



EKİN ENDÜSTRİYEL

Lobe Pumps
Installation and User Guide



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**The first condition of innovation is to question.
And the first condition of sustainable innovation is to question
constantly.**

The journey of innovation has started with a question for us too: "How can we develop value-added technologies in Turkey?". First turning point in this long journey was the birth of MIT (Made in Turkey) brand. MIT made us the first plate heat exchanger producer of Turkey and it's founding vision was not to become a local alternative, it was to build a high-quality brand that can compete on a global level.

While we are working towards this goal in the past 15 years, our products and processes deemed worthy for documentation by many national and international quality assessment institutions such as ISO, TSE, CE, GOST and many more. This was the natural outcome of our constant questioning of the status-quo and our desire to outperform ourselves.

New Generation Engineering

With our engineering approach that focuses on the process, not the problem, we do not just specialize in a product, we consider the entire ecosystem of that product. Ergo, we produce all the other components of a system in addition to plate heat exchangers and we focus on the constant development of engineering staff required to provide an end-to-end application.

We provide a "solution" rather than a product with our business development, presales, sales and after sales services provided by our expert engineers.

In our 15th year, we continue to grow as a solution partner for projects that need high technology in more than 60 countries with our internationally approved high-quality plate heat exchangers; components such as accumulation tanks, boilers, industrial pumps and installation materials that completes these exchangers to form a system; and complementary services provided by our expert engineer staff.



HEAT TRANSFER PRODUCTS

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

PRESSURE VESSELS

- Water Heater Tanks
- Water Storage Tanks
- Buffer Tanks
- Expansion Tanks
- 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
- Homogenizers
- Turn-key Projects

FLUID TRANSFER PRODUCTS

- Lobe Pumps
- Hygienic Centrifugal Pumps
- Acid Pumps
- Dosing Pumps
- Air Operated Double Diaphragm Pumps (AODD)
- Drum Pumps
- Monopumps
- Centrifugal Blowers
- Roots Blowers
- Turbo Blowers

FLOW CONTROL UNITS

- Butterfly Valves
- Ball Valves
- Globe Valves
- Knife Gate Valves
- Actuators
- Check Valves and Strainers
- Thermoplastic Valves

ENERGY SYSTEMS

- Boilers
- Steam Generators
- Solar Collectors
- Chillers
- Cooling Towers

PRODUCT RANGE



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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.
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. **444 35 46 (EKIN)**

GENERAL INFORMATION

Description

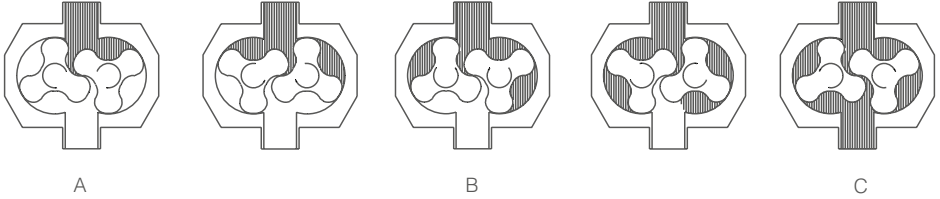
The MLP lobe pumps made by MIT are part of our wide range of positive displacement rotary pumps for viscous liquids. The lobe pump has the following features:

- 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: 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 Reception



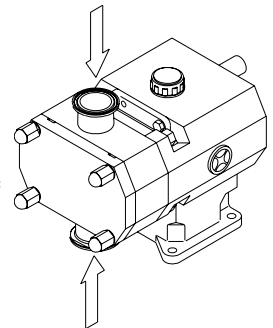
Ekin Endüstriyel is not responsible for any deterioration of the material as a result of its transportation or unpacking. Visually check that the packing has not suffered any damage.

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.



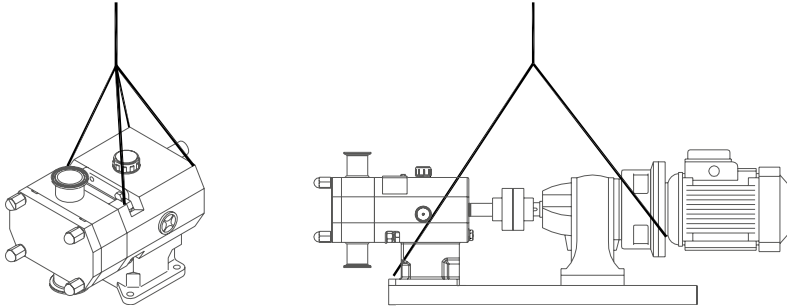
(*) If the pump has been supplied with a drive from Ekin Endüstriyel.

