

Labasics[®]

Recirculating Water Vacuum Pump

Instruction Manual

(Please read this manual thoroughly before using this instrument.)

Contents

1. Intended Use	1
2. Product Features	1
2.1 Significant Water Savings	1
2.2 Multipurpose Operation	1
2.3 Compact Design and Easy Operation	1
2.4 Vacuum Ports and Check Valves	1
2.5 Durable Construction and Oil-Free Operation	2
2.6 Stable and Low-Noise Operation	2
3. Specifications	2
4. Safety Instructions	3
5. Operation	3
5.1 Preparation	3
5.2 Vacuum Operation	3
5.3 Extended Continuous Operation	4
5.4 Circulating Cooling Water Supply	4
6. Common Faults and Troubleshooting	6
7. Vacuum Performance at Different Temperatures	7
8. Vacuum System Maintenance	8
9. Warranty Information	9

1. Intended Use

This multipurpose vacuum pump uses circulating water as the working fluid and generates negative pressure through a jet mechanism. It is designed to provide vacuum conditions for chemical laboratory experiments and can also supply circulating cooling water to reaction apparatus.

The pump is widely used for evaporation, distillation, filtration, crystallization, vacuum processing, sublimation, and other laboratory operations. It is suitable for laboratories at colleges and universities, as well as in the pharmaceutical, chemical, and food-processing industries.

2. Product Features

2.1 Significant Water Savings

The pump uses a recirculating water system, allowing the water in the reservoir to be reused. This significantly reduces the water consumption associated with using a continuous tap-water supply for vacuum operation.

2.2 Multipurpose Operation

In addition to providing vacuum, the pump can supply circulating cooling water to reaction apparatus. During extended continuous operation, a tap-water supply can be connected to add water as needed and replace the water in the reservoir. This helps reduce the water temperature in the reservoir and maintain stable vacuum performance.

2.3 Compact Design and Easy Operation

The pump head is directly immersed in the water, resulting in a compact, low-profile design with a small footprint and low weight. The pump is easy to move and can be placed on a laboratory workbench for convenient operation and observation. The reservoir has an openable cover for easy filling, cleaning, and maintenance.

2.4 Vacuum Ports and Check Valves

Model 3A is equipped with two vacuum ports controlled by one switch. Model 23A is equipped with four vacuum ports, with every two ports controlled by one switch.

Each vacuum port is equipped with a vacuum gauge for monitoring the vacuum level. Each suction line is equipped with a check valve to prevent circulating water from

flowing back into the connected vacuum equipment if the unit stops unexpectedly during vacuum operation.

2.5 Durable Construction and Oil-Free Operation

Key components of the pump are made of stainless steel, providing good corrosion resistance for handling common corrosive media such as acids and alkalis during laboratory operations. The oil-free design requires no lubricating oil, helping to prevent oil mist and oil contamination and providing a cleaner working environment for laboratory applications.

2.6 Stable and Low-Noise Operation

The pump provides stable and reliable operation with low noise.

3. Specifications

Model	3A	23A
Vacuum	Approx. -0.098 MPa (gauge) at circulating water temperatures of 0~25°C	
Suction Rate per Port	10 L/min	
Water Circulation Flow Rate	80 L/min	
Reservoir Capacity	15 L	18 L
Motor Power	180 W	240 W
Operating Voltage	110 V / 60 Hz or 220 V / 50 Hz	
Noise Level	<50 dB	
Dimensions (W x D x H)	385 x 285 x 420 mm	470 x 260 x 516 mm
Net Weight	15 kg	18 kg

4. Safety Instructions

- Only connect the pump to a properly grounded power supply that matches the voltage and frequency ratings of the equipment.
- Keep the power cord, plug, and electrical components dry.
- Do not operate the pump without sufficient water in the reservoir.
- Do not block the ventilation openings, overflow outlet, or water lines.
- Do not evacuate flammable or explosive gases or vapors.
- When handling corrosive, toxic, or solvent vapors, use appropriate trapping and ventilation and confirm material compatibility before operation.
- The circulating water may become contaminated by substances drawn from the connected apparatus. Dispose of contaminated water according to applicable laboratory and local requirements.
- Disconnect the power cord before cleaning, inspection, or maintenance.
- Internal repairs must be performed only by qualified service personnel.

5. Operation

Refer to the accompanying illustrations.

5.1 Preparation

Place the pump level on a laboratory workbench. Before first use, remove the reservoir cover and fill the reservoir with clean, cool water. Water can also be added using a hose.

Stop filling when the water level approaches the height of the overflow outlet at the rear of the reservoir.

The circulating water should be replaced at least once a week. If the water is heavily contaminated or the pump is used frequently, shorten the replacement interval as appropriate to keep the circulating water in the reservoir clean.

5.2 Vacuum Operation

Connect the vacuum tubing from the equipment to be evacuated securely to a vacuum port on the pump. Make sure the water circulation switch is in the “OFF” position.

Connect the pump to the power supply and turn on the power switch to begin vacuum operation. Monitor the vacuum level using the vacuum gauge corresponding to the vacuum port in use.

5.3 Extended Continuous Operation

During extended continuous operation, the water temperature in the reservoir may increase, reducing the achievable vacuum level.

If necessary, connect a tap-water supply to provide make-up water and connect the overflow outlet securely to an appropriate drain. Adjust the tap-water flow so that warmer water is discharged through the overflow outlet while the reservoir remains at the proper water level. Check all tubing connections regularly to prevent leakage or overflow.

