BOMBA PERISTÁLTICA SERIE BT, 300 RPM
BT SERIES PERISTALTIC PUMP, 300 RPM
POMPE PÉRISTALTIQUE SÉRIE BT, 300 TR/MIN

REF. - CODE - RÉF. - MPD002

Este manual es parte inseparable del aparato por lo que debe estar disponible a todos los usuarios del equipo. Le recomendamos leer atentamente el presente manual y seguir rigurosamente los procedimientos de uso para obtener las máximas prestaciones y una mayor duración del mismo.

This manual should be available for all users of these equipments. To get the best results and a higher duration of this equipment it is advisable to read carefully this manual and follow the processes of use.

Ce manuel est une partie indissociable de l'appareil et doit être mis à la disposition de tous les utilisateurs de l'équipement. Nous vous recommandons de lire attentivement ce manuel et de suivre scrupuleusement les procédures d'utilisation afin d'obtenir des performances maximales et une plus longue durée de vie de l'appareil.

LANGUAGE INDEX

Spanish 1-18
English 19-35
French 36-52

IMPORTANT NOTES

■Please read this operation manual carefully before using the product.
■The manufacturer reserves the right to change the product (design or specification) without prior notice.

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 is damaged, turn off the pump and unplug the power cord.
■If the following situations occur, turn off the pump and unplug 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.

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PART 1 MATTERS NEEDING ATTENTION

■ **Safety:**

1. The staff responsible for the installation or maintenance of this equipment should have the experience and ability to carry out related work.
2. This product is not applicable to the ATEX explosion-proof directive and cannot be used in flammable and explosive environments.
3. When pumping dangerous liquids, please follow safety precautions.
4. 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.
5. Non-professionals should not install this pump with other equipment to reduce safety risks.
6. For hazardous fluids, a dedicated operation process must be specified to prevent personal injury.
7. 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.

■ **Tube:**

1. 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.
2. A ruptured tube may cause fluid to splash. Please take appropriate protective measures.
3. 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.
4. Ensure that the chemicals to be handled are compatible with the pump head, tubes and accessories.

■ **Rollers:**

1. Do not touch the rollers while the pump is running.
2.Keep the rollers clean and dry to reduce tube wear.
3.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.

■ **Pump:**

1. There are no user-serviceable parts in the pump.
2. 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.
3.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.
4.After the pump enters the external control mode. The external control icon in the upper right corner of the LED screen lights up, and the pump can realize start&stop/direction/speed control in the external control mode.

PART 2 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, tubes and other accessories can be used normally.

PART 3 PRODUCT DESCRIPTION

3.1 Principle of peristaltic pump operation

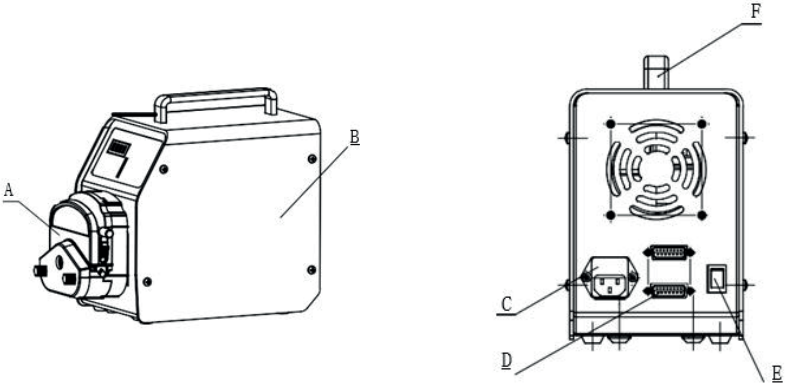
The peristaltic pump uses the rotor to alternately squeeze and release the tube to transfer fluid, just like squeezing a tube full of fluid with a finger. As the finger slides forward, when a negative pressure is formed in the tube, the liquid flows with it.

