YK09-0023-DI-005-00

Dry Vacuum Pump GR-Series Quick Manual

Introduction
This quick manual is for quick check of operation and display of the product. Please refer to instruction manual attached in advance for detailed information about operation, precautions,safety and Warranty Terms for proper use.https://showcase.ulvac.co.jp/ja

1.Setting

Upon receipt of the instrument, unpack it and check it to see that it is not damaged in transit and that accessories aresupplied as specified

Product name	Qty
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2.System Flow

Cooling water, nitrogen gas, and power supply are necessary as utilities.
The cooling water enters from the cooling water inlet of the panel, circulates in the pump body, and then discharges from the cooling water outlet.
Nitrogen gas is used as shaft seal gas that reduces the flow of oil in the lubrication chamber into the casing.
The power supply is a 200V- or 400V-class three-phase power supply. Check the motor specifications.

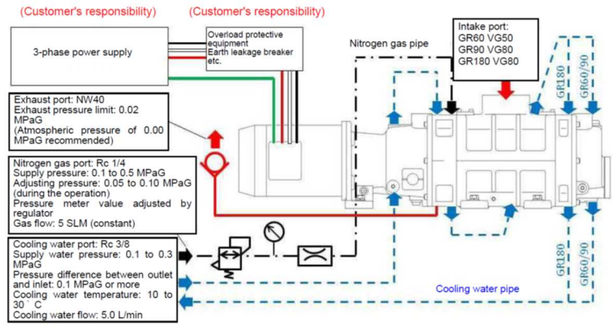

Fig.1 System Flow

Note:Be sure to attach overload protective equipment.
If not, it may result in a motor burnout or fire.
Note: Using a flow sensor etc, make a system that shuts out the supply of electricity to the pump in the event that the cooling water stops. If the operation is continued under the conditions where the cooling water flow is lower than the specified value, the pump may be broken.

3.Installation

Install the pump body horizontally in a ventilated room without dust and with low humidity. For the ambient conditions, see "0.5.3 Ambient conditions during storage, installation, and operation."

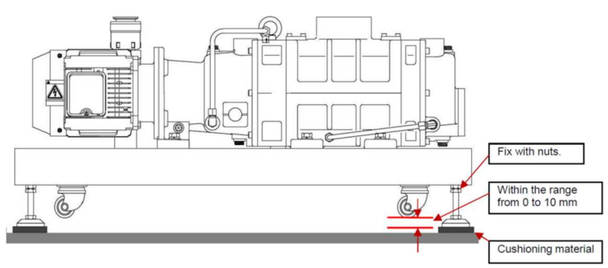

Fig.2 Installation of Pump

4.Oil filling

For both the two oil level gauges, check that the oil level is between the upper and lower level lines.
If the oil level is between the level lines of the oil level gauges when operation stops, the pump can be operated.
If the oil level is not between the level lines of the oil level gauges when operations stops, check that the pump stops and the inner pressure in the pump is the atmospheric pressure, and then remove the oil filler plug and fill the oil so that the oil level is between the level lines of the oil level gauges.

