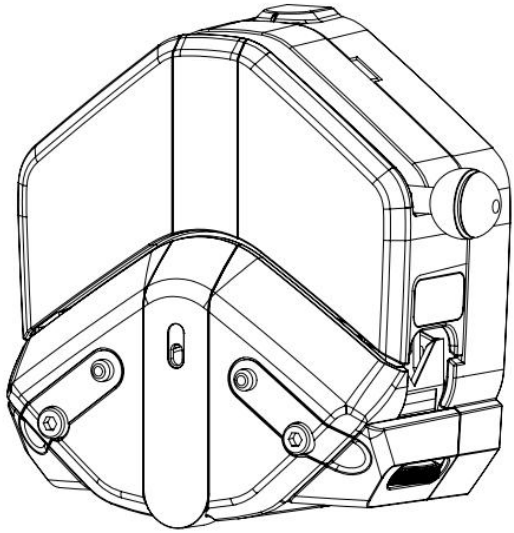
Manual of EasyPump Series
Pump Head



Note:

- Please read the manual carefully before using the product.

Warning:

- Tubing may have crack due to wear. It results in the overflow of fluid from tubing. In that time human body and instruments may be harmed. So users must check frequently and change tubing in time.
- If the pump head in water accidentally, use soft cloth and other absorbent soft cloth to wipe dry to prevent damage to the pump head.
- Before the peristaltic pump start running each time, check the tubing carefully if it is damaged.
- Move the tubing working position after it was used for a period of time, in order to extend the tube lifetime.
- Please loose the tube when not in use for a longtime.
- There are movable parts inside the pump head. Before opening the upper pressure block, the following requirements must be followed:
    - Ensure the pump is isolated from the main power supply;
    - Ensure there is no pressure inside the tube;
    - If the tube fails, make sure that the liquid in the tube is discharged to other containers.
    - If dangerous liquids are transmitted, protective clothing and eye protection must be worn.

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1. Product Introduction

EasyPump series have the unique tube clamp linkage mechanism, with the opening process of the upper block, the tube clamp naturally lifts, and the user can easily put in the tube. With the closing process of the upper block, the tube clamp automatically resets and fixes the tube. At the same time, the "Trigger lever assist mechanism" assists the user in pressing the upper pressure block. The rubbing wheel mechanism can adjust the position of the lower tube clamp to fix tubes of different materials and diameters.

The pump head has single and dual channel available. And there is fixed tube pressure gap pump head and adjustable tube pressure gap pump head. There are two types material of the pump head shell: resistant to organic solvents and non-resistant to organic solvents.

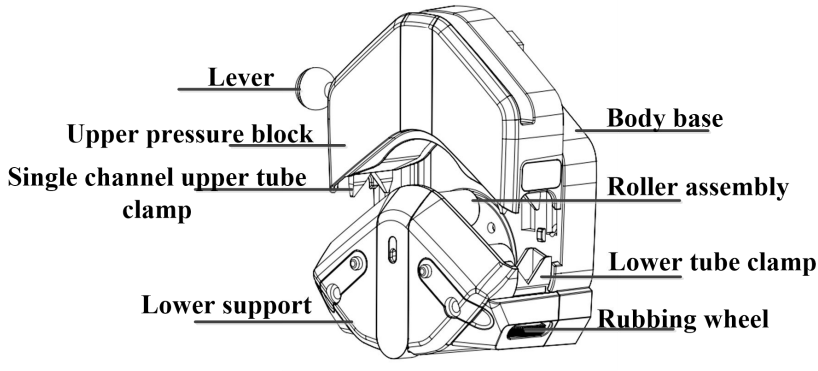
The pump head is widely used in supporting analytical equipment. According to different technical requirement, it can be driven by DC motor, stepper motor and AC motor. It can be also stackable, in order to achieve the purpose of increasing the flow rate.

According to tubing size, channel numbers and tube pressure gap, the EasyPump model No. as below:

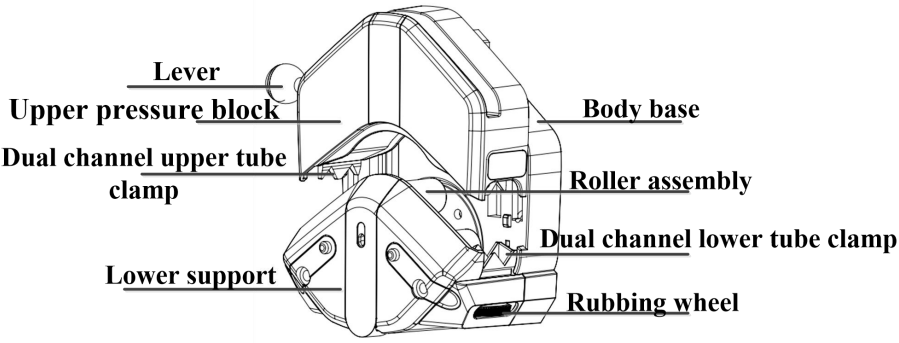
Model No.	Tubing Wall Thickness	Tubing Size	Channel	Tube Pressure Gap
EasyPump I	1.6mm	13#, 14#, 19#, 16#, 25#, 17#, 18#	Single	Fixed
EasyPump II	2.4mm	15#, 24#, 35#, 36#	Single	Fixed
EasyPump III	1.6mm	13#, 14#, 19#, 16#, 25#, 17#, 18#	Single	Adjustable
EasyPump IV	2.4mm	15#, 24#, 35#, 36#	Single	Adjustable
EasyPump V	1.6mm	13#, 14#, 19#, 16#, 25#	Dual	Fixed
EasyPump VI	1.6mm	13#, 14#, 19#, 16#, 25#	Dual	Adjustable

