

Operation Manual

R205BV, R209BV

Safety Instruction

The rotary evaporator is manufactured according to current methods and accepted safety regulations. However, risks still exist during the installation, operation and maintenance of the product. Please observe the safety instructions and keep them available. Remember to pass the instructions on to subsequent owners.

1) General Safety Instructions

The rotary evaporator may only be used,

- a) in an operational condition consistent with full functionality of instrument;
- b) for the intended use: distillation or evaporation of solvents, purification of chemicals, substances, mixtures and preparations, processing reaction batches, and drying of powder (Any other or additional use is considered not to be in accordance with its designated use. The manufacturer is not liable for damage resulted from this. The operator carries the responsibility to comply with the intended use outlined above. Observing these instructions is a part of the designated use of rotary evaporator);
- c) if the operator has the required safety protection and awareness to hazards;
- d) if the instructions of these operating instructions are observed.

2) Improper Use

- a) Do not apply excess pressure to the instrument, which can result in explosion of the system;
- b) Do not use the non-explosion-proof instrument in explosion-prone areas based on local ordinance and compliance of general laboratory equipment. Explosion-proof solution is offer by the manufacturer to protect instrument against explosion. Please contact The manufacturer if the system needs to be used in explosion-prone areas.

3) Use in Corrosive Environment

If the instrument is used in corrosive atmospheres, the service life of the instrument will decrease based on concentration, volumes, and frequency of exposures to these corrosive materials. Epoxy painting is offered by The manufacturer, which can enhance the resistant capability of instrument. Please contact The manufacturer for the information if needed.

4) Responsibilities of Operator

- a) Please operate the instrument in perfect condition. Contact The manufacturer if instrument does not meet the conditions for operation;
- b) Verify that only qualified personnel operate the instrument with the appropriate personal protective protection;
- c) Verify that personnel have received and read the safety instructions;
- d) Verify that the rotary evaporator is set up in a safe and suitable location;
- e) Verify that the set up and the operation are only within the designated buildings with the proper instrument for laboratories;
- f) Verify that the rotary evaporator is operated in conjunction with a good ventilation system.

5) Responsibilities of Operating Personnel

- a) Verify that the distillation material can be evaporated safely and the distillation residue is not explosive;
- b) Verify that the flow rate of < 1 m/s is guaranteed when suctioning liquids that contain combustible;
- c) Verify that explosion gas do not occur in materials or reactions;
- d) Verify that the use of substances with risk of an uncontrolled release of energy associated with a rise in pressure is prohibited;
- e) Verify that the glass surfaces are wiped off by damp cloths.
- f) Wear suitable protective clothing, such as goggles and gloves, for activities on the rotary evaporator;
- g) Verify that the maximum excess pressure of the coolant equals no more than 1 bar in the condenser.

6) Qualifications of Personnel

The rotary evaporator may only be used by personnel that have been trained in the proper operation by qualified personnel determined in accordance with the internal safety regulations of the facility where the rotary evaporator is operated. This user's manual and all safety instructions must be observed, read and understood.