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.

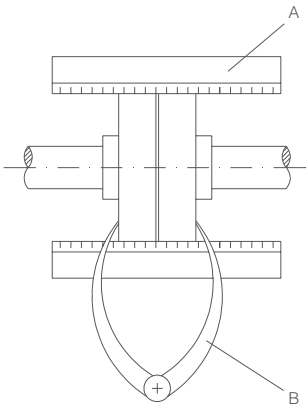


Figure 1

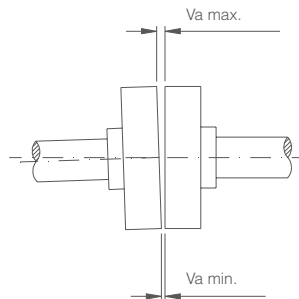


Figure 2

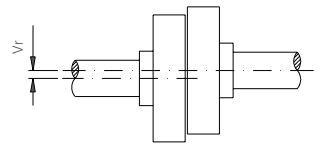


Figure 3

| MAXIMUM ALIGNMENT DEVIATIONS | | | | |
|---------------------------------------|--------------------|--------------------|----------------------------------|----------|
| Outside Diameter of The Coupling (mm) | $V_{a_{min}}$ (mm) | $V_{a_{max}}$ (mm) | $V_{a_{max}} - V_{a_{min}}$ (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 as 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 to 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.

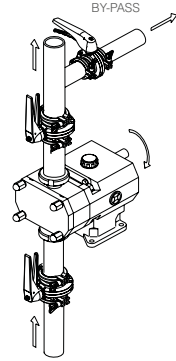
Self-priming Process

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

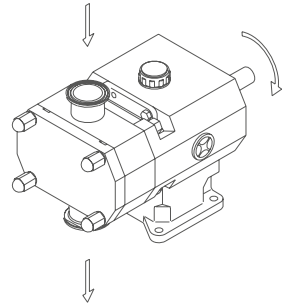
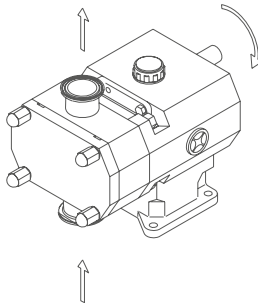
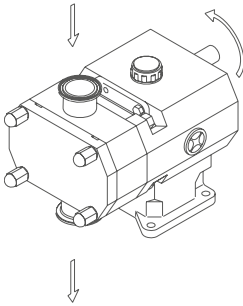


Leave the connecting of the electrical motors to qualified personnel. Take the necessary measures to prevent any breakdowns in the connections and wires.



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 (NPIP_r).
- 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

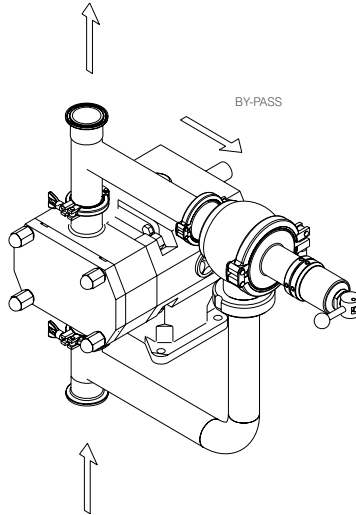
The valve's opening pressure depends on the fluid to be pumped, its viscosity, its rpm, and so before starting-up the pump, the operator ought to adjust the pressure relief valve's opening pressure.



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 Causes | Solutions |
|----|--|--|
| 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. | Fit 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.
444 35 46 (EKIN)

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)

If 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 HNO_3 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.

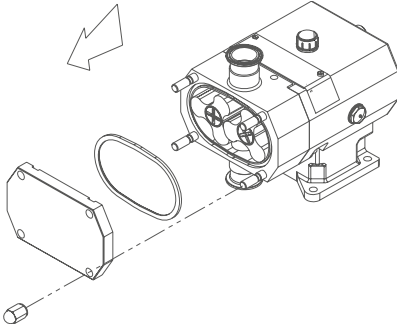


Never clean the pump by hand when it is running

Pump Cover Disassembly

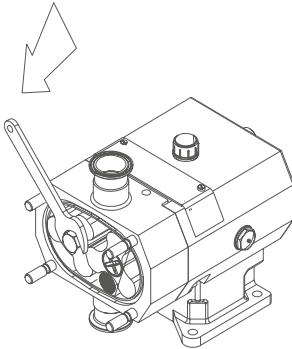


Liquid may spill from the rotor case when removing the pump cover.