3.2 Product features

- Simple operation: simple appearance, key operation, intuitive interface
- Clear interface: 4-digit LED displays flow or speed
- External control function: support RS485/Modbus communication protocol, analog control, foot switch control
- Power-off save: can automatically save the control parameters of the last power-off
- One-touch full speed: features a convenient full speed button for quickly filling or emptying the tube
- Suitable for multiple pump heads: YZ series, TX series and other pump heads can be installed

3.3 Product structure

■ **Pump**



A: Pump head B: Driver
C:Built-in fuse D: External control interface E: Switch F: Carry handle

■ **Pump head/Pump tube/Reference flow rate**

Flow rate unit: ml/min Tube model: ID*wall thickness, mm

	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)
 TX315	300 rpm	21	72	156	288	624	1020	1440
 YZ1515x	300 rpm	21	81	153	246	510	870	1140
 YZ2515x	Max speed	15# (4.8*2.4)			24# (6.4*2.4)			
	300 rpm	510			870			
 TX325	300 rpm	600			980			

Note: The flow values were obtained with water at normal temperature and pressure and are for reference only. Obtain the flow value under your actual conditions.

3.4 Technical parameters

Max speed	300 rpm (Reversible)
Speed resolution	0.1 rpm
Max flow rate	1440 ml/min
Operation panel	Membrane keyboard
Display	4-digit LED screen shows current speed/flow
Suction angle	10°-720°
Suction speed	10-300 rpm
Power supply	220VAC, 50/60Hz
Power	< 35W
External control	Start control/direction control/speed control (0-5V, 0-10V, 4-20mA optional) RS485 serial communication
Ambient temperature	0-40 ºC
Protection class	IP31 (Indoor use, avoid long-term exposure to ultraviolet rays)

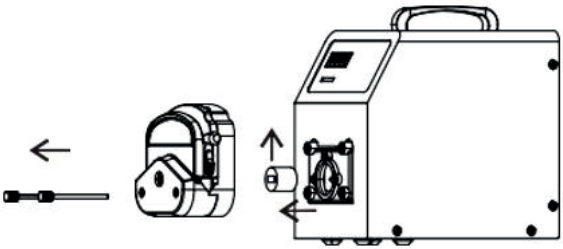
PART 4 INSTALLATION

4.1 Pump head/Pump tube installation

Be sure to disconnect the pump from the power supply.

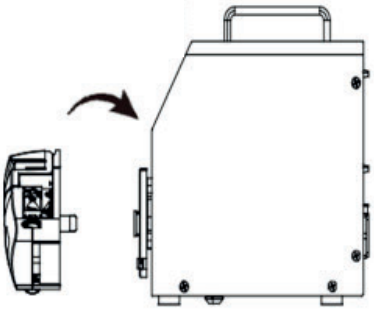
Pump head installation

■YZ1515x(YZ2515x)



■X315(TX325)

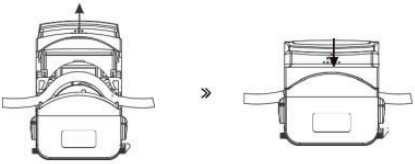
Turn clockwise to buckle on the connecting plate



Pump tube installation

■YZ1515x(YZ2515x)

■TX315(TX325)



4.2 Suggestions and precautions

■ Suggestions

>> Application accessories such as foot switch, countersunk head, check valve, filling nozzle, connector, etc. can be selected according to actual conditions.
>> For the selection of tube, please refer to section 3.3 Pump head/Pump tube/Reference flow rate table.
>> For pump head variants, please refer to section 3.3 Pump head/Pump tube/Reference flow rate table.

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 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.
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 ≥ 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

5.1 Line connection

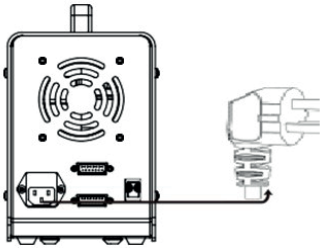
Power connection:

220VAC±10%, 50/60Hz.

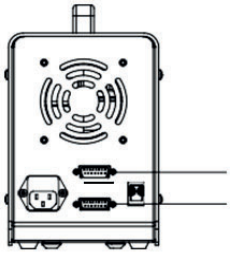
Ensure that all power supplies are matched to equipment power and are well grounded.

The position of the pump should ensure that it is convenient to disconnect the power supply when operating the equipment.

