



Circulating Water Vacuum Pump

Operation Manual

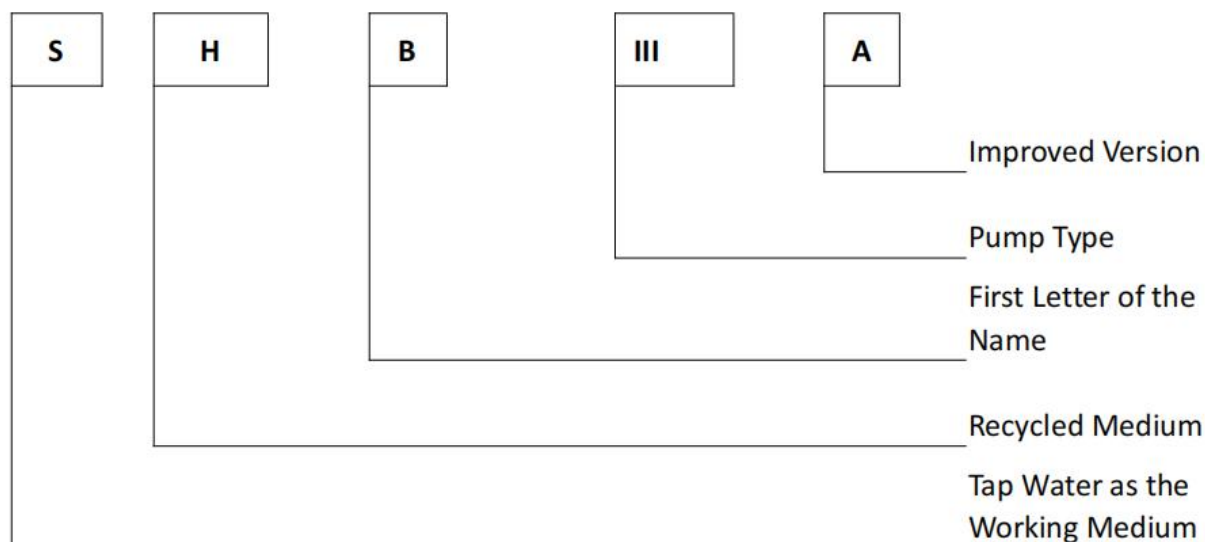
(Please read the instruction carefully before you use the machine)

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I. Purpose and Application

This innovative vacuum pump uses circulating water as its working fluid and the principle of using jet to generate negative pressure. It serves the function of creating a vacuum environment for chemical experiments and provides circulating cooling water for the reaction device. It is widely used in various operations such as evaporation, distillation, filtration, crystallization, decompression, sublimation, and other processing fields. It is the ideal equipment for laboratories.



II. Product Features

1. Obvious water-saving effect. As it utilizes water circulation for operation, the water added to the water tank can be reused, overcoming the problem of significant water waste when using direct tap water. According to the actual measurement, when working continuously for one workday under the same vacuum conditions, using this product can save over 8 tons of water. Moreover, it can be used for a long time with a single water refill, which is particularly suitable for practical situations with insufficient water sources or low water pressure.
2. Comprehensive and multifunctional use. In addition to providing a vacuum condition, this machine can also conduct circulation operation and provide circulating cooling water for the reaction device. It can be connected to the tap water source, and by injecting a suitable amount of water into the system, the vacuum circulation water quality and water quality can be maintained without changing over time. This can ensure that the vacuum degree does not decrease and that cooling water is supplied simultaneously.
3. Innovative design and convenient use. The pump head of this machine is directly immersed in the water, and the overall height is low, with a small volume and light weight, making it easy to move and place on a workbench for convenient operation and observation. The cover of the water tank is installed flexibly and can be opened for adding water and maintenance.

