

Table of Contents

- Safety Precautions..... 2
- Precautions before using 3
- Product Overview 5
- How to use 6
- Tube replacement method..... 7
- Troubleshooting 9
- Product Specifications 10
- References..... 10
- Contact last page



Thank you for your purchase.

Thank you for purchasing our company products.

To use this product in a safer and better condition, please read the instruction manual and use it correctly.





After reading the "Instruction Manual", please store it in a place where it can be seen by users. Also, when transferring or renting the product, please attach the "Instruction Manual" to a prominent place on the main body of the product so that new users will know how to use it safely and correctly.

AS ONE CORPORATION

Safety Precautions











In order to ensure the safe and proper use of the product and to prevent accidents and damage, this instruction manual defines information on items that require special safety attention according to their importance and degree of risk as shown below. Please follow these instructions when using the product safely.

Defining Each Warning Display

	Danger	In case of mishandling, it may be a cause of death or serious injury.		Caution	In case of mishandling, it may be a cause of injury accident or damage of the product.
	Warning	In case of mishandling, it may be a cause of serious injury accident or serious damage of the product.		Suggestion	The matters which need to pay attentions to secure safety.





All of them contain important safety information, so please be sure to follow them.





Indication mark for the Safety

	This indicates the general notice, warning, forbidden items.		This indicates the prohibition the case can cause the electric shock with disassemble or reorganization the product.
	This indicates the prohibition of touching a specific part of the device under certain conditions, reducing the performance.		This indicates the risk of electric shock under certain conditions.
	This indicates the caution of high temperature under certain conditions, reducing the performance.		This indicates the caution for explosion risk under certain conditions.
	This indicates the risk of getting a finger trapped.		This indicates the risk of getting caught in fans.
	This indicates the general notice.		This indicates the connection of the line, in case of the machine with the terminal blocks for safe.

Safety precautions for installation and use

Before using the product, carefully read the following items to ensure safe use and to ensure that the product functions properly.

Warning	
	<ul style="list-style-type: none"> • Do not modify or disassemble the product. • We are not responsible for any accidents caused by using the modified or disassembled product.
	<ul style="list-style-type: none"> • Do not insert or remove the power cord or plug with wet hands. There is a risk of electric shock. • Do not use the device if the power cord or plug is damaged or if the plug is loose. Failure due to short circuit, electric shock or fire may result. • Do not apply excessive force such as damaging, bending, pulling, twisting, or bundling the power cord.
	<ul style="list-style-type: none"> • Please use at an ambient environment temperature of 10 to 40 °C and a humidity of 80% or less. Even within this range, do not use the product in an environment where the body (motor and control board) cannot dissipate heat and cool sufficiently, such as in an enclosed space such as an incubator, or in an environment where the product is covered with plastic wrap. • Do not incorporate it into the product line or control it with an external switch. • Do not use it in an unattended configuration. • Do not use near flammable or corrosive liquids or gases. This product is not explosion-proof. Do not use in a flammable gas atmosphere. • Do not use in areas subject to high temperatures such as fire, heating equipment, or direct sunlight. • Do not wet the body. Do not use in wet areas such as rain water or steam. • Do not use in a dusty place. • If the product generates abnormal heat or smoke, stop use immediately and shut off the power. • In case of damage or malfunction, use the product in a safe condition so that it can be stopped immediately. • Do not remove the pump head cover during operation.
	<ul style="list-style-type: none"> • Be sure to use the supplied AC adapter for the power supply. Also, do not use this product for other products.

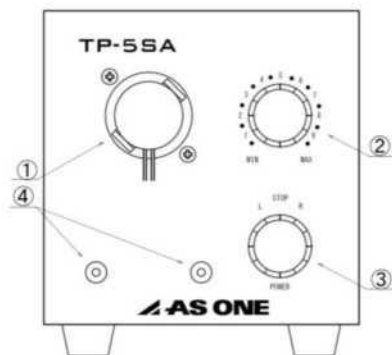
Caution	
	<ul style="list-style-type: none"> •Do not place near equipment that generates high-frequency noise (such as ultrasonic cleaners and microwave ovens). •Do not drop or apply excessive force to the product. There is a risk of damage.
	<ul style="list-style-type: none"> •When not in use for a long period of time, be sure to unplug the power cord from the outlet. When unplugging the power cord, hold the plug part. •Please use it in a state where it can be unplugged immediately from the outlet at any time.
	<ul style="list-style-type: none"> •Please install it in a solid and horizontal place and also to be arranged with consideration to the effect on the surroundings.
	<ul style="list-style-type: none"> •The tube cannot be used for organic solvent (Acetone, Xylene, Chloroform, Toluene, etc.) mineral oil, silicone oil, strong acid (concentrated sulfuric acid and concentrated nitric acid), high concentration surfactant. •Cannot be used for high temperature liquids (above 60°C) or high viscosity liquids. The pump head is severely degraded. •Do not use this product on liquids containing crystalline particles such as adhesives or abrasives or salts. •Do not use deteriorated tubes. (Replace it regularly.) •Do not use for medical purposes. •After use, wash the inside of the tube with cleaning solution before storing. (Recommendation: 70% ethanol followed by a liquid of low impurity such as distilled water;) Empty operation (sending only air without transferring fluid) promotes tube wear. Please avoid it as much as possible.

