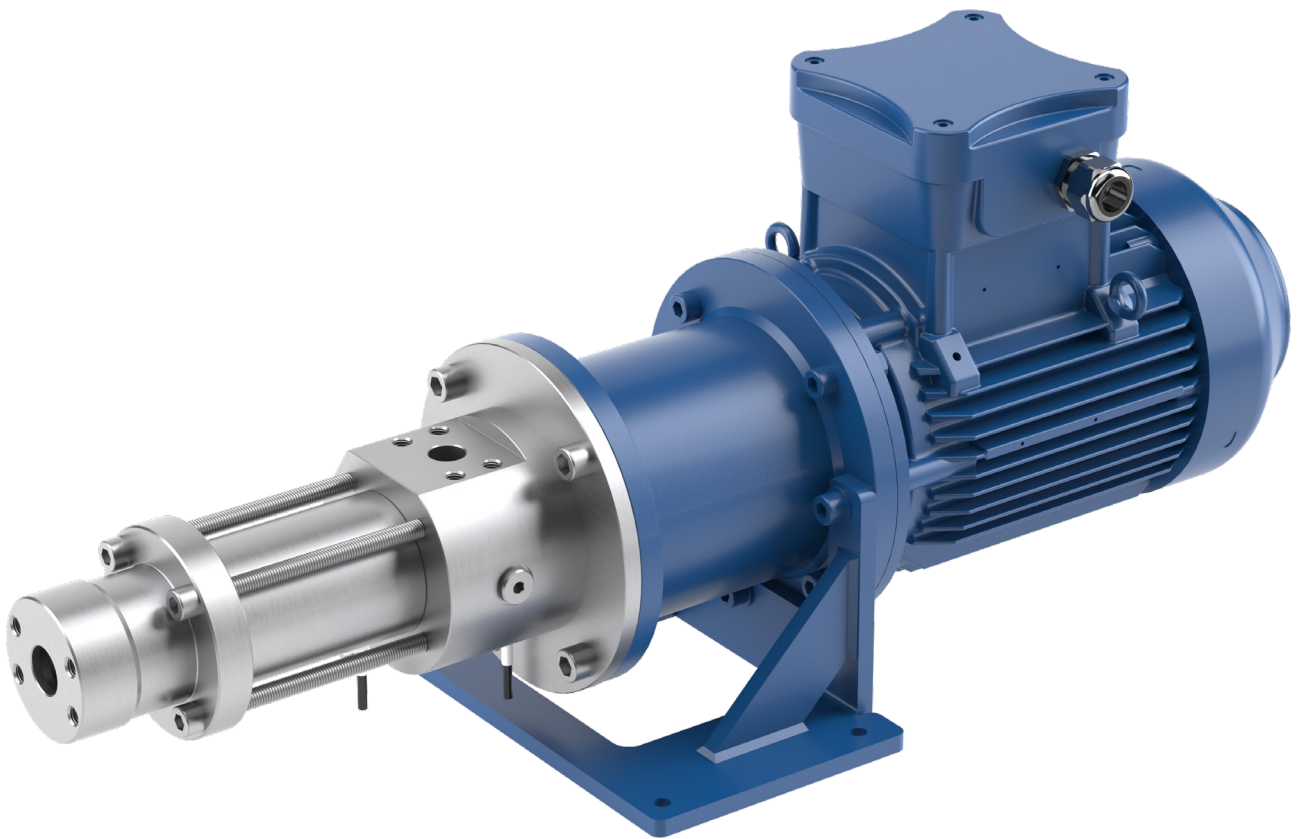


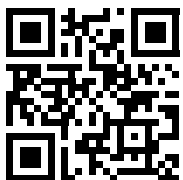
■■■■■■■ Pumps.

KRAL



KRAL Screw Pumps.

F Series.



KRAL Screw Pumps F Series.

For non-lubricating, low-viscosity and aggressive media.



Applications.

Whether dealing with low-viscosity, aggressive or poorly lubricating media, the KRAL F pump series ensures reliable and efficient delivery even under demanding operating conditions and is also ideally suited for use with future fuels.

