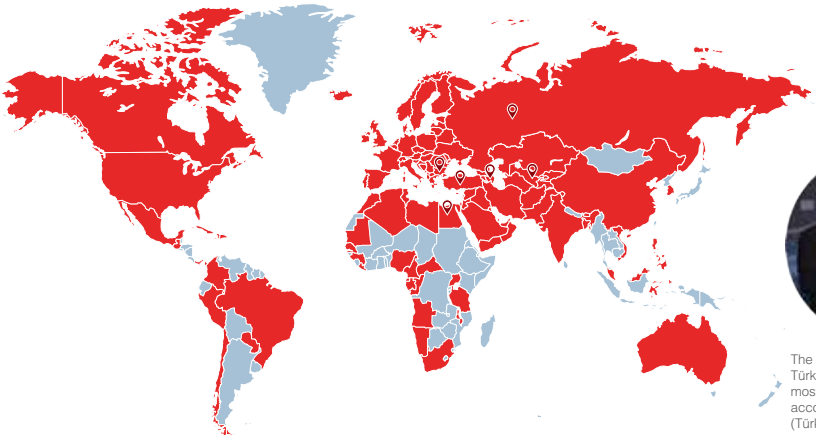
EKIN ENDUSTRIYEL

Lobe Pumps
Installation and User Manual

inoxen

Your Satisfaction Is Our Priority; Globalization Is Our Goal!



The second-rated company in Türkiye has exported to the most different countries in 2021, according to ISIB (Türkiye HVAC-R).

The first condition of innovation is to question. Sustainable innovation is to never stop questioning.

For us, the journey of innovation started with a question: “Why not produce value-added technology in Türkiye?”. The first turning point in this long journey was the birth of the MIT (Made In Türkiye) brand. The founding vision of MIT, which enabled us to become Türkiye’s first domestic manufacturer in the field of “Plate Heat Exchanger”, was not to be a domestic “alternative”, but to create a quality brand that could compete in the global market.
By working for this goal, we have been entitled to receive many international quality certificates such as ISO, TSE, CE, GOST... for our products and processes over many years. For us, questioning the current situation was a natural result of our desire to exceed ourselves.

New Generation Engineering

With our engineering approach that focuses on the process, not the problem, we do not only specialise in one product, but also consider the entire ecosystem of that product. Therefore, we provide an end-to-end application by producing all other components that will form a system as well as the plate heat exchanger. For this, we focus on the continuous development of the necessary engineer staff. With our business development, pre-sales, sales and after-sales services provided by our expert engineers, we produce not only products but also “solutions”.
At the point we have reached; we offer complementary services with our internationally approved plate heat exchangers, components such as accumulation tanks, boilers, industrial pumps and installation materials that turn these heat exchangers into a system. With our team of more than 100 expert engineers, we continue to develop as a solution partner for projects requiring high technology in more than 60 countries.

ISO 9001:2015 CE TSE TSEK EAC FDA ADR YERLİ ÜRETİM

PRODUCT RANGE

HEAT TRANSFER PRODUCTS

- Gasketed Plate Heat Exchangers
- Brazed Heat Exchangers
- Shell & Tube Heat Exchangers
- Evaporators and Condensers
- DC Fan Driven Oil Coolers
- Heat Coils
- Serpentines / Radiators / Economizers

PRESSURE VESSELS

- Water Heater Tanks
- Water Storage Tanks
- Buffer Tanks
- Expansion Tanks / Automatic Pump Controlled Expansion System
- Stainless Steel Tanks
- Balance Tanks / Dirt Separators / Air Separators / Air Tubes
- Steam Separators
- Pressured Air Tanks
- Neutralization Units

INDUSTRIAL AND FOOD GRADE SYSTEMS

- Heat Stations
- Industrial Process Systems
- Dosing Systems
- Substations
- Thermoregulators
- Pasteurizers
- CIP and Hygienic Process Systems
- Hygienic Storage and Process Tanks / Reactors
- Homogenizers
- Turn-key Projects

FLUID TRANSFER PRODUCTS

- Lobe Pumps
- Hygienic Centrifugal Pumps
- Twin Screw Pumps
- Gear Pumps
- Magnetic Drive Pumps / Thermoplastic Pumps
- Dosing Pumps
- Air Operated Double Diaphragm Pumps (AODD)
- Drum Pumps
- Monopumps
- Peristaltic (Hose) Pumps
- Centrifugal Blowers
- Roots Blowers
- Turbo Blowers

FLOW CONTROL UNITS

- Butterfly Valves
- Ball Valves
- Globe Valves
- Knife Gate Valves
- Actuators
- Check Valves and Strainers
- Pneumatic Piston Valves

ENERGY SYSTEMS

- Domestic and Industrial Boilers
- Steam Generators
- Chillers
- Cooling Towers

EKIN

MIT mitrojen DORIS magneto AIRCO TRUEVALVE myra GP GEARYMAX inoxen INNSUN

Contents

Safety

Instruction Manual

This instruction manual contains information on the reception, installation, operation, fitting, stripping and maintenance for the MIT MLP lobe pump. The information given herein is based on the most up-to-date data available. Ekin Endüstriyel reserves the right to modify this instructions manual without having to give prior notice.

Start-up Instructions

This instruction manual contains vital and useful information for properly operating the pump and for keeping it in good running condition. Not only should the safety instructions set forth in this chapter be carefully read before putting the pump into operation, but those concerned must also familiarise themselves with the operating features of the pump and strictly adhere to the instructions given herein. It is extremely important that these instructions be kept in a set place near the installation.

Safety

Warning Signs


Genel olarak insanlar için tehlike.


Danger of injury caused by rotating parts of the equipment.


Danger: Electricity.


Danger: Caustic or corrosive agents.


Danger: Suspended loads.


Danger to the proper operating of the machine.


Obligation to ensure safety at work.


Use of safety goggles obligatory.

General Safety Instructions


Please read the instruction manual carefully before installing and commissioning the pump. Should you have any doubts or queries, contact Ekin Endüstriyel.
+90 216 444 35 46 (EKİN)

Installation



You must always bear in mind the technical specifications. Do not put the pump into operation before connecting it to the pipes. Do not put the pump into operation if the cover of the pump has not been fitted and the impeller fixed in the pump. Check that the motor specifications are correct, especially if there is a special risk of explosion due to the work conditions. During the installation procedure, all the electrical work must be carried out by duly authorised personnel.

Operation

You must always bear in mind the technical specifications. The limit values that have been set must never be exceeded. Never touch the pump or pipes whenever the pump is being used to decant hot liquids or during the cleaning procedure.

The pump has moving parts. Do not put your fingers into the pump when it is operating.

Never work with the suction and the delivery valves shut off. Never directly sprinkle the electric motor with water. Standard motor protection is IP-55. (Dust and water sprinkling protection)

Maintenance

You must always bear in mind the technical specifications. Never strip the pump down until the pipes have been drained. Remember that there will always be some liquid left in the pump casing (if it has not been fitted with a drain). Always remember that the liquid that has been pumped may be dangerous or subject to high temperatures. For situations of this type, please consult the prevailing regulations in the country in question. Do not leave loose parts on the floor.

Always turn the power supply to the pump off before embarking on maintenance work. Take out the fuses and disconnect the wires from the motor terminals. All electrical work must be carried out by duly authorised personnel.

Instructions

Any failure to comply with the instructions could lead to a hazard for the operators, the atmospheric conditions of the room, and the machine, and it could lead to a loss to any right to make a claim for damages. Such non-compliance could bring with it the following risks:

- Important operating failures of the machine / plant.
- Failure to comply with specific maintenance and repair procedures.
- Potential electrical, mechanical and chemical hazards.
- Atmospheric conditions in the room could be hazardous due to the release of chemical substances.

Warranty

The products are guaranteed for 2 (two) years. In the event that the following situations occur:

- Operation and maintenance work has not been done following the corresponding instructions; the repairs have not been made by our personnel or have been made without our written authorization;
- Modifications are made to our material without prior written authorization;
- The parts or lubricants used are not original MIT parts / lubricants;
- The material has been improperly used due to error or negligence or has not been used according to the indications and the intended purpose.
- The parts of the pump have been damaged as a result of having been exposed to strong pressure as there was no pressure relief valve.

