OPERATING MANUAL

QS5

Vacuum Pump

INFICON

Thank you for buying the INFICON QS5 Vacuum Pump!

QS5 is a high-quality, two-stage rotary vane vacuum pump designed for fast evacuation, deep vacuum, simplified maintenance and durability. With normal use and care as outlined in this manual, your QS5 will provide you with many years of trouble-free operation.

The QS5 is a CE approved product and bears the CE mark. Please contact INFICON if you require further information about applicable standards.

Safety First!

This international symbol is intended to alert the user to the presence of important operating, safety and maintenance (servicing) instructions in this Manual. As used in the Manual, it is intended to draw your attention to critical items.

It is important to read this entire manual before using the vacuum pump!

Responsibility

The INFICON QS5 must only be operated by a qualified technician who has been properly trained in the care and use of such equipment. Use of this equipment by unqualified personnel is potentially dangerous and should not be attempted.

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All other brand and product names are trademarks or registered trademarks of their respective companies.

The information contained in this manual is believed to be accurate and reliable. However, INFICON assumes no responsibility for its use and shall not be liable for any special, incidental, or consequential damages related to the use of this product.

Due to our continuing program of product improvements, specifications are subject to change without notice.

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1.0 The QS5's High Performance Features

- High vacuum, high speed pump

  Two-stage rotary-vane design provides deep, 15 micron ultimate vacuum and reduces evacuation time.

- Internal oil pumping design

  Internal oil pump lubricates the pump chamber and bearings.

- Anti-backflow design

  Anti-backflow on the inlet prevents oil from re-entering the system in the event of a power failure, maintaining system purity.

- Gas ballast

  Gas ballast exhausts moisture and condensation from inside the pump, helping to keep the oil cleaner and preserving pump life.

- Innovative oil exhaust/demister

  The exhaust demister dissipates oil vapor and keeps oil from getting on the pump housing.

- Rugged and comfortable handle

  Handle design makes it easy to carry the pump while the "no slip" rubber grip stays cool.

- High quality design and material

  Aluminum oil housing, base and motor cover makes the pump light while ensuring durability.

- Thermal protection

  The thermally-protected motor ensures safe operation.

2.0 Specifications

Frequency	50 Hz	60 Hz
Flow (CFM)	4.5	5.0
Flow (L/min)	127	142
Motor	½ HP	
Inlet	3/8 in & 1/4 in	
Oil capacity	12.5 oz / 370 mL	
Net weight	23.5 lb / 10.6 kg	

3.0 Safety Precautions

Read this manual and become familiar with the specifications of this machine prior to use.

Before operating, be sure the power supply conversion switch is set to the appropriate voltage (110V or 220V) for the power source being used. Be sure the Power switch is set to the “OFF” position before plugging into power supply.

The QS5’s motor is equipped with an automatically resetting thermal overload switch. If the switch is tripped, the motor can restart without any warning when the motor has cooled.

Wear appropriate safety apparel such as gloves, eye protection and foot protection when working on refrigeration systems.

Disconnect power before moving or servicing the INFICON QS5. Improper use or connections may cause electrical shock hazards. Be sure that all associated devices are properly grounded before energizing circuits.

Use care when touching the pump, as certain components may be hot.

To reduce the risk of fire, extension cords should not be used with this device as the wiring can overheat under conditions of high current draw. If an extension cord is absolutely necessary, its length should be as short as possible and it should contain size 16 AWG or larger wiring.

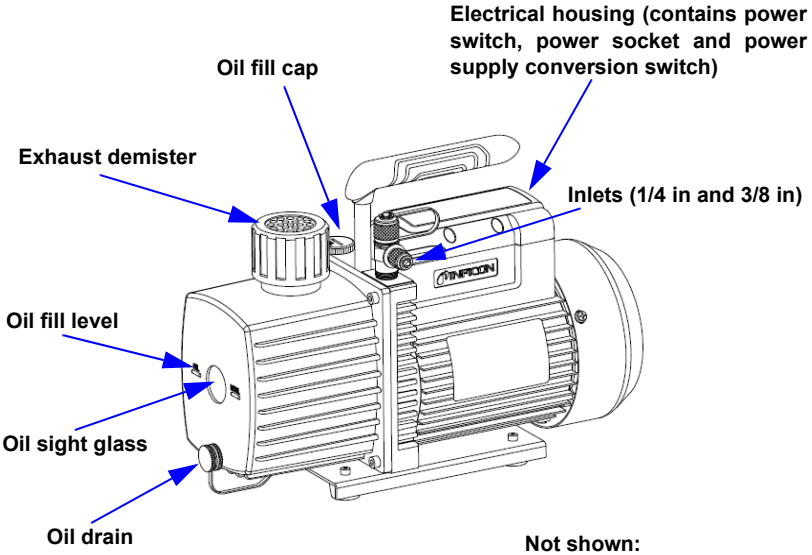
The exhaust gas from the vacuum pump is composed of oil and gases from within the pump. The exhaust gas will be hot and should be well ventilated.