Product Overview

This product is a tubing pump for continuous liquid feed at a flow rate of less than 10mL/min. Since a stepping motor is used for the pump drive, a stable flow rate can be obtained with high accuracy. The number of revolutions is proportional to the flow rate. The discharge direction can be switched.

It is a mechanism to send liquid by pressing the tube with a roller, so the liquid is sent with pulsation. The liquid sample does not come into contact with anything other than the tube, but it is not suitable for the fluid delivery under pressure such as extraction from an airtight container such as a syringe.

Front



- ① Pump head
- ② Flow control knob
- ③ Discharge direction switch
- ④ Discharge lamp

Red: Power is on and the motor is stopped.

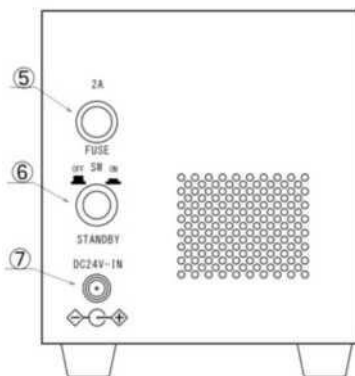
Green: Select the discharge direction and stop the pump.

- ⑤ Fuse Box Fuse : ϕ 5.2x20mm 2A

- ⑥ Main Power

- ⑦ DC Jack

Back



For dedicated AC adapter main body side



- ⑧ Dedicated AC adapter Approximately 1m

*It may differ from the picture on the left, but there is no problem in using it.

How to Use

- Check that the tube is set in the pump.

(Tube 5SA1525 (ID ϕ 1.5mm) is set at the time of shipment.)

- Check that the discharge direction switch of the main unit is in the intermediate [OFF] state, and that the main power switch on the rear panel is in the [OFF] state, then connect the AC adapter to the DC jack and outlet securely.
- When the main power switch on the rear is pressed to [ON], both LR and discharge lamps will light (red).
- When the discharge direction switch is turned in any direction, only the discharge lamp lights (green).
- Turn the flow adjustment knob to use any value up to [MIN to MAX].

- Check the operating time and the amount of fluid to be delivered before each use.

- If the flow rate is extremely low, the tube may be broken or blocked.



- If reproducibility is not obtained or the value is inconsistent, it is possible that the head is affected or the tube is abnormal.

- Make sure that the height of the suction side and discharge side are the same (for use on a table). If there is an extreme difference in height, the flow rate will change.

- It is not suitable for feeding high viscosity liquid. Standard: $\sim 200 \text{ mPa}\cdot\text{s}$

At the end of the operation

- Turn the flow adjustment knob to "MIN", and set the discharge direction switch to [OFF].
- Turn the main power switch on the rear to [OFF] and remove the AC adapter.

Care and Maintenance



- Clean the inside of the tube with cleaning solution (co-wash) after finishing the work.

- Due to the small (thin) inner diameter of the tube, even a small amount of foreign matter or sediment can cause a blockage.

- Wipe off any dirt on the product with a soft cloth containing warm water or mild detergent.

Tube replacement method



- Remove the two black screws securing the pump head cover (transparent part).
- (A precision screwdriver with a width of 3mm or less is required.)



Tube Holder (2 Pieces)

- Remove the tube holder (the two "E" shaped parts) and remove the tube.

*Tube holders vary in size depending on the tube. Use together with the replacement tube (optional).

- Insert a new tube.

At this time, it is not necessary to remove the roller, but if it comes off, set it again so that the recessed side is in front.



- Be careful not to get any dust or foreign matter inside the pump head.
- Do not twist or pull on the tubing

- Set the tube holder securely.
- Lower Tube Holder: Opening toward you
- Upper Tube Holder: Opening towards the back
- Attach the pump head cover again.

