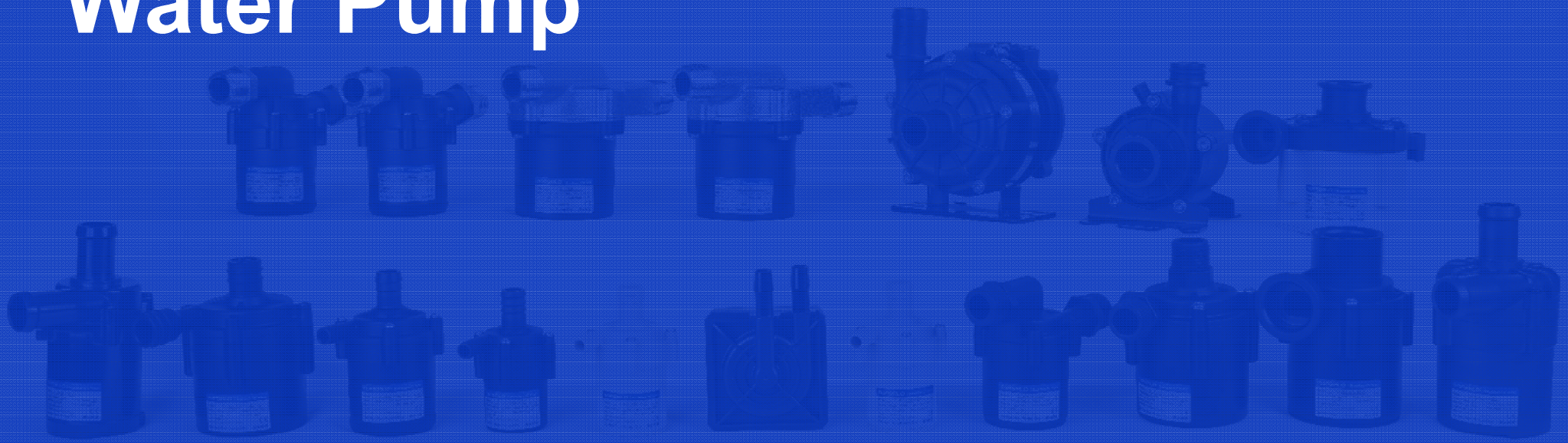
TOPSFLO
Excellence in Micro Pump,DC Pump

Installation Instructions for Water Pump



To be the World-class Micro-pump Brand

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Contents

1 Product Display

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TL-A02	TL-B03	TL-B04	TL-B10	TL-C01
				
TL-C02	**TL-C03**	**TL-C04**	**TL-C06**	**TL-D01**
				
TA50	**TA60**	**TD5**	**TS5**	**TDC**
				

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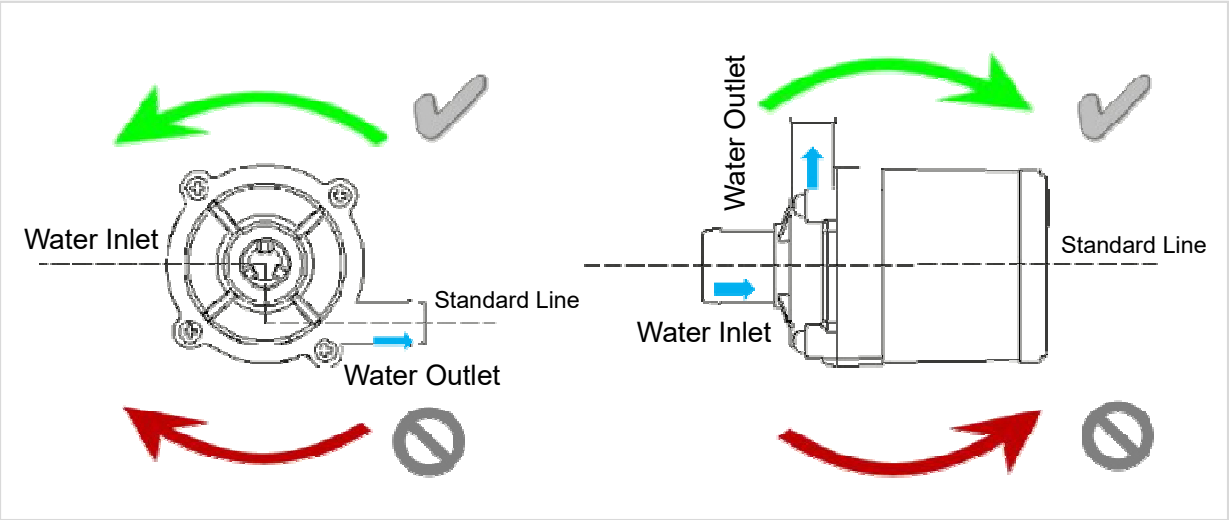
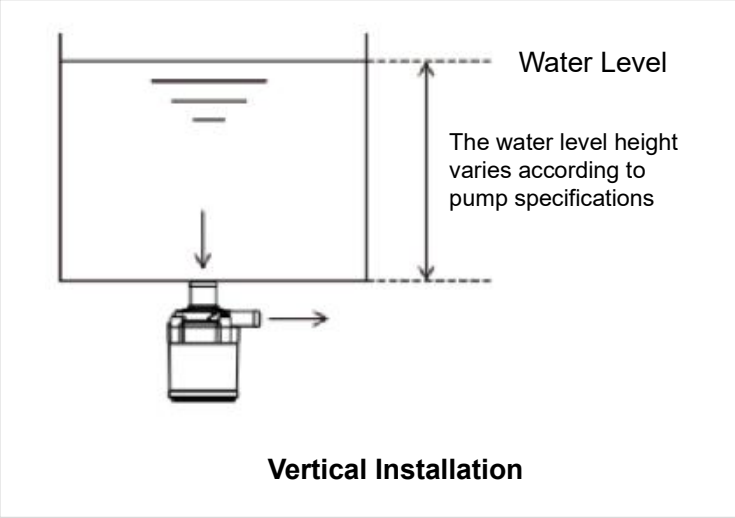
2 Installation Orientation