In the marine sector, the F series supports modern propulsion concepts and dual-fuel systems by reliably pumping alternative fuels such as methanol, ammonia, HVO, FAME and ethanol.

Other areas of application include the energy, chemical and process industries. Here, the F series excels in the handling of demanding media, as well as in applications that require the highest levels of reliability, leak-tightness and process safety.



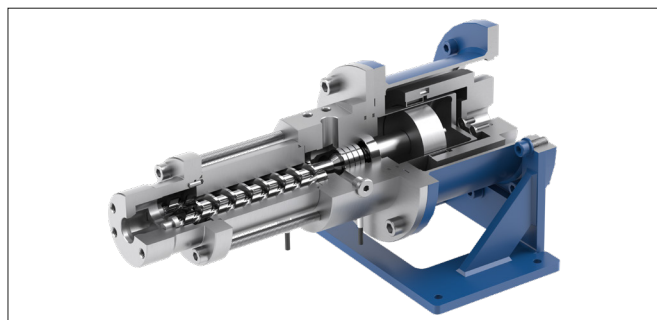
The F pump in the KRAL product range.

The pump for challenging media and alternative fuels.

- All media-wetted parts made of stainless steel.
- Suitable for low-viscosity media from 0.2 mm²/s.
- Hermetic sealing with magnetic coupling.
- Resistant to fuels with acid value > 0.5 mg KOH/g.
- Differential pressures up to 80 bar for LFO and Biofuels. For methanol and ammonia up to 30 bar.
- Approved for use in ATEX zones 1 and 2.
- Various coatings and material combinations are available on request.
- Horizontal or vertical installation possible.

Operation, materials, components.

Delivery rate:	5 to 280 l/min.
Max. differential pressure:	120 bar.
Temperature range:	-40 °C to +300 °C, for coated housing up to max. +80 °C.
Viscosity:	0.2 to 500 mm ² /s.
Housing:	Stainless steel.
Screws:	Stainless steel.
Approvals:	ABS, BV, CCS, DNV, KR, LRS.
ATEX:	Ex II -/2 G Ex h IIC T4...T2 -/Gb X.

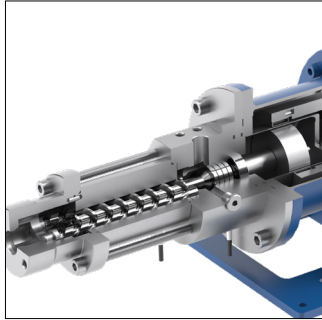


Advantages of screw pumps.

The pumps are self-priming and operate with low pulsation and low-noise. They are characterized by low maintenance requirements and long service life.

Proven technology in a compact design.

KRAL screw pumps offer high delivery performance with a small footprint compared to other pump types. This is especially true at high differential pressures as well as for demanding Future Fuel applications.

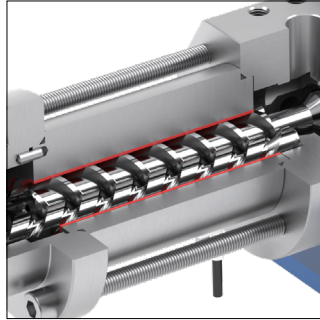


Materials.

The F series features a stainless steel housing and stainless steel media-wetted parts as standard.

The screws are made of stainless steel with high surface hardness and optimized sliding features.

This enables the F series to handle even demanding applications involving future fuels as well as low-viscosity and non-lubricating media reliably and durably.

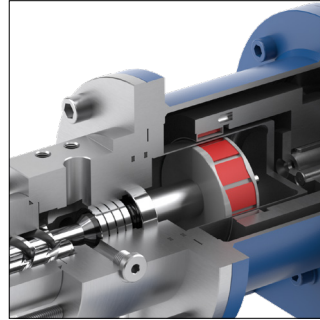


Coatings.

Various coating options are available for different media and operating conditions.

The F series features specially coated or surface-hardened housing bores. These high-quality surface treatments ensure outstanding wear resistance and specific low coefficients of friction.

This makes the F series particularly suitable for low-viscosity media with low lubricity, alternative fuels such as methanol, ammonia or ethanol and chemical liquids.



Magnetic coupling.

