

## Introduction

LMP is a self-priming three-spindle screw pump. It was designed to convey emulsions, as well as cooling and cutting oils. A specially hardened cast iron pump housing and specially hardened drive and running spindles made from high-performance steel ensure an optimal service life. It is available in a variety of sizes for optimum operating point design. The design and material were deliberately selected to ensure optimal performance, good handling and a long service life for the LMP. It is equipped with a three-phase motor and can be equipped or retrofitted with a frequency converter/drive control.

## Features and benefits

- Axial and radial bearings on the drive spindle increase the running smoothness and stiffness, thus minimizing the running noise
- Axial bearings with hydrostatic thrust compensation to absorb high shock loads, resulting in less friction and therefore minimizing wear and tear
- A specially hardened cast-iron pump housing that allows optimal service life
- Special hardened and therefore hard-wearing drive and running spindles
- Use of labyrinth seals to reduce internal operating pressure
- A second discharge opening, located behind the sliding or radial shaft seal to protect the ball bearing in case the seal fails working
- Installation immersed on the tank, as well as dry/horizontal



## Performance

LMP screw pumps are offered in various frame sizes. Within one pump frame size, a combination with various motors is possible; the performance adjustment in 10 bar increments is standard. The pump part combined with the required motor is the pump type.

**LMP:** Delivery pressures to  $p_{\max} = 150$  bar  
Delivery rates to  $Q_{\max} = 686$  l/min

The performance data is applicable to viscosities up to 20 mm<sup>2</sup>/s. Performance data for pressures higher than 150 bar on request.

## Technical data

Operating principle	electrically operated screw spindle pump
Types of fluids	emulsions, cooling and cutting oils, as well as pure liquids without abrasive or long-fibre components
Kinematic viscosity of the conveying media $v_{\max}$	1 – 2 500 mm <sup>2</sup> /s
Grain size (conveying medium)	max. Ø 0,05 mm
Solids (conveying medium)	max. 40 mg/l
Number of spindles	3
Delivery rate $Q_{\max}$	686 l/min
Delivery pressure $p_{\max}$	150 bar
Pressure connection	G ¾ or G 1 ¼ or SAE 2 (depending on model and design)
Operating temperature range	0 to +80°C
Immersion depths	219 to 435 mm (further diving depths with extension tube)
Protection class	IP 55
Approval	CE (UL/CSA/CCC etc. on request)
Noise level	56-79 dB (A)
Weight	30-983 kg
Installation position	vertical (foot flange design horizontal or vertical)

## Mechanical design

	<b>LMP-G</b>	<b>LMP-S</b>
Housing	EN-GJL-250	EN-GJL-250
Spindles	heavy-duty steel, 1 000 HV	heavy-duty steel, 1 500 HV
Sealing bush	Cast iron, hardened	silicon carbide
Radial shaft seal	PTFE	PTFE
Leakage return	PTFE	stainless steel
Pump support	aluminum	aluminum
Bearing	deep groove ball bearing with shield	deep groove ball bearing with shield

## Electrical design

Protection class (DIN EN 60 034-5/4.88)	IP 55
Insulation class (DIN EN 60 034-1)	F.B
Number of pole pairs	2-polig
Direction of rotation <sup>1)</sup>	clockwise rotation, seen from the top on the ventilation side of the motor
Ambient temperature (DIN EN 60 034-1)	max. 40°C at max. 1000 meters above sea level