(Figure 1)



(Figure 2)

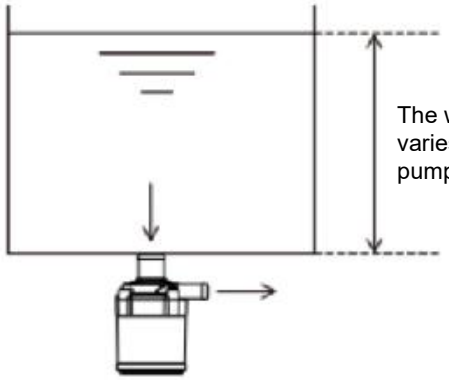
- The pump must be installed with its water outlet as the reference point, following the green arrow direction shown in Figure 1. Installation in the red arrow direction is strictly prohibited.
- For TL-A, B and C series pumps requiring air release during startup, vertical installation (Figure 2) is recommended to facilitate air exhaust and reduce startup noise. If no air release is needed, these pumps can be installed in any orientation.

3 Installation Precautions

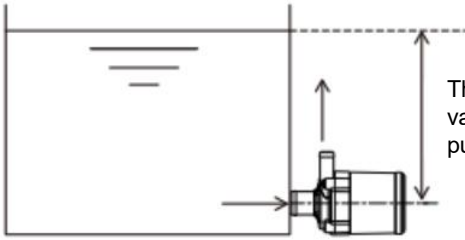
3.1 Installation Position

- Before installation, check for transport - induced deformation or damage and tighten all fasteners.
- Mount the pump on a stable surface; it can be vertical or horizontal based on the outlet. For high - temperature use and optimal performance, install it vertically with the inlet upward to release air.
- Ensure an adequate water supply to avoid cavitation and dry running. As the pump series is non - self - priming, install it below the liquid level (submersible models can be directly placed in water). Observe the following liquid - level requirements above the inlet:

  5–15 L/min: ≥10 cm； 15–40 L/min: ≥20 cm； 40 L/min: ≥30 cm
- (Not applicable to fully-filled closed water circuits). Prevent vortices to avoid air intake, which can cause excessive wear and noise.



Vertical Installation

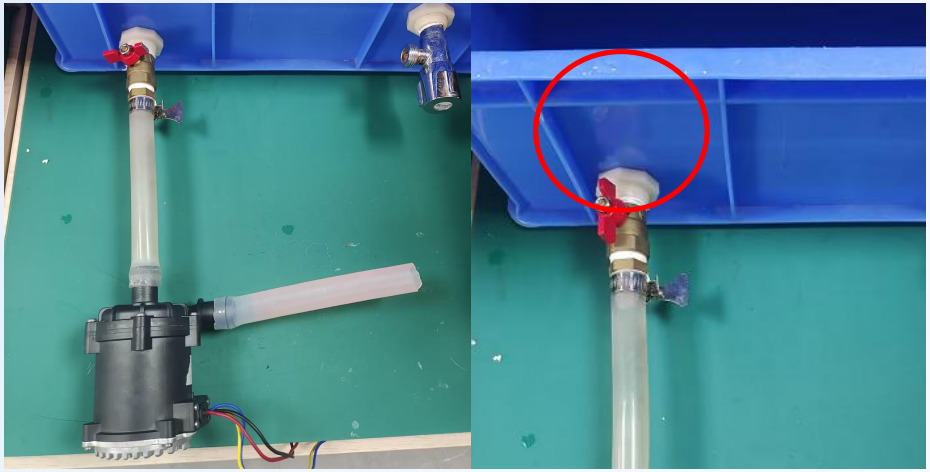


Horizontal installation

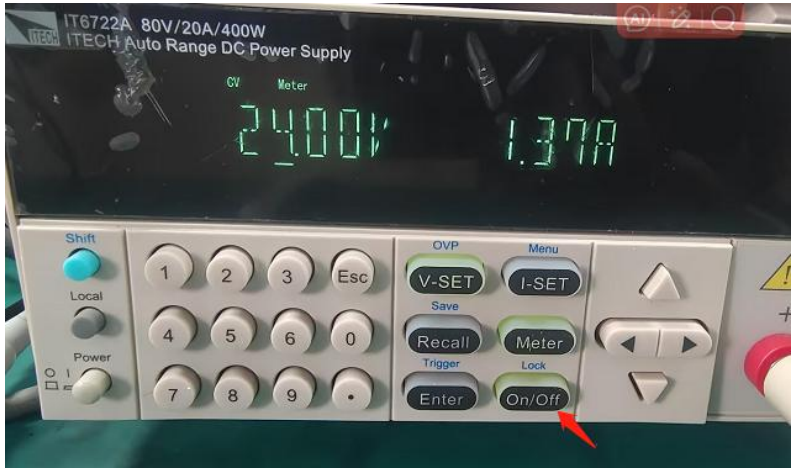
3 Installation Precautions

3.2 How to Remove Air from the Pump

Method 1:
Before starting the pump, open the inlet valve and ensure the outlet is unobstructed. Allow water to naturally flow into the pump and pipeline, pushing the air out through the outlet.