No modification can be made to the machine without the prior consent of the manufacturer. For your safety, use spare parts and original accessories. The use of other parts exempts the manufacturer from any and all responsibility. Any change in operating conditions can only be done with the prior written consent of MIT.

In the event of doubt or should you require a fuller explanation on particular data (adjustment, assembly, disassembly), please do not hesitate to contact us. +90 216 **444 35 46** (EKİN)

General Information

Description

The MLP lobe pumps made by MIT are part of our wide range of positive displacement rotary pumps for viscous liquids. The lobe pump has the following features:

- The MLP pump normal flow rate suitable for differential pressures of up to 20 bar.

The MLP model has been specially developed to respond to all hygienic requirements in the food industry. As regards hygiene, reliability and sturdiness, the complete range of MIT lobe pumps satisfies all requirements set by the aforesaid industry. Its modular design enables optimal part interchange between the different pumps. The lobe pumps are rotary displacement pumps. Owing to the contact between the internal parts, the pressure variations, etc. they make a louder noise than centrifugal pumps. This noise must be taken into consideration when installing these pumps.

Operating Principle

The lobe pump is a positive displacement rotary pump. The left lobe is driven by the driving shaft. The right lobe is located on the driven shaft, and is driven via a helical gear. Both without one touching the other. When the pump is running they displace a set volume of liquid. Figure below shows how a lobe pump operates.

A B C

A: When the lobes rotate, the space on the suction side increases because one lobe moves away from the other, thus causing a partial vacuum that draws the liquid into the pumping chamber.

B: Each lobe void is filled consecutively as the shafts rotate and the liquid is displaced towards the discharge side. The small clearances between the lobes and between the lobes and the walls of the pump body duly cause the spaces to be rather well closed.

C: The pump body is completely full and the liquid leaks through the meshing of the lobes, knocking against the space walls so as to thus complete the pumping action.

Application

The main advantage of the MIT MLP lobe pump is its capacity to pump a great variety of viscous liquids up to 70.000 cps Furthermore, it is capable of pumping liquid products that require very careful handling and liquids that contain soft solids thus causing only a minimum degradation of same.

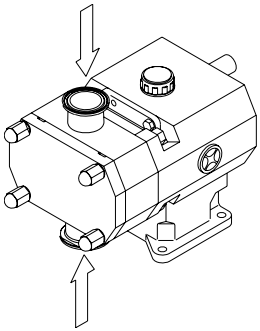
Installation

Pump Receiption

Ekin Endüstriyel is not responsible for any deterioration of the material as a result of its transportation or unpacking. Visually check that the packing has not suffered any damage.

The pump will be accompanied by the following documentation:

- Dispatch notes.
- Pump instruction and service manual.
- Drive instruction and service manual. (*)



Unpack the pump and check the following:

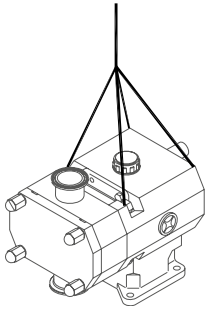
- The pump suction and delivery connections, removing the remains of any packing material.
- Check that the pump and the motor have not suffered any damage.
- Should the pump not be in proper condition and/or does not have all the parts, the haulier must draw up a report as soon as possible with regard to the same.

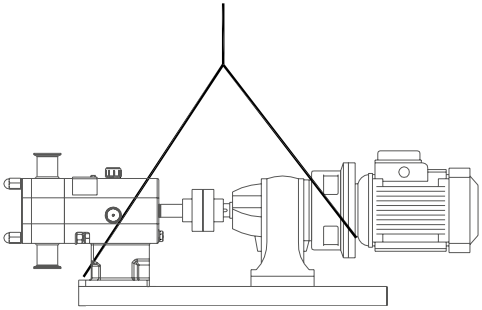
(*) If the pump has been supplied with a drive from Ekin Endüstriyel.

Transport and Storage

Pumps and pumping units are often too heavy to be stored manually. Use an adequate means of transport. Use the points which are indicated in the drawing for lifting the pump. Only authorized personnel should transport the pump. Do not work or walk under heavy loads.

Lift the pump as shown below.





- Always use two support points placed as far apart as possible.
- Secure the support so that it will not move.
- See technical specifications to consult dimensions and weights.

Location

- Place the pump in such a way that there is enough space around it to provide access both to the same and to the motor. (See technical specifications to consult dimensions and weights).
- Place the pump on a level and flat surface.
- The basement must be rigid, horizontal and against any vibration.

Install the pump in such a way that it can be properly ventilated. If the pump is to be installed outside, it must be done so under cover. Its positioning must enable easy access for any inspection and maintenance operations that may need to be carried out.

Foundation

Install the pump base so that the drive and pump are level and well supported. Therefore the pump unit should be installed on a base plate, or on a frame, both placed exactly level on the foundation. The foundation must be hard, level, flat, vibrations free to prevent base distortion. (to keep the alignment pump –drive guaranteed while commissioning)

To install the pump unit on the foundation proceed as follows:

- Make holes in the foundation to fit foundation bolts. This is unnecessary when expanding screws are used instead of foundation bolts.
- Place base plate or frame with the aid of shims horizontally on the foundation.
- Grout
- When the grout has entirely hardened the pump unit can be placed on the base plate or the frame. Tighten the nuts on the foundation bolts carefully.
- After unit is installed recheck alignment of pump and motor shaft and alignment of piping. Realign if necessary.
- In the case of applications dealing with high temperatures the pump can be operated temporarily at its working temperature. Then recheck alignment pump - piping.
- For other foundations contact Ekin Endüstriyel. **444 35 46** (EKİN)

Coupling

If the pump is supplied with motor, the pump and motor shaft of complete units have been accurately pre-aligned in our factory.

After installations of the pump unit, the pump and motor shaft should be re-aligned.

Place a straight-edge (A) on top of the coupling: the straight should make contact with both halves of the coupling over their entire length. See figure 1.

Repeat the check, but this time on both sides of the coupling near the shaft. For the sake of accuracy, this check should also be done using an outside caliper (B) at two diametrically opposite points on the outside surfaces of the two halves of the coupling.

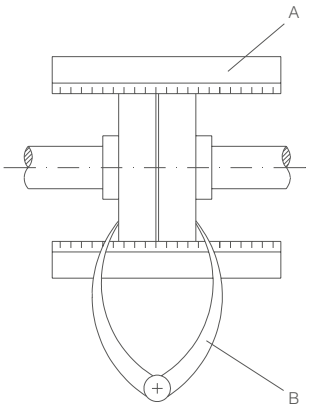


Figure 1

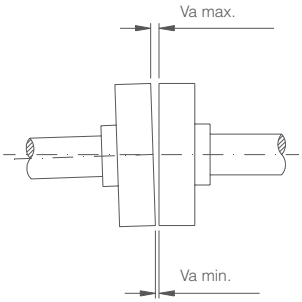


Figure 2

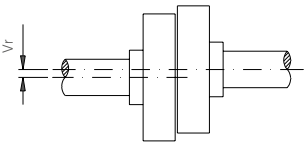


Figure 3

MAXIMUM ALIGNMENT DEVIATIONS				
Outside Diameter of The Coupling (mm)	Va_{min} (mm)	Va_{max} (mm)	Va_{max} - Va_{min} (mm)	Vr. (mm)
70 -80	2	4	0,13	0,13
81-95	2	4	0,15	0,15
96-110	2	4	0,18	0,18
111-130	2	4	0,21	0,21
131-140	2	4	0,24	0,24
141-160	2	6	0,27	0,27
161-180	2	6	0,3	0,3
181-200	2	6	0,34	0,34
201-225	2	6	0,38	0,38

Pipes

- In general, suction and delivery pipes should be fitted in straight stretches, with the minimum amount of elbows and accessories, in order to reduce, as far as possible, any head load loss that might be produced by friction.
- Make sure that the pump ports are well aligned with respect to the piping and that they are similar in diameter to that of the pipe connections.
- Position the pump are near as possible to the suction tank, and whenever possible below the level of the liquid, or even lower with respect to the tank in order for the static suction head be at its maximum.
- Place brackets for the piping as near as possible to the suction and delivery ports of the pump.

Shut-off Valves

The pump can be isolated for the purpose of carrying out maintenance work. To this end, shut-off valves should be fitted at the pump's suction and delivery connections.