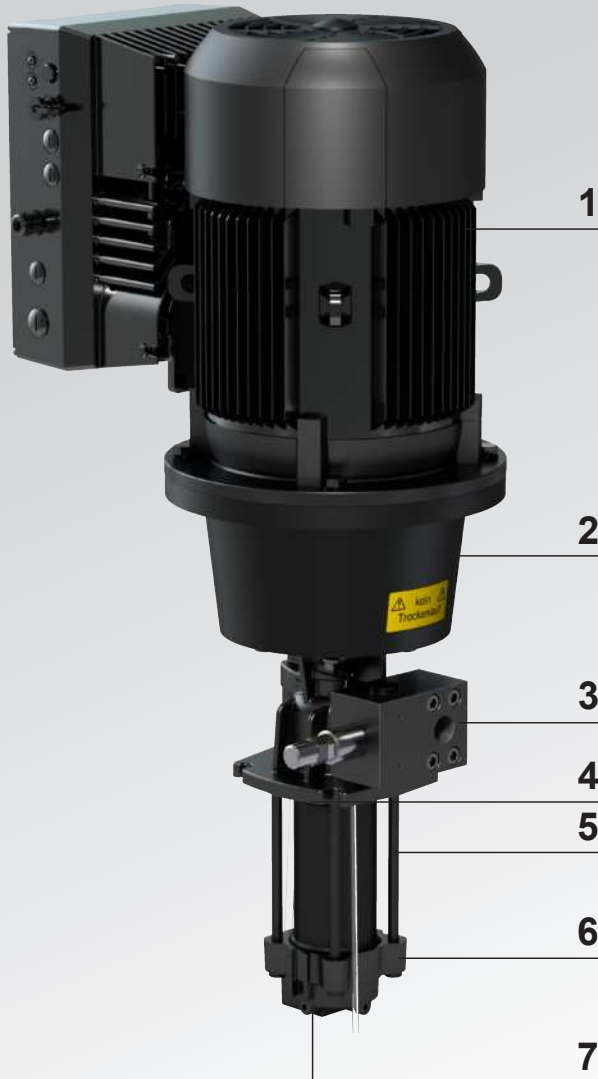
<sup>1)</sup> The wrong direction of rotation (counterclockwise) will destroy the pump.

The drive motors comply with the VDE regulations and the European motor standards with an electrical voltage tolerance of ±5% (DIN EN 60 034-1) and the requirements of the CE mark. In addition, we also offer versions for special operating conditions (e.g. extreme exposure to moisture or dust). remarks after non-European regulations, e.g. B. CSA, UL or according to special requirements, e.g. USA or Japan are possible.

## Power grid conditions (standard, others available on request)

≤ 4 kW	230/400 V, 50 Hz and 265/460 V, 60 Hz
≥ 5,5 kW	Δ 400 V, 50 Hz and Δ 460 V, 60 Hz

## Design



### Design features

Spindles specially hardened	●
Hydrostatic thrust compensation	●
Shaft sealing: Rotary shaft lip-type seal	●
Mechanical seal	○
Screw housing specially hardened	●
Guard ring for rotary shaft lip-type seal	●
Leakage monitoring	●
Installation outside the reservoir with foot flange and external leakage feed-back system	○
Pressure regulating valve:	
Frame size 10-17, 20-22	●
4-pole motor	○
Regulated speed motor	○

