

## Quick Start Manual for Mechanical Booster Pump PMB-040C,PMB-060C

### 《For safe use》

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

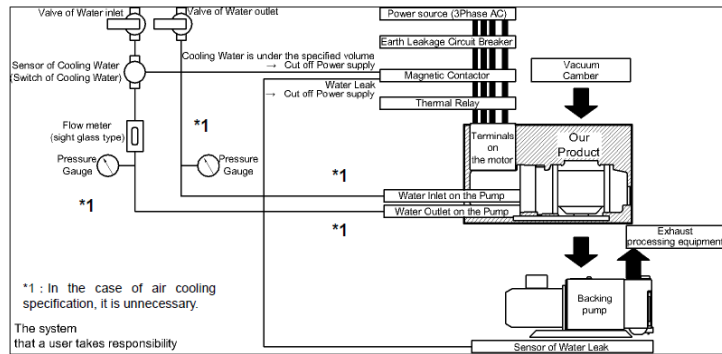
Upon delivery of this product, check first that the delivered is exactly what you have ordered and there is no break or damage through transport or the like.

Part name	Specification	Quantity	Remarks
Oil one time portion	ULVOIL R-72	1 set	For the consumed amount, refer to the specification table.
V belt	5V-1120	2 pcs	-
Belt cover (Bolt for mounting)	-	1 set	-
Anchor bolt	Pump, motor base, belt cover	12 pcs	-
Motor (with key)	-	1pce	Attached only when the motor is placed an order.
Motor base (with bolt for motor fixation)	-	1pce	Attached only when the motor is placed an order.
Motor pulley	50Hz spec. 60Hz spec.	1pce 1pce	Either of them only
Instruction manual	English	1 copy	
Synflex tube	1/4B	1 set	For connecting oil pot
Oil pot	With joint	1pce	-

## 2. System Flow

Cooling water and power supply is required.

And you prepare wiring, safety circuit and exhaust processing equipment, etc.



Location of vacuum pump in host device

## 3. 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;

- ① Ambient temperature and humidity for storage :  
-10°C to 50°C, less than 95%RH
- ② Ambient temperature and humidity for operation :  
5°C to 40°C, less than 80%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 than 114dB (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.

MODEL	Pump fixing hole size	Bolt size protrusion length	Motor fixing hole size	Bolt size protrusion length
PMB-040C	4-φ28	M24×80mm or mre	4-φ15	M12×60mm or more
PMB-060C	4-φ28	M24×80mm or mre	4-φ15	M12×60mm or more

\* Refer to the instruction manual for the dimensions of the base fixing holes.

## 4. Lubrication

Supply the lubrication oil by specified volume through the oiling port on the Gear cover. It takes approximately one minute that the lubrication oil fully spreads out. Check the oil volume by the Oil level gauge after the lubrication got stabled and add the oil if it was under the specified level as far as the oil gets stabled on the upper limit level.

	Place	In oiling	During operating
Cover oil gauge on the gear side		Put the oil up to the upper limit level.	Oil level shall be available between level lines of 2 pieces of the oil gauge.
Cover oil gauge on the pulley side		Put the oil up to the upper limit level.	Oil level shall be available in the range of up and down 5mm centering on the red round mark of the oil gauge.

\* For refueling the mechanical seal, refer to the instruction manual.

- Perform lubrication from the filler opening located at the respective upper part of the cover on the gear side and on the pulley side. The gear side and the pulley side do not connect to each other.
- Be sure to supply oil separately. Put the oil up to the respective upper limit of the oil level gauges located at two locations.

## 5. Water Piping

This pump, cooling water is required (Air-cooled type, cooling water is not required).

Connect piping to the Cooling water inlet / outlet using care not to mistake the port.

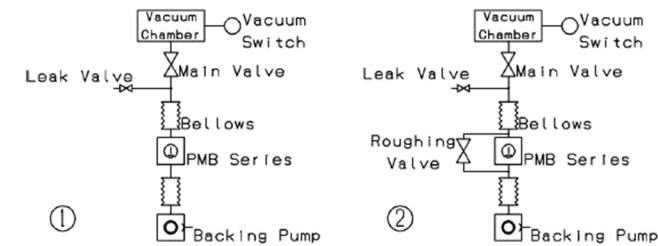
- Connections : Rc1/2
- Primary side pressure : 0.3 MPaG or less
- Inlet/outlet differential : 0.05 MPaG or more
- Temperature : 5~30 °C
- Cooling water volume : 10 L/min

## 6. Inlet port Piping

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

Provide a vacuum valve, vacuum gauge and vent valve between the vacuum chamber and pump, as shown in Fig. Evacuation by mechanical booster pump (example).