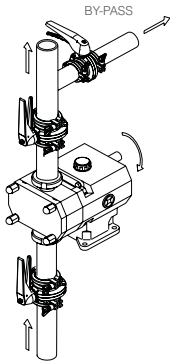
These valves must always be open whenever the pump is operating.

Self-priming Process

In general terms if the self-priming process is followed the pump ought to contain sufficient liquid to fill the internal recesses and the void spaces thus enabling the pump to create a pressure difference. However, if low viscosity fluids are to be pumped, a foot valve of the same or greater diameter as that of the suction pipe should be installed; alternatively, the pump can be installed with a "U" shaped piping.

The use of a foot valve is not recommended for pumping viscous liquids.

In order to eliminate air and gases from the suction pipe, the counter-pressure on the discharge pipe should be reduced. When the self-priming process is used, the pump's start-up should be done by opening and emptying the discharge pipe which allows the air and gases to escape at a low counter-pressure. Another possibility involves long pipes or when a check valve is installed in the discharge pipe; it is also possible to install a by-pass with a shut-off valve on the discharge side of the pump. This valve shall be opened in the case of priming and will allow air and gases to escape at a minimum counter-pressure. The by-pass should not lead back to the intake orifice but to the supply tank instead.



Pressure Relief Valve

The positive displacement lobe pumps must be protected from excess pressure when they are operating. Consequently, all the MLP pumps can be fitted with a stainless steel pressure relief valve or a pressure by-pass.

Protection

This valve protects the pump and prevents excessively high pressure arising in the circuit. It reduces the differential pressure (Δp) between suction and discharge, but not the maximum pressure within the plant.

Do not use the pressure relief valve to protect the system from excess pressure. It is designed to protect the pump only as it is not a safety outlet.

Operation Principle

The by-pass valve prevents excess pressure arising inside the pump. For example, when the pump's discharge port is clogged and the liquid cannot be pumped out, too high a pressure can cause serious damage to some of the pump's parts. The pressure relief valve opens a passage from the pump's discharge side to its suction side: an escape route, redirecting the flow again to the suction side whenever specifically high pressure levels are reached.

If the pressure relief valve operates, this will mean that the equipment is not working properly. The pump should be disconnected immediately. Identify and solve the problem before re-starting the pump.

Remember that the pressure relief valve is not able to be used to regulate the flow rate.

The pressure relief valve can be adjusted to any determined pressure, according to the type of pump being used.

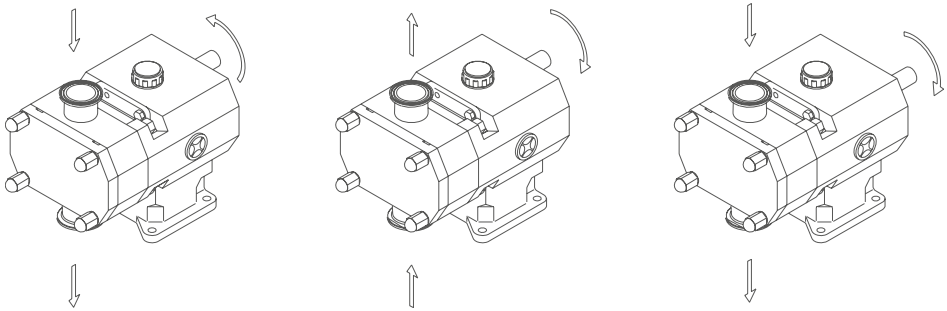
It is recommended to install the safety valve in the output line to protect the pump. Otherwise, damage to pump caused by high pressure will be out of warranty.

Electrical Installation

Leave the connecting of the electrical motors to qualified personnel. Take the necessary measures to prevent any breakdowns in the connections and wires.

The electrical equipment, the terminals and the components of the control systems may still carry an electric charge even when disconnected. Contact with them may put the safety of operators at risk, or cause irreparable damage to the material. Before manoeuvring the pump, make sure that the electric box is switched off.

- Connect the motor in accordance with the instructions supplied by the manufacturer of the same.
- Check the direction of the rotation. (see the signalling label on the pump).



- Start the pump motor briefly. Make sure the pumping direction is the right one. If the pump operates in the wrong direction it may cause severe damage.

Check always the direction of the motor's rotation with liquid inside the pump.

Start-up

Before putting the pump into operation read carefully the instructions on installation.

Start-up

Read technical specifications carefully. Ekin Endüstriyel will not assume responsibility for any improper or incorrect use of the equipment.

Do not touch the pump or the piping while it is pumping products at a high temperature.

Checks To Be Carried Out Before Putting The Pump Into Operation

- Completely open the pipes' suction and delivery shut-off valves.
- Check oil level of the pump. Add correct grade of oil as necessary to maintain level in center of oil sight glass (In the case of first start-up: pumps are shipped with oil in the gearbox).
- If the liquid fails to flow toward the pump, fill it with the liquid to be pumped.

The pump must never rotate without fluid inside it.

- Check that the power supply matches the rating indicated on the motor plate.
- Check that the direction of rotation of motor is the right one.
- If the pump has a double or a flushed mechanical seal, mount the auxiliary connection corresponding to the values indicated in technical specification.

Checks To Be Carried Out On Putting The Pump Into Operation

- Check to make sure that the pump is not making any strange noises.
- Check to see if the absolute inlet pressure is sufficient, in order to avoid cavitations in the pump. Consult the curve for the minimum required pressure above the steam pressure (NPIPr).
- Monitor the delivery pressure.
- Check that there are no leaks in the sealed areas.

A shut-off valve should not be used in the suction pipe to regulate the flow rate. It must be completely open during operation.

Monitor motor consumption in order to avoid a circuit overload.

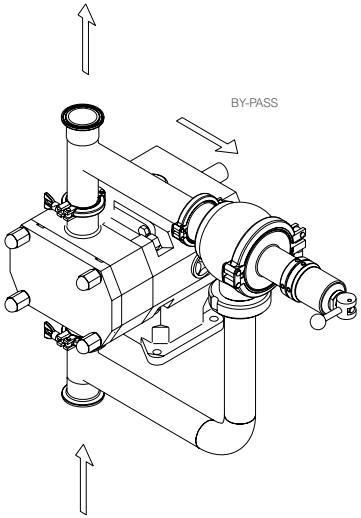
- Reduce flow and motor power consumption by reducing motor speed.

Pressure By-Pass

The valve's opening pressure depends on the fluid to be pumped, its viscosity, its rpm, and so before starting-up the pump, the operator ought to adjust the pressure relief valve's opening pressure.

When checking the relief valve also make sure the pump's pressure will never exceed the pressure setting + 2 bar.

When the pressure relief valve is equipped this valve has been adjusted to the pump's maximum operating pressure. Correct operating pressure has to be adjusted by end user. When the relief valve does not work properly, the pump must be taken out of service immediately. The valve must be inspected by an Ekin Endüstriyel service technician.



Example of Pressure Relief Valve Installation

Operating Problems

The table given below provides solutions to problems that might arise during pump operation. With respect to the same, it is assumed that the pump has been properly installed and has been correctly selected for the application in question.