2. Product Instruction

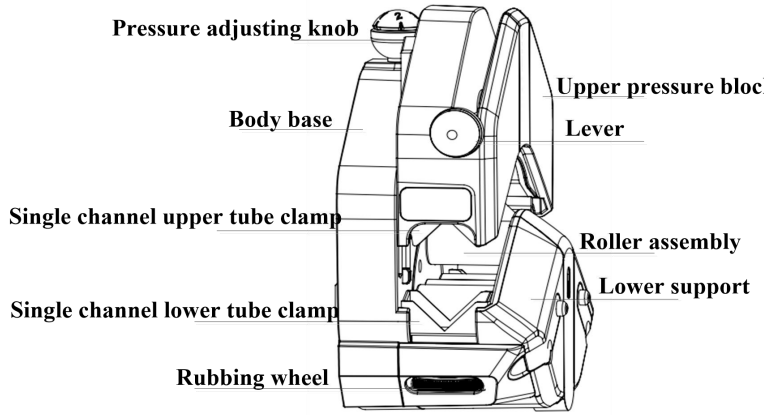
Single channel, fixed tube pressure gap pump head:



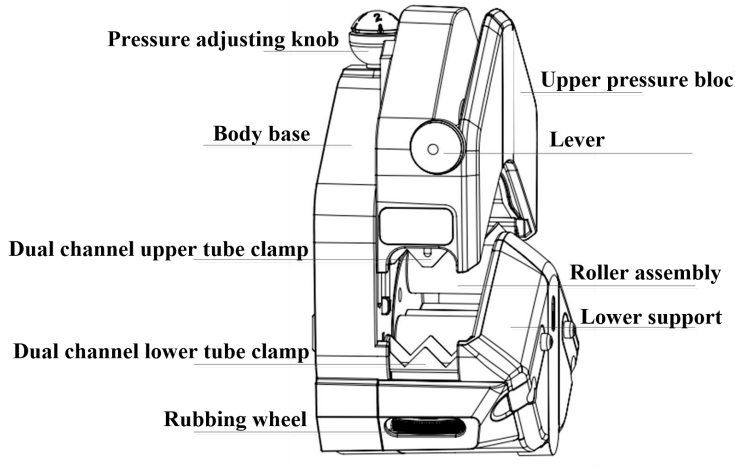
Dual-channel, fixed tube pressure gap pump head:



Single channel, adjustable tube pressure gap pump head:



Dual channel, adjustable tube pressure gap pump head:



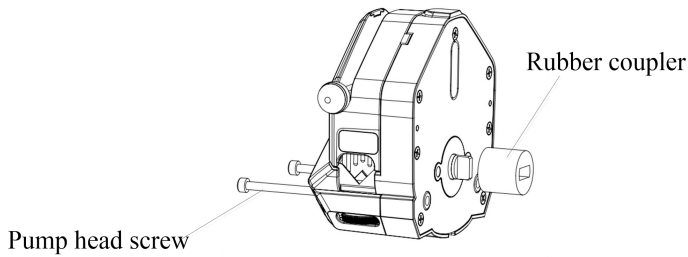
2.1 Pump Head Installation Specification

- Try to install the pump head at or just below the liquid level end of the liquid to be transferred to ensure the most efficient liquid transfer.
- Do not install the pump in a confined location without adequate air circulation around the pump.
- Be sure to keep all moving parts of the pump head clean and free of contamination and debris.
- The tubing diameter used on the suction and delivery ends of the pump must be equal to or larger than the tubing diameter in the pump head. Especially when transporting viscous liquids, the tubing diameter used at the suction end is preferably several times larger than the tubing diameter in the pump head.
- When transferring viscous liquids, be sure to run at low speed.

2.2 Single Pump Head Installation

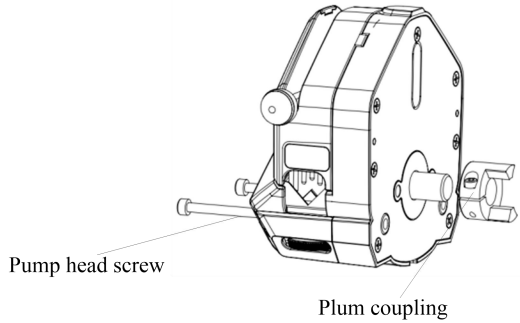
(1) Standard (flat) shaft pump head installation with rubber coupler

First, install the rubber coupler on the pump head shaft, the narrow groove of the rubber coupler is butt-connected with the boss of the main shaft of the pump head. Install the pump head on the driver motor shaft, the wide groove of the rubber coupler is butt-connected with the boss of the motor shaft. Then fix the pump head on the driver with screws. Please fasten the two screws with same force.



(2) Round shaft pump head installation with plum coupling

Install the plum coupling on the pump head shaft, adjust to suitable position, fasten the coupler screw. Then install the pump head on the driver motor shaft with coupler, fasten the pump head screws to fix the pump head on the driver. Please try to use same force to fasten the screws.