Method 2:
Power on the pump for 3-5 seconds, then turn it off for 3-5 seconds. Repeat this on-off process multiple times to expel the air from the pump.

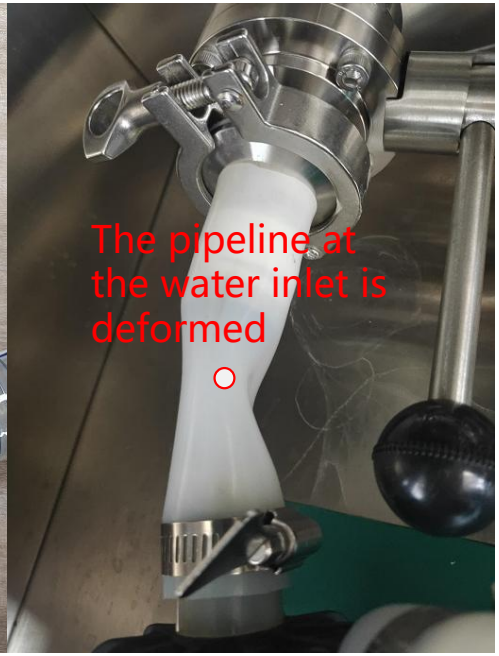


3 Installation Precautions

3.3 Selecting the Proper Pipe Diameter for the Pump

- Flexible Hose Connection: Ensure the hose inner diameter is 2 - 3mm smaller than the maximum outer diameter of the pump's inlet and outlet barbs (same for threaded connections' front-end pipeline inner diameter).
- Keep the pipeline short with few bends to reduce flow resistance.
- Avoid pipe bends over 90°; use gentle curves to minimize resistance.
- Use corrosion-resistant plastic hoses capable of withstanding pump operation pressure.
- For pumps with a capacity over 40L, use spring-reinforced hoses to prevent deformation from high suction force and avoid insufficient water intake (**refer to Figure 1 and Figure 2**).

(Figure 1)



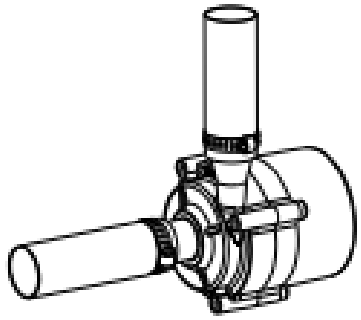
(Figure 2)

3 Installation Precautions

3.4 Pump Pipeline Installation and Connection

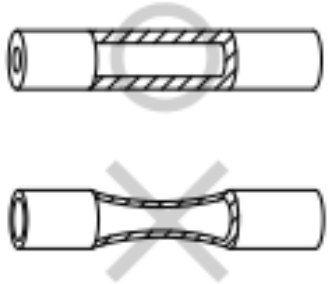
Hose Connection:

Insert the hose over the barbed inlet and outlet of the pump. Use fasteners (e.g., hose clamps) to ensure a tight connection and prevent fluid leakage. If the pipeline material is rigid, do not bend the pipe, as this may cause the pipe ends or pump outlet to crack.



Pipeline Guidelines:

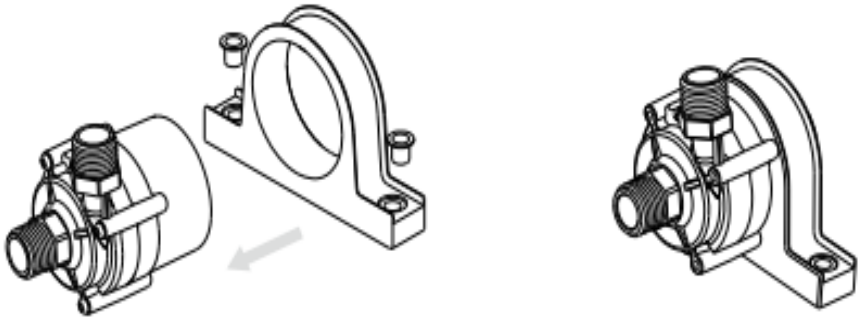
1. To minimize performance loss, reduce pipeline friction resistance as much as possible.
2. Use hoses with high pressure resistance to withstand the pressure generated during pump operation.
3. Select a hose that matches the pump port diameter. Using hoses of incorrect sizes may result in an unreliable connection.