Should there be a need for technical service please contact Ekin Endüstriyel. **444 35 46** (EKİN)

Operating Problems	Possible Causes
Motor Overload	8, 9, 12, 16, 20, 21, 22, 23, 24, 26
Insufficient Discharge Flow Rate	2, 4, 5, 7, 8, 9, 10, 11, 13, 14
No Pressure On The Discharge Side	1, 2, 3, 6, 7
Irregular Discharge Flow Rate / Pressure	2, 4, 5, 6, 9, 12
Noise and Vibrations	2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 16, 19, 20, 21, 22, 23, 24, 25, 26
The Pump Gets Clogged	8, 9, 11, 16, 19, 20, 21, 22, 24, 25, 26
Overheating of Pump	7, 8, 9, 11, 12, 16, 20, 21, 22, 23, 24, 26
Abnormal Water	4, 5, 11, 15, 16, 19, 24, 25
Leak Through Mechanical Seal	17, 18, 27

	Probable Solutions	Working Problems
1	Wrong rotation direction.	Invert the rotation direction.
2	Insufficient NPIP.	Increase available NPIP: - Rise the suction tank. - Lower the pump. - Reduce the speed. - Increase the diameter of the suction pipe. - Shorten and simplify the suction piping.
3	Pump not purged.	Purge or fill.
4	Cavitation.	Increase suction pressure.
5	The pump sucks in air.	Check suction pipe and all its connections.
6	Suction pipe clogged.	Check the suction pipe and filter(s), if any.
7	Wrong setting of pressure relief valve.	Check the pressure relief valve's setting.
8	Discharge pressure too high.	If necessary, reduce the loss of head by increasing the diameter of the discharge pipe.
9	Viscosity of the liquid is too high.	- Reduce the pump speed. - Reduce the viscosity by heating the liquid.
10	Viscosity of the liquid is too low.	- Increase the pump speed. - Increase the viscosity by cooling the liquid.
11	Temperature of liquid too high.	Reduce the temperature by cooling the liquid.
12	Pump speed too high.	Reduce the pump speed.
13	The lobes are worn.	Replace the lobes.
14	Pump speed too low.	Increase the pump speed.
15	Product very abrasive.	Fit hardened lobe hubs.
16	Worn bearings.	Replace the bearings, check the pump.
17	Worn or damaged mechanical seal.	Replace the seal.
18	O-rings and gaskets are not the right ones for the liquid.	Fith the proper O-ring and gaskets, check with the supplier.
19	Worn gears.	Replace and readjust the gears.
20	Insufficient lubricating oil level.	Fill up with oil.
21	Unsuitable lubricating oil.	Use an appropriate oil.
22	The robes rub.	- Reduce the temperature. - Reduce the discharge pressure. - Adjust the clearance.
23	Coupling misalignment.	Align the coupling.
24	Tension on the pipelines.	Connect the pipelines to the pump free of tensions.
25	Foreign bodies in the liquid.	Insert a filter in the suction pipe.
26	Pump and / or electric motor not fixed on foundation.	Tighten, check that the piping has been connected stress-free and align the coupling.

If the problem persists, use of the pump must cease immediately. Contact Ekin Endüstriyel or its representative.
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Maintenance

General Maintenance

This pump, as with any other machine, needs to be maintained. The instructions contained in this manual deal with the identification and replacement of the spare parts. These instructions have been drawn up by maintenance staff and are destined for those people who are responsible for supplying spare parts.

Read carefully technical specifications. All the parts or materials that are changed must be duly eliminated / recycled in accordance with the prevailing directives in each area.

Always disconnect the pump before starting out on any maintenance work.

Check The Mechanical Seal

Periodically check that there are no leaks in the shaft area. Should there be any leaks in the mechanical seal area, replace the same pursuant to the instructions given in the pump disassembly and assembly section.

Dry Thread Torque

Dry Thread Torque [N.m.]									
Material	M5	M6	M8	M10	M12	M14	M16	M18	M20
8.8	6	10	25	49	86	135	210	290	410
A2	5	9	21	42	74	112	160	210	300

Oiling

The bearings are oiled by immersion in an oil bath. The pumps are supplied with oil.

- Regularly check the oil level, for example, weekly or every 150 operating hours.
- The first oil change must be carried out after 150 hours of operation.
- Afterwards, it can be changed every 2500 operating hours or at least once a year when operating under normal conditions.

When change the oil: the oil sump must be filled up to the level in the middle of the peephole.

Do not pour too much oil into the sump.

Leave the pump switched off for a while and then re-check the oil level; if necessary, add a little oil.

Pump Type and Oils In The Gear Case		
Pump Type		Quantity of Oil In The Gear Case
MLP	20, 23, 25	0,5
MLP	30, 36	0,75
MLP	55, 60	0,75
MLP	70, 100, 125	1,40

Storage

Before being stored the pump must be completely emptied of liquids. Avoid, as far as possible, the exposure of the parts to excessively damp atmospheres.

Cleaning

Manual Cleaning

The use of aggressive cleaning products such as caustic soda and nitric acid may give rise to skin burns. Use rubber gloves during the cleaning process.

Always use protective goggles.

Automatic CIP (Cleaning In Place)

f the pump is installed in a system fitted with a CIP process, there will be no need for stripping. The recommended minimum liquid speed for an effective process of cleaning is 1,8 m/s (minimum Re > 100 000 at 1,0~2,5 bar). If it is not fitted with an automatic cleaning process, strip the pump pursuant to the instructions given in the section entitled Stripping and Assembly of the pump.

Cleaning solutions for CIP processes.

Only use clear water (chloride free) to mix with the cleaning agents.

Alkaline Solution: 1% in weight of caustic soda (NaOH) to 70 °C (150 °F)

1 kg NaOH + 100 lt water = cleaning solution or
2.2 lt NaOH to 33% + 100 lt of water = cleaning solution

Acid Solution: 0.5% in weight of nitric acid (HNO_3) to 70 °C (150 °F)
0.7 lt HNO3 to 53% + 100 lt water = cleaning solution

Monitor the concentration of cleaning solutions; it could give rise to the deterioration of the pump sealing gaskets. These solutions are given as examples and should be validated before use on an application.

In order to remove any remains of cleaning products, always rinse the element in question with clean water after completing the cleaning process.

Automatic SIP (Sterilization In Place)

The process of sterilization with steam is applied to all the equipment including the pump.

Do not start the pump during the process of sterilization with steam. The parts / materials suffer no damage if the indications specified in this manual are observed. No cold liquid can enter the pump till the temperature of the pump is lower than 60 °C (140 °F). A flow by-pass is recommended to be used in order to assure the flow of sterile product after the pump.

Maximum Conditions During The SIP Process With Steam or Overheated Water	
Max. Temperature	140 °C (284 °F)
Max. Time	30 min.
Cooling	Sterile air or inert gas.
Materials	EPDM / PTFE (recommended)

Pump Disassembly

The assembly and disassembly of the pumps should only be done by qualified personnel. Make sure that the personnel read carefully this instruction manual and, in particular, those instructions which refer to the work they will perform.

Incorrect assembly or disassembly may cause damage in the pump's operation and lead to high repair costs and a long period of down-time. Ekin Endüstriyel is not responsible for accidents or damages caused by a failure to comply with the instructions in this manual.

Preparations

Provide for a clean working environment as some parts, including the mechanical seal, require very careful handling and others have close tolerances. Check that the parts which are used are not damaged during transport. When doing this, you need to inspect the adjustment edge, the butted faces, the tight fit, burrs, etc. After each disassembly, carefully clean the parts and check for any damage. Replace all damaged parts.

Tools

Use the proper tools for assembly and disassembly operations. Use them correctly.

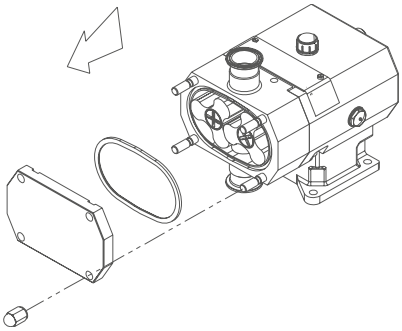
Cleaning

Before disassembling the pump, clean it on the outside and on the inside.

Never clean the pump by hand when it is running

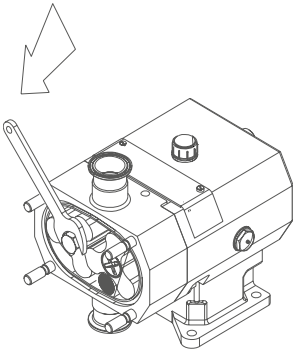
Pump Cover Disassembly

Liquid may spill from the rotor case when removing the pump cover.



- Close the suction and delivery valves.
- Remove the cap nuts.
- Check that the seal is in good condition.

Lobe Disassembly

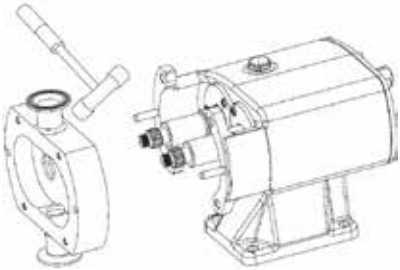


- Loosen the lobe screws using a spanner, remove seal and check.
- These screws have a right-hand thread. In order to prevent the lobes from turning simultaneously, blocks of wood or plastic can be placed between the lobes.
- Remove both lobes. If necessary, use a tool to assist for this purpose.
- Check that the O-ring is in good condition.