Never operate the pump with a blocked or restricted exhaust. The resulting back pressure may blow out the sight glass or otherwise damage the pump.

The QS5 has been designed to operate most efficiently on high viscosity vacuum pump oil. Other vacuum pump oil may work, but performance results may not be as stated.

The QS5 is not designed for pumping corrosive, aggressive or explosive gases, or for use in flammable environments. Do not use with ammonia or lithium bromide systems.

4.0 Identification Of Parts



Not shown:

- **Gas ballast**
- **Electrical Socket**
- **110V/220V switch**

5.0 Start-up Procedure

THE QS5 IS NOT SHIPPED WITH OIL IN ITS RESERVOIR. **DO NOT START PUMP WITHOUT ADDING OIL! USE ONLY HIGH VISCOSITY VACUUM PUMP OIL, SUCH AS INFICON PART NUMBER 071-0730!**

1. Place pump on flat surface. Remove oil fill cap. A coin or large flat-head screwdriver may be required.
2. Pour oil slowly to avoid over-filling and spilling. Fill to the line indicated on the oil box.

   NOTE: Oil level will rise when the pump warms up and reaches its operating temperature. Check oil level when warm and adjust if required. **DO NOT OVERFILL**.
3. Remove cap from one of the inlet ports. Turn power switch ON.
4. Let the QS5 run to warm-up. When it is running smoothly, replace cap on the inlet port.
5. Turn power switch OFF and connect to system. Use hoses rated for high-vacuum work. Do NOT use hoses which have previously been used to recover or charge refrigerants, as these hoses will be contaminated with oil and refrigerant, contributing to a longer evacuation process. Do not use excessively old or worn hoses since they will allow air to permeate through them and will not be vacuum-tight. Use the shortest hoses possible.

PRIOR TO CONNECTING THE QS5 TO AN HVAC/R SYSTEM, REMOVE REFRIGERANT FROM THE SYSTEM USING AN APPROVED REFRIGERANT RECOVERY MACHINE; WE RECOMMEND THE VORTEX® AC FOR THIS PURPOSE. DAMAGE TO THE PUMP MAY OCCUR IF EVACUATION IS STARTED WHILE THE SYSTEM IS UNDER HIGH PRESSURE.

6. If a vacuum gauge is being used, remove cap from one of the inlet ports, and attach it to the intake. However, positioning the gauge closer to the system being evacuated will provide a more accurate reading of the system vacuum.
7. Make sure fittings and connections are tight.
8. Turn power switch ON.
9. Open gas ballast valve for a few minutes to help bring pump to its normal operational temperature sooner.

IT IS IMPORTANT THAT THE PUMP HAS REACHED ITS NORMAL OPERATIONING TEMPERATURE (50°C-70°C / 122°F-158°F) **BEFORE ANY CONDENSABLE VAPORS ARE PUMPED**. FAILURE TO DO THIS MAY CONTAMINATE THE OIL AND DAMAGE THE PUMP.

10 The QS5 is now ready to evacuate air conditioning and refrigeration systems.

UNDER NO CIRCUMSTANCES SHOULD THE FITTINGS ON THE VACUUM PUMP BE USED FOR REFRIGERANT TRANSFER, AS DAMAGE WILL OCCUR TO THE VALVE.

6.0 Using the Gas Ballast

The gas ballast valve allows a controlled amount of air to enter the compression chamber, diluting any water vapor present, then exhausts it out of the compression chamber **before it condenses and accumulates in oil reservoir**.

The gas ballast valve can be opened or closed at any time during pump operation. It is also helpful to open it in the following situations:

- During start-up, it will help the pump reach its normal operating temperature sooner, as a cold pump will more easily condense vapor.
- During the evacuation process, it will minimize the effect of vapor condensing within the pump, but it may slightly reduce ultimate vacuum. If deep ultimate vacuum is required, the Gas Ballast may be closed later in the evacuation process.
- During shut down, it will allow the pump to purge condensable vapors.

Gas Ballast valve, when closed, must only be finger-tight. Otherwise, the valve seat may be damaged.

