



Vacuum Pump Models QV2 & QV5

Operation and Maintenance Instruction Manual 2002-0010

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Introduction

Thank you for selecting Bacharach products for your refrigeration equipment needs. To ensure your safety, and for the safe operation of this equipment, please read, understand, and follow the information contained in this instruction manual.

The model QV2 and QV5 are two-stage, rotary vane vacuum pumps designed to evacuate moisture and air from refrigeration systems (e.g., R-12, R-22, R-134a).

Features

- **Anti-oil-return** – A check valve prevents pump-oil from entering the evacuated system after the pump stops.
- **Environment protection** – A built-in filter eliminates oil mist, and an oil-gas separator removes oil contamination from the exhaust.
- **Aluminum alloy motor casing** – The motor casing is an aluminum alloy that has a high rate of heat dissipation, which provides for continuous pump operation.
- **Two stage design** – The second stage of the two-stage design starts pumping at a lower pressure to pull a deeper ultimate vacuum.
- **High starting torque** – Designed for low-temperature and low-voltage operation, the pump will start in temperatures $\geq 40^{\circ}$ F ($\geq 5^{\circ}$ C), at its rated input voltage of 110 VAC $\pm 10\%$.
- **Oil circulation design** – Offset rotary vanes work in conjunction with the vacuum pump oil to create high compression within the pumping chamber.

Oil Pre-Fill Notice

CAUTION: Your Bacharach vacuum pump is shipped empty and must be filled with the oil supplied prior to its first use. The following are the instructions to fill the unit with oil.

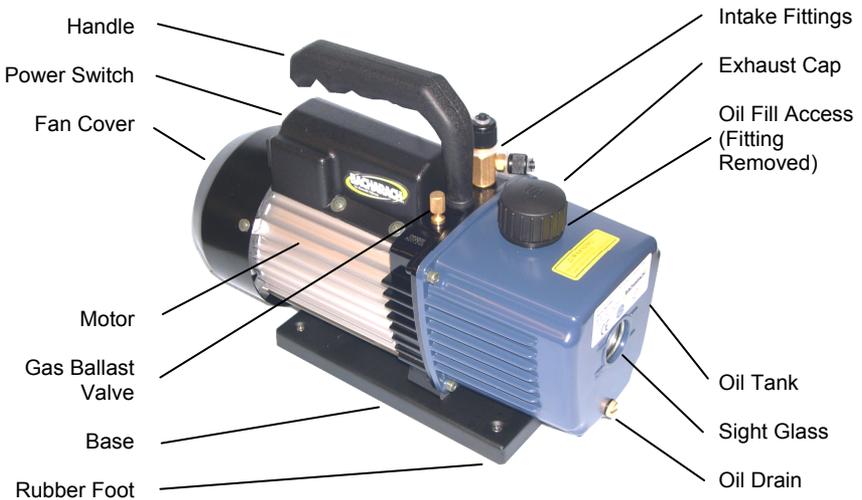
1. Unscrew exhaust cap/oil fill access cap. (Refer to page 2.)
2. Fill the unit through the access port being careful not to over fill. Use the pump's sight glass to monitor the oil level.
3. Replace the exhaust cap/oil fill access cap hand tight.

The unit is now ready for use.

Technical Characteristics

Model	QV2	QV5
Part No.	2002-0001	2002-0005
Voltage	110V 60 Hz	110V 60 Hz
Free Air Displacement	1.7 CFM	5.3 CFM
Ultimate Vacuum	25 microns (0.03 mbar)	25 microns (0.03 mbar)
Motor	1/4 HP	1/2 HP
Intake Fitting	1/4", 3/8", 1/2" Flare	1/4", 3/8", 1/2" Flare
Motor Speed	1,720 rpm	3,450 rpm
Oil Capacity	11.8 fl oz (350 ml)	14.2 fl oz (420 ml)
Dimensions	13.0 × 5.3 × 10.0 in (330 × 135 × 255 mm)	13.8 × 5.6 × 10.4 in (350 × 143 × 265 mm)
Weight	19.4 lb (8.8 Kg)	24.7 lb (11.2 Kg)

Pump Components



Operation

Check the pump's oil level as viewed through the sight glass before each use. Add oil as necessary through the oil fill access. Use only high grade vacuum pump oil with the following specifications.