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

Lobe Disassembly

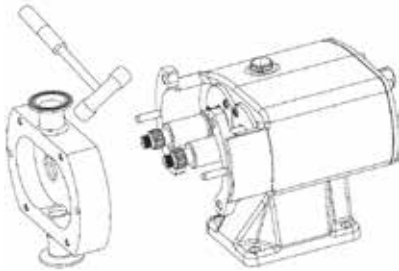


- Loosen the lobe screws using a spanner, remove seal and check.
- These screws have a right-hand thread. In order to prevent the lobes from turning simultaneously, blocks of wood or plastic can be placed between the lobes.
- Remove both lobes. If necessary, use a tool to assist for this purpose.
- Check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

Disassembly of Mechanical Seals

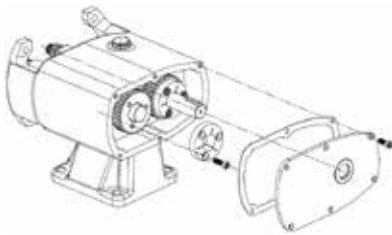
As a result of the pump design, it is not necessary to disassemble the rotor case in order to assemble / disassemble the mechanical seals. Mechanical seal is directly mounted to the rotor case.

Rotor Case Disassembly



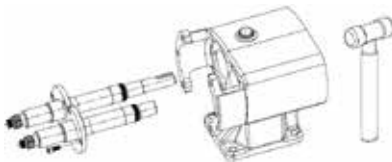
- Loosen and remove the nuts and bolts using a spanner.
- Remove the rotor case using nylon hammer if necessary.

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

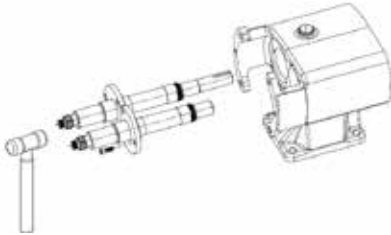


- Loosen and remove the bolts in the sealing cap using a hex spanner,
- Remove the shaft assembly from the gear case. Due to the tightness of the bearings cover, a nylon hammer must be used. Lightly tap the rear part of the driveshaft and till take off the two driveshaft .
- Remove the oil sealing bottom 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.

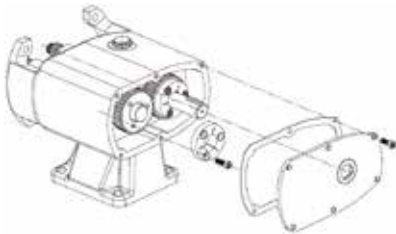
Pump Assembly Shaft Assembly



- 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

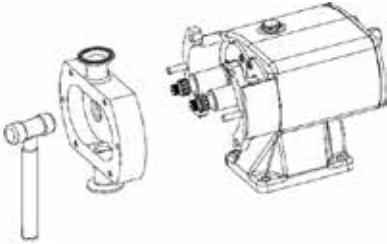


- Remove the oil plug located at the top of the gear case.
- Fill the gear case with lubricant oil up to the middle level of the sight-glass.
- See oiling section for the type and quantity of oil to use.

Rotor Case Assembly



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

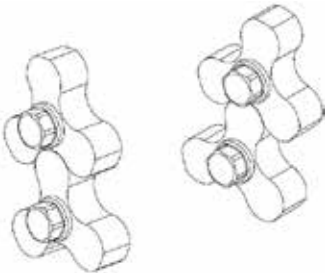


- Grease O-ring and fix it into mechanical seal stationary ring put it in the sealing step in the back of the rotor case, insert the stationary ring pin into the stationary ring hole.
- Mount the tightening cover in the driveshaft, then place the mechanical seal rotary ring into the driveshaft.
- Insert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

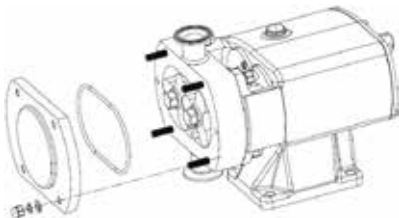


Always check the clearance between the lobes and lobes and rotor case before finishing assembly.