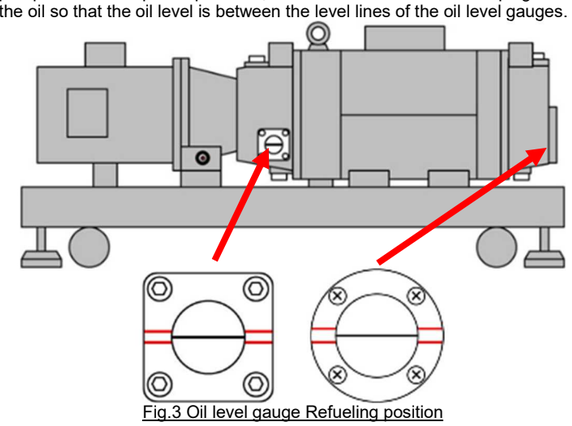

Fig.3 Oil level gauge Refueling position

5.mechanical seal

This product uses mechanical seal. The mechanical seal causes slight oil leakage even under normal conditions due to its mechanism. If the oil level of the cover on the atmospheric side is lower than the lower limit or if you see the oil in the oil level gauge indicated by the A part shown in the lower left figure, the oil may leak from the mechanical seal.
In such a case, it is necessary to collect the leak oil from the mechanical seal and then return it into the cover on the atmospheric side. Check that the pump stops and the pressure in the pump is at the atmospheric pressure, supply oil according to the lower right figure.
However, if the amount of oil leaking from the mechanical seal is 0.15 ml or more per hour, the mechanical seal may deteriorate. In such a case, the mechanical seal needs to be replaced. Contact the nearest service center.
This product uses mechanical seal. If the pump needs to be operated after it has been stopped for three months or longer or after it is relocated, the oil film may not be formulated at the sealing part of the mechanical seal and it is not sealed. (If it is operated under this condition, high-frequency metallic noise occurs.)
In such a case, it is necessary to supply the pump oil you are using by approx. 20 ml to the mechanical seal. Check that the pump stops and the pressure in the pump is at the atmospheric pressure, supply oil according to the figure below.

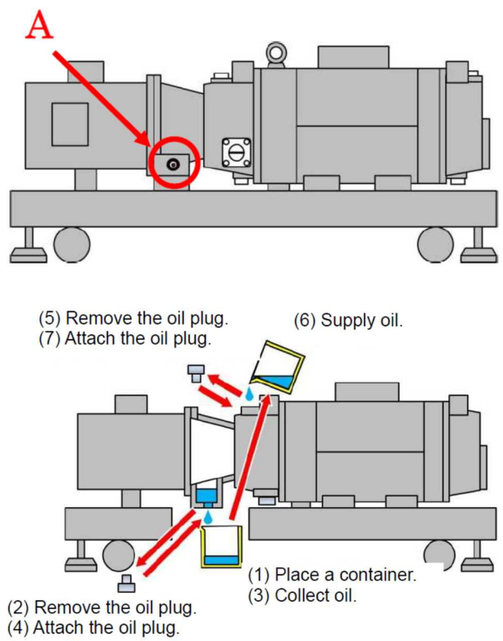

Fig.4 mechanical seal Oil filling

6.Electric Connection

(1)The motor electric connection shall be made in reference to the figure below. After the connection is established, re-check that all screws in the motor terminal are tightened.
(2)The motor rotates clockwise when viewed from the motor (counterclockwise when viewed from the load). In it rotates in the reverse direction, re-check the electric connections. It is a three-phase induction motor and therefore if the two of the input lines are in the reversed phase, it rotates in the reverse direction.
(3)Be sure to attach an overload protective device. If not, it may result in a motor burnout or fire.
(4)Ensure to have a correct grounding.
You have a risk of getting electrical shock in case of failure or electric leakage. You are recommended further to install a dedicated earth leakage breaker.
(5) Minimize the length of the ground wire.
(6) Be sure to ground.It is recommended to install a dedicated earth leakage breaker.
(7) For electrical wiring, select, install, and operate wiring materials in accordance with the safety regulations and laws of the country in which you are using it (for example, the Fire Service Act, electrical wiring regulations, etc.).
(8) Since this pump uses a 200V class / 400V class shared motor, it is possible to operate the 200V class and 400V class without replacing the motor by changing the wiring inside the motor terminal box., 200-240V 50 / 60Hz and 380-415V 50HZ, 380-460V 60Hz, it is necessary to change the connection. Please be careful.

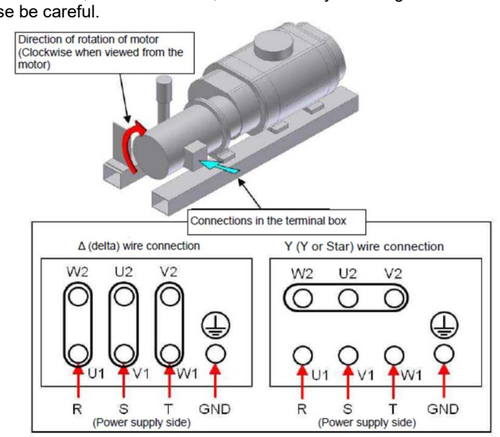

Fig5.terminal box

7.Nitrogen gas pipe

The pump nitrogen gas port is Rc 1/4. Connect to the nitrogen gas pipe using an appropriate joint.