3 Installation Precautions

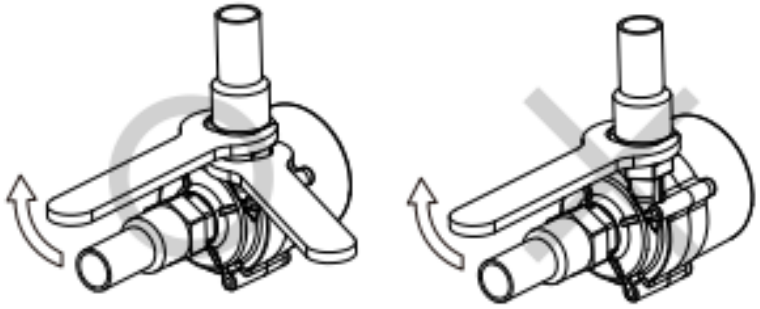
3.5 Pump Bracket Installation

If the product needs to be secured, use the accompanying bracket and tighten the screws to prevent pump vibration. The bracket must be firmly fixed to the installation surface. The bracket installation is as shown in the figure below.



3.6 Pump Thread Connection

To avoid damaging the inlet and outlet of the pump, when connecting and tightening the threads, use another wrench to secure the inlet and outlet, as shown in the figure below.



3 Installation Precautions

3.7 Safety Precautions During Installation

- Keep away from water.
- Handle with care. Dropping or impacting the product is strictly prohibited.
- Do not store or use near hazardous or flammable materials.
- Do not modify or rethread the inlet/outlet ports, as this may cause cracking.
- Dry running is prohibited, as it may lead to excessive bearing wear, friction heat, and pump damage.
- Do not pump liquids containing large solid particles.
- If the pump or electronic components become wet, immediately disconnect the power supply.

4 Wiring Connection

- **Before starting wiring work, ensure the main power supply is turned off.**
- **Check that the power cable is free from bends, stretching, or deformation.**
- **Use appropriate wiring materials, follow the motor instruction manual, and comply with local and national electrical codes.**
- **It is recommended to use the rated voltage indicated on the pump lable. The operating voltage range is 6~18V for 12V models and 12~28V for 24V models.**
- **This product does not have an on/off button. The pump starts when the power cable is connected. Avoid frequent on/off operations.**
- **The power cable has positive (+) and negative (-) poles: red is positive, and black is negative. Incorrect polarity will damage the motor. If the power cable is reversed, the motor will be irreversibly damaged.**

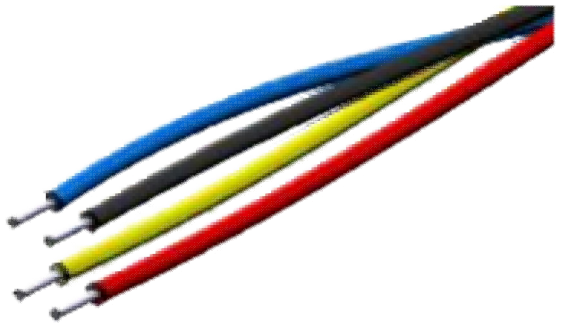
Three/Four-Wire Pump

Red = 12 / 24 VDC

Black = GND

Blue = PWM / 0~5VDC speed control

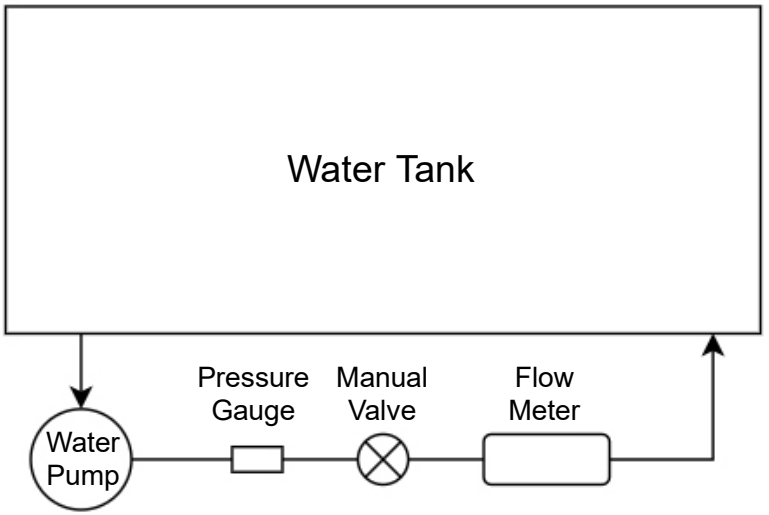
Yellow = RPM monitoring



Note: Special models may have different wire colors. Refer to the product label for details.

5 Pump Performance Test

- Pressure gauge installed before the manual valve, test more accurate.
- Flow meter behind the manual valve, to avoid installing in front of the pump to affect the flow rate.
- Carry out the operation after venting. Ensure a high water level, sufficient water volume, and an unobstructed water outlet for venting.
- Test the flow point evenly, and then connect them to form a curve.
- The control valve used by our company is a solenoid valve, which can be controlled by a computer.