- 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



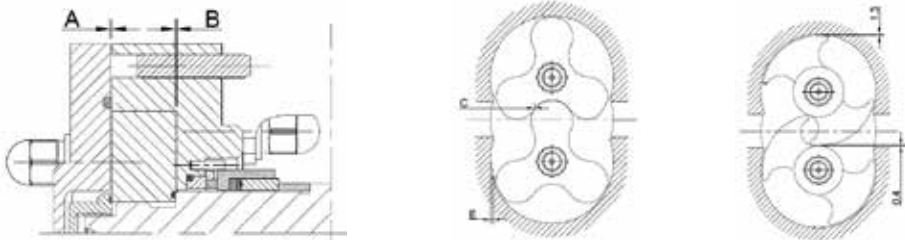
- Check that the O-ring is in good condition or, if necessary, replace it with a new one.
- Place it in the pump rotor case.
- Place the pump cover onto the rotor case and tighten the bolt and blind nuts.



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 |

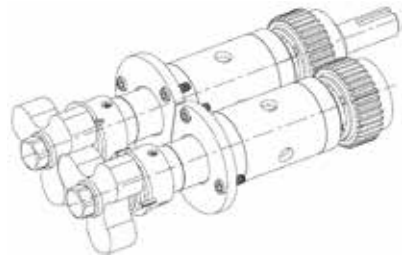
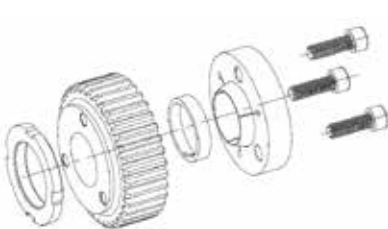
A: Axial clearance between the lobe and the cover.

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.

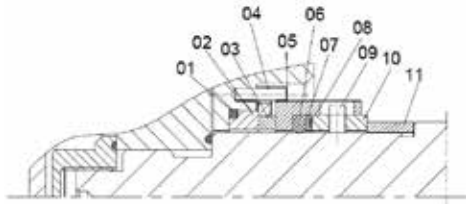
Mechanical Seal Assembly and Disassembly

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 | Retaining 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 parts in 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. **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 Material | Carbon |
| Rotary Parts Material | Silicon Carbide |
| Elastomers Material | EPDM veya Viton |

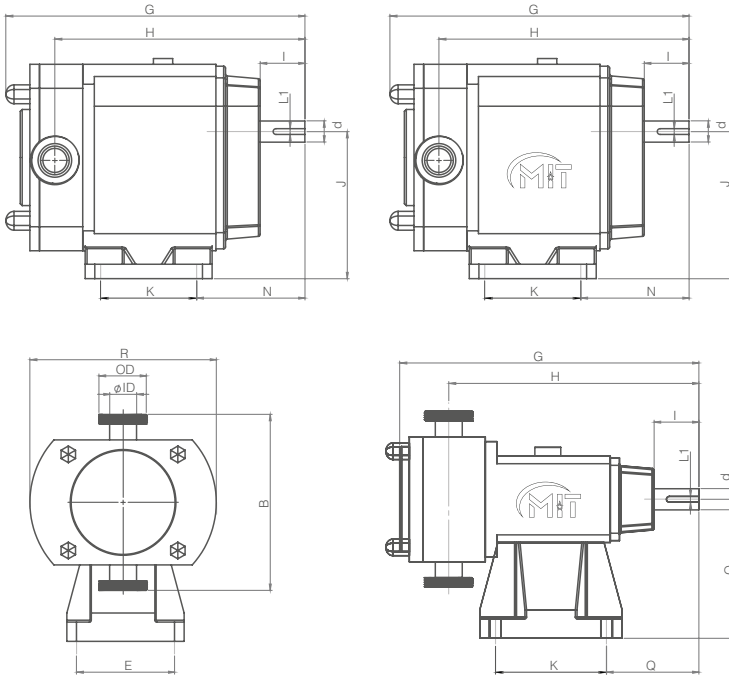
Cooled Mechanical Seal

| | |
|------------------------------|--------------------------------|
| 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