7.0 Shut-down Procedure

1 CLOSE the manifold valve between the QS5 and the system.

2 OPEN Gas Ballast valve for a few minutes before shut down. This allows the pump to purge condensable vapors.

3 Turn power switch OFF.

4 If necessary, drain oil while the pump is warm.

8.0 Maintenance

DISCONNECT QS5 FROM POWER SUPPLY BEFORE CARRYING OUT ANY MAINTENANCE.

8.1 Changing the Oil

THE OIL MUST BE CHANGED WHEN CONTAMINATED.

Evacuation of most used systems results in some contamination of the oil, causing deposits of sludge which contain water and acids. These substances will corrode your pump. Changing the oil removes damaging substances and will enhance the life of the vacuum pump. For optimum performance, change the oil after each use of the QS5.

Poor vacuum reading or a gray or milky appearance to the oil usually indicates that the oil is contaminated. If the QS5 is pumping condensable vapors, it may be necessary to change the oil after each process so that the pump does not sit with contaminated oil.

To change the oil

1. Remove the oil drain plug and drain the oil into a suitable receptacle. This process may be easier if the vacuum pump is tilted slightly.
2. Turn power switch ON momentarily with the inlet port open to remove any residual oil.
3. Replace the oil drain plug when the flow of oil has stopped.
4. Place the pump on a flat surface. Remove oil fill cap and fill the oil reservoir with new vacuum pump oil to the line indicated on the pump. The oil level will rise when the pump warms up and is operating under vacuum conditions. The oil level should be checked later and adjusted as required.

USE ONLY HIGH VISCOSITY VACUUM PUMP OIL INTENDED FOR USE IN HVAC/R VACUUM PUMPS, SUCH AS INFICON PART NUMBER 071-0730.

5. Replace oil fill cap, then turn power switch ON and check for any oil leakage.

Dispose of waste oil in accordance with local regulations. Refer to Section 5.0, Start Up Procedure, for instructions on filling the pump with oil.

NOTE: OIL UNDERNEATH THE HOUSING COULD BE CAUSED BY CARELESS FILLING AND SPILL OVER. THIS IS NOT COVERED BY WARRANTY.

9.0 Trouble-Shooting

Problem	Possible Cause	Remedy
Does not achieve good vacuum	1. Loose/open fittings 2. Not enough oil 3. Dirty/contaminated oil 4. Old/dirty/non-vacuum rated hoses 5. Gas ballast open in deep vacuum operation 6. Pump has reached the end of its useful life	1. Make sure all connections are tight, gas ballast & oil fill cap are closed and unused inlet is not open. 2. Add oil to level indicated 3. Change oil 4. Use new hoses rated for deep vacuum 5. Close gas ballast 6. Service or replace pump
Oil discolored	1. Excess moisture in oil, or oil burnt	1. Change oil
Oil leakage	1. Loose fittings/connections 2. Over-filled with oil	1. Ensure oil drain and related fittings are tight 2. Check oil level, drain extra if necessary
Failure to start	1. Power disconnected 2. Thermal protection has shut pump down 3. Cold start condition 4. Operating voltage too low 5. Power supply cord too long 6. Foreign matter has entered pump 7. Blown fuse	1. Connect power 2. Allow pump to cool, will re-start on its own 3. Subject pump to heat to raise the ambient temperature 4. Check operating voltage 5. Use shorter power supply cord 6. Check and clean pump 7. Check fuse (near power receptacle) and replace if necessary.

10.0 Warranty

For technical and customer assistance, please call 1-800-344-3304. Do not return pump to INFICON. Contact your local distributor if necessary.

INFICON warrants the QS5 vacuum pump to be free from defects of materials or workmanship for a period of two (2) years from the date of purchase. INFICON does not warrant any machine that has been subjected to misuse, neglect, accident or repaired or altered by anyone other than INFICON. This warranty applies to normal usage conditions and INFICON reserves the right to deny warranty on the basis of product misuse and/or abuse.

INFICON's liability is limited to machines returned to INFICON, transportation prepaid, and for which INFICON judges to have malfunctioned because of defective material or workmanship. INFICON's liability is limited to, at its option, repairing or replacing the defective machine or part.

This warranty is in lieu of all other warranties, express or implied, whether of merchantability or fitness for a particular purpose or otherwise. All such other warranties are expressly disclaimed.

INFICON shall have no liability in excess of the price paid to INFICON for the machine plus return transportation charges prepaid. INFICON shall have no liability for any incidental or consequential damages. All such liabilities are excluded.

TWO TECHNOLOGY PLACE
EAST SYRACUSE, NY 13057-9714 USA

Phone: 1-800-344-3304
Fax: 315-434-2552
E-Mail: service.tools@inficon.com
www.inficonservicetools.com

074-518-P1C