Disassembly of Mechanical Seals

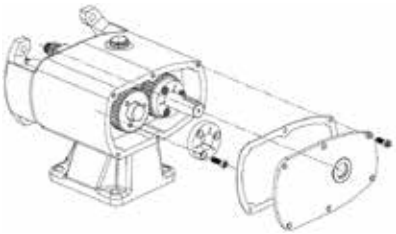
As a result of the pump design, it is not necessary to disassemble the rotor case in order to assemble / disassemble the mechanical seals. Mechanical seal is directly mounted to the rotor case.

Rotor Case Disassembly



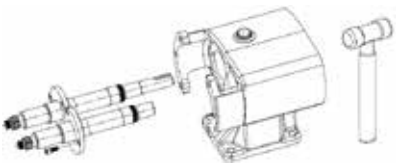
- Loosen and remove the nuts and bolts using a spanner.
- Remove the rotor case using nylon hammer if necessary.

Gear Case Rear Cover Disassembly



- Loosen and remove the bolts in the rear cover of the gear case using a spanner.
- Remove rear cover, take off the washer carefully and check.
- Loosen the three bolts in the gear case using a hex.spanner, remove the gear cap, take off tighten ring.
- Remove the two gears.

Shaft Assembly Removal

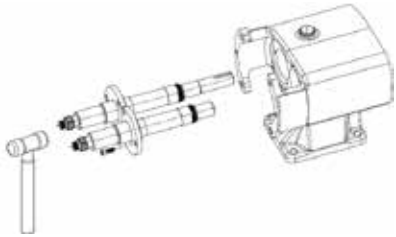


- Loosen and remove the bolts in the sealing cap using a hex.spanner,
- Remove the shaft assembly from the gear case. Due to the tightness of the bearings cover, a nylon hammer must be used. Lightly tap the rear part of the driveshaft and till take off the two driveshaft .
- Remove the oil sealing bottom cover from the driveshaft and, remove the oil sealing and check, if there are any defects, find a replacement before reassembling the pump.

Each driveshaft must be taken off separately.

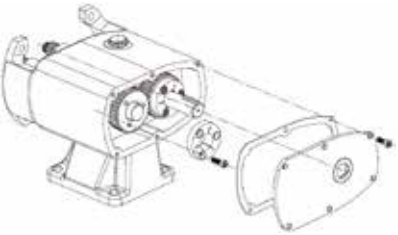
Pump Assembly

Shaft Assembly



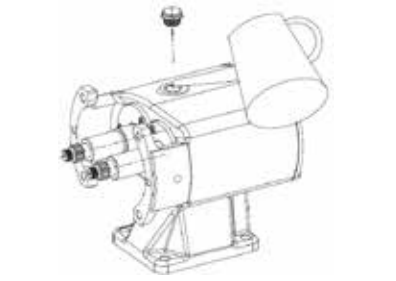
- Check that the oil sealing has not been damaged and attach with a little grease or oil in the correct position of the bottom cover.
- Along the two driveshaft holes of the gear case, use a nylon hammer use a nylon hammer and lightly tap the shafts until the bearings cover is well fixed to the gear case.

! Each driveshaft must be assembled into the gear case separately.



- Place gear on the driveshaft, put tightening ring into gear, along the driveshaft put the gear bottom cover into gear and aim at the bolt hole, assemble the bolt into the gear using a hex. spanner. After finishing the assembly of the gear, turn the driveshaft several circles to make sure there is no friction and lock.
- Check seal and oil sealing, make a replacement if necessary
- Fix the oil sealing into the rear cover of the gear case.
- Grease the seal, and place it in the gear case carefully and aim at the bolt hole.
- Along the driveshaft, put the oil sealing hole of the rear cover into the gear case, and aim at the bolt hole.

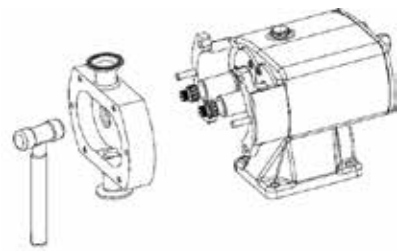
Filling With Lubricant Oil



- Remove the oil plug located at the top of the gear case.
- Fill the gear case with lubricant oil up to the middle level of the sight-glass.
- See oiling section for the type and quantity of oil to use.

Rotor Case Assembly

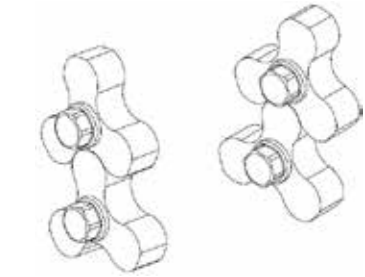
When reassembling the rotor case, pay attention to the position of the centring pins.



- Grease O-ring and fix it into mechanical seal stationary ring put it in the sealing step in the back of the rotor case, insert the stationary ring pin into the stationary ring hole.
- Mount the tightening cover in the driveshaft, then place the mechanical seal rotary ring into the driveshaft.
- Insert the fixing pin of the rotor case into the gear case, and then assemble the rotor case into the gear case, tighten the bolt using a spanner.

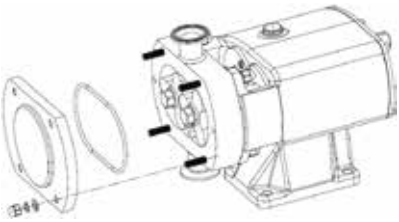
Lobe Assembly

Always check the clearance between the lobes and lobes and rotor case before finishing assembly.



- Fit new O-rings to the lobe screws, replace a new o-ring in the driveshaft.
- Push the lobe into the driveshaft slightly. Place the lobe bolt onto the driveshaft.
- Assembly is exactly the same for all lobe types.

Pump Cover Assembly

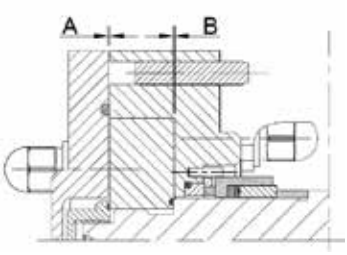


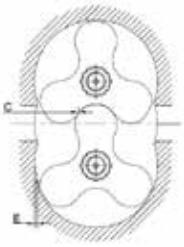
- Check that the O-ring is in good condition or, if necessary, replace it with a new one.
- Place it in the pump rotor case.
- Place the pump cover onto the rotor case and tighten the bolt and blind nuts.

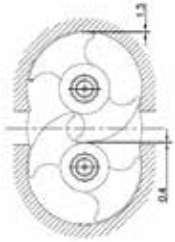
Checks to be carried out before putting the pump into operation.

Lobe Adjustment

Clearance and Tolerance Table



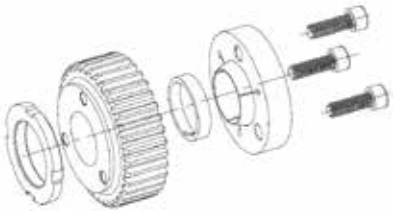


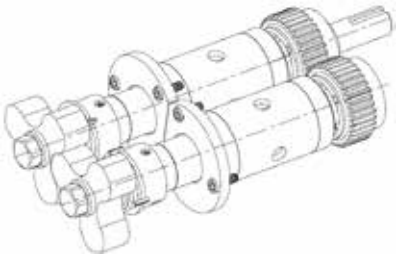


Size	C (mm)	D (mm)	E (mm)	K (mm)
MLP 20	0.25±0.05	0.20±0.05	0.20±0.05	0.20±0.03
MLP 23	0.25±0.05	0.20±0.05	0.20±0.05	0.20±0.03
MLP 25	0.25±0.05	0.20±0.05	0.20±0.05	0.20±0.03
MLP 30	0.30±0.05	0.30±0.05	0.30±0.05	0.30±0.05
MLP 35	0.30±0.05	0.30±0.05	0.30±0.05	0.30±0.05
MLP 55	0.30±0.05	0.30±0.05	0.30±0.05	0.30±0.05
MLP 60	0.30±0.05	0.30±0.05	0.30±0.05	0.40±0.05
MLP 70	0.40±0.05	0.40±0.05	0.50±0.05	0.50±0.05
MLP 80	0.40±0.05	0.40±0.05	0.50±0.05	0.50±0.05
MLP 100	0.40±0.05	0.40±0.05	0.50±0.05	0.50±0.05
MLP 125	0.40±0.05	0.40±0.05	0.50±0.05	0.50±0.05

A: Axial clearance between the lobe and the cover.
B: Axial clearance between the lobe and the rear of the rotor case.
C: Radial clearance between the lobes.
E: Radial clearance between the lobe and the rotor case on the suction side.