The F series is hermetically sealed by a magnetic coupling as standard. This ensures that the pump is completely leak-free.

Furthermore, the design is suitable for demanding operating conditions, including medium temperatures of up to 300 °C and, optionally, inlet pressures of up to 80 bar.

Operating principle:
The motor torque is transmitted through the containment can to the pump shaft without contact, using magnetic forces.

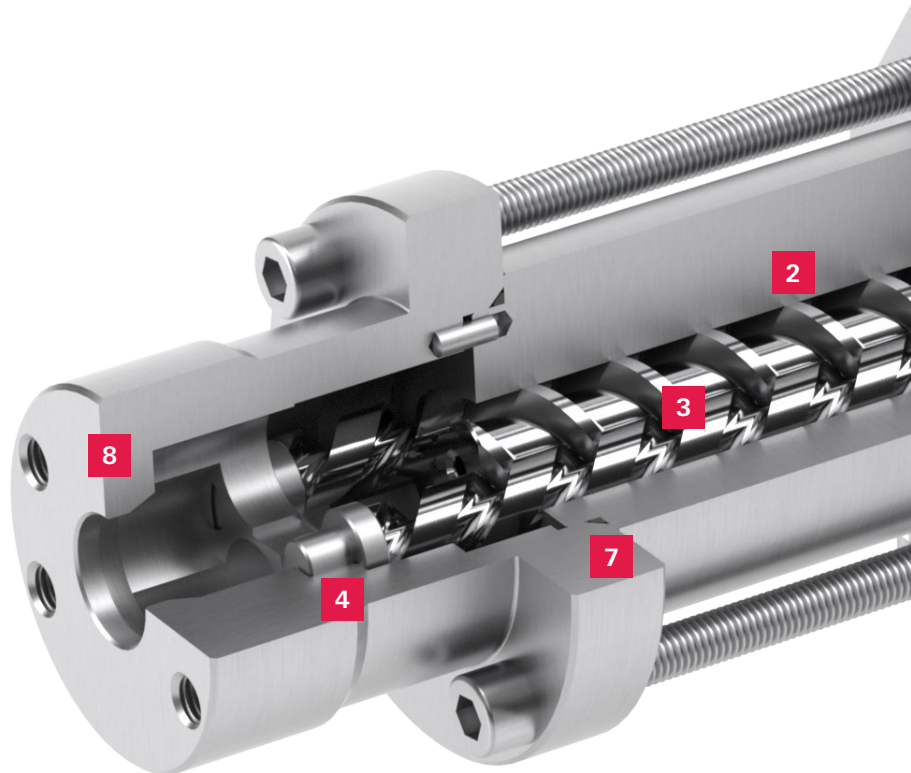


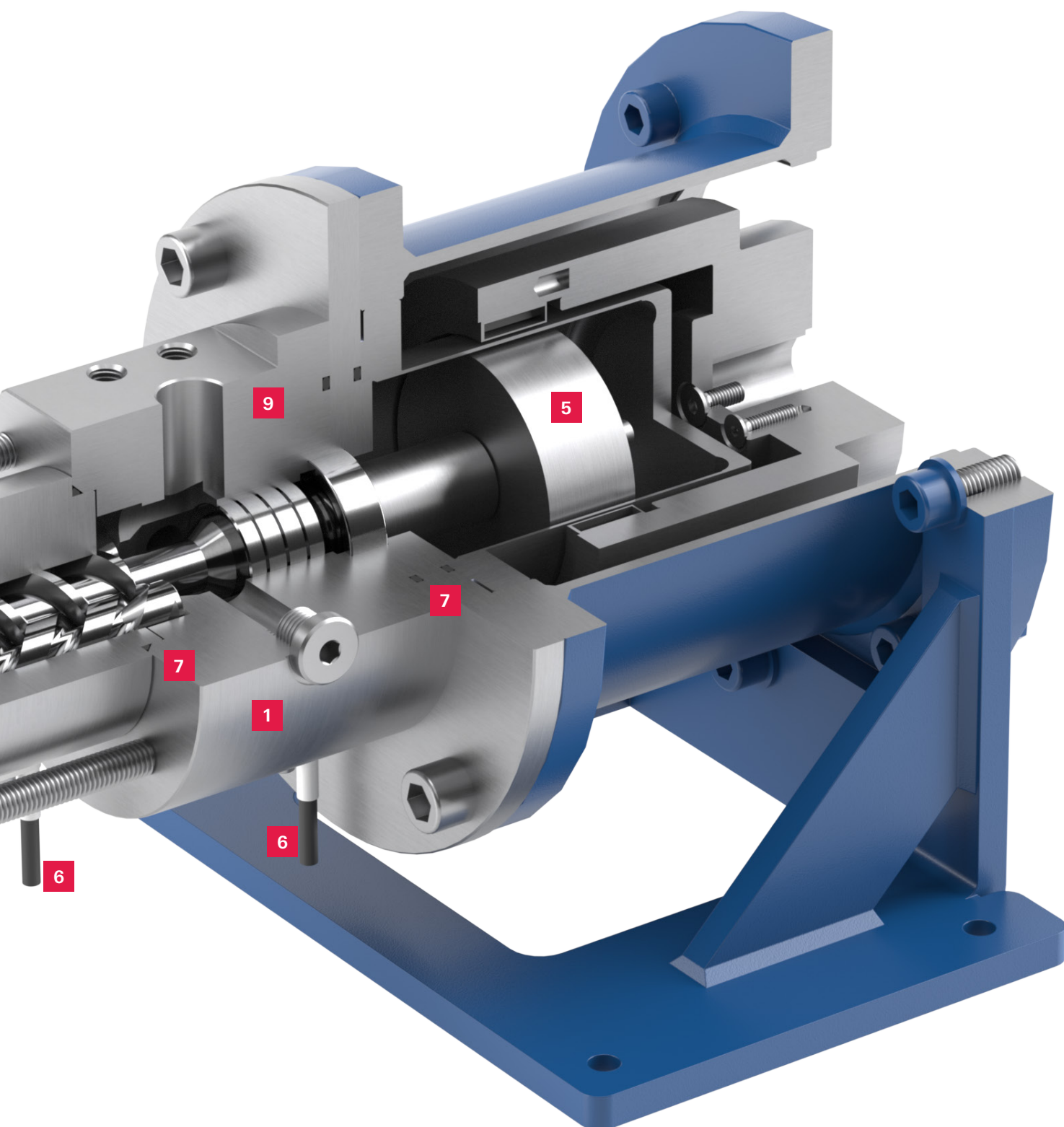
ATEX zones 1 and 2.

The F series is approved for use in ATEX zones 1 and 2. The containment can with an integrated temperature sensor enables safe operation in potentially explosive gas atmospheres.

This makes the pump particularly suitable for applications involving methanol, ammonia and other critical medias.