Kinematic viscosity (104° F)	46
Viscosity index	100.0
Flash point	437

Remove the intake fitting cap and connect the pump to the system being evacuated using a hose with appropriate fittings. Keep the connection as short as possible and ensure that all connections are sealed and not leaking. If desired, use a vacuum gauge manifold set to monitor the vacuum level.

Remove the exhaust fitting cap. Plug the pump into an appropriate AC outlet. Then turn ON the pump to begin the evacuation process.

After pumping is complete:

- turn OFF pump
- disconnect the power plug
- remove the connecting hose
- reinstall intake and exhaust caps.

Gas Ballast Operation

The vacuum pump utilizes a feature allowing for the partial removal of condensing gases in the vacuum pump. The gas ballast valve can be operated in the following manner.

CAUTION: If there is a possibility that there is condensation or high amounts of water in the system, install a vapor condenser in the line.

- Before you begin to draw a vacuum, the pump must be operational with the intake port closed and the gas ballast valve open until the instrument has reached its operating temperature. This is done to ensure that vapor does not condense inside of the pump.

NOTE: The gas ballast should be closed and the intake valve should be open during typical operation.

- Running the pump with the gas ballast valve open typically causes a slight noise increase as well as an increase in the amount of oil vapor at the exhaust cap/oil-filler plug vent.
- When drawing condensing vapor for an extended period of time, observe the oil level often and change it frequently as needed.
- After the evacuation has been completed, we recommend that you allow the pump to run for a few minutes with the gas ballast valve open and the intake closed. This allows any vapor condensed in the oil to be removed.

Warnings

- Do not evacuate combustible, explosive, or poisonous gases.
- Do not operate the vacuum pump in the rain.
- Do not remove or insert power plug, or turn ON the pump in an explosive atmosphere.
- If using the pump in a confined area, connect a hose to the pump's exhaust fitting and route the hose to the outside.
- Power the pump from a grounded AC outlet. Consult a professional electrician to ensure proper grounding.
- Do not use a defective AC power plug or outlet.

Cautions

- Do not evacuate gases that corrode metal or react chemically with the pump oil.
- If the air being evacuated contains dust or is above 175° F (80° C), then a filter or cooling device should be installed at the pump's intake.
- Do not operate the pump for more than 3 minutes with the intake open to the atmosphere.
- For proper cooling and air ventilation, keep the sides of the pump at least 1" (2 cm) away from walls, and allow 2" (5 cm) of clearance at the front and rear of the pump.
- Do not lay heavy objects on the power cord or allow the power cord to become pinched.
- Operate the vacuum pump in a dry, well-ventilated area.
- Do not operate the pump below an ambient temperature of 40° F (5° C).
- Do not use as a compression pump or transfer pump.
- Do not operate without clean vacuum pump oil.
- Do not block the exhaust fitting when the pump is operating.
- When removing the power plug, grip the plug rather than the cord.

Troubleshooting

Problem	Probable Cause	Remedy
Pump does not produce desired vacuum	Oil level is low	Add oil until level is correct as viewed through sight glass.
	Oil is emulsified or dirty	Replace dirty oil with fresh, high-grade vacuum pump oil.
	Oil inlet or oil flow is blocked	Clean oil inlet and filtering screen.
	System leak	Check system being evacuated for leakage and repair.
	Pump is too small	Check the size of system being evacuated and choose proper pump size.
	Pump is worn	Rebuild or replace the pump.
Oil leakage	Oil seal is damaged	Install new oil seal.
	Oil tank connection is loose or damaged	Tighten oil tank screws or replace gasket.
Oil injection	Too much oil is in tank	Drain oil until level is correct as viewed through sight glass.
	Pump is too small	Check the size of the system being evacuated and choose proper pump size.
Difficult starting	Oil temperature is too low	Open intake to atmosphere and intermittently start motor to heat pump oil.
	Foreign matter is in pump	Clean the pump by replacing pump-oil.
	Motor is defective	Replace the motor.

Maintenance and Service

If the vacuum pump motor stops because of an overload condition, first turn OFF the pump and open its intake to the atmosphere. Wait 5 minutes (press the RESET button if present) and try restarting the pump. If the overload condition persists, refer to the “Difficult starting” problem under Troubleshooting.