Synchronising The Lobes





- In order to enable the gear to be tightened, mount it in the driveshaft, and put the tighten ring into the inside of the gear, then push the bottom cover into the inside of the gear, aim at the bolt hole, and tighten it with bolt.

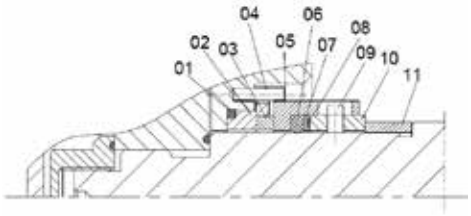
The gear and lobes run synchronously, and the lobes will not touch each other.

Mechanical Seal Assembly and Disassembly

Single Mechanical Seal

Mechanical seals are fragile parts. Take care when handling them. Do not use any screwdriver or similar tool to pull out the parts.

- Clean all the components of the mechanical seal before placing them.
- Check that the working surfaces are not damaged. Ekin Endüstriyel recommends replacing the entire mechanical seal if one of the working surfaces has a defect.
- Replace the O-rings during assembly.



Pos.	Single Mechanical Seal
01	O-Ring
02	Stationary Cover
03	Graphite
04	Fixed Pin
05	Rotary Ring
06	O-Ring
07	Retainning Ring
08	Wave Spring
09	Fixed Bolt
10	Fixed Cover
11	Driveshaft Tightening Cover

Disassembly

- Remove the stationary fixed pin from the rotor case, take off the stationary cover. Please proceed carefully.
- Loosen the fixed bolt in the driveshaft, remove the rotary ring and fixed cover from the driveshaft.

Assembly

- Lubricate all the O-rings of the mechanical seal with soapy water or oil compatible with the material of the seals, pumped liquid and application.
- Mount the driveshaft tightening cover in the driveshaft, mount the rotary sealing partsin the driveshaft.
- Fit the stationary part into the rotor case, and aim at the bore, ensuring that the fixed pin engage with the slot edge of stationary ring.
- Assemble the rotor case and gear case, push the rotary parts several times, adjust the fixed bolt using the hex.spanner,till the rotary ring and stationary ring reach to a perfect position.
- Clean the working surfaces with solvent.
- Reassemble the lobe rotor according to lobe assembly section.

Technical Specifications

	Short Rotor	Long Rotor
Theoretical Displacement Volume X100 Rev	217 litres	321 litres
Maximum Flow Rate	78 m^3/h (586 gpm)	115 m^3/h (700 gpm)
Maximum Differential Pressure	12 bar (174 psi)	7 bar (102 psi)
Maximum Working Pressure	16 bar (232 psi)	16 bar (232 psi)
Maximum Temperature[1]	110 °C (230 °F)	110 °C (230 °F)
Maximum Viscosity[2] (Recommended)	70.000 mPa.s	70.000 mPa.s
Maximum Speed	950 rpm	950 rpm
Maximum Connections	100 mm (4")	150 mm (6")
Suction / Delivery Connections	Clamp (standard)	Clamp (standard)

[1] Maximum temperature due to EPDM gaskets, for continuous application. To consult for higher temperatures contact with Ekin Endüstriyel. +90 216 **444 35 46** (EKİN)
[2] The maximum viscosity allowed will depend on the nature of the liquid and the sliding speed of the seal faces.

Use special protection when the noise level in the operation area exceeds 95 dB(A).

Model	N_{max} (rpm)	rpm	B (mm)	D (mm)	Q_{th} (m^3/h)	P_{max} (bar)
MLP 20	950	200-450	24.6	86	7.5	12
MLP 23	950	200-450	34.6	86	11.0	12
MLP 25	950	200-450	48.6	86	15.0	10
MLP 30	650	200-400	47.4	108	16.0	12
MLP 35	650	200-400	59.4	108	20.0	10
MLP 55	650	200-400	67.4	108	23.0	12
MLP 60	650	200-400	74.4	108	26.0	10
MLP 70	450	200-400	78	165.5	41.0	12
MLP 80	450	200-400	78	165.5	42.0	10
MLP 100	450	200-400	100	165.5	52.0	10
MLP 125	450	200-400	127	165.5	67.0	10

N_{max} : Maximum Speed
B : Lobe Width
D : Lobe Diameter
Q_{th} : Theoretical flowrate at N_{max}.
P_{max} : Maximum differential pressure.

Materials

Parts in connect with pumped material.	AISI 316L
Other parts in stainless steel.	AISI 304
Gaskets in contact with pumped material.	EPDM veya Viton
Other materials for optional gaskets.	Please contact with Ekin Endüstriyel. **444 35 46** (EKİN)
Surface finishing.	Standart Finish.

Mechanical Seal

Type of Seal	Single Internal Balanced Mechanical Seal
Stationary Parts Materıal	Carbon
Rotary Parts Materıal	Silicon Carbide
Elastomers Materıal	EPDM veya Viton

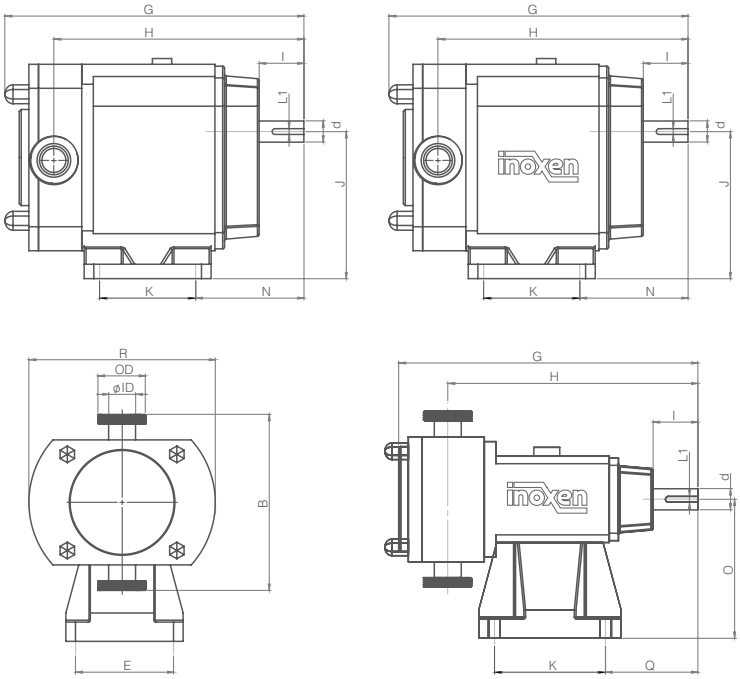
Cooled Mechanical Seal

Working Pressure	0,5 bar (73 psi)
Flow Rate of The Circulation	2,5 - 5 lt/min (0,7 - 1,3 gpm)

Double Mechanical Seal

Type of Seal	Dengeli tasarım
Due to the balanced design, no over pressure is required. Operating pressure (If it is required by process.)	1,5 - 2 bar (22 - 29 psi) over the pump operating pressure.