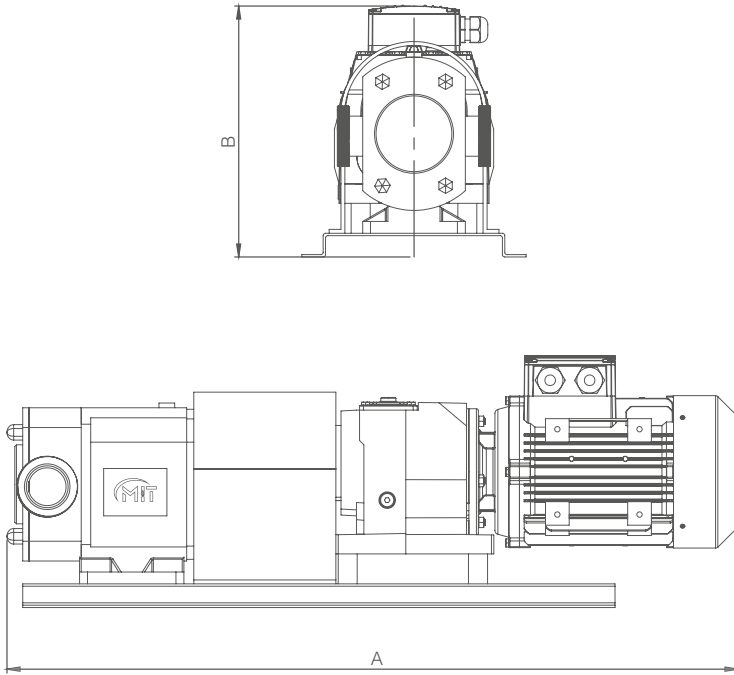


| Model | A | B | C | D | E | F | G | H | I | J | K | L |
|--------|------|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|
| MLP-20 | 21 | 172 | 222 | 123 | 100 | 125 | 334 | 291 | 52 | 153 | 100 | 19 |
| MLP-23 | 21 | 172 | 222 | 123 | 100 | 125 | 334 | 291 | 52 | 153 | 100 | 19 |
| 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 |

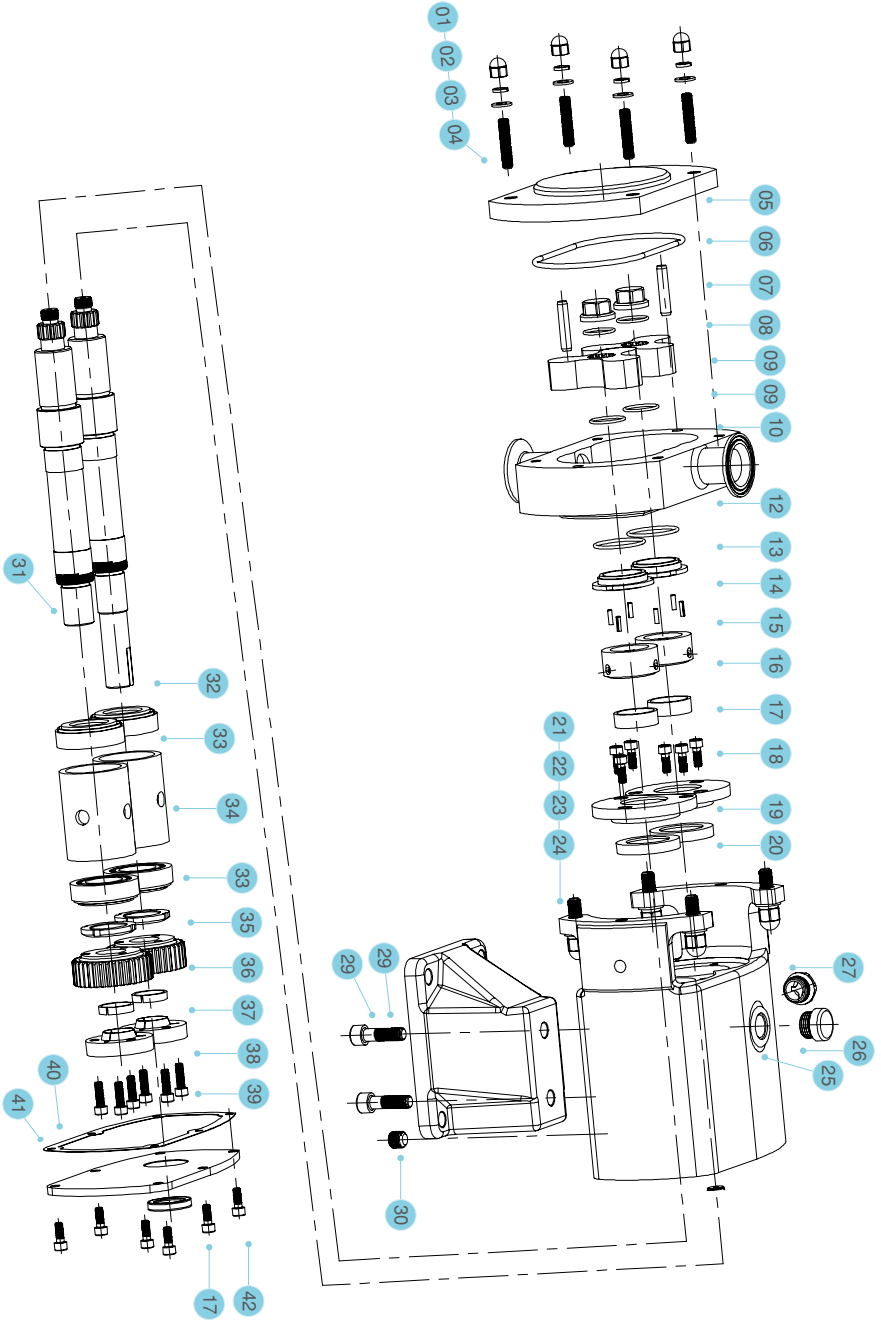
| Model | M | N | O | P | Q | R | S | T | U | OD | ID |
|--------|-----|-----|-----|-----|-----|-----|----|-----|-----|------|------|
| MLP-20 | 132 | 107 | 145 | 146 | 105 | 198 | 21 | 172 | 120 | 50.5 | 26 |
| MLP-23 | 132 | 107 | 145 | 146 | 105 | 198 | 21 | 172 | 120 | 50.5 | 26 |
| MLP-25 | 132 | 107 | 145 | 146 | 105 | 198 | 21 | 172 | 120 | 50.5 | 26 |
| MLP-30 | 181 | 140 | 175 | 210 | 146 | 234 | 25 | 184 | 155 | 64.0 | 35 |
| MLP-36 | 181 | 140 | 175 | 210 | 146 | 234 | 25 | 184 | 155 | 64.0 | 35 |
| MLP-55 | 181 | 140 | 175 | 210 | 146 | 234 | 25 | 184 | 155 | 64.0 | 47.5 |
| MLP-60 | 181 | 140 | 175 | 210 | 146 | 234 | 25 | 184 | 155 | 77.5 | 59.5 |