Model	Piping flange
PMB-040C	VF250
PMB-060C	VF300



Evacuation by mechanical booster pump (example)

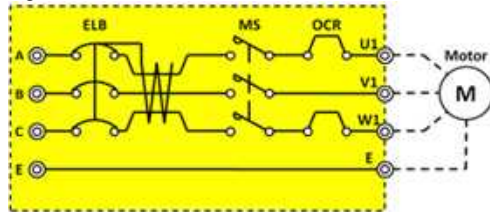
## 7. Outlet port Piping

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

Model	Piping flange
PMB-040C	VG150
PMB-060C	VG200

## 8. Electrical Connection

Refer to the figure below for motor connection.



Recommended connection diagram

## 9. How to Tighten and How to 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) Set the Ring for Deflection to "Table".
- 4) Set the Ring for Load to 0N.
- 5) Push the center of the belt, between the motor pulley and the pump pulley, down deflection with tension meter.
- 6) Read the load after pushing. It is normal that the load is "Table".
- 7) If the tension of belt is right, attach the belt cover.

Model	Frequency (Hz)	Deflection amount (mm)	Range of deflection load (N/1本)	
			When new	re-tensioning
PMB-040C	50 60	16.3	57.8~63.7	
PMB-060C	50 60	16.9		

## 10. Operation

10-1. Test run

Follow the procedure (1) – (5) below to start operation of the Pump unit.

- (1) Check the piping.  
Check and ensure that the piping and cable connection is completed
- (2) Check the "3.7 How to tighten and how to remove the belt".
- (3) Check the lubrication oil level.
- (4) Check the Cooling water.  
Ensure that the Cooling water is flowing.  
Check and ensure also that there is no cooling water leakage.
- (5) Check the lubrication oil discharge operation and direction of rotation.
  - a. Close the air intake either by closing the valve on the inlet side of the mechanical booster pump or by attaching a blind flange to the air intake.
  - b. Run the backing pump to exhaust inside the Mechanical booster pump.  
This time, confirm that the pressure of the inlet or outlet of the booster pump comes down around the ultimate pressure of the backing pump (1.3-13.0Pa for the standard backing pump) and keep exhausting three minutes or more only by the backing pump under that state.  
Exhausting three minutes shall delete the air component in the lubrication oil in the Mechanical booster pump. If the pressure does not decrease, leakage of piping, failure of backing pump, etc. are conceivable, so please check.
  - c. Flow cooling water, and operate it for 3 seconds or so while seeing the belt.  
If the belt moves in the arrow direction which is attached on the belt cover, it is normal rotation.  
If it rotated reverse, check the motor wire connection. The Motor is a three-phase induction motor that would rotate reverse if two of three input wires were connected reverse.
  - d. After checked the direction of rotation, run the Mechanical booster pump three minutes or more to conduct the lubrication deaeration and lubrication circulation inside the Pump unit.

10-2. Exhaust start

- (1) Flow the Cooling water.
- (2) Close the main valve of the Mechanical booster pump and start running the backing pump to exhaust inside pipes.
- (3) Open the main valve above the suction side of the mechanical booster pump, and exhaust inside the vacuum chamber.
- (4) Start the operation upon the vacuum chamber was exhausted to the pressure lower than the maximum inlet pressure of the Mechanical booster pump.

10-3. Operation Stop

- (1) Close the main valve (inlet side) of the Mechanical booster pump and stop it.
- (2) The Mechanical booster pump shall keep running a while by the Rotor inertia.  
Check and ensure that the rotation stopped through the gear (or the motor) to stop the backing pump.
- (3) Open the Suction leak valve upon stopped the backing pump to make atmospheric pressure inside the Mechanical booster pump and backing pump.
- (4) Wait until the Pump cools down as far as you can touch by hand to stop flowing the Cooling water.

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You can download the instruction manual from here.