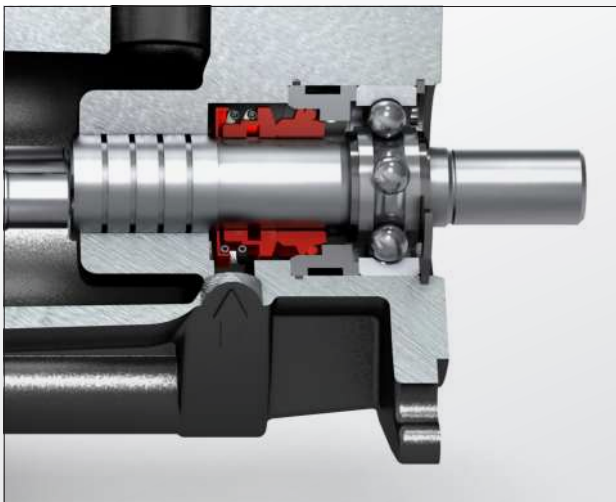
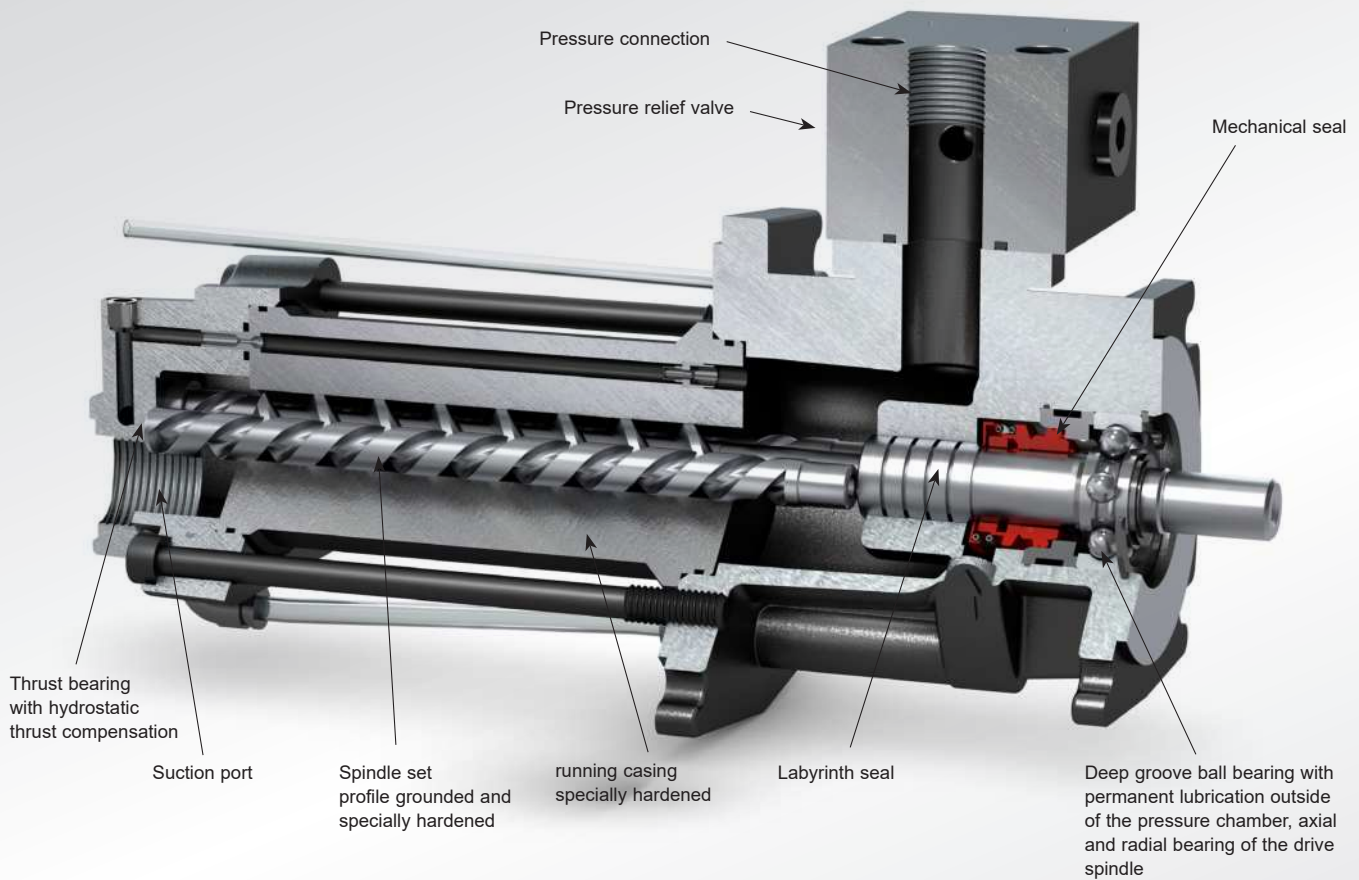
● standard    ○ optional

Drive **(1)** and pump unit are connected using a curved-tooth coupling **(2)** within the pump support. The pressure housing **(4)** contains the bearings for the drive spindle and its sealing.

The LMP is a self-priming positive-displacement pump. The medium is pumped by a set of spindles **(5)** in the screw housing. This consists of a drive spindle and two screw spindles. Rotation of the spindles causes the pumped medium to move continually and without pulsation axially from the suction opening **(7)** in the suction housing **(6)** to the pressure limiting valve (up to size LMP17) **(3)** with pressure port.