Nitrogen gas	Supply pressure	MPaG	0.1 - 0.5
	Adjusting pressure *2	MPaG	0.05-0.10 （During operation）
	Gas flow rate	SLM	5.0 ※1

*1: The flow rate of nitrogen gas (= Shaft seal gas) is 5.0 SLM constant.
*2: Pressure meter value adjusted by regulator

8.Cooling watar pipe

The pump cooling water port is Rc 3/8. Connect to the cooling water pipe using an appropriate joint.
(1) The cooling water port of the pump is Rc3 / 8.
Use the appropriate fittings to connect to the cooling water piping.
(2) Adjust the flow rate of the cooling water with the primary pressure or the device flow rate adjustment valve so that it flows at 5 L / min or more.
If the operation is continued when the flow rate of the cooling water is less than the specified amount, the pump may break down.
Secure the specified flow rate.
(3) When using multiple pumps, connect the cooling water pipes in parallel.
If connected in series, the cooling capacity will be insufficient and it may cause a malfunction.

Cooling water	Supply water pressure	MPaG	0.1~0.3
	Pressure difference between outlet and inlet	MPaG	0.1
	Supply cooling water temperature	℃	10~30* No condensation
	Flow rate	L/min	5.0

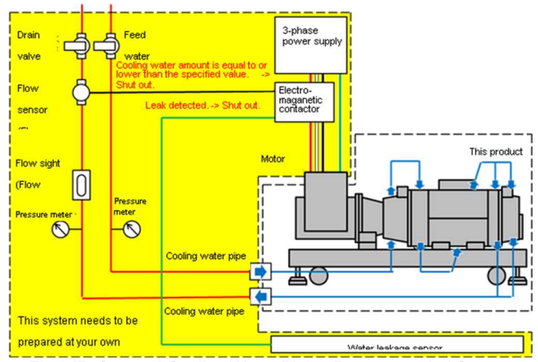

Fig.6 [Reference] Cooling Water Piping Recommended System

9.Operation Start

(1)Check that piping work and wiring connection work are completed.
(2)Oil Level Check
For both the two oil level gauges, check that the oil level is between the upper and lower level lines. After the operation, the oil level decreases by approx. 1 cm. If it is at a lower limit level, supply oil.
(3)Cooling water (See "3.6 Cooling Water Piping.")
Open the feed valve for cooling water and, while checking the flow meter, adjust the flow rate so that a specified amount of cooling water flows.
(4)Direction of rotation check
Operate the pump for approx. 2 to 3 seconds and check the motor's direction of rotation with the fun at the motor end. If the motor correctly rotates (clockwise when viewed from the motor), the pressure decreases. If the motor rotates in the reverse direction, the power phases are opposite from each other. Replace the two of the three connection wires in Fig. 5.
(5)After the completion of steps (1) to (4), start to operate the pump.
(6)Nitrogen gas (See "7 Nitrogen Gas Pipe.")
Adjust the pressure of nitrogen gas during the operation.
1)Open the valve for nitrogen gas to apply pressure to the nitrogen gas pipe.
2)The regulator is locked at the time of delivery. Pull the knob until it "clicks" to unlock, and then adjust the pump pressure between 0.05 and 0.10 MPa (Gauge pressure). In addition, the flow rate of nitrogen gas to seal the shaft is controlled by a fixed orifice. 5.0 SLM flows by adjusting the pressure between 0.05 and 0.10 MPa. No need to adjust the flow rate.

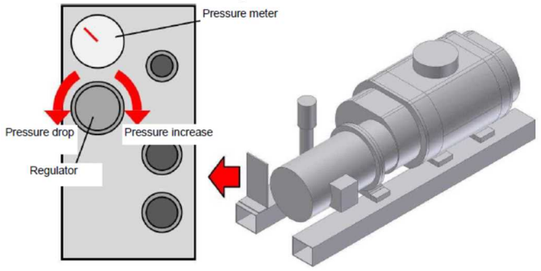

Fig.7 Nitrogen gas Adjustment

10.OperationStop

Shut off the power supplied to the motor.
Note:For a while after the operation stops, do not touch the vacuum pump, motor, and pipes since they are subjected to high temperature. If your body comes into contact with them, you may get burned. Supply cooling water until the pump temperature becomes low.
Note:When shutting off the supply of cooling water immediately after the pump operation stops, the cooling water remaining in the pump may boil with an inner pressure increase, causing damage to the cooling water pipes. Supply cooling water until the pump temperature becomes low.

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You can download the instruction manual from here.

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