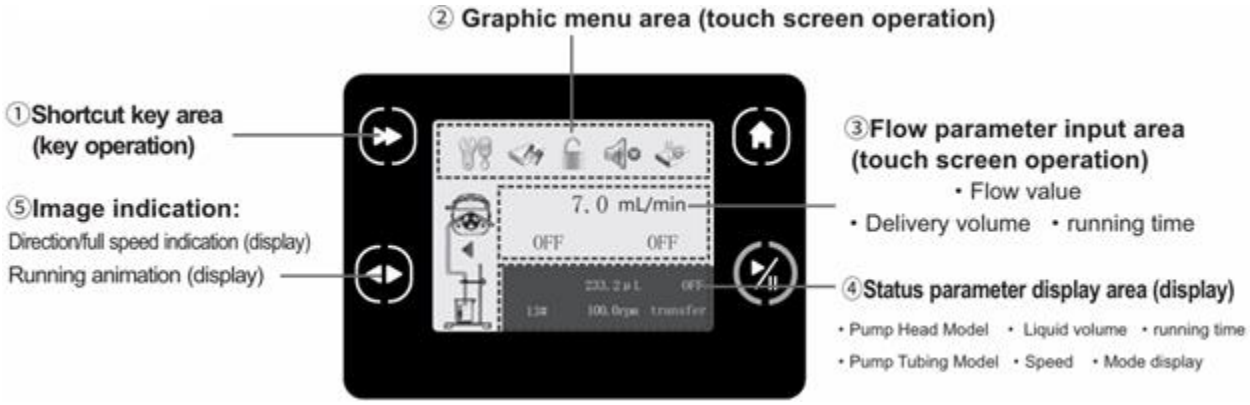

Figure-7

8.2.1 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.

8.2.2 Graphic menu area

Figure-8

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.

8.2.3 Flow parameter input area

1) **Mode 1: Transmission (default)**

Figure-8

Flow value (μL /min) (mL /min) (L/min)
Liquid delivery volume (OFF) Running time (OFF)

2) **Mode 2: Quantitative**

Figure-9

Flow value (μL/min) (mL/min) (L/min)
Delivery volume (μL/mL/L) Operating time (OFF)

3) **Mode 3: Timing**

Figure-10

Flow value (μL/min) (mL/min) (L/min)
Liquid delivery volume (OFF) Running time (sec/min)

4) **Mode 4: Timing quantitative**

Figure-11

Flow value (μL /min) (mL /min) (L/min)
Fluid delivery volume (μL/mL/L) Running time (sec/min)

8.2.4 Status parameters display area

Note: A single start and stop are a complete timing measurement, stop and then restart, and re-time measurement.

Figure-12

Pump head model Cumulative liquid volume (μL/mL/L) Running time(s/m)
Pump Tube Model Speed (rpm) Mode Display

8.2.5 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.

8.3 Menu function operation

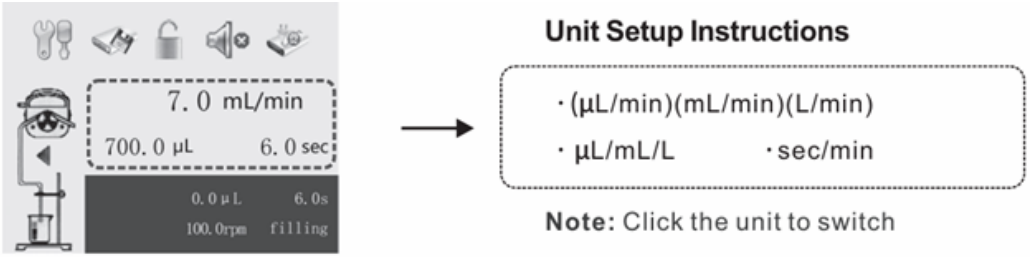

Figure-13

8.3.1 Flow parameter setting instructions

Delivery volume - Target demand for a single delivery.
Transfer time - The time required to complete the target transfer volume.
Stop time - The stop time between transfers.

(1) **Fluid Volume Setting**

Figure-14

1) The main interface → click the amount of the conveyor liquid, display the small keyboard → input value (as shown in the figure)
2) C-Clear Exit- Do not save withdrawal confirmation-save value and exit.
3) The input range of the amount of transport liquid: 0.001ml-9999L, the value is the pump limit.
4) Set it on the main interface for micro-rise/ml/liter. Pumps do not support settings when running.