Power supply diagram:



External control diagram:



External control input interface

External control output interface (optional)

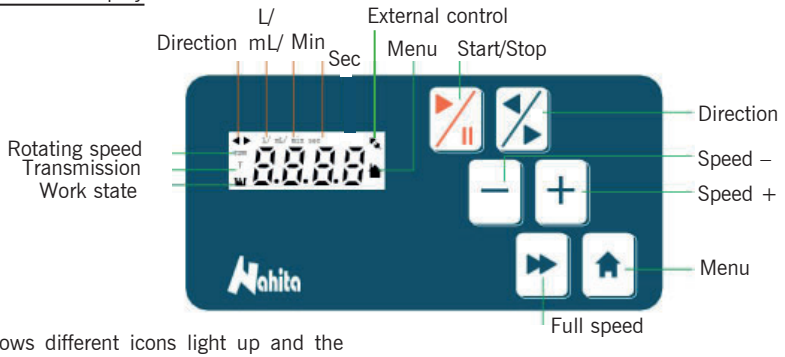
5.2 Power-on

■ **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 LED display will light up and you can start specific operations and settings.

5.3 Operation panel and display



LED screen shows different icons light up and the current working status of the pump.

5.4 Quick operation

■Switch

After confirming that the power supply is installed correctly, press the drive switch  "|"-Power on", "0"-Power off.

■Start/Stop

When the pump is stopped, press the Start/Stop button to start the pump. When the pump is running, press the Start/Stop button to stop the pump.

■Speed control

Press the "+" button, the LED speed (flow) display increases; press the "-" button, the LED speed (flow) displays decrease.

■Menu operation function

When the pump is stopped, press the menu button to enter the menu, press the "+" and "-" buttons to select the corresponding option, and press the menu button to confirm.

■Full speed

When the peristaltic pump is running at the displayed speed, press the full speed button, the pump will run at the highest speed (300rpm) and display "FULL" to complete the rapid emptying, filling or cleaning operation; after pressing the full speed button again, the pump will return to the speed in the previous state.

■Direction switching function

When the pump is stopped or running, press the direction button, the pump will run in the opposite direction, and the LED will display the changing direction. Press the direction button again, the pump will switch to the original direction, and the LED will display the changing direction.

5.5 Application cases

Application 1: speed mode (Fluid transmission with rotation speed of 80 rpm)

1- Press the Menu key to  (display mode selection)
2- Press Menu, press "+" or "-" to  (speed display mode)
3- Press the Menu key to confirm that the current mode is the speed display mode
4- Press "+" or "-" to adjust to  and press the Menu key (return to the main interface)
5- Press "+" or "-" to adjust to 
6- Press the Start/Stop button, the peristaltic pump runs at 80 rpm

Application 2: flow mode (Fluid transmission with a flow rate of 80 ml/min)

1- Press the Menu key to enter  (display mode selection)
2- Press Menu, press "+" or "-" to  (flow display mode)
3- Press the Menu key to confirm that the current mode is the flow display mode
4- Press "+" or "-" to adjust to  and press the Menu key (return to the main interface)
5- Press "+" or "-" to adjust to 
6-Press the Start/Stop button, the peristaltic pump runs at 80 ml/min 

Application 3: calibration function (With a flow rate of 100 ml/min)

1- To access this function, the pump must be set to flow mode
2- Adjust the flow rate to 100 ml/min. If the accuracy cannot meet the user's needs, flow calibration is required.
3- Press the Menu key to enter E0-- ; press Menu, 100.0ml is displayed at this time.
4- Press the Start/Stop button, the peristaltic pump will carry out liquid transfer, and will automatically stop and display after the timer expires ----
5- Press the Start/Stop button to display 100.0ml, at this time adjust the actual test liquid volume by pressing the buttons "+" or "-" (eg: 105.0ml), then press the Menu key to confirm, show E0--
6- Press "+" or "-" to make the screen display ESC, press the Menu button to confirm the return to the main interface; completed calibration.

Note: If the actual liquid volume accuracy does not meet the requirements, you can enter E0-- and repeat the calibration several times.