Lobe Pump With Motor Assembly Dimensions



| Modelv | 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 | 52 | 25 | 22 |
| MLP-23 | 191 | 229 | 123 | 100 | 100 | 315.5 | 264.5 | 46.5 | 153 | 6 | 64.5 | 35 | 22 |
| MLP-25 | 194 | 229 | 123 | 100 | 100 | 325 | 274 | 46.5 | 153 | 6 | 77 | 47.8 | 22 |
| MLP-30 | 225 | 271 | 149 | 125 | 125 | 432.5 | 357 | 56 | 186.5 | 8 | 77.5 | 47.8 | 28 |
| MLP-36 | 260.5 | 271 | 149 | 125 | 125 | 438.5 | 363 | 56 | 186.5 | 8 | 77.5 | 59.5 | 28 |
| MLP-55 | 240 | 271 | 149 | 125 | 125 | 443.5 | 368 | 56 | 186.5 | 8 | 77.5 | 66 | 28 |
| MLP-60 | 245 | 271 | 149 | 125 | 125 | 447.5 | 372 | 56 | 186.5 | 8 | 109 | 72.2 | 28 |





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 |

EC DECLARATION OF CONFORMITY



(in accordance with the 89/392 CEE Machinery Regulations and successive amendments.
Enclosed II point A).

EKIN INDUSTRIAL HEATING AND COOLING INDUSTRY CO.

Des San. Sit. 107 Sok. B14 Blok No :2A/4 Umraniye- Istanbul / TURKEY

Declares on its own responsibility that the new pump which has been denominated:

Description of Machine: ROTORY LOBE PUMP


Model Name: MIT MLP-20, MIT MLP-23, MIT MLP-25, MIT MLP-30, MIT MLP-36, MIT MLP-55, MIT MLP-60, MIT MLP-70, MIT MLP-80, MIT MLP-100, MIT MLP-125

is in conformity with the legal requirements presented in the 89/392 CEE Machinery Regulations and its successive amendments.

Applicable Harmonized Standards:

- EN 292-1 (General principles of terminology design and basic methodology)
- EN 292-2 (General principles of specifications design and technical principles)
- EN 60204-1 (General regulations for the electrical equipment of the machinery)
- EN 349 (Minimum spaces to prevent parts of the body being crushed)
- EN 294 (Minimum safety distances for the upper limbs).