About Tubes

- Since the control range is different for each tube, select an appropriate size.
- The tube is a consumable. Life time is approximately 1,000 hours (when used at maximum rotational speed) Therefore, please change it regularly before it explodes.
- Prolonged idle operation promotes tube deterioration.
- It can be operated continuously for a long time, but it can be operated immediately when the tube is broken. "This product does not have a function to detect tube rupture."
- Tubes may break inside the pump head depending on the degree of deterioration.
- In order to prevent liquid from entering the motor side, the amount of liquid sent is significantly reduced, If there is a sign of rupture, immediately turn off the power and remove the tube.



About Pump Head

- Pump heads also deteriorate and break, but they can still operate to some extent even if they are worn out. However, please request an inspection before the symptoms gets worse. (Symptoms such as insufficient flow rate, abnormal noise, or failure to rotate smoothly after tube replacement.)



Troubleshooting

Problem	Cause	How to deal with
The power does not turn on. (Neither lamp is lit)	The board is broken. (Dew condensation, submergence, high temperature, power supply other than rated power, etc.)	Repair: Contact your dealer.
	The AC adapter is faulty.	Contact your dealer.
	The fuse is blown.	Replace the fuse. (2A, ϕ 5.2 x 20 mm) (If it occurs frequently, repair is required.) Contact your dealer.
The pump doesn't work.	The discharge direction switch is OFF.	Turn the discharge direction switch in any direction of L or R.
	The motor is locked.	Repair: Contact your dealer.
	The supply voltage is insufficient because an AC adapter other than the one supplied was used.	Use a dedicated AC adapter.
	A tube other than the dedicated one is inserted.	Replace with a dedicated tube.
The pump is running but does not discharge.	A tube other than the dedicated one is inserted.	Replace with a dedicated tube.
	The viscosity of the liquid is too high.	Perform in liquids of 200 mPa · S or less
	The tube is blocked.	Replace the tube.
	The tube is deteriorated. (The elasticity is lost by liquid, etc.)	Replace the tube.
	The rotor inside the pump head is worn out.	Repair: Contact your dealer.
The tube is drawn into the pump.	The tube is not elastic. (The tube has been degenerated by chemical attack)	Replace the tube.

•About Repair

- Contact your dealer.

Product Specifications

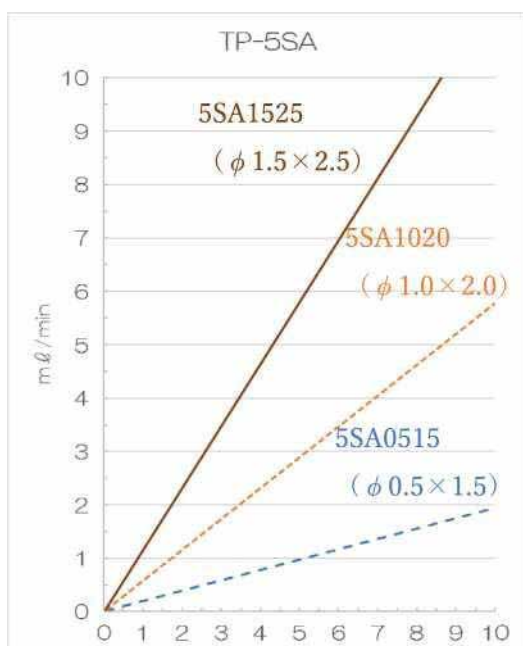
Model	TP-5SA
Motor	Stepping Motor (Forward and Reverse Switchable)
Pump	Ring pump
Compatible Tube	Dedicated Tube (2-7870-11/5SA0515, 2-7870-12/5SA1020, 2-7870-13/5SA1525) Material: PharMed ® BPT
Flow Rate (ml/min)	0.01 to 10 *
Speed (rpm)	2-600
Body Material	Steel coating
Size	120 x 132 x 132
Weight	Approximately 1.2 kg
Power supply	AC100 to 240V 50/60 Hz (DC24V/1A)
Ambient environment	Temperature: 10 to 40 °C, Humidity: 0 to 80% RH or less. No condensation.
Safety device	Fuse (2A), Overcurrent protection circuit of AC Adaptor

Country of origin: Japan

Please note that the specifications will be changed without prior notice for improvement.

*Flow rate is a standard. It is also affected by the type of tube, the degree of deterioration, the viscosity of the liquid and the pump head.

References



•Relationship between set value and flow rate
The graph on the left is just a guide.

The flow rate varies depending on the liquid properties, the condition of the tube, and the head. (For example, the flow rate tends to decrease in tubes deteriorated by highly viscous liquids or chemicals.)

Test conditions: Tap water, room temperature, liquid is conveyed by placing a pump and a container on the same plane.

The amount of liquid delivered per hour is measured as the flow rate.

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