The special profile formation of the spindles generate sealed chambers with minimum medium backflow and a high level of effectiveness.

## Sectional view

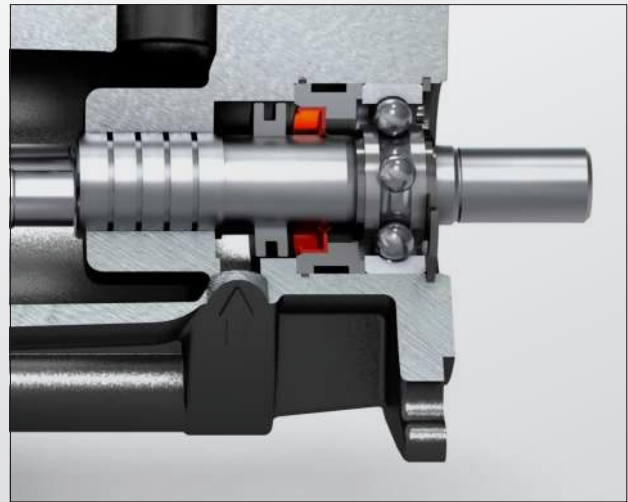


### Mechanical seal

The mechanical seal is the premier class among the LMP shaft seals and is particularly recommended for dry-installed pumps. The complex design of this seal with sealing lips and spiral springs helps to prevent even the smallest leaks along the shaft to the motor.

### Attention!

Mechanical seals are not suitable for dry running! Due to the friction caused by the dry running, these seals wear out within minutes.



### Radial shaft seal

The radial shaft seal is the LMP's standard shaft seal and is particularly recommended for submersible pumps. It is designed for the usual inlet pressures of max. 5 bar and thus prevents leaks along the shaft to the motor.

### Attention!

Radial shaft seals are not suitable for dry running! Due to the friction caused by the dry running, these seals wear out within minutes.

## Standard series for machine tools

LMP standard series are market-proven pumps. These pumps have towards the custom solutions a number of advantages. In addition to the significantly simplified product selection, these series score particularly well with their high availability and short delivery times. Thanks to the pressure relief valve integrated in this series, the service life of the pumps is increased and thus reliable system operation is supported. Regarding the components are these ranks nevertheless absolutely identical with the individually configurable LMP variants.

### Advantages

- Optimal product availability
- Short delivery times (approx. 1 week)
- 3D CAD data available online
- Simplified product selection
- Improved ordering process
- Overpressure protection by pressure relief valve



Order number	Operating pressure max.	Design	Frequency f	Flow rate		Voltage U	Capacity P	IE class	Weight net
				1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s				
LMP1140GWK219L01CA	40 bar	standard (LMP-G)	50 Hz	25 l/min	31 l/min	230/400 V	3,0 kW	IE 3	47 kg
			60 Hz	33 l/min	38 l/min	265/460 V	3,45 kW		
LMP1140SGK219L01CA	40 bar	highly wear-resistant (LMP-S)	50 Hz	25 l/min	31 l/min	230/400 V	3,0 kW	IE 3	47 kg
			60 Hz	33 l/min	38 l/min	265/460 V	3,45 kW		
LMP2160GWK219N02CA	60 bar	standard (LMP-G)	50 Hz	34 l/min	42 l/min	400 V	5,5 kW	IE 3	63 kg
			60 Hz	43 l/min	51 l/min	460 V	6,3 kW		
LMP1260GWK262O02CK	60 bar	standard (LMP-G)	50 Hz	50 l/min	60 l/min	400 V	7,5 kW	IE 3	78 kg
			60 Hz	62 l/min	73 l/min	460 V	8,6 kW		
LMP2080GWD219N06CK	80 bar	standard (LMP-G)	50 Hz	24 l/min	34 l/min	400 V	5,5 kW	IE 3	78 kg
			60 Hz	32 l/min	43 l/min	400 V	5,5 kW		
LMP2180GWK219O06CK	80 bar	standard (LMP-G)	50 Hz	30 l/min	40 l/min	400 V	7,5 kW	IE 3	77 kg
			60 Hz	40 l/min	50 l/min	400 V	7,5 kW		
LMP2180SGK219O06CK	80 bar	highly wear-resistant (LMP-S)	50 Hz	30 l/min	40 l/min	400 V	7,5 kW	IE 3	77 kg
			60 Hz	40 l/min	50 l/min	400 V	7,5 kW		
LMP1215GWK262R02CA	150 bar	standard (LMP-G)	50 Hz	32 l/min	52 l/min	400 V	18,5 kW	IE 3	110 kg
			60 Hz	45 l/min	65 l/min	460 V	21,3 kW		