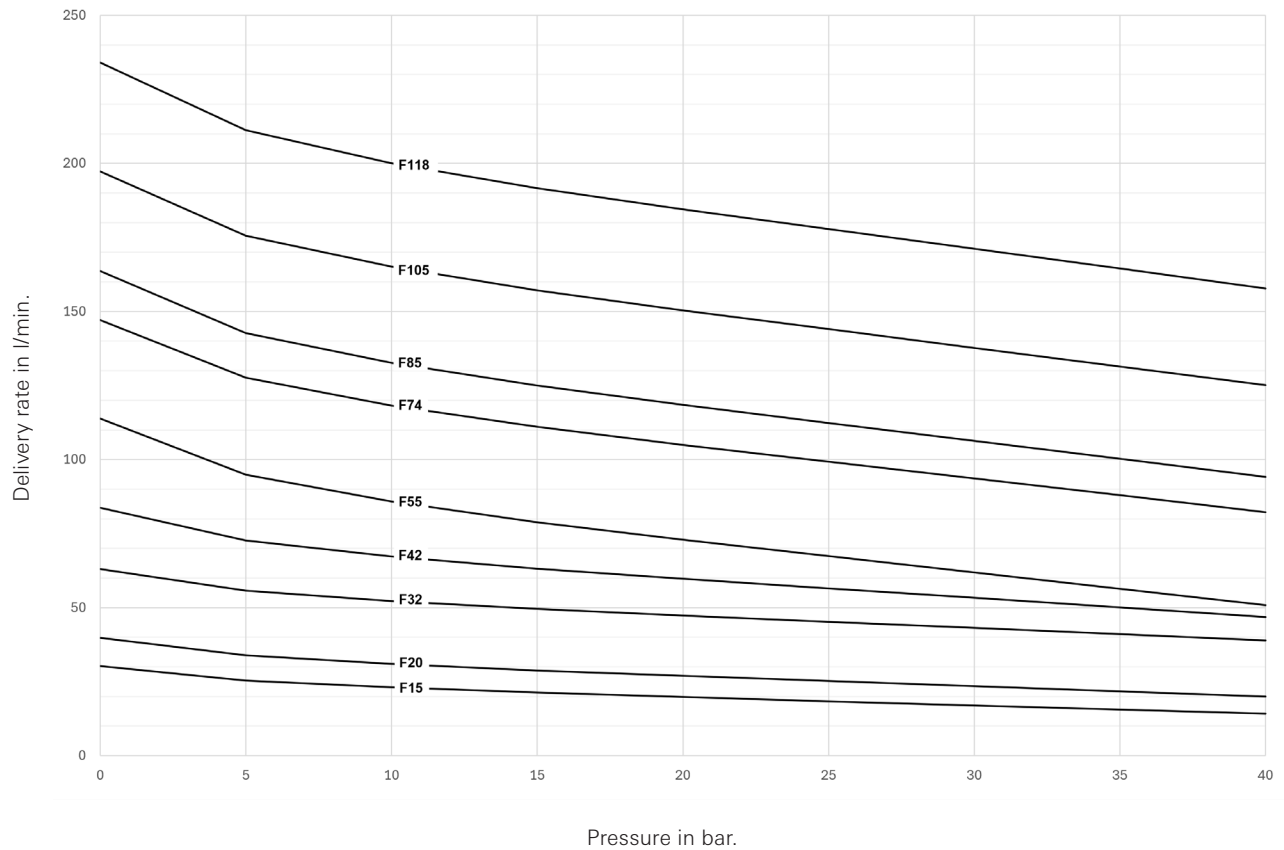
- 1 Corrosion-resistant materials.**
The housing and all media-wetted parts are made of stainless steel as standard.
- 2 Coated housing options.**
A range of coatings for outstanding sliding properties and minimal friction.
- 3 Corrosion-resistant screws.**
The stainless-steel screws feature high surface hardness and special coatings for optimized sliding behaviour and excellent emergency-running properties.
- 4 Balanced idle screws.**
Hydraulically balanced idle screws for minimum axial forces and low-noise operation.
- 5 Standard magnetic coupling.**
Hermetically sealed thanks to magnetic coupling.
- 6 For ATEX zones.**
Containment can with temperature sensor for use in potentially explosive gas atmospheres (ATEX zones 1 and 2).
- 7 Reliable sealing.**
Adequate elastomer selection for reliable sealing of critical points.
- 8 Axial and radial.**
A wide range of connection options enables compact system integration.
- 9 Almost maintenance-free.**
Selected materials, special coatings and axial-load compensation ensure virtually maintenance-free operation over many years, even when handling media with low lubricity.





All Data at a Glance.