(2) **Flow rate setting**

Figure-15

1) The main interface → click the amount of the conveyor liquid, display the small keyboard → input value (as shown in the figure)
2) C-Clear Exit- Do not save withdrawal confirmation-save value and exit.
3) The input range of the amount of transport liquid: 0.001ml-9999L, the value is the pump limit.
4) Set it on the main interface for micro-rise/ml/liter. Pumps do not support settings when running.

(3) **Running time setting**

Figure-16

1) Main interface → click the amount of transport liquid, display the small keyboard → input value (**Figure 16**)
2) C-Clear Exit- Do not save withdrawal confirmation-save value and exit.
3) The input range of the transmission time: 0.001 seconds-9999 minutes, the value is the pump limit.
4) The pump does not support setting when running.
   Note: During transmission, the transmission time and stop time have a countdown display function on the main interface; During transmission, the state parameter displays the area of the transmission fluid volume, and the display is updated in real-time.

8.3.2 System setting instructions

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

Figure-17

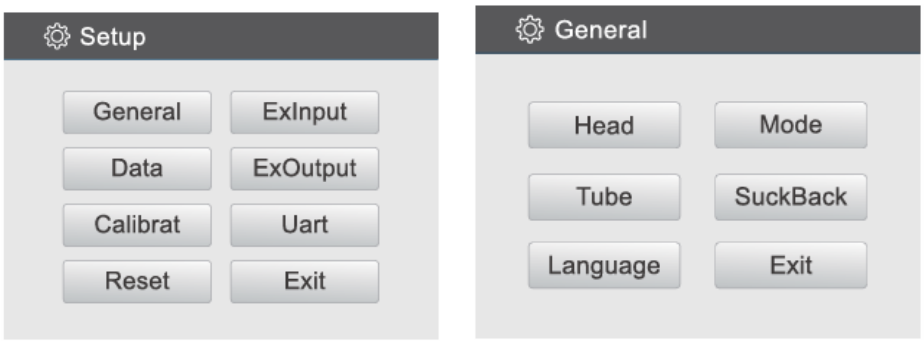

Figure-18

Head **Select the current use of the pump head.**

Main interface→ Click → General→ Click **Head**→ The user 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.**

Main interface→ Click → General→ Click **Tube**→ The user 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, then do not need to select the pump head model again.

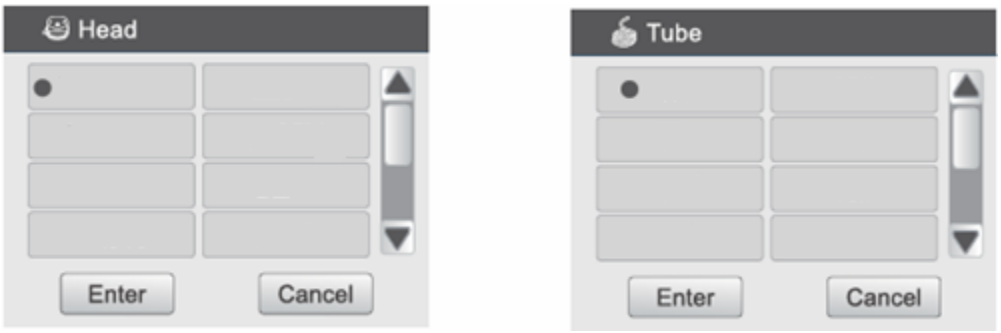

Figure-19

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.

ExOuput-External control ouput **Select External control output parameters**

Main interface→ Click → ExOuput→ 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 and 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.

Note:

- The NPP-202 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 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, 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——Adress.

Suck Back **Select Suck-back parameters**

Main interface→ Click →General→Click Suck Back→ Small keyboard input suck back angle (10-720deg)/Small keyboard input suck back speed→ Click Enter, save and exit; Click **Cancel**, exit without saving.
Note: Fillingmode, Pause time should be greater than the suck back time.

Language **Choose English**

Main interface→ Click → General→ Click Language→ 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.

8.3.3 Calibration Guide

The NPP-202 peristaltic pump has a flow calibration function, which can realize high-precision filling. When a new tube is replaced, external conditions change, or other conditions cause a deviation in the flow value, the flow needs to be calibrated 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).

