

Quick Start Manual for Oil Rotary Vacuum Pump VS1501/2401, VS650/750

Introduction

This quick start manual is prepared to help users to quickly understand the product's operating method and display content. Please read the instruction manual beforehand for detailed usage, caution on product use, and safety information to use the pump correctly.

You can download the instruction manual from Ulvac website. <https://showcase.ulvac.co.jp/ja>

1. Setting

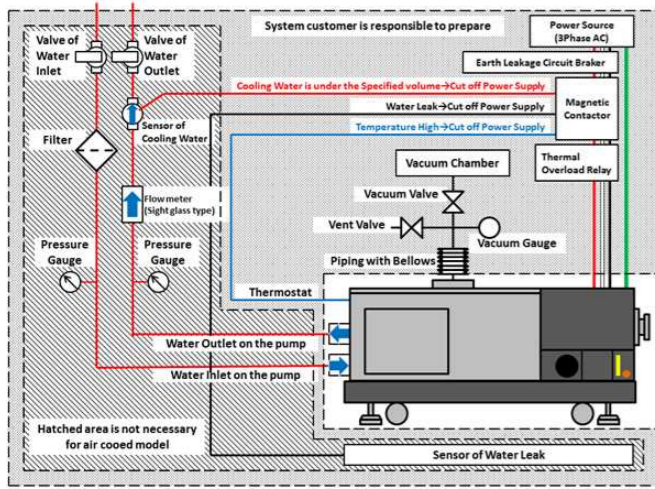
You are kindly requested, upon delivery of this product, to check that the delivered product is exactly what you have ordered and it has no damage caused by transport or the like.

Part name	Specification	Quantity
Oil/ one time portion	ULVOIL R-72	1 set
Quick start manual	Japanese/English	1 copy

2. System Flow

Power supply and cooling water are required.

Please prepare wiring, piping, safety circuit, exhaust processing equipment, etc.



Location of vacuum pump in host device

3. Ambient Conditions for Installation and Operation

As ULVAC pump is a precision equipment, be sure to fulfill the following for its storage, install and operation, to ensure product performance and reliability.

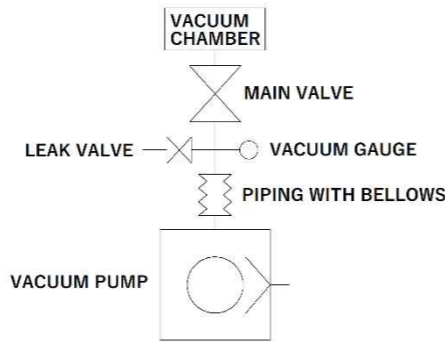
- ① Ambient temperature and humidity for storage: -10°C to 50°C, less than 95%RH
- ② Ambient temperature and humidity for operation: 4°C to 40°C, less than 80%RH (No condensation)
Use the pump oil "ULVOIL R-42" for operation under the temperature from 4°C to 10°C and "ULVOIL R-72" for operation under the temperature from 10°C to 40°C.
- ③ Height (for both installation and operation) : Altitude of 1,000m or less
- ④ External vibrations (for both installation and operation) : Vibrating acceleration ≤ 114dB (0.5G)
- ⑤ Other conditions (for both installation and operation) :
 - a. There shall be no corrosive or explosive gases
 - b. There shall be no freezing or condensation
 - c. There shall be no dust
 - d. The pump should be installed indoor
 - e. Another pump shall not be put on the pump. The pump shall not be put laid down nor put touching its motor edge face or oil gauge edge face with the ground.
 - f. The pump shall not be exposed to direct sunlight
 - g. Heat sources shall be put away from the pump

Install the pump horizontally to a place where there are less dust and moisture. For the layout, consider works such as mounting, removal, inspection, and cleaning of the pump.

Model	Foot print	Bolt	Anti-vibration Rubber mount
VS1501 VS2401	 The Pump has four holes. The Pump is fixed with four bolts.	More than "M12 x 40mm"	Kurashiki Kako., Ltd. Model: KLB-8030 (Recommended) * NOT included
VS650	 Fix with hexagon nuts. Adjust the adjusters so that it is installed as horizontally as possible. After adjusting the adjusters, fix it with hexagon nuts.		