(Installation Schematic Diagram)

6 Pump Fault Identification and Handling

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The water pump mainly has the following possible faults during use：

No.	Fault Phenomenon	Possible Cause	Solution
1	High current, low flow	Impurities in the rotor	Flush by injecting water from the water outlet
		Failure of the MOS tube on the control board	Replace the pump
2	Pump doesn’ t rotate, the current fluctuates	Rotor stuck by foreign objects	Remove the foreign objects causing the rotor to get stuck
		Air inside the pump	Remove the air according to method 3.2
	Pump doesn’ t rotate, short-circuit current	Control board damaged	Replace the pump
	Pump doesn’ t rotate, no current	Wires not properly connected or poor contact inside the self - loaded terminal	Check if the connectors are properly connected
		Internal circuit of the pump burnt out	Replace the pump
3	Abnormal sound/loud noise	Impurities in the pump	Remove impurities (it is recommended that the size of liquid impurity particles should not exceed 20um)
		No liquid in the pump, and it runs dry	Ensure there is liquid in the pump
		Gas inside the pump cannot be discharged	Place the water outlet upward, squeeze the water outlet pipe several times for 3 - 5 seconds and then release, ensuring there is no air in the liquid source
		Internal shaft broken	Replace the shaft
		Unbalanced rotor	Replace the rotor
		The pump installation method resonates with the equipment in use	Check the pump installation method and eliminate resonance

7 SOP for Pump Water Flow Test (PWM speed)

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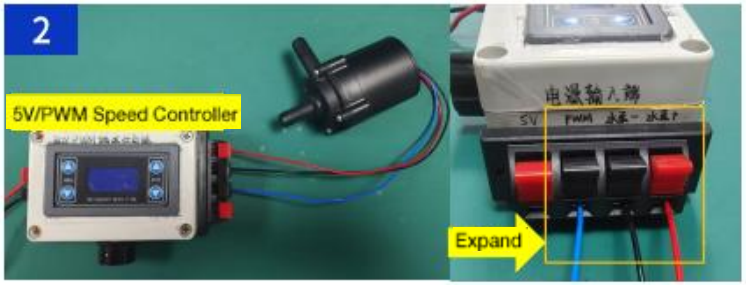
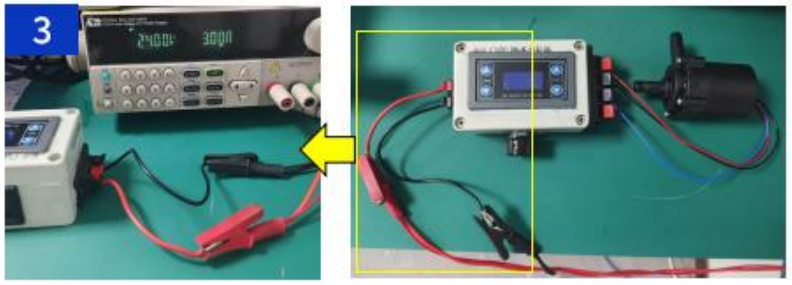
1. Set the regulated power supply's voltage and current limits. The B10 model with a rated voltage of 24V, set the current limit to 3A, given the pump's maximum operating current of around 1.5A.



2. Connect the pump wires to the 5V/PWM speed controller. Connect the red wire to the positive terminal, the black wire to the negative terminal, and the blue wire to the PWM terminal of the speed controller.



3. Connect the regulated power supply wires to the other end of the speed controller.
Connect the red wire to the positive terminal and the black wire to the negative terminal.

4. Before powering on, position the pump outlet parallel to the water surface, tilt it upward at 30-45° for 2-3 seconds to prime the pump and remove air from the pump head, then submerge the pump head in water.

5. Turn on the power switch to test the pump performance. Check its operation, water output, and operating current. At 100% PWM, the pump has maximum water output with an operating current of about 1.52A.

6. Adjust the pump speed via the speed - controller using PWM. For instance, at 90% PWM, the water output decreases, and the operating current is about 1.34A.

7 SOP for Pump Water Flow Test (5V speed

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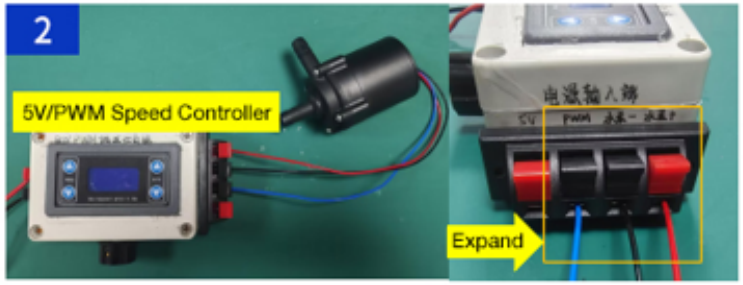
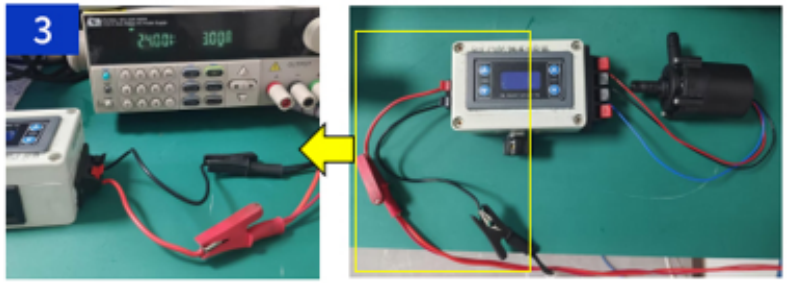
1. Set the regulated power supply's voltage and current limits. For the B10 model (rated 24V), set the current limit to 3A as the pump's max operating current is about 1.5A.