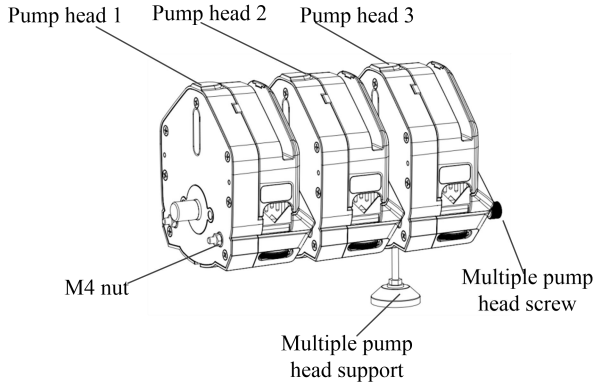


2.3 Multiple Pump Head Installation

In most cases, the pump head is already installed on the driver before leaving the factory. The following are instructions for installing the pump head when it is not installed on the driver. And if the user needs to disassemble and replace the pump head, they can also refer to the following methods:

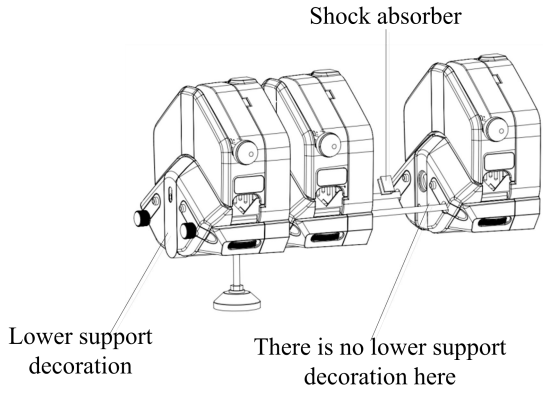
(1) Pump heads are connected in series as a whole. (Take three pump heads as an example)

- The pump head status as in below picture when you receive it.
- Remove the two M4 nuts, install the complete pump head group (pump head1/2/3) to the pump drive, then adjust the height of the multiple pump head support according to the actual situation on site.



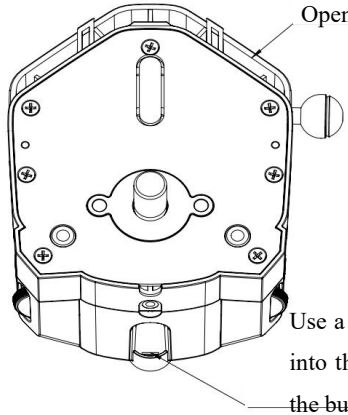
(2) The pump heads are separately or users need to disassemble and replace the pump head in the later use process, please refer to the below instruction:

- The main shaft connection between two adjacent pump heads needs to install shock absorber, as in below picture, otherwise it will cause the pump head to work abnormally.
- Except that the outermost pump head has a lower support decoration, the other pump heads need to remove the lower support decoration, as in the below picture:



➢ Take off the lower support decoration as in below picture:

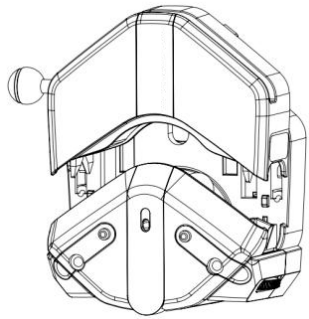
Open the upper pressure block, then use a flat-blade screwdriver to insert into the buckle position as shown in below picture, pry open the buckle position with a slight force, and then remove the lower support decoration.



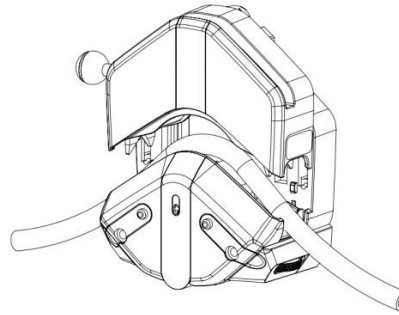
Note: Double pump heads and above are connected in series. It is recommended to install multiple pump head support feet to improve the stability of pump head operation.

2.4 Tubing Installation

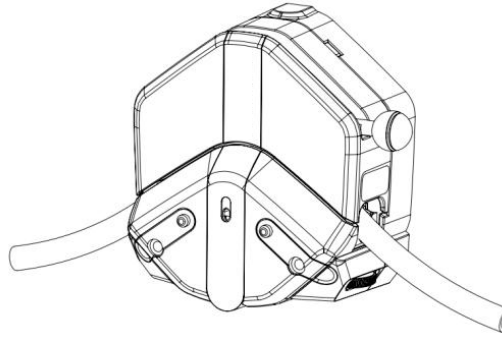
➢ Pull the lever 180°counterclockwise, and open the upper pressure block.



- Put the tubing between rollers and upper pressure block.

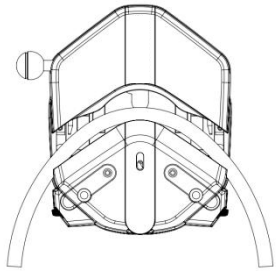


- Pull the lever 180°clockwise, and push upper pressure block to the correct position, compress the tube.