7) Safety Conscious Working

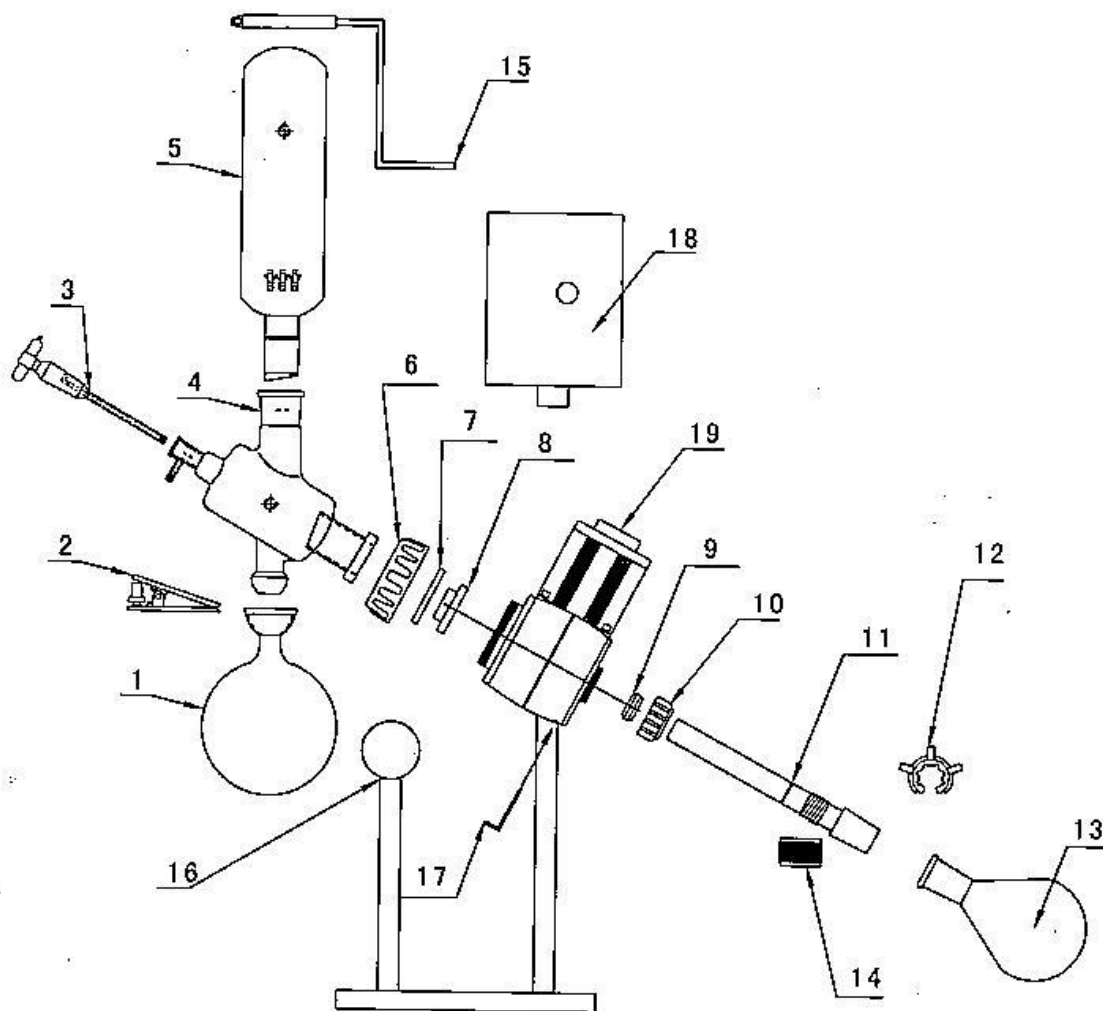
The manufacturer is not liable for personal injuries and / or property damages caused by an incorrect and improper usage of the rotary evaporator. Please observe the following regulations: laboratory guidelines, accident prevention regulations, ordinance on Hazardous Substances, other generally accepted rules of safety engineering and occupational health, and local regulations.

Installation Instruction

Rotary Evaporator has 3 main parts, (1) Motor and Electric Equipment; (2) Glassware; (3) Bath, with modular package and transportation, which makes assembly much easier. Please follow the instruction as below,

- 1) Put the main frame on the stable and dry board or ground;
- 2) Fix the motor (19) on the frame and adjust the angle between motor (19) and horizon to 30°, and screw down the bolt;
- 3) Put the small nut (10) through the vapor duct (11) (flask unloader (14) has been fix on vapor duct (11) during manufacture);
- 4) Put the cramp ring (9) through the vapor duct (11) and fix it in the groove of the vapor duct (11);
- 5) Lock the motor (19) with inserting brake bar (17) into the bottom hole of the motor (19), and then insert the vapor duct (11) with small nut (10) and cramp ring (9) from the right side of the motor (19);
- 6) Tighten the small nut (10) to fix motor (19) and vapor duct (11);
- 7) Grease the O-ring in the seal (8) and put it through the vapor duct (11) from the left side of the motor (19);
- 8) Put big nut (6) through the flange mouth of the distribution piece (4), and then put gasket (7) through the flange mouth (4);
- 9) Calibrate and insert the distribution piece (4) into motor (19) to coincide with seal (8) on the vapor duct (11), and then tighten the big nut (6);
- 10) Fix the support rod complete (15) on the frame;
- 11) Insert the vertical condenser (5) into the top standard mouth of distribution piece (4) and fix the condenser (5) with the support rod complete (15);
- 12) Adjust the position of distribution piece (4) and condenser (5) to guarantee the verticality of the condenser (5);
- 13) Insert inlet valve with stop cock (3) into the left mouth of the condenser (5);
- 14) Connect receiving flask (1) and the condenser (5) with clamp (2);
- 15) Put the bath at the right side of the main frame (If R209 is chosen, connect bath and the main frame with connecting wire);
- 16) Connect evaporating flask (13) and the vapor duct (11) with clip (12);
- 17) Fix rotary speed controller (18) on the main frame, connect it and motor (19) with connecting wire, then screw down the bolt;
- 18) Remove the brake bar (17);
- 19) Plug and turn on the power, and then choose rotary speed by knob.

