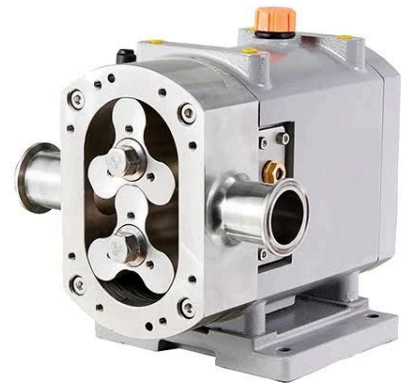


KOB Food-Grade Lobe Pump

A two-way positive-displacement pump with a food-grade stainless steel body and two synchronised three-lobe rotors that turn in opposite directions without touching. The liquid is carried gently rather than sheared, which makes the pump particularly suited to food, dairy, juice, pharmaceutical and cosmetic products and to other high-viscosity fluids. Nine sizes are available, with inlet and outlet bores from 25 to 100 mm, a discharge pressure up to 10 bar and a flow rate up to 79.2 m³/h.



TECHNICAL SPECIFICATIONS

Model Range	3RP-25 to 3RP-100
Flow Rate	2.1 – 79.2 m ³ /h
Capacity / 100 rev	6 – 220 L
Discharge Pressure	Up to 10 bar
Speed	Up to 600 r/min
Motor Power	2.2 – 75 kW
Inlet / Outlet	25 – 100 mm
Max Viscosity	2,000,000 cP
Solids Content	Up to 70%
Temperature Range	-50 °C to +250 °C
Sealing	Mechanical or packing seal
Connections	Flanged, threaded, quick-release

KEY FEATURES

- Two-way pumping with gentle product handling, reducing damage to food and pharmaceutical products.
- Transfers fluids with viscosity up to 2,000,000 cP.
- Handles media containing up to 70% solids.
- Serves as a metering pump when its speed is controlled by a frequency inverter.
- No contact between the rotors, which reduces wear and extends service life.
- Easy to maintain, clean, dismantle and reassemble.
- High efficiency, low energy consumption and low noise.
- Built with advanced technology to a quality close to German products.

One / About the Pump

The lobe pump is a two-way, multi-purpose positive-displacement pump that relies on a set of synchronised rotors to move the medium efficiently and steadily.

Two synchronised rotors sit inside the pump body and are driven by a set of synchronous gears in the gearbox. The rotors turn in opposite directions on the main and auxiliary shafts, changing the volume inside the pump chamber and generating both suction and discharge pressure.

The pump is particularly suited to hygienic media, high-viscosity media and certain corrosive media.

The product is manufactured in two main series:

- A sanitary series for food and hygienic applications.
- A corrosion-resistant series.

It is also available in two main application categories:

- High viscosity / high pressure.
- Low viscosity / high pressure.

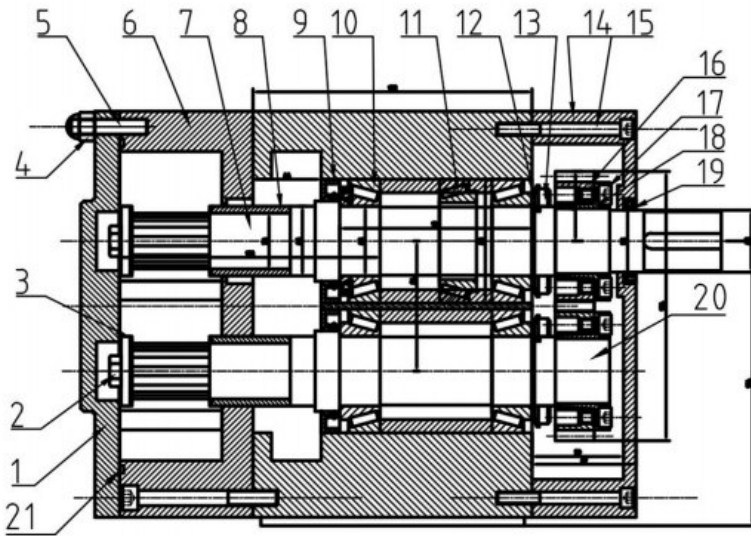
Core components and sealing systems are selected according to the properties of the medium, with different materials and seal types available to suit the application and improve conveying efficiency and operating performance.