4. Inlet port Piping

Provide main valve, vacuum gauge and leak valve between the vacuum chamber and pump, as shown in figure.



Use the flange for connection between the Pump Inlet and the piping.

MODEL	Flange at the pipe
VS1501 VS2401	VF80 JIS B 2290:1998 Vacuum technology-Flange dimensions; Attachment book (Reference) Flange dimensions for maintenance
VS650	DN100 ISO-K VF100(OPTION)

5. Outlet port Piping

Use the flange for connection between the Pump Outlet and the piping. It is recommended to provide an oil mist trap to reduce oil consumption and to trap oil mist.

MODEL	Flange at the pipe
VS1501 VS2401	VF50 JIS B 2290:1998 Vacuum technology-Flange dimensions; Attachment book (Reference) Flange dimensions for maintenance
VS650	DN100 ISO-K VF100(OPTION)

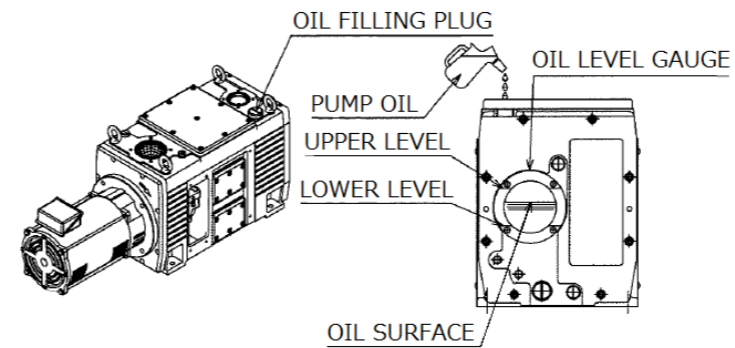
6. Cooling Water Piping(for Water Cooling Type)

Never fail to flow the coolant during operation. The required cooling water flow rate is as follows. For the cooling water system, use joints and pipes with a resistant water pressure of 0.5 MPaG or more and a heatproof temperature of 90°C or more.

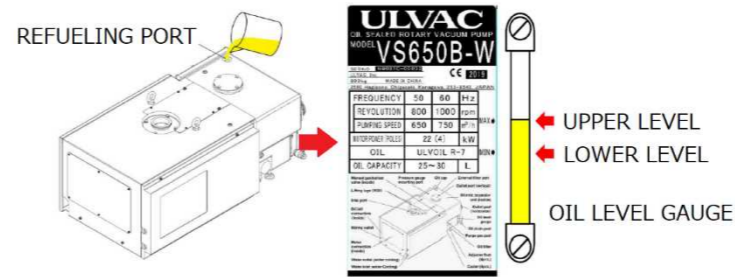
MODEL	Coolant volume	Cooling water specifications
VS1501	4.0L/min or more	Supply pressure:0.5MPaG or less Differential pressure between inlet and outlet:0.1MPa or more Feedwater temperature: 5°C to 30°C(non-condensing)
VS2401	5.0L/min or more	
VS650	3.0L/min or more	

7. Oil Filling

Remove oil filling plug, and fill the Pump with oil until oil level should be between the two level lines (MAX and MIN on the Pump case) on the oil level gauge.
When the oil level is between the two level lines, the Pump is allowed to start.



