

# OIL SEALED ROTARY VACUUM PUMP

## PKS-016, PKS-030, PKS-070B

### 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 are supplied as specified.

Product name	Qty
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#### 2. System flow

Requires power as a utility. Customers are requested to prepare wiring, piping, protective equipment, exhaust treatment equipment, etc.

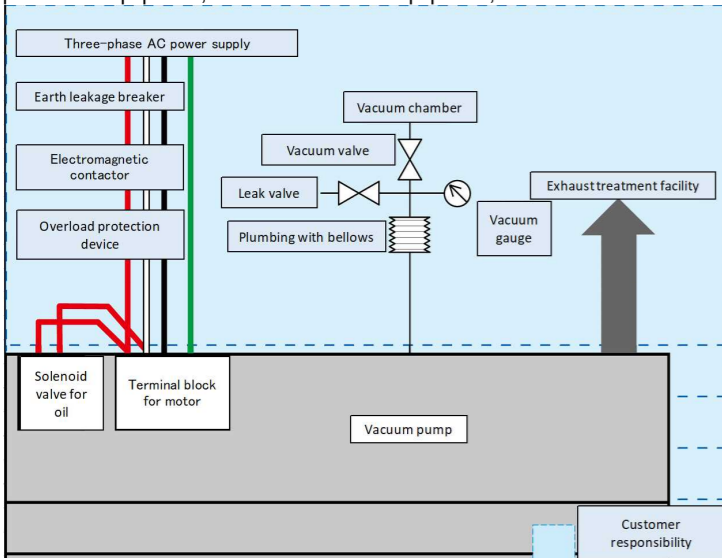


Fig.1 Responsibility diagram

#### 3. Ambient Condition for Storage, Install and Operation

As precise clearances are provided with this Pump, be sure to fulfill the following for its storage, install and operation;

- ① Ambient temperature and humidity for storage :  
-30°C to 60°C, less than 95%RH
- ② Ambient temperature and humidity for operation :  
10°C to 40°C less than 80%RH ※1
- ③ Height (for both storage and operation) : Lower than 1,000 meters altitude
- ④ External vibration (for both storage and operation) :  
Vibration acceleration less
- ⑤ Miscellaneous (for both storage and operation) :
  - a. There shall be no corrosion behavior or explosive gas.
  - b. There shall be no freeze or dew formation.
  - c. There shall be no dust.
  - d. It shall be in house.
  - e. Another pump shall not be put on the Pump. The Pump shall not be laid down nor put touching its motor edge face or oil gauge edge face with the ground.
  - f. There shall be no direct sun beam.
  - g. Heat source shall be put away from the Pump.  
\*1 Condition of "Ambient temperature and humidity for operation" is 4°C to 10°C less than 80%RH, if The Pump use ULVOIL R-42.

Select a place where there is little dust and humidity, and install it horizontally. Then, arrange the pump in consideration of work such as installation, removal, inspection, and cleaning.

Model	Fixed location	Bolt size	Anti-vibration rubber
PKS-016	There are 4 holes. Anchor fix 4 places with foundation bolts	M16×250	Please do not use
PKS-030		M20×250	
PKS-070B		M20×300	

#### 4. Lubrication

Remove the refueling plug and add pump oil so that the oil level is between the level lines of the oil level gauge. If there is an oil level between the level lines of the oil level gauge during operation, the pump can be operated. The position of the oil filler port is indicated on the inscription on the pump body.

\* **PKS-070B is a pipe type level gauge.**

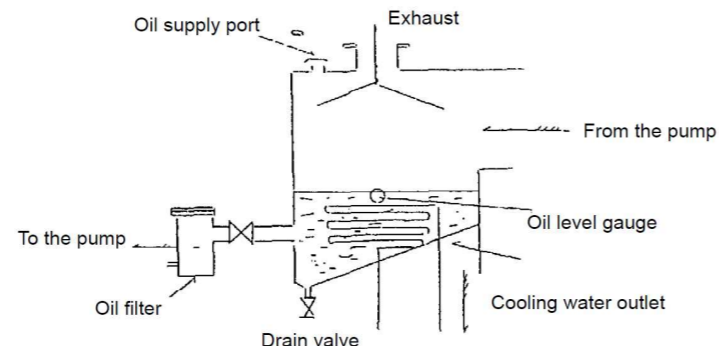


Fig.2 Oil tank structural drawing  
model : PKS-016, PKS-030

#### 5. Water Piping

Refer to the table below for the cooling water port of the pump and connect it to the cooling water piping using the appropriate fittings. Do not mistake the cooling water inlet and cooling water outlet. The location of the cooling water inlet/outlet is indicated on the inscription on the pump body.