2.5 Tubing Installation Note

- Before you press the upper pressure block, please make sure the tubing have been straighten when tubing installed. Otherwise it will cause the tubing accumulating in the pump head, leading to the tube deviates to scratch itself in a running process, as below:



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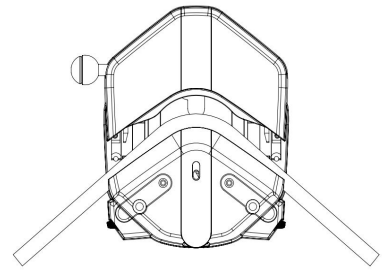

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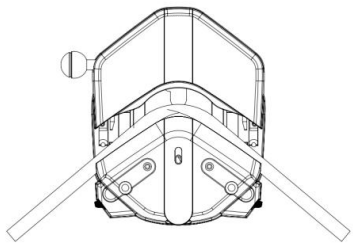
- Please pay special attention to straighten the tube in the natural direction. It should not be twisted and pressed on the slider, otherwise it will cause the tube deviates to scratch itself in a running process, as below:



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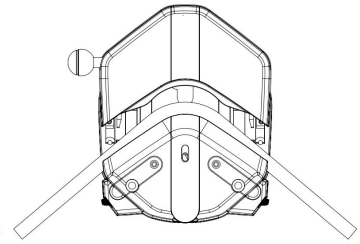

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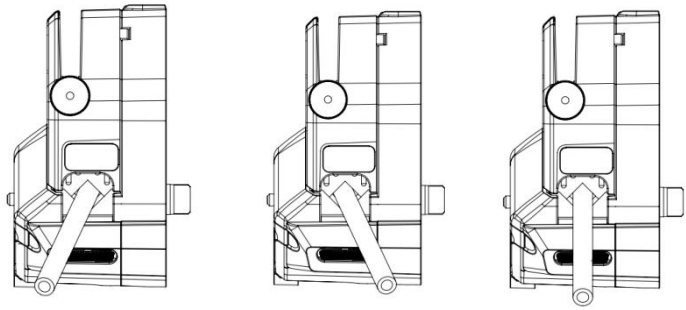
- Tubing in the inlet and outlet area of the pump head, leaning forward or backward state, causing the tubing inside the pump head work part deviation, tubing will be cut, as below:



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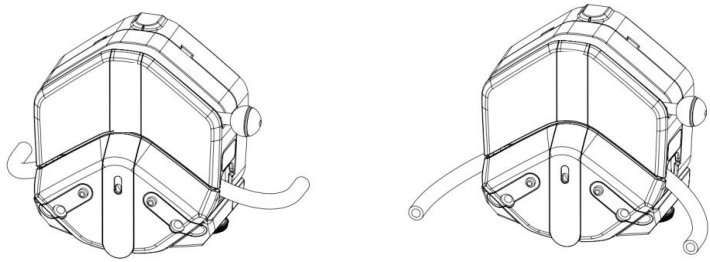
- When the tubing needs to be bent installed, it does not set aside enough length and space to cause the tubing inside the pump head work part deviation, tubing will be cut, as below:



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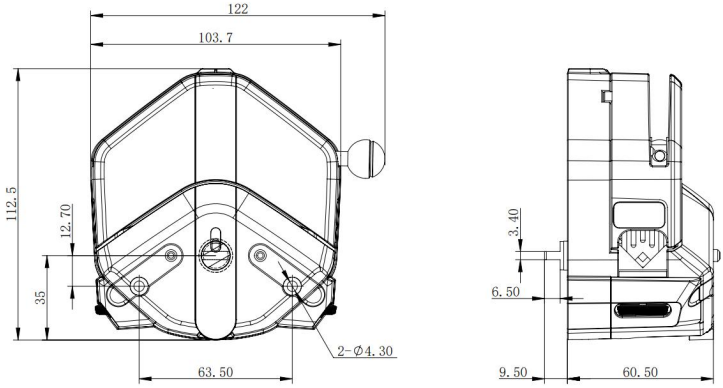
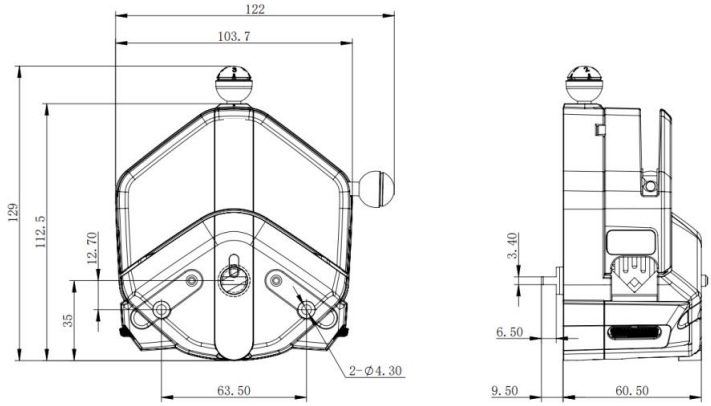
Note : If must use the tubing as in above status, please contact us to provide a workable solution according with the actual application.