2. Connect the pump wires to the 5V/PWM speed controller. Red to the positive terminal, black to the negative terminal, and blue to the 5V terminal.



3. Connect the regulated power supply wires to the opposite end of the speed controller. Red to positive, black to negative.

4. Before powering on, position the pump outlet parallel to the water surface, tilt it 30-45° upward for 2-3 seconds to prime the pump and remove air from the pump head, then submerge the pump head in water.

5. Turn on the power switch to test the pump. Check its operation, water output, and operating current. At 100% 5V, the pump reaches maximum water output with an operating current of approximately 1.49A.

6. Adjust the pump speed via the speed controller using 5V. For example, when the voltage is set to 4V, the water output drops and the operating current is around 1.13A.

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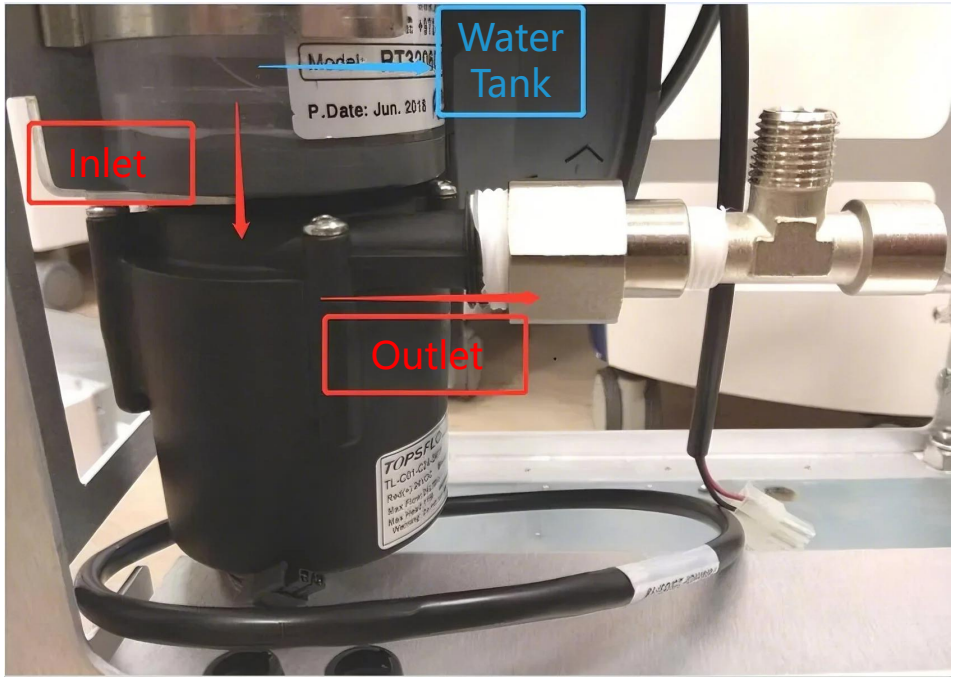
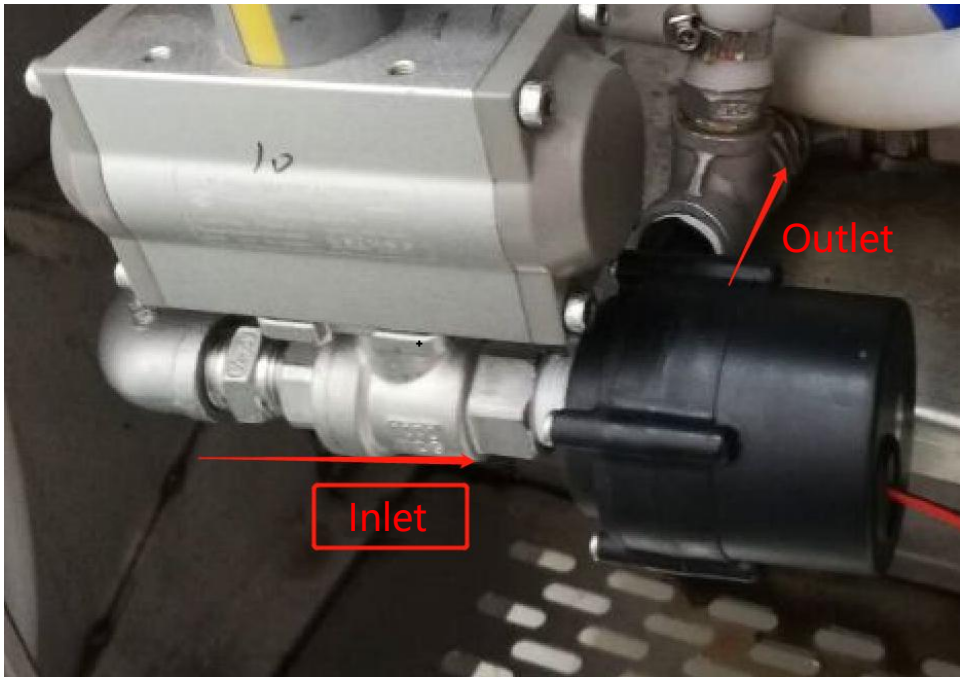
8 Customer Installation Case