The pump is widely used in petrochemicals, fine chemicals, chemical processing, food, pharmaceuticals, environmental protection, paper, paint, metallurgy and other industries.

Two / Characteristics

- 1.** Calculated clearances between the rotors mean there is no direct contact, which reduces friction and helps extend the life of the pump.
- 2.** The pump is easy to dismantle and reassemble, easy to maintain and clean, and has a limited number of wearing parts.
- 3.** It offers high energy efficiency, stable transfer, a low failure rate, good leak-tight sealing and a low noise level.
- 4.** It can transfer media with a viscosity up to 2,000,000 cP, including media containing up to 70% solids.
- 5.** It can transfer three-phase media consisting of gas, liquid and solids.
- 6.** With a frequency inverter the flow rate follows the pump speed, and the pump can also be used as a general metering pump.
- 7.** The pump can be supplied with a heating jacket on request.
- 8.** Permissible temperature range: -50 °C to +250 °C.
- 9.** Several inlet and outlet connections are available: flanged, threaded or quick-release.

Three / Structure

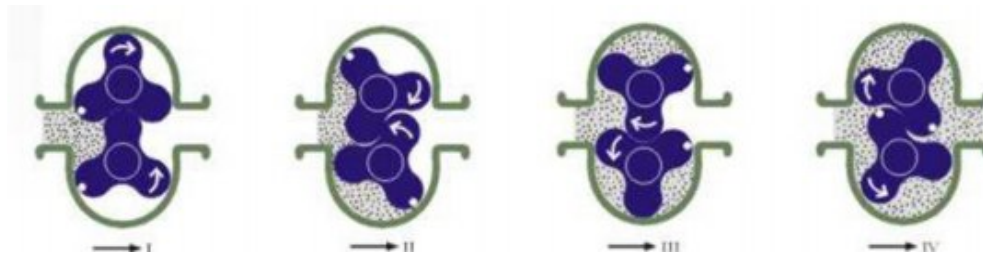


Longitudinal section — part numbers are shown on the drawing

- | | | |
|------------------|----------------------|------------------------------------|
| 1. Cover | 8. Sealing | 15. Bolt |
| 2. Screw | 9. Oil seal | 16. Synchromesh gear |
| 3. O ring | 10. Bearing | 17. Bolt |
| 4. Nut | 11. Bearing sleeve | 18. Synchromesh gear fixing sleeve |
| 5. Bolt | 12. Retaining washer | 19. Oil seal |
| 6. Pump body | 13. Nut | 20. Driven shaft |
| 7. Driving shaft | 14. Gear case | 21. O ring |

Four / Working Cycle

Pumping passes through four successive stages as the rotors turn:



1. Suction — the medium enters the pump chamber as the rotors turn.
2. Trapping — the medium is captured between the rotors and the chamber wall.
3. Transfer — the trapped medium travels with the rotors towards the discharge port.
4. Discharge — the medium is pushed out of the pump through the outlet.

Five / Seal Types

A. Mechanical seal

Materials:

- Hard alloy
- Ceramics
- Silicon nitride
- Graphite
- Silicon carbide

B. Packing seal

Materials:

- PTFE (polytetrafluoroethylene)
- Carbon fibre
- Graphite
- Graphite-core carbon fibre

Six / Drive Transmission

1. Fixed speed

- Gear reducer
- Belt-and-pulley reducer

2. Continuously variable speed

- Motor with a frequency inverter
- UD mechanical continuously variable transmission

Seven / Installation

1. The pump is inspected and tested before it leaves the factory, so installation must be carried out correctly; otherwise the pump may vibrate severely, affecting its performance and service life. Refer to the foundation dimensions on the drawing.

2. The foundation must be horizontal and level. Mark the anchor-hole positions to the installation dimensions, then set the anchor bolts in the concrete. Once the concrete has cured, level the frame with shims and tighten the anchor bolts evenly.

3. Install the pump no more than 3 metres below the supply tank. The inlet pipe diameter must be larger than the pump inlet to avoid a reduced flow rate or cavitation.

4. The inlet and outlet pipes must have their own supports; their weight must not rest on the pump body.

5. Fit a safety valve on the discharge line and an overcurrent protection device to protect the pump and motor.

6. When installing a new pump, fit a strainer on the inlet line with a 60–120 mesh screen. Its effective filtration area must exceed twice the inlet pipe diameter to avoid flow blockage.