## Primary areas of use

- Machine tools / filter systems
- Cooling and temperature control devices
- Aerospace Industry
- Air conditioning technology
- Cooling systems for laser cooling
- Cleaning and degreasing systems
- Grinders
- Lapping machines
- Medical devices
- Optical machines
- Surface and process engineering
- i.a.

Due to its wear-resistant design, the LMP series is especially well suitable for the following applications:

- Demanding applications involved in processing difficult to mill materials such as aluminium and stainless steel
- Various precision applications such as in the aerospace industry
- Grinding applications

## Operating conditions

LMP screw pumps were developed to pump clean liquids without abrasive or long-fibrous components. When selecting the type, it should be noted that the delivery rate of the pump is calculated based on the required system output.

Generally acceptable contamination:

- max. solids content: 40 mg/l
- max. grain Size: 0.05 mm (50 µm) for machining (lathing, drilling, milling)

Application specific values on request.

Kinematic viscosity:

22–2500 mm<sup>2</sup>/s (more than 2500 mm<sup>2</sup>/s on request)

Maximum admission pressure:

- For design with rotary shaft seal: 5 bar
- For design with mechanical seal: 10 bar

Geodesic suction head max. 4 m

Pumping temperature: 0 °C to +80 °C

**Running dry and operation with closed pressure side is not permissible.** As positive-displacement pumps, screw pumps have to be protected against overpressure on the system side using a pressure regulating valve.

## Switching-on frequency:

The pumps should be used for continuous operation to the extent possible. If this is not possible due to the process, then the pump's constant flow rate should be regulated using a frequency converter or a regulating valve for example

## Configurator - complete pump

With the following configurator, individual LMP screw pumps can be assembled. Please note that the LMP standard series (See page 8) are much better available and can be delivered faster than individual configurations.

### Do you have questions about the configurator?

Talk to our customer service:

+49 30 72002 219

#### Type number key

	L	M	P															
Series																		
Size																		
Maximum delivery pressure																		
10 = 10 bar 20 = 20 bar 30 = 30 bar ... (in increments of 10 up to) 00 = 100 bar 11 = 110 bar 12 = 120 bar 15 = 150 bar																		
Material design																		
G = Cast iron with lamellar graphite EN-GJL-250 S = Hardened cast iron with flake graphite EN-GJL-250 and silicon carbide bushing																		
Seal type																		
W = rotary shaft seal G = mechanical seal																		
Pump guide																		
K = SAE flange + pressure regulating valve T = SAE flange + pressure regulating valve + foot flange																		
Immersion depth in mm																		
219, 262, 311, 361, 381, 435																		
Motor index <sup>1)</sup>																		
L = 3kW at 50Hz; 3,45kW at 60Hz ...																		
Electrical supply <sup>1)</sup>																		
01 = 230V/400V 50Hz, 460V 60Hz bis 4kW (European standard) 02 = 400V 50Hz, 460V 60Hz ab 5,5kW (European standard)																		
Motor design <sup>2)</sup> in IE3																		
CA = Standard ((insulation class F.B, IP 55, 2-polig) CC = UL/CSA design CD = Industrial plug connection (DESINA) CI = Integrated frequency converter CK = PTC thermistor ...																		

<sup>1)</sup> to determine the index, please use the tables with the explanations from page 14 onwards

<sup>2)</sup> Data and dimensions refer to IE3 motors