5.4 Circulating Cooling Water Supply

For Model 3A Only: Turn off the pump before connecting the cooling-water tubing. Connect the water inlet of the reaction apparatus to the pump's circulating water outlet. Connect the water outlet of the reaction apparatus to the pump's circulating water inlet.

Make sure all tubing is securely attached and free of kinks or blockages. Fill the reservoir to the proper level, turn on the power, and then set the cooling-water circulation switch to the "ON" position.



Front View



Side View



Rear View of Model 3A



Rear View of Model 23A

1. Power Switch
2. Vacuum Port
3. Power Indicator
4. Vacuum Gauge
5. Reservoir Cover
6. Drain Cover
7. Fuse Holder

8. Top Cover
9. Ventilation Grille
10. Circulating Water Outlet
11. Circulating Water Inlet
12. Water Circulation Switch
13. Motor Fan Cover
14. Power Cord

6. Common Faults and Troubleshooting

Disconnect the pump from the power supply before inspection. Internal electrical or mechanical repairs must be performed only by qualified service personnel.

No.	Fault	Possible Cause	Corrective Action
1	Vacuum level cannot be reached or the vacuum gauge reading is inaccurate	Motor speed is insufficient or the supply voltage is too low	Check whether the supply voltage is stable
		Dirt or corrosion in the vacuum bottle or check valve	Clean the deposits or debris, or replace the bottle or valve core
		Inlet port or filter screen is clogged	Clean the inlet and filter screen, and remove any blockage
		Impeller has come loose or detached	Replace the impeller
		Water has entered the vacuum gauge or there is an air leak	Drain any water from the vacuum gauge and check whether the pointer returns to zero. Replace the gauge if necessary
		Vacuum tubing is clogged or cracked	Clean the tubing or replace it
2	Motor does not run	Fuse is blown	Replace the fuse
		Run capacitor has failed	Replace it with a capacitor having the same capacitance and voltage rating as the original. This work must be performed by qualified service personnel
		Motor winding is burned out	Replace the motor. This work must be performed by qualified service personnel
		Bearing is severely worn or seized	Replace the bearing. This work must be performed by qualified service personnel
		Impeller is jammed	Remove the debris and correct the impeller position
		Loose solder joint or loose wire terminal	Contact qualified service personnel to repair the electrical connection

3	Motor overheats or produces excessive noise	Bearing is worn	Replace the bearing. This work must be performed by qualified service personnel
		Impeller is worn or deformed	Replace the impeller
		Supply voltage is unstable or too low	Check whether the circuit is overloaded and whether a low-voltage condition exists
4	Water splashes or churns excessively in the reservoir	Water discharge direction is incorrect	Adjust the discharge direction
		Water level is too low	Add water until the water level reaches the overflow outlet
5	Water leakage	Reservoir overflow fitting is loose or the sealing ring is aged	Tighten the fitting or replace the sealing ring
		Reservoir is cracked	Replace the reservoir

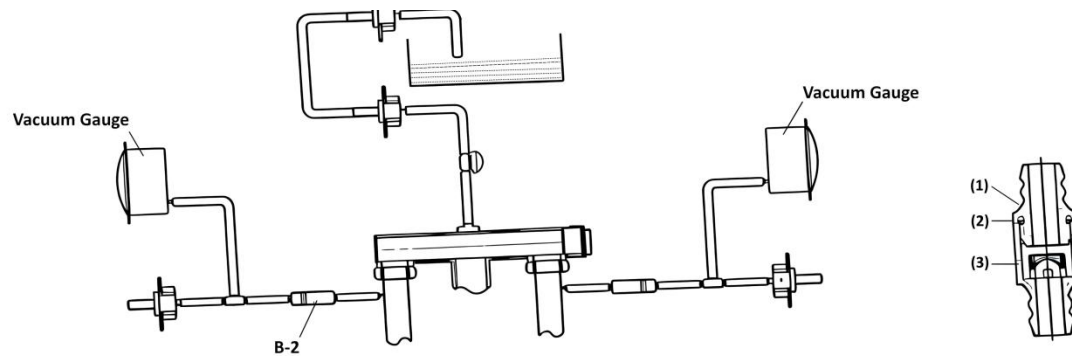
7. Vacuum Performance at Different Temperatures

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

8. Vacuum System Maintenance

The following procedure must be performed only by qualified service personnel. Disconnect the power cord and drain the reservoir before removing the top cover. Unauthorized disassembly may result in electric shock, leakage, equipment damage, or loss of warranty coverage.

- Before performing any maintenance or disassembly, turn off the power and unplug the power cord. Make sure the equipment has come to a complete stop. Remove the four screws on the side of the top cover and then remove the top cover. The system components shown in the figure below will be visible. The component marked B-2 in the figure is the check valve.
- Check Valve Structure: The component marked (3) is the valve core. After removing the valve core, polish its end face with wet/dry abrasive paper and clean it thoroughly before reassembly. After reassembly, manually move the valve core back and forth along the axial direction of the valve body to make sure it moves freely inside the valve body. The component marked (1) can be unscrewed to remove the valve core.



9. Warranty Information

Warranty is effective from the date of purchase and is non-transferable.

For more details about the warranty, please refer to the link below:

<https://labasics.shop/pages/warranty>

For any inquiries or assistance, feel free to contact us:

Email: support@labasics.shop

Phone: 631-406-7227

Website: <https://labasics.shop/>

This instruction manual is subject to change without prior notice.