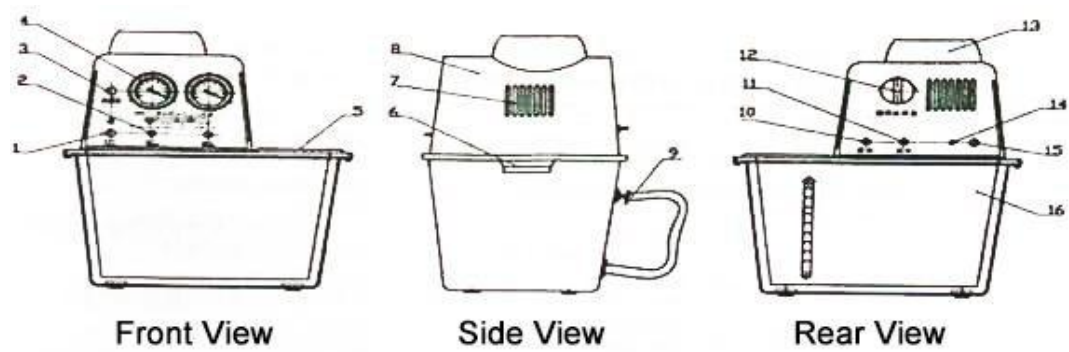
4. It is equipped with two suction nozzles that can operate separately or simultaneously. Each suction nozzle has a vacuum gauge installed, which facilitates the observation of the vacuum degree. Check valves are installed on the suction path to prevent circulating water from flowing back into the vacuum equipment in the event of an unexpected shutdown during the vacuum operation.
5. Corrosion-resistant and pollution-free. The water pump parts of this machine are made of stainless steel and are not affected by acids, bases, and other corrosive substances. It is also free from oil pollution and other laboratory pollution.
6. This machine operates stably and reliably with low noise.
7. The IIIS type pump in this series uses engineering plastics for its main components and is resistant to acid and alkali corrosion as a plug-in vacuum pump.
8. The IIIT type vacuum pump uses stainless steel material for its system and a newly developed transparent plastic for its water tank. This allows for the observation of the pump's operation, making it useful as a visual teaching tool.
9. The IIIA type vacuum pump uses stainless steel material for its main components and is resistant to corrosion from organic solvents such as acetone, ether, and chloroform.
10. The IIY type vacuum pump is made of stainless steel and features a suction pipeline made of the same material. This design not only provides resistance to acid and alkali organic solvents but also eliminates common issues like rubber aging, cracking, and air leakage in the vacuum system.

III. Technical Indicators

Model	SB-ZKB-III A	SB-ZKB-2IIIA	SB-ZKB-IIIT
Power	180W	250W	180W
Sucking Rate for Single Tap	10L/min		
Pump Displacement	80L/min		
Noise	<50dB		
Maximum Vacuum	0.098Mpa (Standard atmospheric pressure, circulating water temperature: 0~25°C)		
Water Tank Volume	15L	18L	15L
Weight	11KG	17KG	11KG
Overall Dimensions	385 × 285 × 420mm	430 × 230 × 320mm	385 × 285 × 420mm
Power Supply	1-110V, 60Hz; 220-240V, 50/60Hz		

IV. Instructions for Use (Please Refer to the Diagram)

1. Preparation: Place the machine flat on the workbench. When using it for the first time, open the cover of the water tank and fill it with clean and cool water (you can also add water through the water outlet hose). Stop adding water when the water level is about to reach the overflow nozzle at the back of the water tank. The water should be changed at least once a week, and the water should be kept clean in the water tank.
2. Vacuum operation: Connect the equipment that needs to be evacuated tightly to the suction nozzle of the machine. Check that the circulation switch is off, and turn on the power and the switch to start the vacuum operation. The vacuum degree can be observed through the vacuum gauge corresponding to the suction nozzle.
3. When the machine needs to operate continuously for a long time, the water temperature in the water tank will rise and affect the vacuum degree. At this time, the water outlet (tap water) can be connected, and the overflow nozzle can be used for drainage. Control the flow of tap water appropriately to keep the water temperature in the water tank stable and maintain the vacuum degree.
4. When providing cooling circulating water for the reaction device, connect the inlet and outlet pipes of the device that needs to be cooled to the circulating water outlet at the back of the machine. Turn the special circulating water switch to the ON position on the inlet nozzle to achieve the supply of circulating cooling water, based on the operation in the third point above.