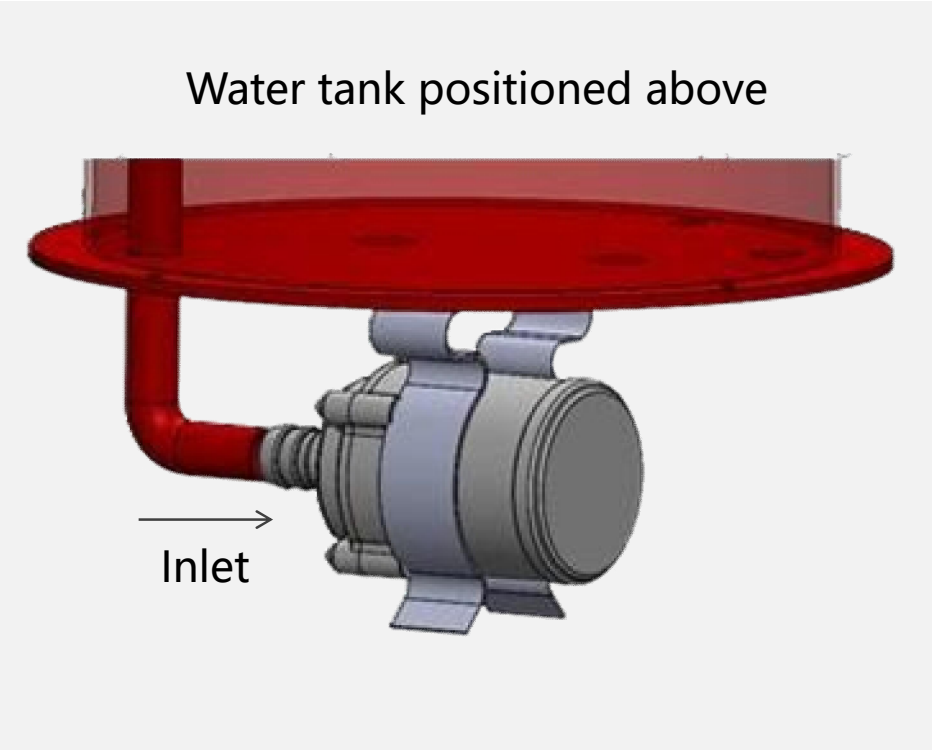


Vertically installation, threaded connections
Connect the pump inlet directly to the water tank to ensure sufficient water intake.

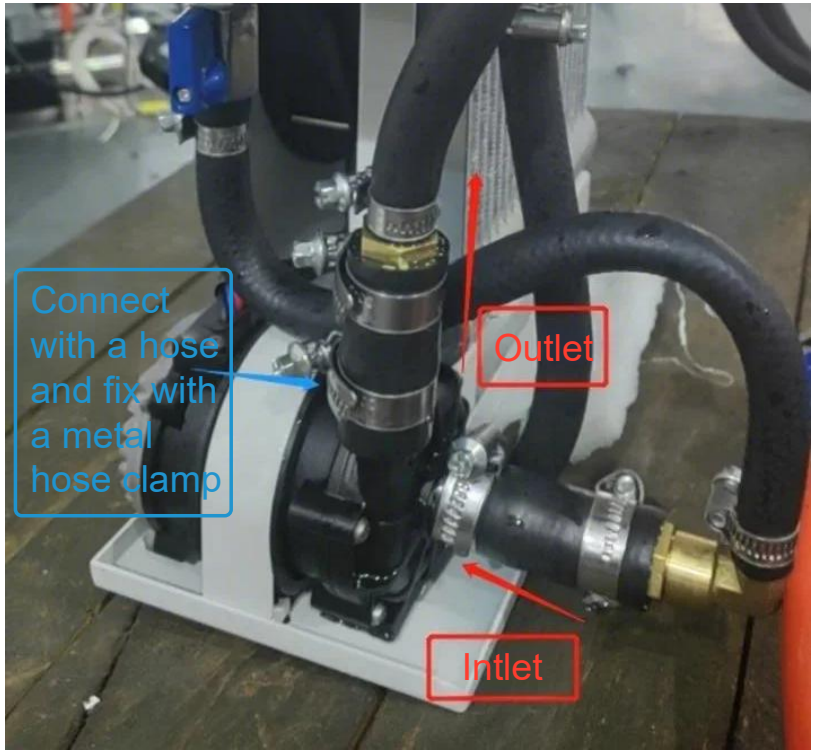


Horizontally installation, threaded connections
Connect the pump inlet to the pipeline.