\*Be sure to flush the cooling water during operation. The amount of cooling water required is as follows. However, PKS-016 does not require cooling water.

- Water Pressure : 0.3 MPa (gauge pressure) or less
- Differential pressure : 0.1 MPa (gauge pressure) or more
- Water temperature : 5 to 30 °C

Model	Fitting size	Flow rate
PKS-030	Rc3/8	3L/min or more
PKS-070B	Rc3/8	5L/min or more

#### 6. Inlet port Piping

1) Wash sufficiently inside the Vacuum chamber, pipes, Main valve and so on to connect them to the Pump. If dirty unit were connected, it would cause a trouble such like raise the ultimate pressure or extend the depression time to the specified pressure. Wear a pair of gloves to touch any vacuum section. Do not touch with the bare hand.

2) Connect the inlet of pump to pipes that are larger than the internal diameter of the pump inlet. Use a pipe having bellows between the Vacuum chamber and inlet of the Mechanical Booster Pump so as to avoid any direct load to the Pump flange and not to transfer the Pump vibration to the Vacuum chamber.

3) Put the Main valve, Vacuum gauge and Leak valve between the Vacuum chamber and the Pump. When the Pump stop operation, close the main valve and keep the equipment side at a vacuum condition. And open a leak valve in order to release the pressure of the Pump until atmospheric pressure so that the oil in the Pump won't flow backward. It would be convenient at an unexpected stop, if the main valve is used for a pneumatic valve or electromagnetic valve, and leak valve is used for an automatic vacuum breaking valve.

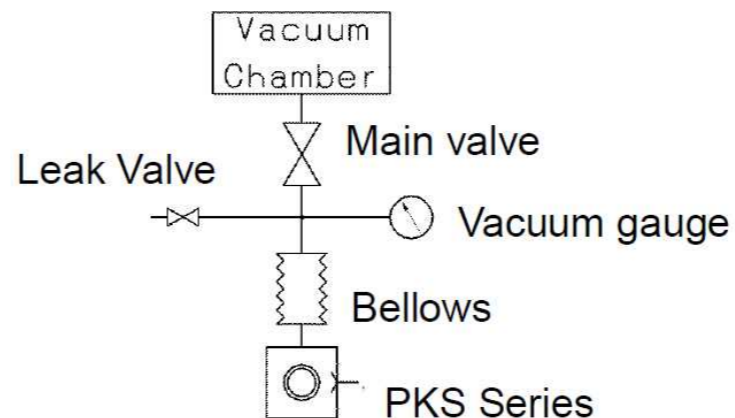


Fig.3 Connection to vacuum chamber (example)

#### 7. Outlet port Piping

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

#### 8. Oil mist trap

The oil mist trap can be mounted The TM series (as optional parts) to trap the oil mist discharged from the Pump (refer to "Table"). If you are using an oil mist trap, please also check the instruction manual for the oil mist trap.

Model	Pump	Bolts	O-ring
TM-2	PKS-016	M8*L20 4pc	JISB2401 V70 1pc
TM-3	PKS-030	M10*L25 4pc	JISB2401 V100 1pc
TM-4	PKS-070B	M10*L25 8pc	JISB2401 V120 1pc

#### 9. Electrical Connection

Refer to the figure below to connect the motor. Since the ULVAC Tenma motor 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. \*For specifications / models that are not ULVAC Tenma motors, check the motor specifications and connect according to the rotation direction of the pump. The direction of rotation of the motor is indicated on the motor flange or the inscription on the pump body. \*Connect the electromagnetic valve for filling the oil to synchronize with the motor. \*Install and operate this product in compliance with the laws and regulations relating to the safety, e.g. Fire Defense Law, Electric wiring regulation and so on. In the country and region you use this product.