IIIA Type Circulating Water Multi-Purpose Vacuum Pump External Schematic Diagram

1. Power switch
2. Suction nozzle
3. Power indicator light
4. Vacuum gauge
5. Small cover of water tank
6. Buckle handle
7. Heat dissipation window
8. Upper cap
9. Drainage air hood
10. Circulating water inlet nozzle
11. Circulating water outlet nozzle
12. Circulating water rotation switch
13. Motor air hood
14. Power input line
15. Fuse
16. Water tank

V. Troubleshooting and Solutions

No.	Common faults	Find Parts	Solutions
1	Insufficient vacuum level or inaccurate vacuum gauge reading.	Insufficient motor speed or low voltage.	Verify if the voltage is stable.
		Blockage or corrosion of vacuum bottle or check valve.	Clean the internal dirt or replace the bottle/valve core.
		Blockage in the water inlet or filter screen.	Clean and remove internal dirt from the inlet or filter screen.
		Detachment of impeller.	Replace the impeller.
		Water or air leakage in the vacuum gauge.	Remove any water in the vacuum gauge or replace the gauge if it's leaking.
		Blockage or cracks in the vacuum pipe.	Clean the vacuum pipe or replace it with a new one.
2	Motor is not working.	The fuse is burned out.	Replace the blown fuse with a new one.
		The running capacitor is punctured.	Replace a new capacitor that has the same capacity and voltage as the original.
		The motor winding is burnt.	Replace the motor with a new one.
		The bearings are severely worn and seized.	Replace the bearings with new ones.
		The impeller skirt is blocked.	Clear any debris and correct the impeller position.
		Loose wire joints or loose wire connections.	Ensure proper welding and tighten wire connections.
3	The motor is overheating or producing excessive noise.	The bearings are worn.	Replace the bearings with new ones.
		The impeller is worn and deformed.	Replace the impeller with a new one.
		The voltage is unstable or too low.	Check for overloading or low voltage on the circuit.
4	Excessive water agitation inside the water tank.	The drainage direction of the filter tube is incorrect.	Adjust the drainage direction.
		The water level is too low.	Add water up to the overflow outlet.
5	Water leakage.	The drain and overflow outlet of the water tank is loose or the sealing ring is aged.	Tighten the water outlet or replace the sealing ring.
		The water tank is cracked.	Replace the water tank.

VI. Vacuum Performance Under Different Temperature Conditions

Temperature (°C)	6	8	10	15	20	25	30
Vacuum Degree (MPa)	~0.099	~0.099	~0.099	~0.099	~0.097	~0.096	~0.095
mmHg	~750	~750	~748	~746	~736	~732	~724

Our Product comparison with industry competitors revealed high air suction speed and unique features. Our new vacuum bottle improves suction by around 30% from its original design.

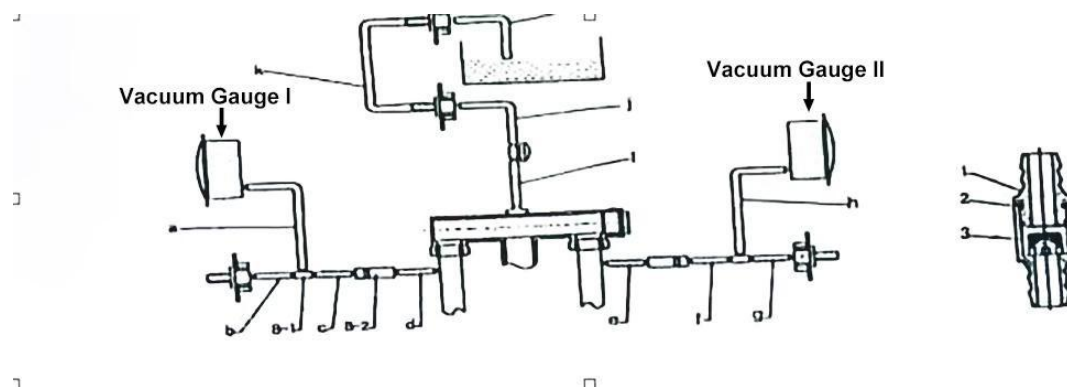
VII. Instructions for Repairing the Pumping System

1. Detach the upper cover by unscrewing its four side screws to reveal the system components in the upper section. The check valve can be found on the B-2 side.

2. Check valve diagram:

a. Take out the valve core at position 3 and polish its end face with sandpaper before cleaning it. Once reassembled, manually shake the valve core along its length and listen for any noise to verify that it moves smoothly.

b. Position 1 can be unscrewed to take out the valve core.



VIII. Warranty and Service

For warranty details, please refer to the link below:

<https://stonylab.com/pages/warranty>