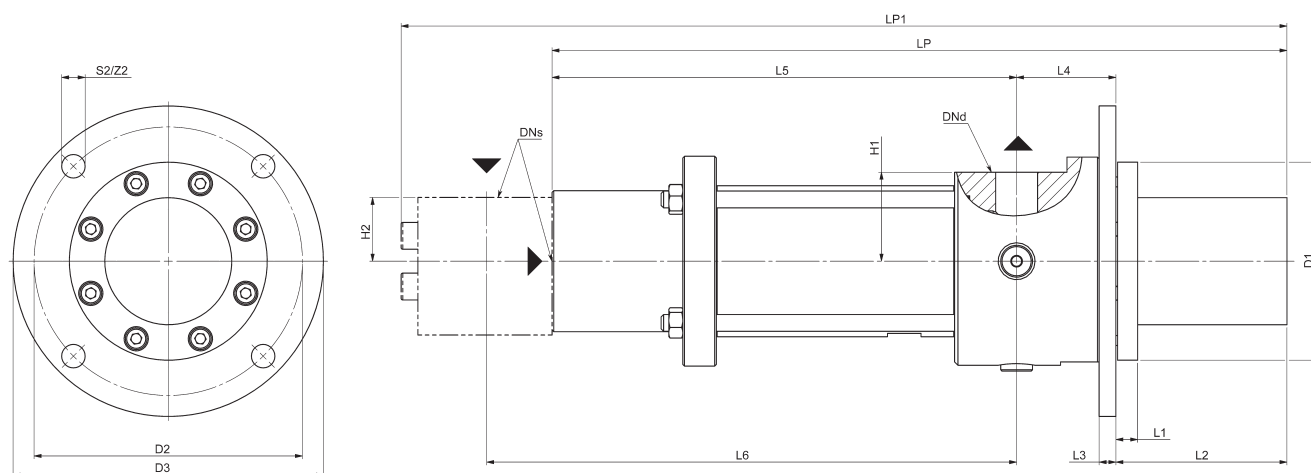
Overview of delivery rates at 2,900 min⁻¹ and 0.5 mm²/s (cSt).



Technical data F.		15-20	32-42	55-74-85	105-118
Delivery rate (at 2900 min ⁻¹ , 40 bar, 1 mm ² /s)	l/min	up to 25	up to 60	up to 120	up to 180
Max. differential pressure	bar	120	120	120	120
Temperature	°C				
with coated housing		80	80	80	80
with standard running housing		300	300	300	300
Viscosity	mm ² /s				
min.		0.2	0.2	0.2	0.2
max.		500	500	500	500
Max. rotational speed	min ⁻¹	4.000	4.000	4.000	4.000
Max. feed pressure *	bar	16	16	16	16

* Special designs possible for deviating values.

Dimensional Overview



F pump with radial suction flange.

Pump.	Nm.	Flange.			Pump dimension.											Optional connection.		
		DNs *	DNd *	H1	D1	D2	D3	S2	Z2	L1	L2	L3	L4	L5	LP	L6	LP1	H2
15 – 20	10/20	SAE 1"	SAE 3/4"	50	118 ^{f8}	160	185	14	4	13	102	10	54	234	390	267	465	40
32 – 42	20/30	SAE 1 1/4"	SAE 1"	53	118 ^{f8}	160	185	14	4	13	102	10	59	277	438	316	528	38
55 – 85	20	SAE 2"	SAE 1 1/2"	70	163 ^{h7}	200	248	14	4	3	105	11	76,5	358	540	409	639	48
55 – 85	60	SAE 2"	SAE 1 1/2"	70	163 ^{h7}	200	248	14	4	3	130	11	76,5	358	565	409	664	48
105 – 118	60	SAE 2"	SAE 1 1/2"	75	163 ^{h7}	200	230	14	4	4	117	16	79	373	569	424	668	48
105 – 118	80	SAE 2"	SAE 1 1/2"	75	163 ^{h7}	200	230	14	4	5	117	16	79	373	569	424	668	48

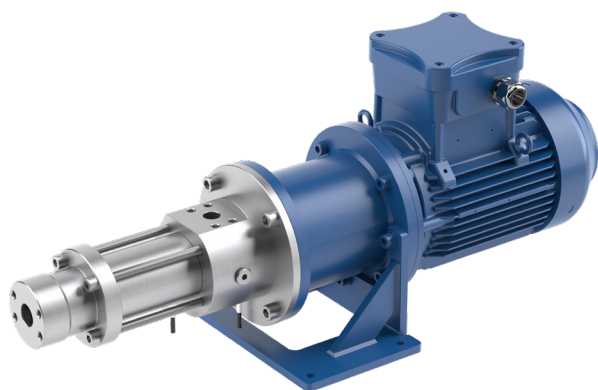
* 3.000 psi.

When Future Meets Experience.

KRAL screw pumps for future fuels.