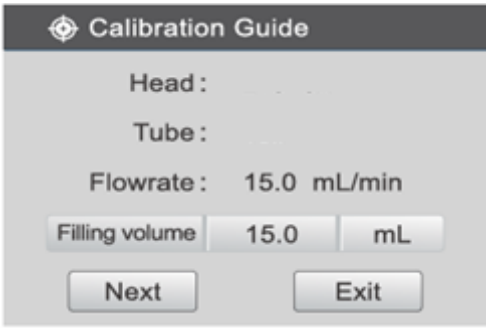

Figure-20

- **Tube:** Automatically display the tube model currently in use.
- **Flowrate:** Automatically display the flow rate generated when filling volume and filling time (ml/min).
- **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**, and save the result to complete the calibration (or press Return to return to the calibration interface, this time the result is invalid).

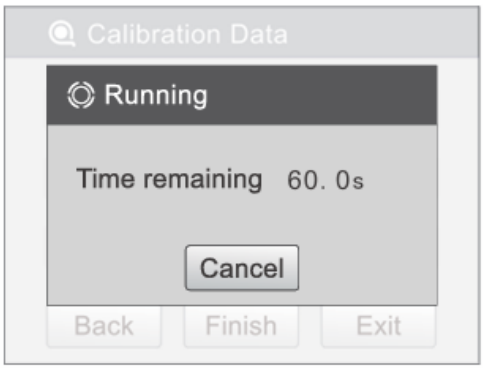

Figure-21 Countdown interface

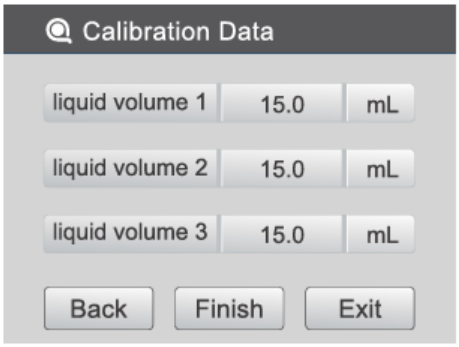

Figure-22 Calibration data interface

8.3.4 Mode selection instructions

NPP-202 peristaltic pumps have four modes to choose from: transfer mode, timing mode, ration mode, and filling mode.

1) Main interface→ Click  →Click **General**→ Select transfer/timing/ration/filling (Or click **Exit** to return to the previous menu)

Figure-23 Transfer mode

Figure-24 Timing mode

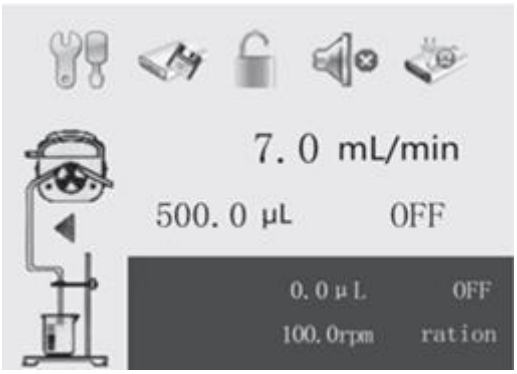

Figure-25 Ration mode

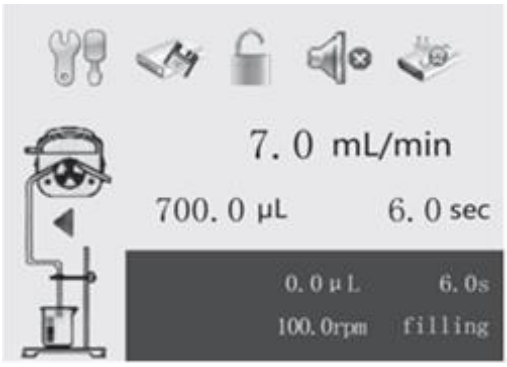

Figure-26 Filling mode

8.3.5 Data operation instructions

NPP-202 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.