Keep the pump clean and avoid foreign matter from entering the pump.

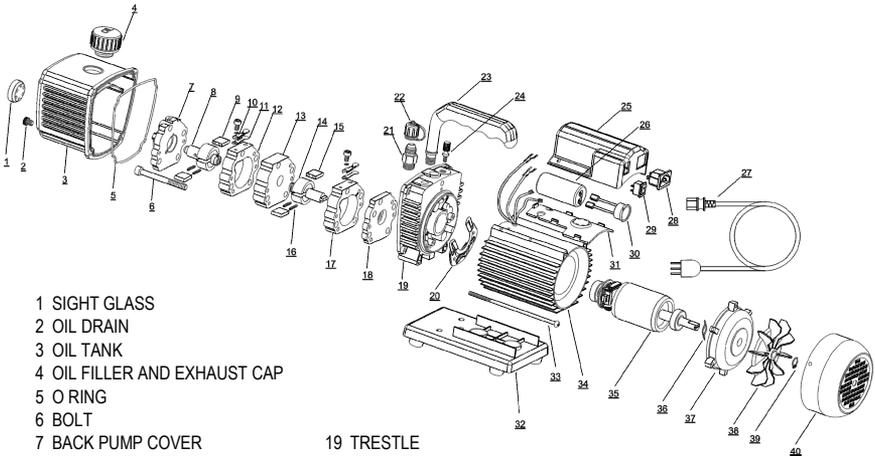
Keep the vacuum pump oil at the correct level during normal operation as viewed through the sight glass. Do not run the pump without oil.

Using clean, fresh, vacuum pump oil is a critical part of achieving the desired vacuum. Replace the pump oil if it becomes dirty and looks turbid, or contains water or volatile matter. When replacing the oil, first thin down the oil by running the pump for 30 minutes with the intake closed. Stop the pump, remove the exhaust fitting and remove the oil drain plug, allowing the oil to drain. Run pump for 1–2 minutes with intake open while adding a small amount of clean pump-oil through the intake to flush out any residual oil in the pumping chamber. Repeat this process several times until the pump is clean. Replace the oil drain plug, and then fill the oil tank through the oil fill access with fresh vacuum pump oil to the desired level as viewed through the sight glass.

When storing the pump, install the intake and exhaust caps and place the pump in a dry location.

Only qualified technicians should attempt to disassemble and repair the vacuum pump. Service performed by unauthorized personnel during the warranty period will void the pump's warranty. For warranty repair and replacement parts, please call Bacharach Service at 724-334-5000.

Exploded Drawing



- | | | |
|------------------------------|-----------------------------|-----------------------|
| 1 SIGHT GLASS | 19 TRESTLE | 31 CAPACITOR BOX SEAT |
| 2 OIL DRAIN | 20 CENTRIFUGAL SWITCH BOARD | 32 BASE PLATE |
| 3 OIL TANK | 21 INTAKE FITTING | 33 SCREW |
| 4 OIL FILLER AND EXHAUST CAP | 22 INTAKE PORT CAP | 34 MOTOR STATOR |
| 5 O RING | 23 HANDLE | 35 MOTOR ROTOR |
| 6 BOLT | 24 GAS BALLAST | 36 UNDER WASHER |
| 7 BACK PUMP COVER | 25 CAPACITOR BOX | 37 MOTOR BACK COVER |
| 8 BACK PUMP ROTOR | 26 CAPACITOR | 38 FAN |
| 9 BACK ROTARY VANE | 27 POWER SUPPLY | 39 SPRING REED |
| 10 VALVE SLICE ASSY | 28 POWER SOCKET | 40 FAN COVER |
| 11 EXHUAUST VALVE | 29 SWITCH | |
| 12 BACK PUMP STATOR | 30 PROTECTOR | |
| 13 MIDDLE FENCE | | |
| 14 FRONT PUMP ROTOR | | |
| 15 FRONT ROTARY VANE | | |
| 16 ROTARY VANE SPRING | | |
| 17 FRONT PUMP STATOR | | |
| 18 FRONT PUMP COVER | | |



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