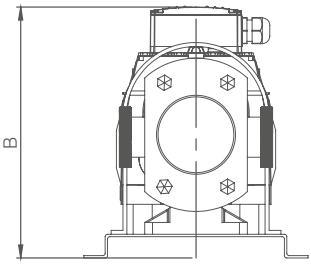
Lobe Pump Without Motor Dimensions

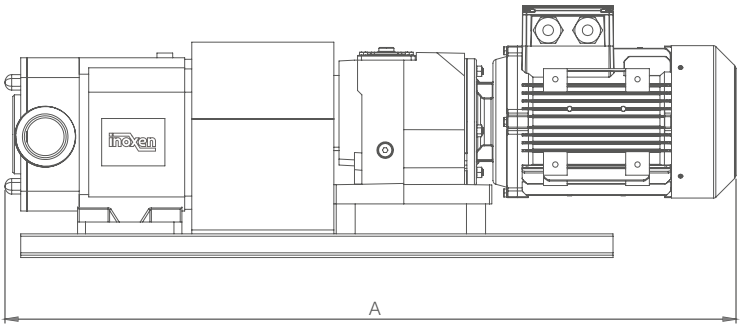


Model	A	B	C	D	E	F	G	H	I	J	K	L
MLP-20	21	172	222	123	100	125	334	291	52	153	100	19
MLP-23	21	172	222	123	100	125	334	291	52	153	100	19
MLP-25	21	172	222	123	100	125	334	291	52	153	100	19
MLP-30	25	184	226	149	125	155	437	381	60	146	125	30
MLP-36	25	184	226	149	125	155	437	381	60	146	125	30
MLP-55	21,5	184	226	149	125	167	462	381	60	146	125	30
MLP-60	21,5	184	226	149	125	167	462	381	60	146	125	30

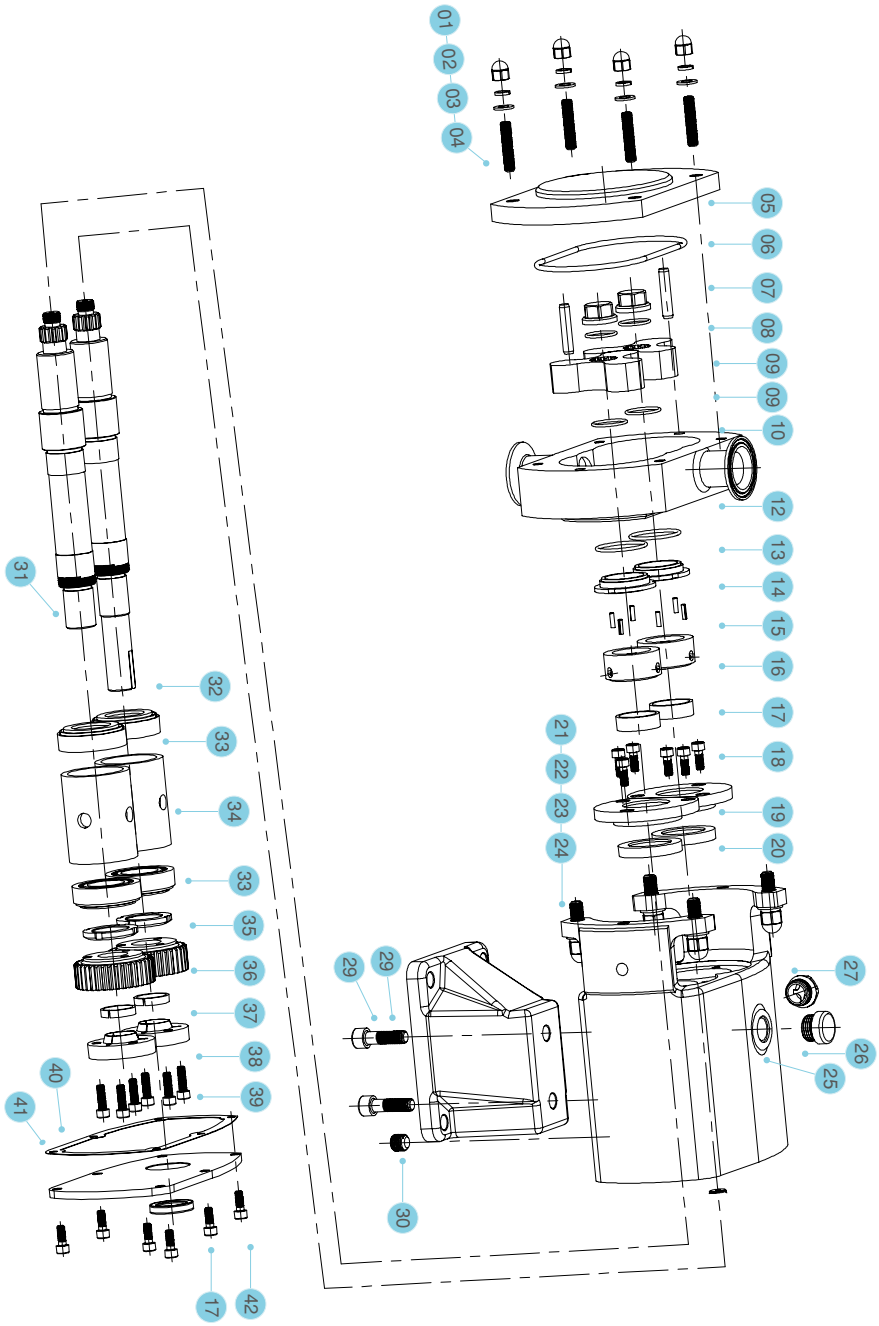
Model	M	N	O	P	Q	R	S	T	U	OD	ID
MLP-20	132	107	145	146	105	198	21	172	120	52x1/6"	25
MLP-23	132	107	145	146	105	198	21	172	120	65x1/6"	37
MLP-25	132	107	145	146	105	198	21	172	120	78x1/6"	49
MLP-30	181	140	175	210	146	234	25	184	155	78x1/6"	49
MLP-36	181	140	175	210	146	234	25	184	155	95x1/6"	66
MLP-55	181	140	175	210	146	234	25	184	155	95x1/6"	66
MLP-60	181	140	175	210	146	234	25	184	155	110x1/4"	75

Lobe Pump With Motor Assembly Dimensions





Model	B	C	D	E	K	G	H	I	J	L1	0D	ID	d
MLP-20	182	229	123	100	100	311	260	46.5	153	6	52x1/6"	25	22
MLP-23	191	229	123	100	100	315.5	264.5	46.5	153	6	65x1/6"	37	22
MLP-25	194	229	123	100	100	325	274	46.5	153	6	78x1/6"	49	22
MLP-30	225	271	149	125	125	432.5	357	56	186.5	8	78x1/6"	49	28
MLP-36	260.5	271	149	125	125	438.5	363	56	186.5	8	95x1/6"	66	28
MLP-55	240	271	149	125	125	443.5	368	56	186.5	8	95x1/6"	66	28
MLP-60	245	271	149	125	125	447.5	372	56	186.5	8	110x1/4"	75	28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Spare Parts

Pos.	Part Name	Material	Qty.
22	Spring Gasket	316L	4
21	Cap Nut	316L	4
20	Oil Sealing	NBR	2
19	Bearing Cover	45#	2
18	Hex. Bolt	A2-70	6
17	Tightening Cover	316L	2
16	Mechanical Seal Rotary Parts	SiC/SiC/EPDM	2
15	Column Pin	316L	6
14	Mechanical Seal Stationary Parts		2
13	O-Ring	NBR	2
12	Rotor Case	316L	1
11	O-Ring	EPDM	2
10	Lobe (Rotor)	316L	2
9	O-Ring	NBR	2
8	Lobe Nut	316L	2
7	Column Pin	316L	2
6	O-Ring	EPDM	1
5	Front Cover	316L	1
4	Bolt	A2-70	4
3	Flat Gasket	316L	4
2	Spring Gasket	316L	4
1	Cap Nut	316L	4
43	Bolt	A2-70	c
42	Oil Sealing	NBR	6
41	Gear Case Rear Cover	45#	1
40	Gear Case Gasket		1
39	Hex. Bolt	A2-70	1
38	Gear Cover	45#	6
37	Gear Tightening Ring	45#	2
36	Gear		2
35	Tightening Nut	45#	2
34	Bearng Fix Position Cover		2
33	Bearing		4
32	Long Drive Shaft	316L	1
31	Short Drive Shaft	316L	1
30	Jam	316L	1
29	Hex. Bolt	A2-70	2
28	Base Support	Cast Iron	1
27	Oil Sight Glass		1
26	Oil Plug	316L	1
25	Gear Case	Cast Iron	1
24	Bolt	A2-70	4
23	Flat Gasket	316L	4