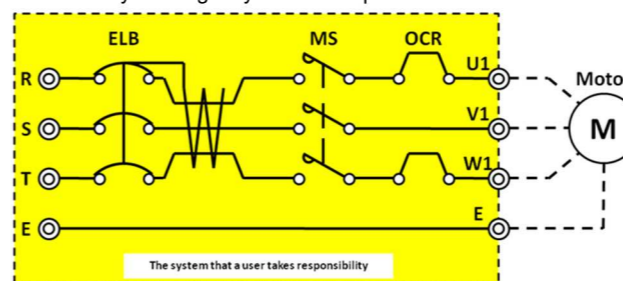


Fig.4 Recommended connection diagram

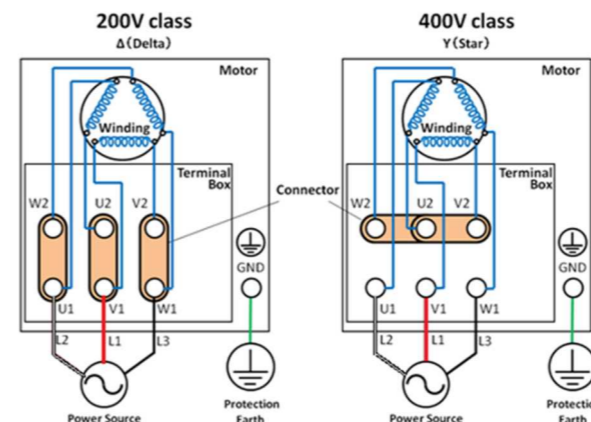


Fig.5 Electrical wiring diagram

#### 10. How to tighten and remove the belt

The belt to connect the main body of pump and a motor to is made by rubber. When the belt tension continues driving in an insufficient state... The belt is shortened the life-time by the wear. The motor is shortened the life time by overheat. The pump is not start or not perform pumping speed. Measure the tension of the belt

- 1) Shut down the pump, and be sure to turn OFF the power supply.
- 2) Remove the belt cover.
- 3) Open the leak valve.
- 4) Set the Ring for Deflection to "Table".
- 5) Set the Ring for Load to 0N.
- 6) Push the center of the belt, between the motor pulley and the pump pulley, down deflection with tension meter.
- 7) Read the load after pushing. It is normal that the load is "Table".
- 8) If the tension of belt is right, attach the belt cover.
- 9) Close the leak valve.

Model	Operating Frequency(Hz)	Reference value of deflection volume(mm)	Range of deflection load(N)	
			For new belt tightening	For re-tightening
PKS-016	50	6	9-14	9-12
	60		8-12	8-10
PKS-030	50	8	12-18	12-16
	60		11-17	11-14
PKS-070B	50/60	10	19-29	19-25

#### 11. Operation Start

Before starting the Pump, check the following again.

- (1) Piping and wire connection are 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 could be come down after operation. The oil level is lowered than limit level, you should fill the oil.
- (3) Checking the water flowing  
Checking the cooling water is flowing.

Flow rate PKS-030 : 3 L/min or more PKS-070B : 5 L/min or more

- (4) Checking the rotation  
Close the main valve in pump inlet side, open the leak valve, and confirm the Pump which can rotate by hand lighter. There would be a problem, if the rotation is heavier.
- (5) Checking the rotating direction  
Close the main valve on the Inlet side, open the leak valve, and run the Pump for two to three seconds to check the rotating direction of the motor. If the motor is rotating in the correct direction (Clockwise as viewed from the motor side), pressure will drop. If it is reversed, interchange two of the three wires shown.
- (6) After checking (1), (2), (3), (4) and (5) above, close the leak valve and run the Pump. Here, ensure that the vacuum gauge between the main valve and the Pump indicates a pressure close to the ultimate pressure.

#### 12. Operation Stop

- (1) Close the main valve on the Inlet side, and stop the Pump.
- (2) Open the Suction leak valve to make atmospheric pressure inside the Pump.
- (3) Discharge the water in the Pump unit and Cooling water piping in case where the environment temperature comes down below 5°C under the state that the operation is stopped (Supply the compressed air of 0.3MPaG (gauge pressure) through the Cooling water inlet without closing the outlet.). Residual water, if any, might freeze up and cause crack of the Pump unit and/or Cooling water pipe.

ULVAC SHOWCASE



You can download the instruction manual from here.