7. Fit a vacuum gauge at the inlet and a pressure gauge at the outlet to monitor the pump, with isolating valves ahead of the instruments so they can be replaced easily.

8. If the pump is mounted on wheels, use flexible hoses for the inlet and outlet lines. The base carries four wheels, two of them swivelling. Move the pump on level ground and take care to prevent tipping or rolling on a slope or in a sharp turn.

Eight / Operation

A. Starting

1. The gearbox is not filled with lubricating oil at the factory. Select a gear oil to suit the lowest temperature at the site. While filling, check the level through the sight glass — the correct level is roughly halfway up the glass.
2. Change the lubricating oil regularly. N220 or N320 gear oils are normally replaced every 4000 operating hours.
3. Before starting, open all inlet and outlet valves in the pipeline. As the medium enters the pump, turn it by hand. If nothing is abnormal, jog the pump to check its rotation and the flow of the medium. Once both are sound, start the pump and watch the pressure indicator.
4. If the installation position requires suction, fill the inlet pipe and the pump chamber with the medium before starting.
5. If the medium must be heated or cooled during the process, start the heating or cooling system before the pump — usually 10 to 30 minutes beforehand.

B. While running

1. If the motor power or the pump's running condition becomes abnormal, stop the pump immediately and identify the cause.
2. Mechanical seals must show no leakage and no overheating.
3. On packed pumps, minor leakage can be corrected by tightening the ring gradually, without dismantling the pump.
4. With a variable-speed transmission such as a CVT,

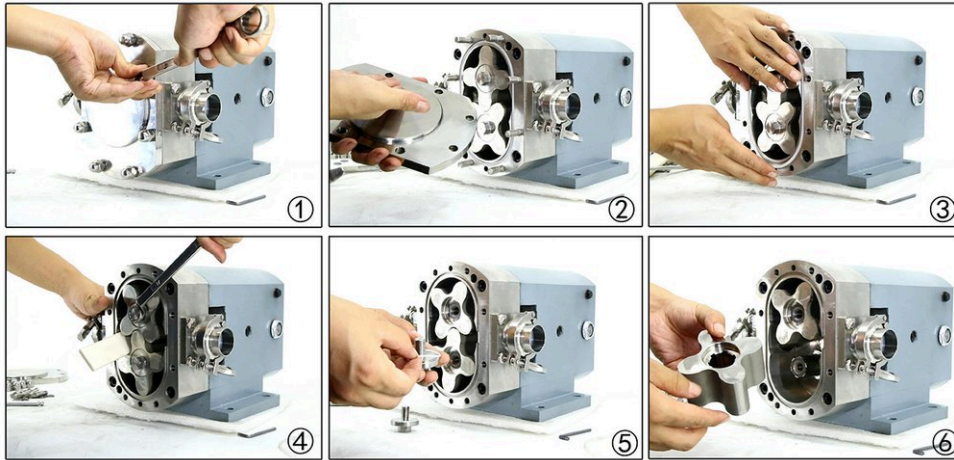
change speed gradually according to the controller display. Changing speed while the pump is stopped is forbidden and may damage the transmission.

5. Monitor the temperature of the pump and motor continuously. Under water cooling the bearing temperature is 40 °C. With hot-water insulation, the bearing housing must not exceed the pump temperature by more than 30 °C.
6. Do not use the inlet-line valves to adjust the flow rate, as this causes cavitation.
7. Closing the inlet and outlet valves while the pump is running or restarting is strictly forbidden.

C. Stopping

1. After a long shutdown, turn the drive shaft by hand before restarting. Slight resistance is normal, but the shaft must turn smoothly and evenly. Check that there is no friction or foreign matter inside the pump.
2. When refitting the pump and gearbox, check the alignment of the pump shaft with the motor shaft. Coupling deviation measured in any direction must not exceed 0.1 mm, otherwise the pump will vibrate and shaft life will be reduced.

Nine / Disassembly and Cleaning



The disassembly steps in order

1. Undo the fastening bolt with a suitable wrench.
2. Remove the pump cover.
3. Take the O ring out of the pump cover.
4. Block the rotor with a plastic plate, then undo the end bolt of the main and auxiliary shafts.
5. Take out the seal ring from the shaft-end bolt.
6. Remove the rotors from the main and auxiliary shafts.