Diagram



1. Receiving Flask
2. Clamp for Receiving Flask
3. Inlet Valve with Stop Cock
4. Distribution Piece
5. Vertical Condenser
6. Big Nut
7. Gasket
8. Seal
9. Cramp Ring
10. Small Nut
11. Vapor Duct
12. Clip for Evaporating Flask
13. Evaporating Flask
14. Flask Unloader
15. Support Rod Complete
16. Vacuum Meter
17. Brake Bar
18. Rotary Speed Controller
19. Motor

Maintenance Instruction

- 1) Please do check all the glass parts before start operation;
- 2) Please guarantee applicable buoyant force for the rotary flask, even if there is no material in the flask. But too much buoyant force will damage the glassware and motor;
- 3) Do not tighten the PTFE valves to much;
- 4) Clean and grease the seal O-ring, joints and the vapor duct regularly (Once per two month is advisable, vacuum silicon grease is recommended, do not use vaseline);
- 5) Keep the electric parts away from water and corrosive organic liquid;
- 6) Do use the accessory from Shanghai The manufacturer instead of other suppliers;
- 7) Please clean the surface of instrument after every operation.

Trouble Shooting

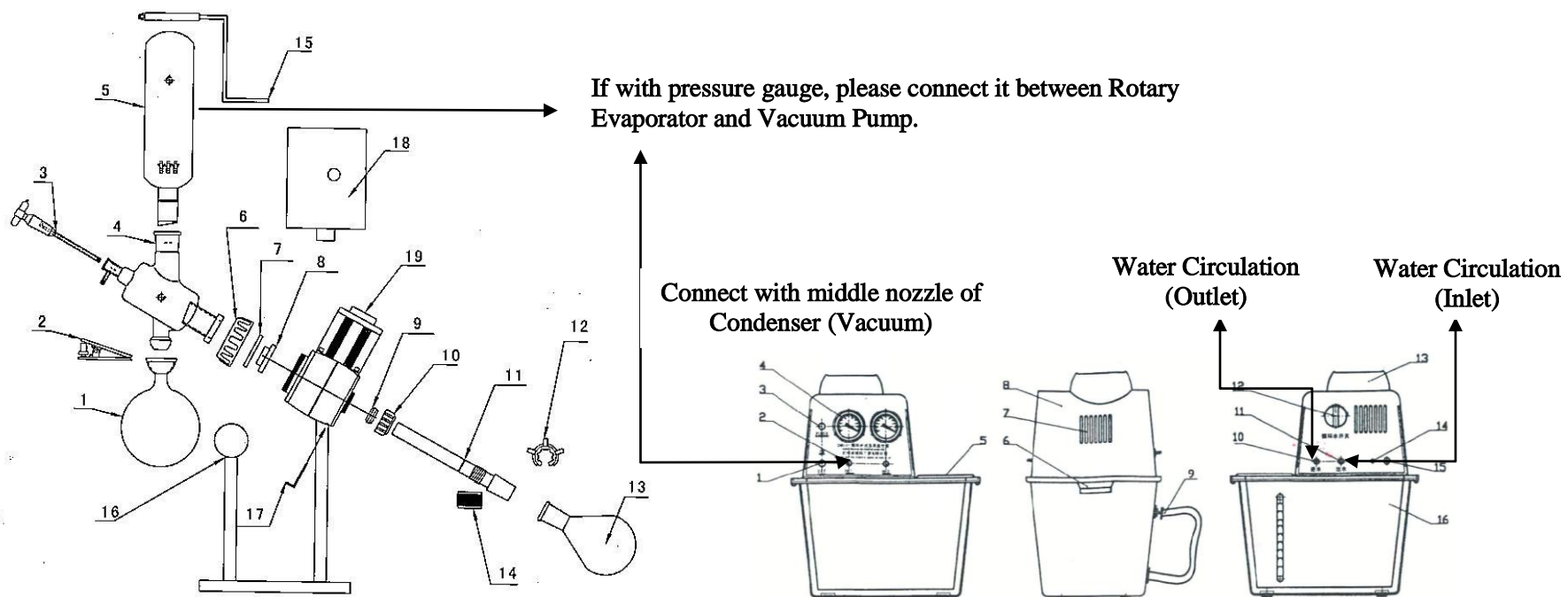
Fault	Possible Cause	Corrective Measures
No vacuum	1. Solvent in flask with saturated vapor pressure;	1. Empty the flask;
	2. Malfunction of vacuum pump;	2. Change the water of vacuum pump, clean, or repair;
	3. Malfunction of vacuum meter;	3. Replace vacuum meter;
	4. Defective connection of vacuum pump and meter;	4. Check the whole connection and replace the broken parts;
	5. Seal is defective;	5. Replace seal;
	6. Sealing system has been installed incorrectly;	6. Check and reinstall the sealing system, clean and grease the joint;
	7. Broken glassware or valve.	7. Replace glassware or valve.
No power	1. Instrument is not connected to power supply;	1. Check the plug;
	2. Fuse defective.	2. Replace fuse.