We also declare that, as required in the Vth Enclosure of the 89/392 CEE Machinery Regulations:

- the  symbol is displayed on the machinery;
- the Technical File is available for examination by the appropriate Authorities at the Manufacturer's Head Office.

Job Title - Date - Authorized Signature

10.10.2017

BARBAROS GENCER
General Manager



Address: DES SAN. SIT. 107 SOK. B14 BLOK NO :2A/4 UMRANIYE ISTANBUL -TURKEY

Phone: + 90 216 660 1305

Mail: info@ekinendustriyel.com

DECLARATION OF CONFORMITY

FDA DECLARATION OF CONFORMITY



We herewith declare

EKIN INDUSTRIAL HEATING AND COOLING INDUSTRY CO.

Ekin Industrial Heating and Cooling Industry Co. hereby certify that our EPDM & PTFE & FKM rubber compound

EPDM-70 & PTFE & FKM
meets the following regulations

| | |
|----------------------------|--|
| FDA 21 CFR 177.2600 | Rubber articles intended for repeated use in contact with foods. The requirements stated in FDA 21 CFR 177.2600 on type and amount of carbon black is fulfilled in the following way: The carbon black (type furnace black) exceeds 10% but not 50% of the total weight of the rubber article. <u>Aqueous and fatty foods:</u> EPDM-70 & PTFE meets the specifications (extraction in distilled water and n-hexane) regarding repeated use in contact with aqueous and fatty foods. |
|----------------------------|--|

| | |
|------------------------|---|
| EG VO 1935/2004 | Based on the "FOOD and DRUG (FDA)" Administration 21 CFR § 177.2600 and USP Class VI, Ekin Industrial Heating and Cooling Industry Co. confirm the harmlessness for human health as required in EG VO 1935/2004 and in addition, Ekin Industrial Heating and Cooling Industry Co. confirm that the requirements for traceability have been fulfilled. |
|------------------------|---|

Job Title – Date – Authorized Signature

03.11.2017

BARBAROS GENCER
General Manager



Address: DES SAN. SIT. 107 SOK. B14 BLOK NO :2A/4 UMRANIYE ISTANBUL -TURKEY

Phone: + 90 216 660 13 05

Mail: info@ekinendustriyel.com

DECLARATION OF CONFORMITY



CERTIFICATE

EKİN ENDÜSTRİYEL ISITMA SOĞUTMA SAN. VE TİC. LTD. ŞTİ.

ATATÜRK CAD. DESSAN SANAYİ SİTESİ B14 BLOK 107 SOK. Z/A NO:4 ÜMRANIYE / İSTANBUL
/ TÜRKYE, Türkiye

İNTERSİSTEM TEKNİK BELGELENDİRME tarafından denetimmiş ve uygulanmakta olduğu
Kalite Yönetim Sisteminin

is authority INTERSİSTEM TEKNİK BELGELENDİRME Certification and applied
Quality Management System meet the requirements of

ISO 9001:2015

standartına aşağıdaki kapsamda uymakta olduğu görülmüştür.
standard for the following activities.

PLAKALI EŞANJÖR, AKÜMÜLASYON TANKI, BOYLER, LEHİMLİ EŞANJÖR, BORULU EŞANJÖR,
GENLEŞME TANKI, ISI İSTASYONU, DENGİ TANKI, TORTU TUTUCU, HAVA AYIRICI, BUFFER TANKI,
PAKET SİSTEM, POMPA, SOĞUTMA KULESİ, CHİLLER, SOĞUTMA GRUBU, KAZAN, DİFÜZÖR,
BLOWER, BATARYA, ISI DEĞİŞTİRİCİ RADYATÖR, EKONOMİZER,
SERPANTİN, VANA, UHT, CİP VE PASTÖRİZATÖR ÜRETİMİ VE SATIŞI

MANUFACTURER AND SERVICE OF PLATE HEAT EXCHANGER, ACCUMULATION TANK, WATER STORAGE TANKS, WATER HEATER TANK,
BRATED HEAT EXCHANGER, THERM AND TUBE HEAT EXCHANGER, EXPANSION TANK, SUSSTATION, BALANCE TANK, DRIFT SEPARATOR,
AIR SEPARATOR, BUFFER TANK, COMPACT SYSTEM PUMP, COOLING TOWER, CHILLER, COOLING GROUP, DIFFUSER, BLOWER, COIL,
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Sertifika No / Certificate No: QM-0090-13001066-TR