General Terms Of Use and Important Warnings

- Our products are guaranteed for 2 years against material and manufacturing defects. The warranty period starts with the delivery of the product to the user. Consumables and parts worn out in normal use (Gasket, shaft seal, stator, rotor, diaphragm, membrane, resistor, springs, electrical circuit elements, etc.) are not covered by the warranty. Warranty conditions are void if the product is used outside of the specified operating conditions.
- Failures caused by the product's installation, commissioning and use contrary to the items in the user's manual are not covered by the warranty. Ekin Industrial sends the user manuals with the product. It also publishes it on its website. In cases where the user manual does not reach the Buyer, the product should not be commissioned and must be requested in writing from Ekin Industrial. Otherwise, it is accepted that you are aware of the installation, maintenance and usage conditions, that you have this competence and that you have taken responsibility for all problems that may arise, and Ekin Industrial is not responsible for any problems that may arise.
- Periodic maintenance and repairs should be done using original parts supplied by Ekin Industrial or authorized services. Otherwise, the Warranty Terms are void.
- When procuring the product, the type of the product, the type of fluid used, pressure, temperature, density, etc. All information must be given completely and accurately. Otherwise, our company is not responsible for the problems that may occur.
- Problems, blockages and contaminations caused by the quality of the fluid used in our products or the installation are not covered by the warranty. Damages that may occur as a result of corrosion, cavitation, vibration, water hammer and freezing are not covered by the warranty.
- The reason for the damages that may occur due to the absence or malfunction of the armatures in the system or the non-use of the safety armatures (safety valve, thermostat, pressure sensor, temperature sensor, etc.) cannot be determined later and is not covered by the insurance. Our company is not responsible for material and moral accidents and losses that may occur.
- Any products and accessories that we trade or use in our products that are not our own production are not under the guarantee of Ekin Industrial. The warranty of these products and the responsibility of the damages that may occur are under the commitment of the manufacturers of the products.
- Our company is not responsible for process, production or real estate losses that may arise from our products. Claims for compensation will not be accepted unless the damage caused by us is the result of willful or gross negligence. The compensation amount for the damages that may occur, the delay penalty or any penalty that may arise for any reason cannot exceed the invoice amount.
- After receiving the products, the buyer; For obvious defects, the period of direct or indirect control, inspection and notification is 2 business days, for hidden defects, the period of direct or indirect control, inspection and notification is 8 business days. Products that are not notified in writing by the buyer within this period are deemed to have been accepted..
- Except for assembly and usage errors, we have the right and obligation to improve in the event of a manufacturer's defect and the product's lack of guaranteed features. We also have the right to choose to replace the product with a new one. However, the buyer has no right to demand a new one. In case of no improvement, repair or new delivery, the buyer may request the termination of the contract or a refund of the product price.
- The system designer and user are responsible for the selection of the appropriate product, its suitability for specific applications, its safe and trouble-free installation, operation and maintenance. Otherwise, we are not responsible for any damage or work accidents that may occur.
- Our company is only responsible for making the products to be delivered carefully ready for shipment. Since our company does not provide engineering services, product selection should be made after the application details, suitability of the material to the system and product features are technically evaluated by the buyer. Improper selection, installation or misuse of products may result in property damage or injury. Our company does not accept responsibility for product selection.
- If the buyer is a merchant or public law legal entity, all legal disputes will be resolved by the court over which we have jurisdiction. Anadolu Adliyesi / Turkey is exclusively authorized and competent authority in all disputes arising from joint legal relations. In case of dispute, Istanbul Anatolian courthouse courts and enforcement offices are authorized.

Notes

EKİN ENDÜSTRİYEL

CERTIFICATE OF WARRANTY

2 YEARS WARRANTY

The Document's Confirmation Date and Number:

The usage of this document has been authorized by T. C. Sanayi Bakanlığı İl Müdürlüğü in accordance with the Law No: 4077 on the Protection of Consumers and the Communiqué on the Implementation of the Guarantee Certificate put into effect based on this Law.

WARRANTY CONDITIONS

1. Warranty period starts from the delivery date of the goods.
2. In case of malfunction of the products within the warranty period, the time spent in the repair is added to the warranty period. The repair period of the goods is maximum 30 working days. This period starts from the date of notification to the service station of the defect goods. In the absence of service station, this period starts from the date of notification to the seller, dealer, agent, representative, importer or manufacturer of the goods.
3. In case of malfunction of the goods within the warranty period due to material, workmanship or assembly or assembly defects, the goods will be repaired at no cost and no additional cost will be asked from buyer under the name of changed part price or any other name.
4. Defects caused by the use of the product contrary to the items in the user manual are out of the warranty.
5. For the problems that may arise regarding the Warranty Certificate can be applied to the Sanayi ve Ticaret Bakanlığı Tüketicinin ve Rekabetin Korunması Genel Müdürlüğü.
6. The manufacturer may request that the product be sent to its own production facility at its own discretion. The shipping cost to be spent by the customer belongs to the manufacturer if it is evaluated within the scope of warranty as a result of the examination made on the product. If the defect is not evaluated under the warranty, all costs incurred will be invoiced to the customer.
7. The manufacturer is not responsible for any damages and losses that may occur in the cargo or warehouse during the shipment of the product.
8. The manufacturer accepts no liability for the damage cause by the following reasons;
   - Failure to comply with temperature, pressure or other conditions specified in the technical specifications.
   - Incorrect applications and normal abrasion conditions.
   - Damages that may occur from sudden opening and closing of the fluid valves.
   - Damages cause by the usage of non-original spare parts.
   - Damages that may occur during shipping.
   - Damages that may arise from corrosion.
   - Blockages cause by the fluid passed through inside the product.
   - Damages that may arise from condensate discharge in products which are used in steam applications.
   - Damages that may occur by the blockages cause by the solid materials which can block the products.
   - Damages that may occur as a result of incorrect interventions by the un-authorized services.
   - Damages that may be caused by the lack of fixtures or not working properly.
   - Accidents and problems that may occur in the system if the safety fixtures (safety valve, thermostat, pressure sensors, temperature sensors etc.) are not used are not considered under warranty. The manufacturer is not responsible for any of the pecuniary and non-pecuniary damages that may occur.
9. Manufacturer is not responsible for secondary damages, loss of production and accidents whether it is under warranty or not.
10. All of the above items have been specified in our offer and order confirmations and you have been informed that they supersedes the contract. Commissioning of the product means acceptance of the contract.

For the product that was sold to ..... LTD. ŞTİ. /A. Ş / Legal Entity on ...../...../20... with stated model, brand and serial number, all kinds of manufacturing and material defects are covered by the warranty of our company for 2 (two) years.

SELLER **DEALER** **END USER**

Brand : _____

Product Type : _____

Product Code : _____

Serial No : _____

Product No : _____

NOTE: User mistakes are not covered by warranty.
www.ekinendustriyel.com

Please keep this certificate!

Notes

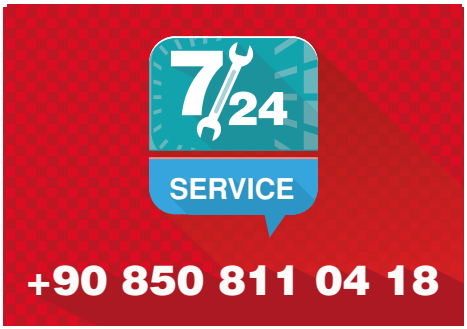
Notes

Professional System Solution Center

You can get answers to the problems you experience with your pumps, heat exchangers and system from our MIT professional system solution center. You can also benefit from our 7/24 uninterrupted service with our solution center consisting of our expert engineers.

- Domestic hot water installations.
- Central and district heating systems.
- Milk, yogurt, heating, cooling and pasteurization systems.
- Industrial cooling and heating systems.
- Oil cooling systems.
- Energy recovery systems.
- Pool heating systems.
- Steam installations.

It is vital for your system to be designed and implemented correctly in the first installation in order to be able to operate at the desired capacity, smoothness and long life. For this reason, you can get first-hand the technical support you need during the installation phase of your system and the problems that may arise in the business; You can reach us **24 hours +90 (216) 232 24 12 in 7 days**.



We would like to reiterate that we will be happy to share our knowledge accumulated over many years with our valued customers in order for your system to work correctly and performance.

Ekin will continue to be the best solution partner for you in all applications with all kinds of heating and cooling applications.

Producer; reserves the right to change the product features, technical dimensions and information and installation diagrams specified in this catalog without notice. No specified information can be copied and used without the permission of the manufacturer. In no way can the manufacturer be held responsible by giving examples of technical information and diagrams. In case of need, we request you to request a special technical drawing for your project for exact dimensions.

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