ULVAC

SK00-4802-DI-004-00

Quick Start Manual for OIL DIFFUSION PUMP ULK-04A,ULK-06A,ULK-10A,ULK-14A

≪For safe use≫

This quick start manual is prepared to help users to quickly und erstand the product's operating method and display content. Plea se read the instruction manual beforehand for detailed usage, ca ution on product use, and safety information to use the pump c orrectly.

You can download the instruction manual from Ulvac website. https://showcase.ulvac.co.ip/ia

1.Setting

Upon delivery of this product, check first that the delivered is exactly what you have ordered and there is no break or damage through transport or the like.

	OLVOIL D TIOPD 31	ISEL
Qiuck Start Manual		1copy

2. Ambient Condition for Storage, Install and Operation

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

Ambient temperature and humidity for storage :

- -10°C to 60°C, less than 95%RH 2 Ambient temperature and humidity for operation :
- 10°C to 40°C, less than 95%RH
- 3 Height (for both storage and operation) : Lower than 1,000 meters altitude
- ④ External vibration (for both storage and operation) : Vibration acceleration less than114dB (0.5G)
- (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.

Install the machine horizontal to a place where there are less dust and humidity. Make a layout taking into consideration of works such as setting, removal, check, cleaning and so on,

3. Preparation

- 1) Remove the tape around the lead-in connection port for cooling water, and protection materials for the inlet port of the baffle and the pumping ports (where the inlet and outlet ports are blocked with protection materials), and then check the pump and the jet for damage.
- 2) Wipe the flange dry with alcohol etc.
- 3) Oil is poured at the factory but check the presence of the oil before use Heating without oil may cause a break in a cable of the heater or damage to the boiler.

4.**Oil filling**

- (1) Prepare a well washed and dry graduated cylinder (500 to 1,000cc).
- (2) Pour the specified amount (ULK-04A: 150cc; ULK06A: 350cc, ULK-10A: 800cc, ULK-14A: 1,500cc) of given oil (ULVOILD-11 or ULVOIL D-31) into the graduated cylinder.

(3) Pour oil into the air outlet.

5.Watar piping

Make connections so that the cooling water enters from the cooling water inlet at the upper part of the pump body and then comes out of the cooling water outlet at the upper part of the evacuation pipe.

For the cooling water, see Table 1. The cooling water inlet and outlet is ULK-04A/ULK-06A: Rc1/4, ULK-10A/ULK-14A: Rc3/8. Attach the joints for water piping (nylon tubes etc.) to install the piping. Use the supplied connectors.

Tube for connector supplied as standard: Outside diameter of 9.53 mm × Inside diameter of 6.99 mm.

- 6.Inlet / Outlet port piping(1) Thoroughly clean the inside of the vacuum chamber, piping, vacuum valves, etc. and then connect to the pump. If it is connected under a dirty condition, the ultimate pressure becomes higher or the time required for the pressure to decrease down to a given pressure becomes longer. Do not touch any part under vacuum by bare hands but wear clean nylon aloves
- (2) Remove the gaskets set on the inlet and outlet port flanges, lightly wipe them with a cloth moistened with a solution, such as alcohol to remove dirt on the surface.
- (3) Do not apply even grease with a low vapor pressure to the gasket surfaces. Only wipe dirt off.
- (4) Also wipe the gasket grooves on the flange and the corresponding flange surfaces with a clean cloth.
- (5) Set gaskets in place.

(6) Connect the inlet port with the piping using a JIS vacuum flange.

7. Electrical Connection

Model number	Power consumption of heater (KW)	Oil type	Current value (A)*1	
			1φ 200V	1φ 220V
ULK-04A	0.55	ULVOIL D-11	2.8	2.5
ULK-04A	0.73	ULVOIL D-31	3.7	3.4
ULK-06A	0.9	ULVOIL D-11	4.5	4.1
ULK-06A	1.2	ULVOIL D-31	6.0	5.5
ULK-10A	2.0	ULVOIL D-11	10.0	9.1
ULK-10A	2.4	ULVOIL D-31	12.0	10.9
ULK-14A	2.25	ULVOIL D-11	11.3	10.2
ULK-14A	2.4	ULVOIL D-31	12.0	10.9

*1) Within the rage of ±5%

Oil diffusion vacuum pump: Current value of ULK series



Connection of outside lines to terminal box for ULK-04A/ULK-06A



Connection of outside lines to terminal box for ULK-10A/ULK-14A

8. Operation

8-1. Operation start

Check the following items again before operating the pump.

(1) Check that the piping and wire connections are complete.

(2) Leak check

The pump-specific leak check is performed by a helium leak detector. The detectable minimum leak is

6.5 × 10-11 Pam3/s (5 × 10-10 Torr · L/s).

For leakage from the flange connections on the high vacuum side or the other parts, follow the procedure below.

- 1. Check the presence of leakage with the helium leak detector.
- 2. If you do not have a helium leak detector, apply an organic solvent, such as a volatile substance like alcohol, to the seal area and check the pressure variation on the ionization gauge.
- (3) Oil level check Be sure to pour the specified amount of oil using a graduated cylinder etc.
- (4) Cooling water flow rate check Check that the cooling water is flowing at a flow rate equal to or more than that shown in table. In addition, check that no pooling water lookage oppur

	no cooling water realtage occurs.							
	Model	ULK-04A	ULK-06A	ULK-10A	ULK-14A			
	Oil	D-11/D-31	D-11/D-31	D-11/D-31	D-11/D-31			
	Water Capacity L/min	1.0	1.0/1.5	2.5/3.0	2.5/3.5			

- (5) Operation of auxiliary pump Close the main valve and do the roughpumping of the vacuum chamber, diffusion pump, and connection piping to 13 to 1.3Pa (0.1 to 0.01 Torr).
- (6) Turn on the power to the heater. If water cooling baffles, L-N traps, and valves are set at the top of the inlet port of the oil diffusion pump in use, close the valves, supply cooling water to the water cooling baffles and pour liquid nitrogen into the L-N traps.
- (7) Check that a given flow rate of cooling water flows.

8-2. Operation Stop

- (1) Turn off the power to the heater switch of the oil diffusion pump.
- (2) Close the valves on the inlet (above this unit) and outlet (below this unit) sides
 - If no valves are supplied, continuously operate the oil rotary pump for approx. 70 minutes until the oil temperature becomes 150°C or lower.
- (3) Stop the oil rotary pump Release the oil rotary pump to return to the atmospheric pressure
- (4) Turn off the heater switch. After 70 minutes, stop the cooling water. Do not stop the cooling water because it may cause damage to the pump immediately after the heater switch is turned off.
- (5) If the operation stops and the ambient temperature becomes 5°C or lower, drain the water in the cooling water system. (Supply compressed air of 0.3MPaG (gauge) from the cooling water inlet port without stopping the cooling water outlet port.) If water is accumulated, it may be frozen and the cooling water pipe may be damaged.

ULVAC SHOWCASE



You can download the instruction manual from here.

ULVAC, Inc. Components Division 2500 Hagisono, Chigasaki, Kanagawa, Japan 253-8543 http://www.ulvac.co.ip/