3. EasyPump Head Dimension (Unit:mm)

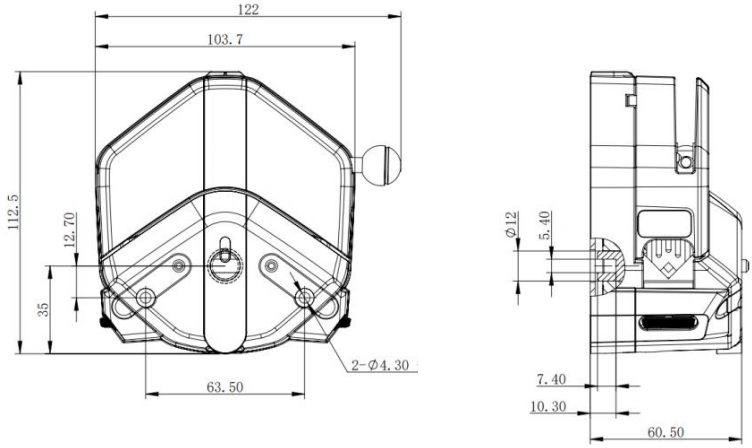
3.1 Fixed tube pressure gap EasyPump (Standard shaft)



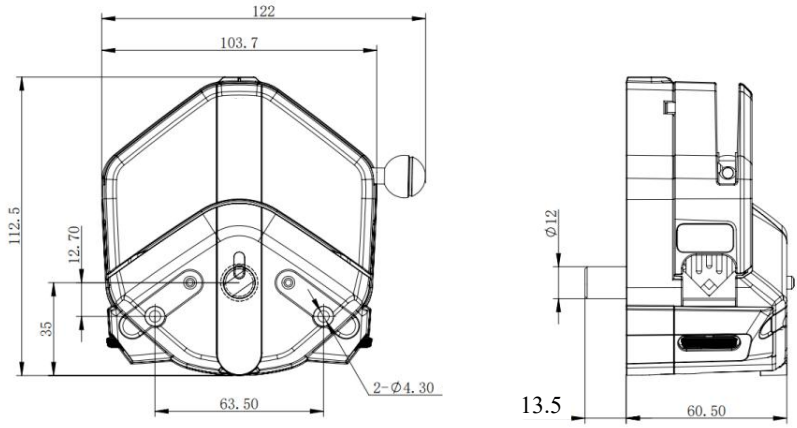
3.2 Adjustable tube pressure gap EasyPump (Standard shaft)



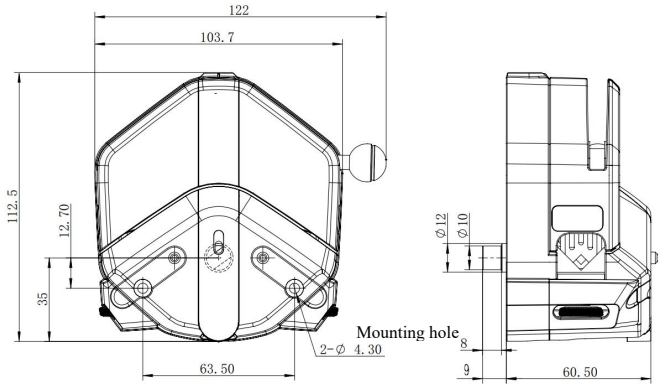
3.3 Fixed tube pressure gap EasyPump (Compact shaft)



3.4 Fixed tube pressure gap (Round shaft)



3.5 Fixed tube pressure gap (Step circular axis)



Note: The required height for opening the pump head is 155mm (from the bottom of the pump head)

4. EasyPump Series Specification and Flow Rate Chart

4.1 Pump Head Specification

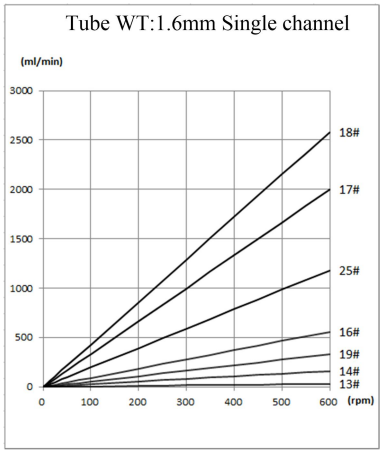
Pump head	Tube		mL/R	Speed 0.1-600rpm	Maximum Pressure (Mpa)		Rollers	Weight (kg)
	Size	ID×WT (mm)		Flow rate range mL/min	Intermittent	Continuous		
Single channel EasyPumpI /III	13#	0.8×1.6	0.053	0.0053-32	0.27	0.17	4 Rollers	0.6
	14#	1.6×1.6	0.27	0.027-162				
	19#	2.4×1.6	0.55	0.055-330				
	16#	3.1×1.6	0.933	0.093-560				
	25#	4.8×1.6	1.967	0.197-1180	0.24	0.14		
	17#	6.4×1.6	3.333	0.333-2000	0.14	0.1		
	18#	7.9×1.6	4.3	0.430-2580	0.1	0.07		
Single channel EasyPump II/IV	15#	4.8×2.4	1.8	0.180-1080	0.27	0.17		
	24#	6.4×2.4	2.733	0.273-1640				
	35#	7.9×2.4	3.833	0.383-2300	0.24	0.14		
	36#	9.6×2.4	5.167	0.517-3100				
Dual channel EasyPump V/VI	13#	0.8×1.6	0.053	0.0053-32	0.27	0.17		
	14#	1.6×1.6	0.27	0.027-162				
	19#	2.4×1.6	0.55	0.055-330				
	16#	3.1×1.6	0.933	0.093-560				
	25#	4.8x1.6	1.967	0.197-1180	0.24	0.14		

Experimental conditions: Standard atmospheric pressure, room temperature is 20℃, the liquid is pure water, no pressure, no suction lift.