Application 4: foot switch (only controls start and stop)

(The liquid is transferred at a flow rate of 200 ml/min, and the foot switch controls the start and stop)
1- Press the Menu key to enter A0-- (display mode selection)
2- Press Menu, press "+" or "-" to A0-1 (flow display mode)
3- Press the Menu key to confirm that the current mode is the flow display mode.
4- Press "+" or "-" to adjust to ESC and press the Menu key (return to the main interface)
5- Press "+" or "-" to adjust to 200
6- Press the Menu key and press "+" or "-" to A1-- (External control, system settings)
7- Press the Menu key to enter A1-0 (speed control selection) Press "+" or "-" to adjust to C0-4 (internal control speed)
8- Press the menu key to enter A1-2 (start and stop control selection) Press "+" or "-" to adjust to C2-1 (external control start and stop)
9- Use the direction keys on the operation panel to control the running direction
10- Press the menu key to return to the main interface

■ **Default factory settings**

Factory setting: Display mode is speed mode, pump head model is TX315, tube model is 18#.
Note: The factory settings can be adjusted according to the actual needs of user
Instructions for Menu function operation are given in 5.6
If it is not necessary, please do not modify factory settings

Device address selection	1	Boot display
Default display mode	Speed mode	A0-0
External control speed mode	Internal control	A1-0: C0-4
External control direction mode	Internal control	A1-1: C1-0
External control Start&Stop mode	External control	A1-2: C2-1
Start-stop signal mode	Pulse mode	A1-3: C3-1
Signal action mode	Low level/Falling edge start	A1-4: C4-0
Initial state of pulse signal	Stop	A1-5: C5-0
Communication baud rate	9600	A1-6: 9600
Suck back speed selection	10 rpm	A1-8: 10
Suck back angle selection	0° (No suck back)	A1-9: 0
485 enable selection	485 disabled	A1-o: Co-0
External control output setting	No output	A1-b: Cb-4
External control start-stop line selection	1 is valid	A1-d: Cd-0
Pump head setting	TX315	A2-0: A202
Pump tube setting	18#	A2-1: -18-

*After the pump is turned on, it runs according to the default setting. All operating parameters can be changed by accessing them via the Menu button (read 5.6)

5.6 Menu function operation

1- Press the menu button to enter the first-level menu from the main interface: A0- - / A1- - / A2- -
2- Press “+” or “-” to adjust, press the menu key to confirm, enter the secondary menu AX-X (If the operation option is up to level 2, select and confirm, that is, the function setting is completed. To exit, press “+” or “-” to adjust to ESC, and press the menu key to exit.).
3- Press “+” or “-” to adjust the selection, press the menu key to confirm, and enter the third-level Menu.
4- Press “+” or “-” to adjust the selection, press the menu key to confirm, complete the function setting, then press “+” or “-” to adjust to ESC, and then press the menu key to exit step by step.

Boot display, device address (1)

Boot display 

Main interface → **First level menu** → **second level menu** → **third level menu**

→ **Display mode selection: A0- -**

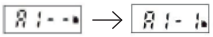
1. Speed display  → 
2. Flow display → 

→ **External control, system settings: A1--**

1 Speed control method selection

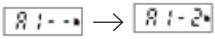
- C0-0 0-5V control
- C0-10-10V control
- C0-2-4-20mA control
- C0-3 0-10kHz control
- C0-4 Internal control speed
- ESC

2 Direction control method selection



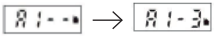
- C1-0 Internal control direction
- C1-1 External control direction
- ESC

3 Start&stop control method selection



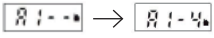
- C2-0 Internal control direction Start and Stop
- C2-1 External control direction Start and Stop
- ESC

4 Start-stop signal mode selection



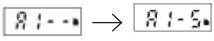
- C3-0 Level mode
- C3-1 Pulse mode
- ESC

5 Signal action mode



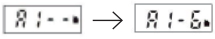
- C4-0 Low level/Falling edge start
- C4-1 High level/Rising edge start
- ESC

6 Initial state pulse signal



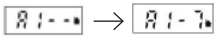
- C5-0 Stop
- C5-1 Run
- ESC

7 Communication baud rate selection



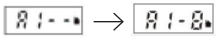
- 1200 · 2400
- 4800 · 9600
- ESC

8 Device address selection



- 01- Choose address as (1)
- -30- Choose address as (30)
- ESC

9 Suck back speed selection
Resolution 1 rpm

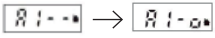


- 10-100
- ESC

10 Suck back angle selection
Resolution 1°

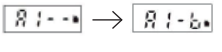
- 0, 10-720 °
- ESC

11 485 enable selection



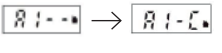
- Co-0 (485 disabled)
- Co-1(485 enable)
- ESC