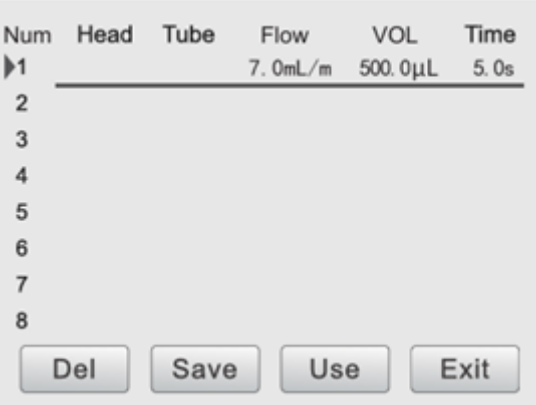

Figure-27

1 is a set of saved liquid volume timing data:
Pump head: The pump head model currently uses the settings.
Pump Tubing: The model of the pump tubing that is currently in use.
Flow rate: Display of liquid flow rate.
Volume: Display of the amount of fluid transferred.
Time: Transmission time display.

1) Del : Select a group of data → Click **Del** → Yes → Complete data deletion.
2) Save : 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) Use : Select a set of data → Click **Use** → Enter the main interface automatically.
4) Exit : Click **Exit**→ Automatically return to the main interface.

8.4 External control operation

Note:

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

8.4.1 DB15 The external control interface sketch

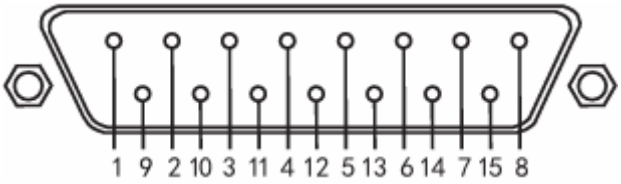

Figure-28

Drive external control interface:

(1) **The using method of the external interface**

1) Enabled wire and Ground wire connect or shut, control the entry of the external control.
2) Start/Stop wire and Ground wire connect or shut, control the start and stop of the pump.
3) The direction wire and Ground wire connect or shut, controlling the running direction of the pump.
4) 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 of 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, the user may inject some glue to reinforce these wires, and at last install the shell and screws.

8.4.2 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

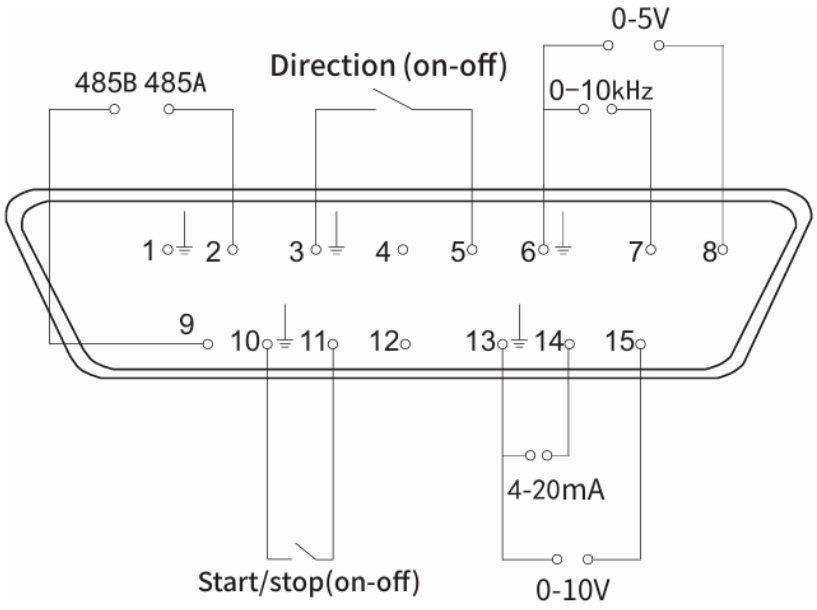

Figure-29 External control input wiring diagram

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

8.4.3 External control output

PIN	1	2	3	4	5	6	7	8
DEFINITION	//		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
	Start-stop output A	Direction output A	0-10kHz output	4-20mA output positive	0-10V output	0-5V output

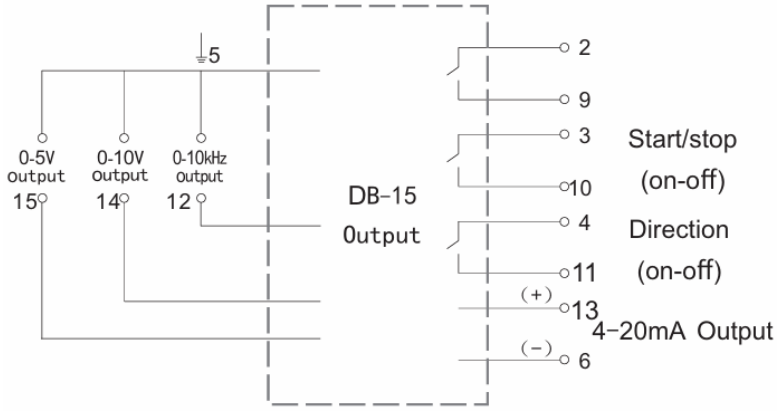

Figure-30 External control output wiring diagram

External control output line color function definition

Serial number	Function	The 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

Note: When the external control input/output is analog control speed, there will be some deviation due to different signal source types.