VS1501,VS2401 Refueling position, oil amount explanatory diagram

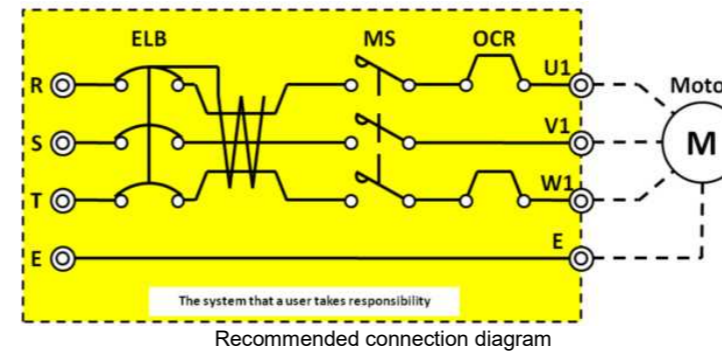


VS650 Refueling position, oil amount explanatory diagram

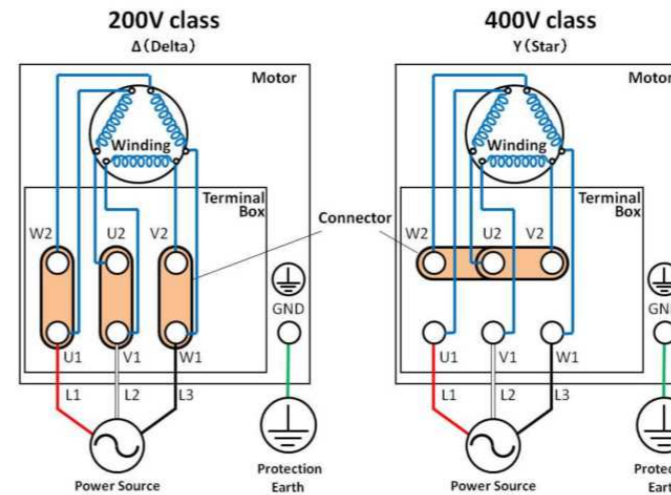
8. Electrical Connection

Conduct the electrical connection referring to the Figure. Be sure to install the overload protection device.

This unit uses 200V and 400V class shared motors. The unit can be operated without changing the 200V and 400V class motors by changing the wiring connections inside the motor terminal box.



Recommended connection diagram



Electrical wiring diagram

9. Operation

9-1. Operation Start

Before operating this unit, check the following again.

- (1) Check that the piping and electric wiring connection work have been completed.
- (2) Checking the oil level

Ensure that the oil level is between the two level lines on the oil level gauge.

The oil level comes down after started operation. Add the oil if it was around the minimum level.

- (3) Check the amount of cooling water
Ensure that the cooling water is flowing above the specified value. Check also that there is no leakage of the Coolant.

- (4) Checking the rotating direction
Close the vacuum valve at the intake port, open the leak valve, operate the pump for 2 to 3 seconds, and check the rotation direction of the motor according to the rotation direction of the fan or the gas condition (in / out) of the leak port.

The pressure shall come down if the rotation direction was correct (clockwise viewed from the Motor). If the direction of rotation of the motor is opposite, the phases on the power supply side have been switched, so replace two of the three connections in the recommended circuit diagram.

- (5) After checking (1), (2), (3), and (4), close the leak valve and operate the pump.
Check this time whether the Vacuum gauge between the Vacuum valve and Pump unit indicates the pressure comes down around the ultimate pressure.

9-2. Operation Stop

- (1) Close the vacuum valve at the intake port
- (2) Open the leak valve.
- (3) Stop the pump with the leak valve open and return the pressure inside the pump to atmospheric pressure.
- (4) After stopping, let the cooling water flow until the pump temperature drops.

9-3. Gas Ballast Function (VS1501 and VS2401 are optional)

For details on the gas ballast function, please refer to each product instruction manual.

9-4. Vacuum Pump Oil For cold district

It may be difficult to start the pump when using it in cold regions or in winter. This is an overload phenomenon due to the increased viscosity of the pump oil. To be on the safe side, make sure that the pump body is normal and that the capacity of the motor overload protection device is the rated value of the motor. Then warm the pump oil or use our vacuum pump oil ULVOIL R-42, which has a lower viscosity.

Recommended type of oil:

- 1) ULVOIL R-72 (standard oil)
- 2) ULVOIL R-42 (For cold regions, when the ambient temperature is 4°C to 10°C)

9-5. Installation of oil mist trap (VS1501 and VS2401 are optional)

For details on the oil mist trap, please check the instruction manual of each product.

9-6. Check the tension of the belt (VS650 only)

In early stages of operation, the belt tension is loosened due to the elongation of the belt itself and the fit with the pulley (the belt falling into the groove of the pulley). Please check the product manual and perform regular inspections.

ULVAC SHOWCASE



You can download the instruction manual from here.