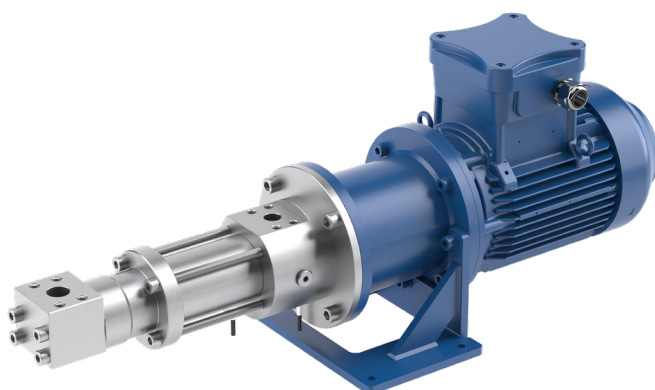


Design and Installation Variants.



Flange pump.

- Mounting on the pump bracket with foot.
- With axial inlet.



Flange pump.

- Mounting on the pump bracket with support foot.
- With radial inlet.

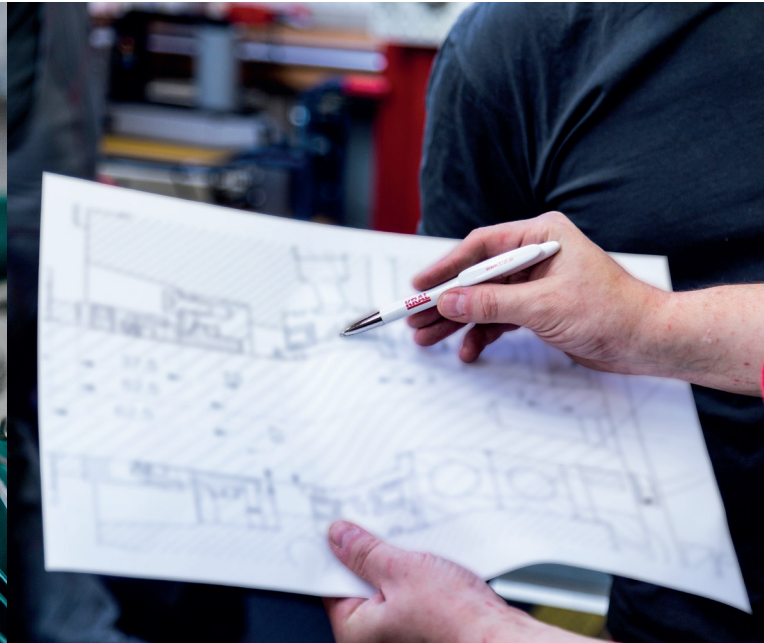
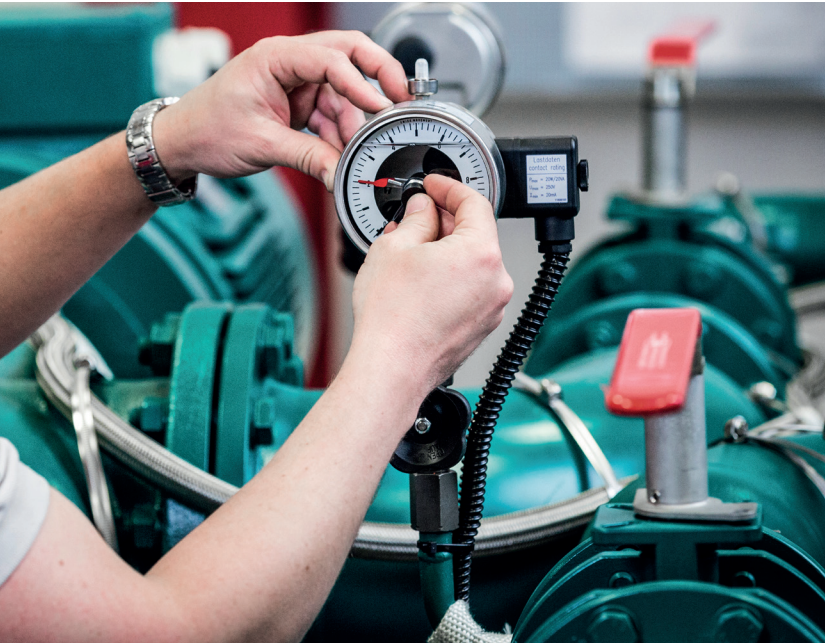


Vertical pedestal pump.