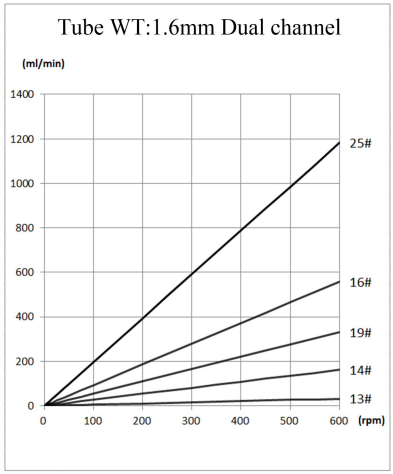
Note: In actual use, it is affected by many factors such as transmission medium, inlet and outlet pressure, tube material and error, working environment, etc.The flow rate may vary, this data is for reference only.

4.2 Flow Rate Chart

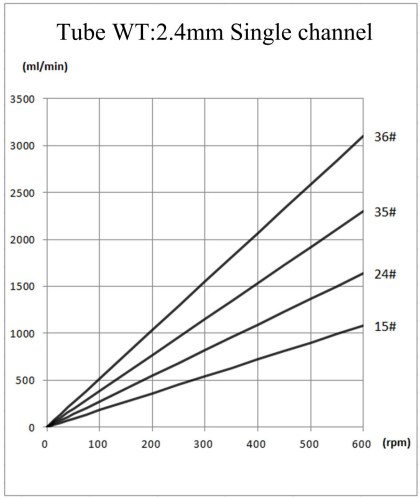
Single Channel EasyPump I/III



Dual Channel EasyPump V/VI



Single Channel EasyPump II/IV



Note: The reference data of the flow rate above is measured at room temperature under standard atmospheric pressure with pure water as the transmission medium, under the condition of no pressure and no suction lift. Actually, it is affected by many factors such as transmission medium, inlet and outlet pressure, hose material and error, working environment, etc. This data is for reference only.

4.3 Pump Head Torque

Pump Head Model	Tubing		Scale Position		Starting Reference Torque (N·M)				
	Tubing Size	ID× Wall Thickness (mm)	Fixed	Adjustable	Silicone Tubing	PharMed	E-3603	N-C	Viton
Single Channel EasyPumpI/ III	13#	0.8×1.6	/	3	0.16	0.13	0.13	0.17	0.11
	14#	1.6×1.6	/	3	0.12	0.21	0.18	0.34	0.16
	19#	2.4×1.6	/	3	0.19	0.23	0.23	/	/
	16#	3.1×1.6	/	3	0.14	0.36	0.21	0.53	0.24
	25#	4.8×1.6	/	3	0.22	0.34	0.24	0.58	0.25
	17#	6.4×1.6	/	3	0.21	0.40	0.30	0.66	0.30
	18#	7.9×1.6	/	3	0.23	0.35	0.28	0.7	0.23
Single Channel EasyPumpII/ IV	15#	4.8×2.4	/	3	0.24	1.03	0.69	0.91	0.43
	24#	6.4×2.4	/	3	0.35	0.78	0.56	1.22	0.47
	35#	7.9×2.4	/	3	0.43	0.70	0.55	1.34	0.53
	36#	9.6×2.4	/	3	0.43	0.81	0.54	1.1	0.51
Dual Channel EasyPumpV/ VI	13#	0.8×1.6	/	3	0.25	0.24	0.24	0.37	0.19
	14#	1.6×1.6	/	3	0.2	0.43	0.39	0.62	0.32
	19#	2.4×1.6	/	3	0.35	0.50	0.47	/	/
	16#	3.1×1.6	/	3	0.21	0.67	0.43	0.82	0.50
	25#	4.8×1.6	/	3	0.45	0.73	0.50	0.89	0.63

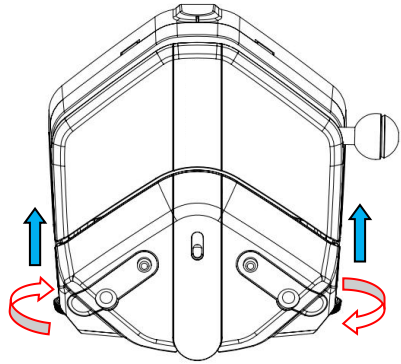
5. Function Instruction

5.1 Adjustable Function For Position of Lower Tube Clamp

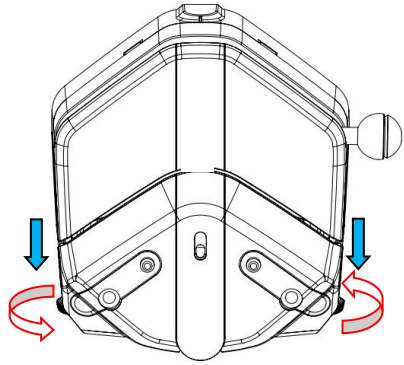
Adjust the rubbing wheel to adjust the position of the lower tube clamp position, to make the pump head fit for different size tubing.

Note: Please adjust the lower tube clamp position first before install tubing.

5.1.1 The lower tube clamp position will rise when two sides of rubbing wheel rotates in clockwise direction as below:



5.1.2 The lower tube clamp position will move downward when two sides of rubbing wheel rotates in a counterclockwise direction as below:

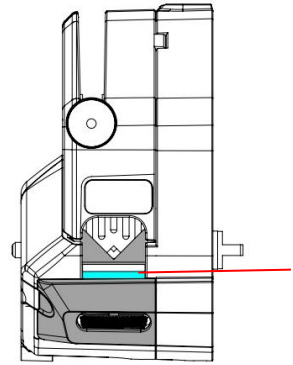


5.1.3 Low tube clamp position for different size tubing instruction:

(1) When the lower tube clamp is at the top, it can fit for:

1.6mm wall thickness tubing: 13#, 14#, 19#, 16#, 25#.