8.4.4 Footswitch operating instructions

A foot switch and Handheld 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 touchscreen settings are used normally.

Operating setting:

Main interface→ Click  →Click ExInput→①Click ☐ to start the External control. →②Click ☐ to start and stop to turn on, and click **"Level/Pulse"** on the right to switch the signal type. →③After 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.

Figure-31

Note:

Liquid volume transfer:

[Level signal] Keep pressing for continuous operation, release to stop. **[Pulse signal]** press to start, press again to stop.

9. Maintenance

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

9.1 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, 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. Deal with it in time if there is effusion.
7) 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℃.

9.2 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, use a mild detergent to scrub the surface. Do not immerse the pump in liquid or use too much liquid to clean it.

10. Troubleshooting

Fault	Solution
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.
The 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.

11. Accessories

Standard Accessories

Accessories No	Name
1	Silicone tube (available with interior dimensions of 0.8/1.6/2.4/3.1/4.8/6.4/7.9 mm)
2	Foot pedal
3	Power line

Other Accessories: (optional)

Accessories	Image	Features
Flat mouth Filling nozzle		Connecting tube, precise filling
Closing-type Filling nozzle		Connecting tube, precise filling, splashproof
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)

12. Replacement

12.1 Replace the fuse

1) Place the power switch in the "off" position ("|" On", "○" 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.

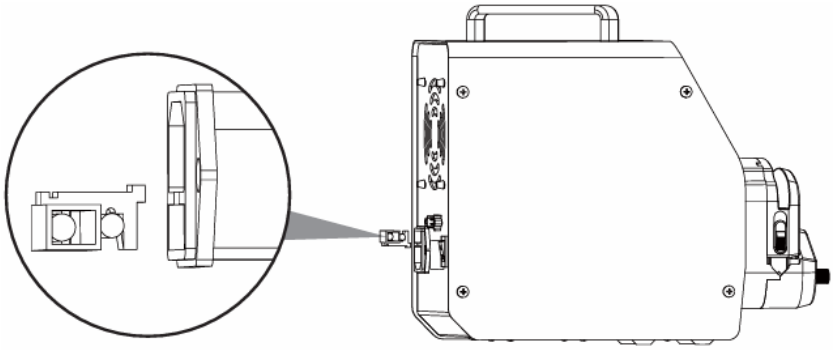

Figure-32

12.2 Replace the pump head coupling

1) Place the power switch in the "off" position ("|" On", "○" 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.

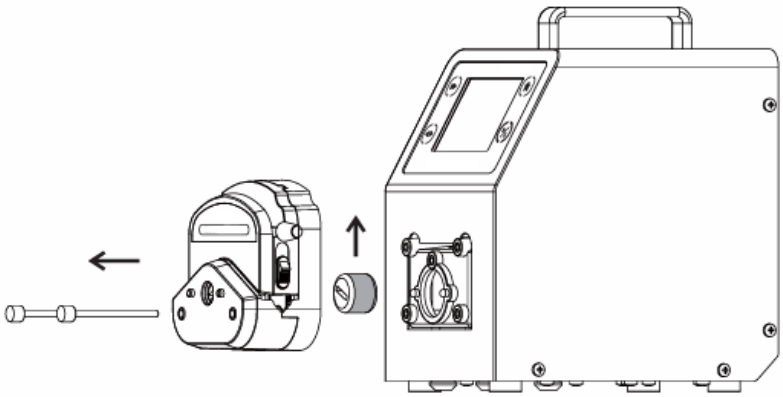

Figure-33

13. Appendix

1:1 Comparison table of tube size

Micro flow tube:

Tube	0.5x0.8	1x1	2x1	3x1	2.4x0.8	3.2x0.8
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				

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