8 Customer Installation Case

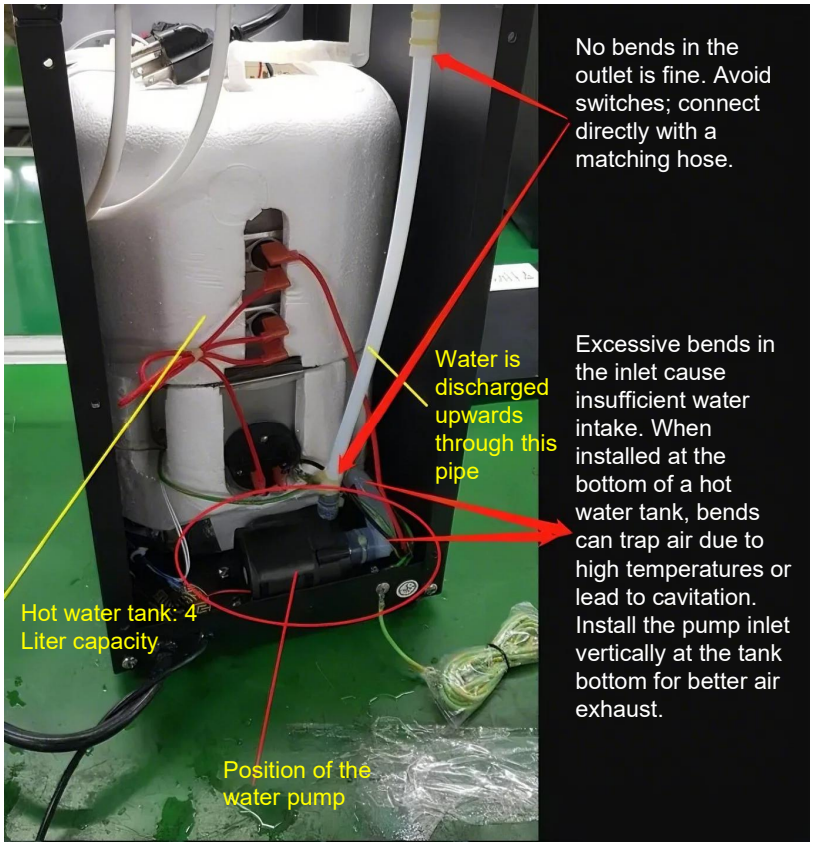


Connect with a hose. The water tank is located above to ensure sufficient water intake.

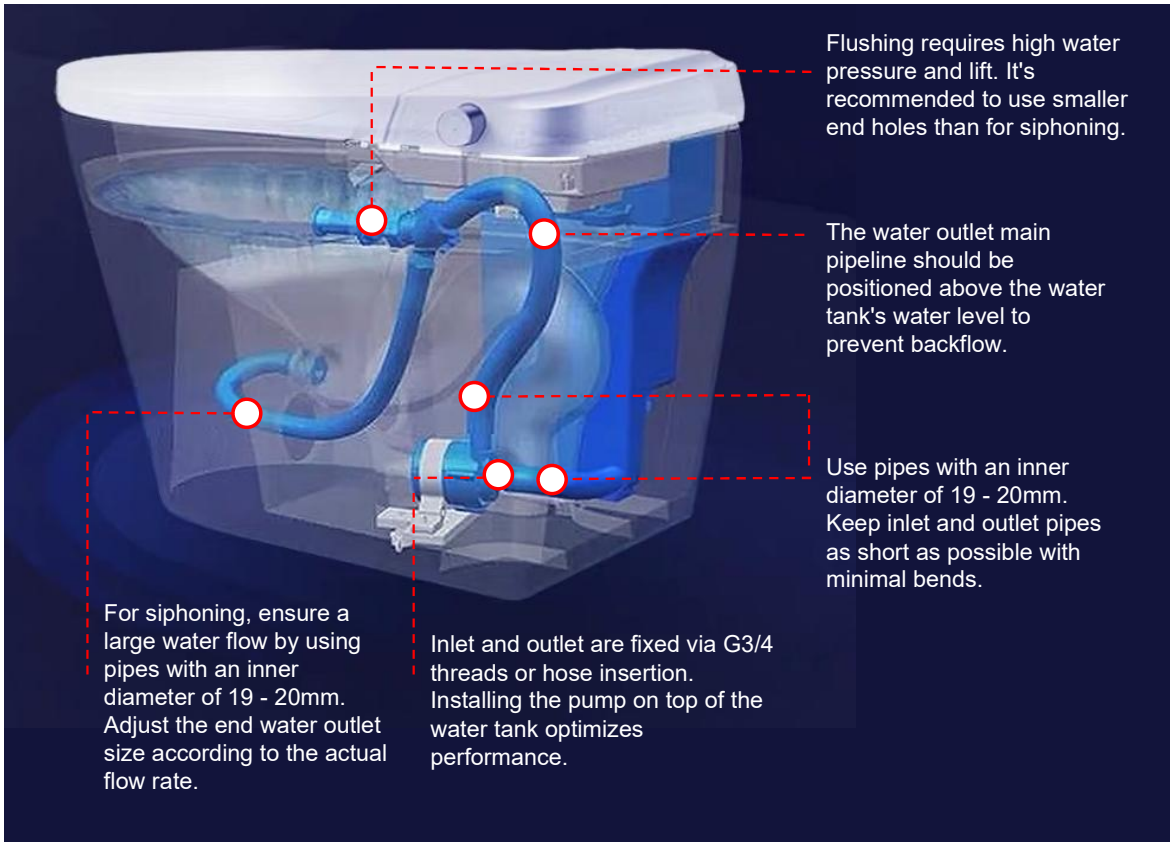


Connect with a hose and fix with a metal hose clamp.

8 Customer Installation Case



Installation Suggestions for Hot Beverage Machines



Installation Suggestions for Smart Toilets