Motor does not work	1. Fuse defective;	1. Replace fuse;
	2. Malfunction of rotary speed control box;	2. Check plug of control box, connect broken wire in the control box;
	3. Rust of axle bearing;	3. Replace the motor;
	4. Breakdown of electric parts.	4. Replace the motor.
Unstable rotary speed	1. Rotary parts are not concentric;	1. Reinstall the system, calibrate the rotary parts;
	2. Gears is defective;	2. Replace the gears;
	3. Too much friction caused by O-ring;	3. Check the seal and apply one O-ring;
	4. Breakdown of electric parts.	4. Replace the motor or rotary speed control box.
Bath does not heat	1. Malfunction of heater;	1. Replace relay parts or heater;
	2. Malfunction of heating circuits;	2. Replace relay parts or heating circuits;
	3. Malfunction of temperature detector.	3. Replace temperature detector.
Temperature of motor is 40C higher than room temperature	1. Abnormal friction of mechanical parts;	1. Reinstall the system, calibrate the rotary parts, grease the seal;
	2. Rotary speed is set too low for a long time;	2. Increase the rotary speed;
	3. Rotary resonance;	3. Change the rotary speed;
	4. Joints have not been greased.	4. Grease joints.
Abnormal noise during operation	1. Overload operation of motor;	1. Take parts of solvent out of the evaporating flask;
	2. Incorrect installation;	2. Reinstall the system, calibrate the rotary parts, grease the seal;
	3. The ground is not stable or plain;	3. Relocate the system;
	4. Rotary resonance.	4. Change the rotary speed.

Technical Specification

Model	R205BV	R209BV
Evaporating Flask (L)	0.5L+1L/NS29	0.5L+1L/NS29
Receiving Flask (L)	1L/KS35	1L/KS35
Condenser Surface (m ²)	Vertical (0.16)	Vertical (0.16)
Evaporating Efficiency (H ₂ O)	> 1.2L/h	> 1.2L/h
Motor Power (W)	30 w	30 w
Rotary Speed (rpm)	50 - 180	50 - 180
Digital Display	Rotary Speed, Bath Temp.	Rotary Speed, Bath Temp.
Ultimate Vacuum Level (mbar)	2 mbar	2 mbar
Vacuum Meter	Scale	/
Drive	Stepless Electronic	Stepless Electronic
Sealing	PTFE Assembly	PTFE Assembly
Glass Material	Borosilicate G3.3	Borosilicate G3.3
Frame Material	SS304	SS304
Bath Size, Capacity, Material	Φ24×15H, 6L, SS304	Φ25×17H, 7L, SS304
Heating Power (kW)	1.5 kW	1.5 kW
Temperature Control Range & Accuracy (°C)	20 - 99°C±1°C	20 - 99°C±1°C
Lift Type	Bath Manual Lift	Motor Motorized Lift
Bath Height Adjustment (cm)	11cm	11cm
Dimensions (cm)	88×55×70H	88×55×70H
Power Supply	220V/50Hz	220V/50Hz

R205B/R205D/R209B Connection with Vacuum Pump SHB-3



Vacuum Pump SHB-3

1. Power switch	7. Vent	13. Cover
2. Extract channel	8. Cap	14. Electric wire
3. Power indicator	9. Draining off water horse	15. Fuse
4. Vacuum gauge	10. Water circulation inlet	16. Water tank
5. Water tank lid	11. Water circulation outlet	
6. Water tank handle	12. Water circulation switch	