Note

When dismantling the main and auxiliary shaft parts, keep each set separate and clean it on its own. Inspect every part carefully during cleaning; any scratched or deformed part must be replaced.

Reassembly follows the reverse order of disassembly; make sure the rotors are aligned and every part is returned to its correct position.

Ten / Cautions

1. A rise in medium viscosity, flow rate or discharge pressure increases the load on the motor. Monitor the pressure gauge, the safety valve and the overcurrent protection device and confirm they are working correctly.
2. On a pump with a hot-water jacket: start the hot-water circulation first, wait for the temperature to reach the required level, then start the pump. When stopping, stop the pump first and then the hot-water circulation.
3. On a pump with a water-cooled mechanical seal: start the cooling-water circulation first, confirm the flow is continuous, then start the pump. Running the pump without cooling water is strictly forbidden.
4. Clean the strainer monthly to avoid blockage. Y-type strainers with a small effective area are not recommended, as they can throttle the flow.
5. For low-viscosity media there is no special requirement when stopping. For high-viscosity media that can set, dilute the medium inside the pump before stopping to prevent residue from solidifying; if needed, circulate cleaning fluid through the pump for a few minutes.
6. After conveying a thick or condensed medium, clean the pump's inner cavity immediately with a suitable cleaning fluid; repeat or extend the cleaning as required.
7. With newly installed pipes, remove welding slag and hard particles before starting so they cannot enter the pump and damage the rotors, the body, the shafts or the mechanical seal.

8. Inspect all connections regularly and re-tighten the fastening bolts if needed.
9. Watch the oil level continuously and top it up to about halfway up the sight glass when necessary.
10. Remove any foreign object that could obstruct the pump's rotation or stop it working.

Eleven / Faults and Remedies

Fault	Likely cause	Remedy
Low pressure or flow	Poor inlet sealing; wear of the rotor or the pump body	Refit the pump, or replace the rotor or the pump body
Motor overheating	Loss of a supply phase; poor connections; high pressure; excessive flow; high medium viscosity; friction in the rotating parts	Check the supply and connections; adjust pressure and flow; check for overload; reduce the medium viscosity; inspect the rotating parts and replace any damaged ones
Severe vibration or high noise	Blocked inlet line; high pressure; high vacuum; or an undersized inlet line	Increase the inlet-line diameter, reduce the vacuum, or reduce the discharge pressure
Seal leakage	The seal is loose or damaged	Adjust or replace the seal
Pump overheating	Debris has entered the pump, throttling the flow or stalling the pump	Open the pump cover, clear the debris, inspect the pump and replace damaged parts
Bearing overheating	Bent shaft; damaged bearing; or insufficient lubricating oil	Replace the shaft or bearing, check the oil level and top up as needed
Bubbles in the conveyed medium	Air leaking into the inlet line	Check the inlet pipe, its connections and valves and confirm they are tight

Twelve / Technical Data

Model	Capacity (L / 100 rev)	Flow at 600 r/min (m³/h)	Discharge pressure (bar)	Speed (r/min)	Motor power at 10 bar	Inlet / Outlet (mm)
3RP-25	6	≤ 2.1	≤ 10	≤ 600	2.2 kW	25
3RP-32	9	≤ 3.2	≤ 10	≤ 600	3 kW	32
3RP-40	18	≤ 6.4	≤ 10	≤ 600	5.5 kW	40
3RP-50	36	≤ 12.9	≤ 10	≤ 600	11 kW	50
3RP-50D	42	≤ 15.1	≤ 10	≤ 600	15 kW	50
3RP-65	60	≤ 21.6	≤ 10	≤ 600	18.5 kW	65
3RP-65D	72	≤ 25.9	≤ 10	≤ 600	22 kW	65
3RP-80	126	≤ 45.3	≤ 10	≤ 600	37 kW	80
3RP-100	220	≤ 79.2	≤ 10	≤ 600	75 kW	100

The flow and discharge-pressure figures are maxima. The actual duty point is set by the medium's viscosity, the system pressure and the operating conditions; the pump size must be selected to suit the requirements of the application.