- Easy access for maintenance, inspection and servicing.
- Suitable for small installation spaces.

Service from a Single Source.

Short reaction times. Fast and competent.

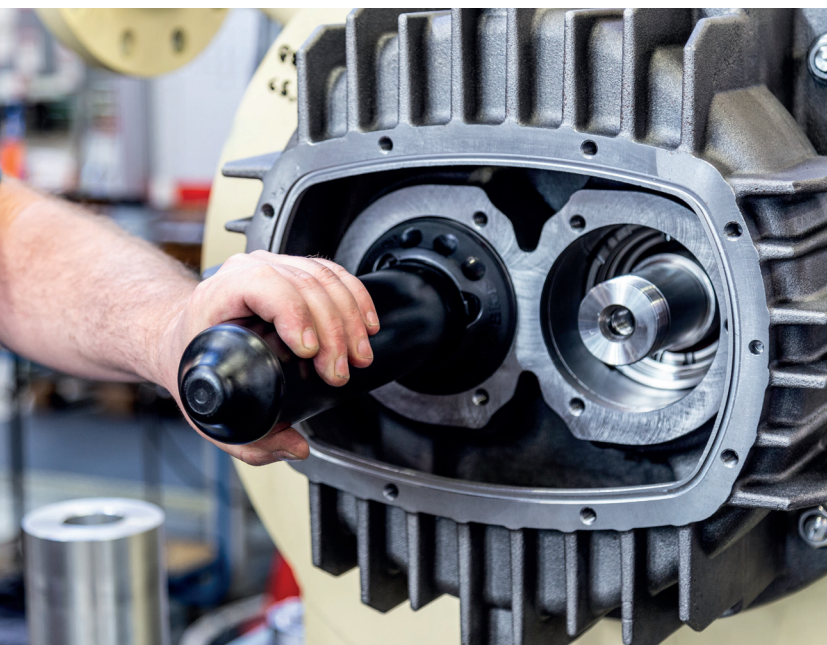


Installation and commissioning.

We can help you install and commission your KRAL products upon request. Professional installation and optimal deployment of the pumps are prerequisites for error-free operation. Our technicians not only know our products; they also know how the system affects the pump and can configure the latter accordingly for optimal performance. As a customer, you benefit from our wealth of experience, because we've commissioned large numbers of KRAL pumps at our customers' premises.

Training.

KRAL training provides you with in-depth knowledge on installing, commissioning, and maintaining your KRAL product. You receive expert information from the manufacturer on how to install and commission your KRAL product properly, and you learn about various applications and utilization limits. You also learn to identify and rectify faults based on actual damage profiles. We lead you through a professional maintenance routine and show how you can reduce your product's operating costs. The training can be held either at our headquarters in Lustenau or at your premises, upon request.



Maintenance and repair.

Downtime can generate substantial costs. Increase the operational safety and minimize the life-cycle costs of your KRAL product through the preventative maintenance services provided by our competent service team. When a breakdown occurs, our service technicians react quickly and arrive at your premises in no time. When you make a repair shipment, confirmation of receipt is sent to you as soon as the shipment arrives. Each time a repair is made, we send you a comprehensive technical report together with detailed images. We perform maintenance work and repairs at our headquarters in Lustenau, Austria or at your premises, upon request. And the genuine KRAL parts we use guarantee the highest standards of quality.

Spare parts.

KRAL pumps meet the highest quality standards. To ensure those standards are maintained, you should only use genuine KRAL parts as spare parts. They guarantee that your pumps maintain a high level of quality, continue to operate smoothly, and last a long time.



Headquarters.

KRAL GmbH

Bildgasse 40, Industrie Nord
6890 Lustenau, Austria
e-mail: kral@kral.at
Tel.: +43/55 77/86644-0

Further locations.

KRAL Deutschland GmbH

88131 Lindau
Germany

KRAL Polska Sp. z o.o.

40-668 Katowice
Poland

KRAL SAS

69100 Villeurbanne
France

KRAL-USA, Inc.

28105 Matthews, NC
USA

KRAL (Wuxi) Machinery Technology Co., Ltd.

214100 Wuxi
China