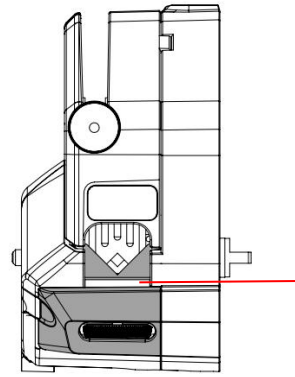
Note: It is suitable both for single and dual channel.



(2) When the lower tube clamp is at the middle position, it can fit for:

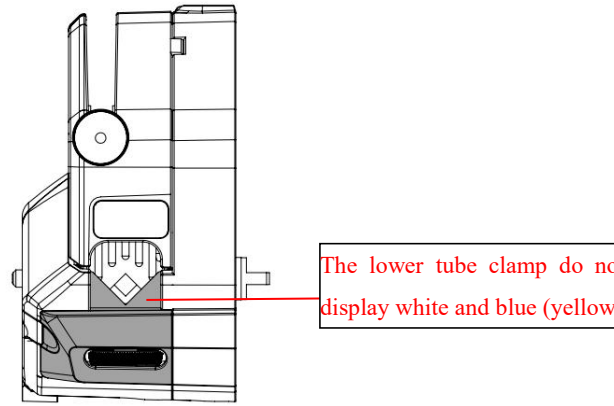
1.6mm wall thickness tubing, size: 17#, 18#

2.4mm wall thickness tubing, size: 15#, 24#



(3) When the lower tube clamp is at the bottom position, it can be fit for:

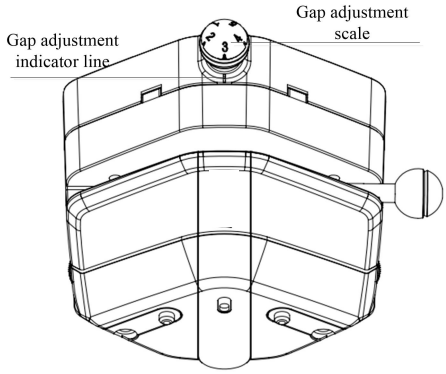
2.4mm wall thickness tubing, size: 35#, 36#



Note: The above lower tube clamp position just suitable for silicone and PharMed tube. If need to use other material tubing, please contact with us for technical support.

5.2 Tube Pressure Gap Adjustable Function

- Adjust the pressure adjusting knob to adjust the tube pressure gap, to change the pump head tube output pressure and flow rate.
- Pressure adjustment is stepless adjustment, adjust to any position within the adjustment range can be used normally.
- A total of 5 scale values are set as indicators in the adjustment range. Scale 3 is the factory standard scale value, which can be used as the initial position of the tube pressure gap adjustment during the use of the pump head. The factory default scale vale 3 is aligned with the gap adjustment indicator line, as in below picture:



- Turn the pressure adjusting knob clockwise, the scale value will increase, tube pressure gap will reduce, the output pressure of the pump head tube will increase and flow rate will reduce.
- Turn the knob counterclockwise, the scale value will reduce, tube pressure gap will increase, the output pressure of the pump head tube will reduce and flow rate will increase.

Note:

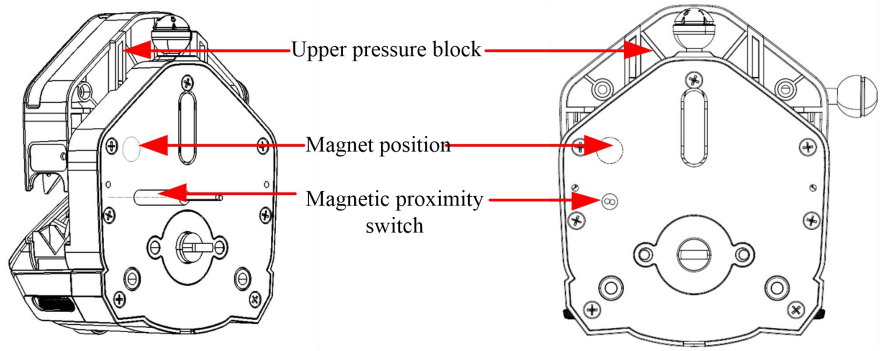
- The larger the scale value, the greater the output pressure of the pump head tube, the faster the tube wears, and the lower the tube life. Therefore, it is not recommended to use it at the position of the scale 5 for a long time.
- The smaller the scale value, the smaller the output pressure of the pump head tube, and the lighter the tube is compressed. The pump head is more prone to "no liquid" or "output liquid dropping" during use. Therefore, please use the scale 1 with caution.