11.10.2017

Sertifika Tarihi

Certificate Date

10.10.2020

Belgeleme Periyodu Baş Tarihi
Certification Period Expression Date

10.10.2020

Sertifika Geçerlilik Tarihi

Certificate Expiry Date

3 YIL

Belgeleme Periyodu
Certification Period



TÜRKAKK ISO NO
YS-0105-AB



TR 820 31 Yapan Kuruluş: 07.2012 Revizyon No: 03 Yarı Yılı: 03.2015

Revizyon / Revision Tarihi:

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CERTIFICATE OF WARRANTY



The Document's Confirmation Date And Number.

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1. Warranty period starts from the delivery date of the goods.
2. All parts of the goods are covered by our company's warranty.
3. In case of malfunction of the goods 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.
4. In case of malfunction of the goods within the warranty period due to material, workmanship or assembly defects, the goods will be repaired at no cost and no additional cost will be asked from the buyer under the name of changed part price or any other name.
5. Malfunctions arising from the use of the product in contravention of the provisions in the user manual are not covered by the warranty.
6. For the problems that may arise in relation to the warranty certificate can be applied to the Sanayi ve Ticaret Bakanlığı Tüketicinin ve Rekabetin Korunması Genel Müdürlüğü.

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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 two years.

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Model : _____
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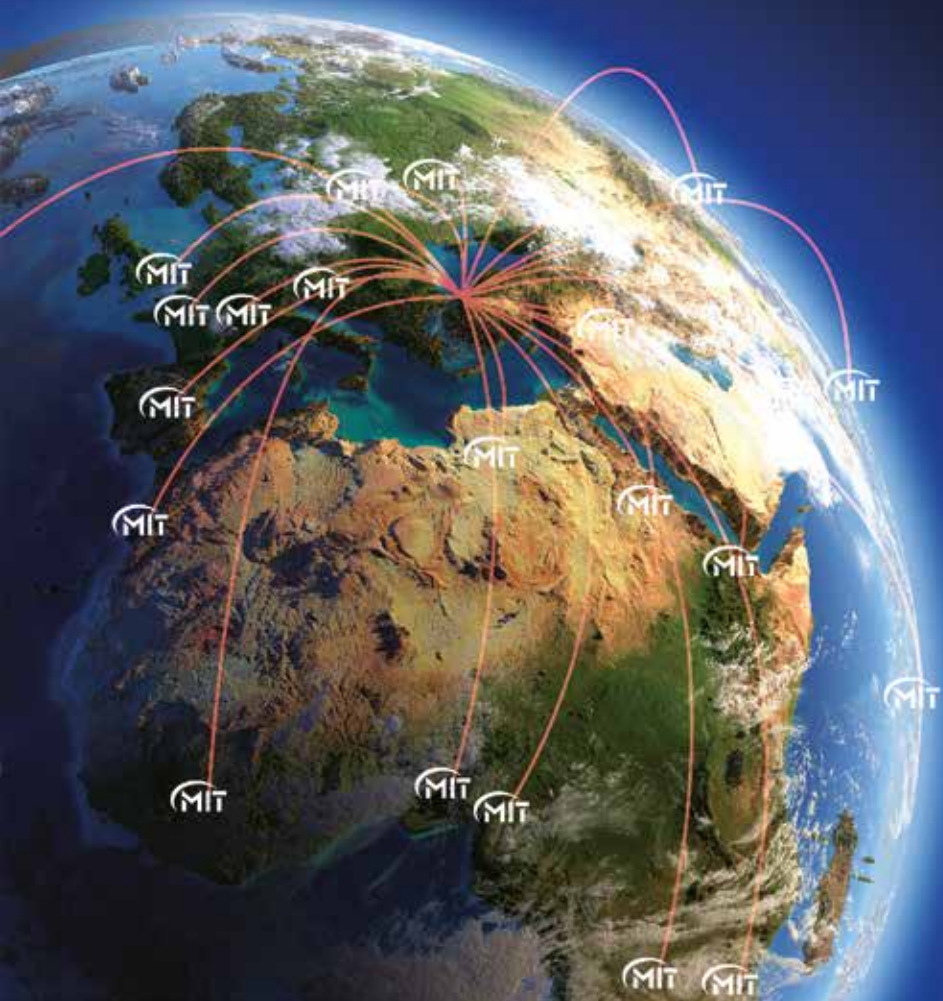


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