12 External control output setting



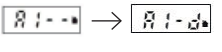
· Cb-0 (0-5V output) · Cb-3 (0-10kHz output)
· Cb-1 (0-10V output) · Cb-4 (no output)
· Cb-2 (4-20mA output) · ESC

13 Restore factory settings



· Cc-0 (Restore calibration K value)
· Cc-1 (Restore factory settings)
· ESC

14 External control start-stop line selection

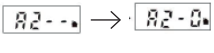


· Cd-0 (valid)
· Cd-1 (Invalid)
· ESC

→ **Pump head and pump tube setting: A2--**

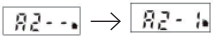
Note: This menu is displayed in flow mode

1 Pump head setting



· A200 (YZ1515x)
· A202 (TX315)
· A203 (YZ2515x
· ESC

2 Pump tube setting



· -18- (18#)
· -13- (13#)
· -0.5- (DI 0.5mm)
· ESC

→ **Calibration function: E0--**

Calibration function

· Set the calibration fluid volume
· Start/Stop key operation
· Actual volume value input
· Press the Menu button to confirm
(Section 5.5, Application 3)

→ **Exit display: ESC**

Exit display

Notes:
* When A0-0 (speed display) mode is selected, A1 option menu (external control, system setting) can be opened.
* When A0-1 (flow display) mode is selected, the A1 option menu (external control, system setting), A2 (pump head and pump tube setting), E0 (calibration function) can be opened.

■ **Accessories**

The following accessories are included with the pump

Accessory	Image	Features
Filling nozzle		Precise filling, # 18
Foot switch		With 15-pin RS485 connector Control of peristaltic pump start and stop
Check valve		Prevents backflow of transferred liquid, 10 mm
Straight connector		Connects 2 tubes of the system, 7.9 mm
Silicone tube # 18		Inner diameter: 7.9 mm Wall thickness: 1.6 mm

PART 6 TROUBLESHOOTING AND MAINTENANCE

Note: If the pump needs to be repaired, please contact your distributor

6.1 Troubleshooting

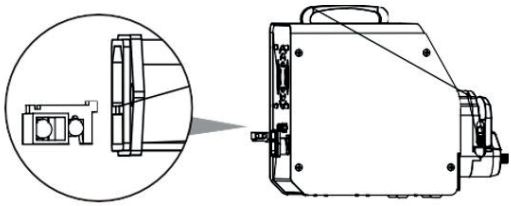
No response at boot	>>If a circuit protection device is installed, confirm that the circuit has not tripped >>Confirm that the power plug is inserted into a working socket >>Check whether the power cord is firmly inserted >>Check whether the fuse at the power interface is blown
The fan and display screen 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	>>After cutting off the power, manually check whether the pump head is rotating normally >>Check if the coupling is damaged
Low or no flow when the pump is running	>>Check whether the material supply is normal >>Check if the tube 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 whether the external control icon in the upper right corner of the LED display is on >> 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.

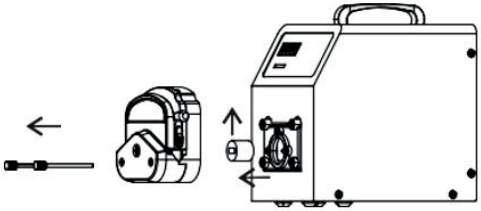
■ Replace the fuse

1- Place the power switch in the “off” position (“|” 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 (“|” 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 ºC.

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

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.

APPENDIX: COMPARISON TABLE OF TUBE SIZE

Basic flow tuve

Tube	13 #	14 #	19 #	16 #	25 #	17 #	18 #
Tube section (1:1)							
Wall thickness (mm)	1 . 6						
Inner diameter (mm)	0 . 8	1 . 6	2 . 4	3 . 1	4 . 8	6 . 4	7 . 9
Pressure (MPa) Continuous	0 . 17				0 . 14	0 . 1	0 . 07
Pressure (MPa) Interval	0 . 27				0 . 24	0 . 14	0 . 1

Tube	15 #	24 #
Tube section (1:1)		
Wall thickness (mm)	2.4	
Inner diameter (mm)	4 . 8	6 . 4
Pressure (MPa) Continuous	0 . 17	
Pressure (MPa) Interval	0 . 27	