5.3 Open Head Stop Running Function (For Optional)

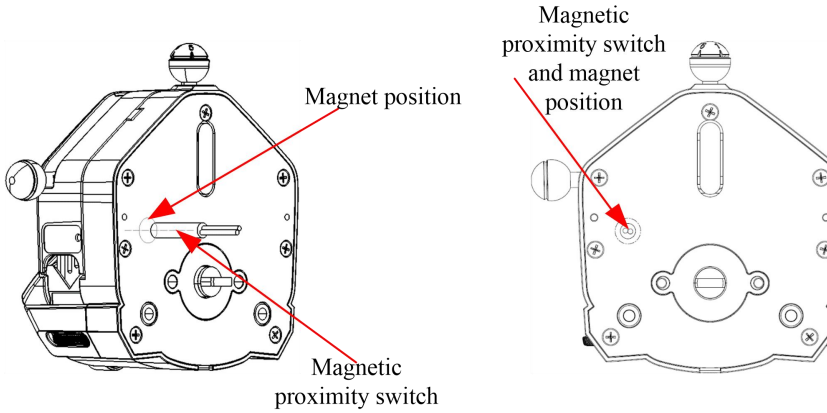
Function Principle: Magnetic proximity switch

Introduction: A magnetic proximity switch is a non-contact electronic component that triggers the opening or closing of a circuit by detecting the presence or change of an external magnetic field. When the lever with cap is toggled to open the upper pressing block, the sensor on the actuator no longer detects the magnetic field, causing the switch to open. When the upper pressing block is closed, the sensor detects the magnetic field again, triggering the switch to close.

Pump Head:

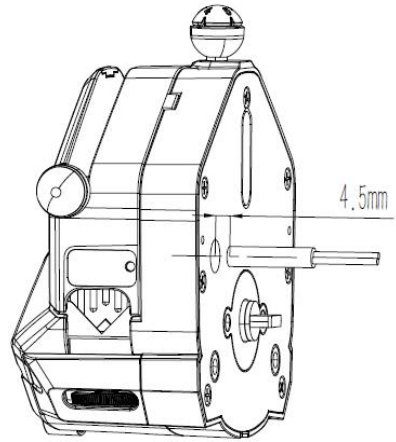


When the upper pressing block is in the open position, it triggers the switch to open (or disconnect).

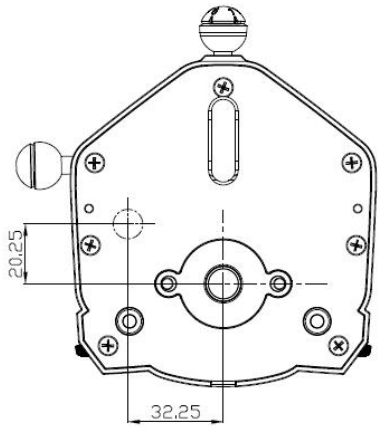


When the upper pressing block is in the close position, it triggers the switch to close (or connect).

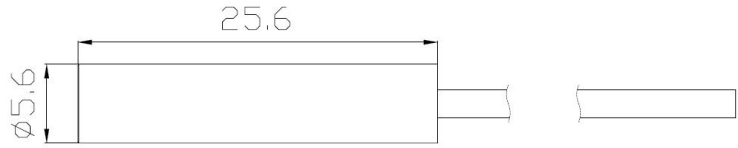
The distance between the pump head rear cover plate and the magnetic proximity switch:



Magnet installation dimensions:



Magnetic proximity switch dimensions:



Precautions:

- The distance between the magnetic proximity switch and the pump head should be ≤4.5mm.
- Keep away from devices that shield or conduct magnetism, as well as other magnetic sources.
- Install the magnetic proximity switch on the customer's own mounting plate.

Magnetic proximity switch performance:

Maximum contact capacity	10W
Maximum switching voltage	DC200V
Minimum breakdown voltage	DC250V
Maximum switching current	0.5A
Maximum load current	1.0A
Vibration resistance	30G
Vibration resistance	30G (10~50Hz)
Operating temperature range	-30~80℃
Thermal shock resistance	-40~85℃

6. Troubleshooting

If the pump head flow rate is very low or no flow rate, please check the following:

- Check whether there is liquid from input side;
- Check whether the suction side tube is blocked by suction wall;
- Check whether the tube is cracked;
- Check for blockages or kinks in the tube;
- Check whether the wall thickness of the tube is correct;
- Check whether all valves in the tube are open;
- Check whether the direction of the pump rotation is correct.

7. Maintenance

- When pump does not work, please loose the upper block which press the tubing for avoiding changing the shape of tubing because of longtime extrusion.
- Keep the rollers of pump head clean and dry, otherwise it can quicken the tubing wear, reduce the useful life of tubing and lead the rollers to damage in earlier.
- Before the peristaltic pump start running each time, check the tubing carefully if it is damage.
- If the pump head in water accidentally, use soft cloth and other absorbent soft cloth to wipe dry to prevent damage to the pump head.
- After replacing the tube, fluid or any connecting tube, must be re-calibrated the pump. It is recommended to re-calibrate the pump regularly to maintain accuracy.
- The pump head is not resistant to organic solvents (except for special indications) and strong corrosive liquids, special attention should be paid when using.
- Regarding the tubing, there is a certain deviation in the inner diameter and wall thickness of the hose due to its own tolerance and different batches; it will affect the product flow accuracy, and it is recommended that customers should leave a certain margin design when selecting.
- When the input and output diameters become smaller or there is suction and lift, the flow will be affected and the flow will be reduced.
- The data recorded in this document is the value under short-term measurement conditions, and there will be changes in long-term use.
- The company shall not bear the direct and indirect losses caused by the malfunction or improper operation of this product.

8. Warranty and After-sales Service

We support 1 year warranty for the pump, subject to the exceptions below. Our company shall not be liable for any loss, damage, or expense directly or indirectly related to or arising out of the improper use of its products. This warranty does not obligate our company to bear any costs of removal, installation, transportation, or other charges which may arise in connection with a warranty claim.

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

Exceptions:

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