Screw Pumps for Marine Applications
Efficient and reliable for many years
Welcome to KRAL

About us.
With headquarters in Austria, KRAL AG was founded in 1950 and has been an independent family enterprise ever since. We therefore think and invest long-term so that we can remain a stable and reliable business partner for our customers. KRAL develops and produces screw pumps and flow measurement technology. In addition, we offer customer-specific solutions for systems, from the initial engineering process through to commissioning. And of course our After Sales Service is available to help you after purchase. Our primary business sectors include marine, power generation, oil and gas, mechanical engineering and chemicals. Our customers include local businesses as well as global industrial concerns.

What you can expect from us.
Since the company was founded, KRAL has established itself as a manufacturer of quality products with a fair price/performance ratio. In order to live up to our standard, we continuously invest in our employees, our manufacturing processes and our methodological expertise. A commitment to Total Quality Management (TQM) is a key component in our company philosophy. Furthermore, we are increasing the levels of automation and digitization in our company.

Our customers claim that we can meet virtually any special need. What’s more, KRAL is greatly appreciated for its reliable partnerships and the fact that working together with us is professional and very straightforward. This makes us quite proud. We will continue to strengthen these values in the future. That’s why we continuously invest in innovations, both for products as well as methodology and processes. A key component in our approach to customer-orientation is that you can rely on excellent care from our Customer Center as well as our After Sales Service. This includes both expertise and reaction speed.

We have summarized what you can expect as a KRAL customer in our company vision:

„KRAL is quality, innovation and quick response, anytime and anywhere around the world."

Check out our services and see for yourself. We will be happy to help you.

Dr.-Ing. Harald Raak, MBA
CEO
## Table of Contents

### Applications
KRAL pumps – a wide range of applications  
Pages 04 – 05

### Booster module – K series
High performance, compact design – optimal for booster modules  
Pages 06 – 07

### Boiler – DKC | DLC series
When uninterrupted oil supply must be guaranteed  
Pages 08 – 09

### Engine and gear lubrication – K | C series
For efficient, reliable and long-lasting operation  
Pages 10 – 11

### Cargo, tank transfer and bunkering – Z series
Dry-run safe in all areas and optimum operating performance  
Pages 12 – 13

### Hydraulic applications – C | W series
The optimal solution for hydrodynamic know-how on deep-sea vessels  
Pages 14 – 15

### KRAL screw pump with magnetic coupling
Optimum safety and significantly reduced operating costs  
Pages 16 – 17

### Service & quality
Comprehensive service from a single source  
Pages 18 – 19
# Applications

**KRAL pumps – a wide range of applications**

<table>
<thead>
<tr>
<th>Applications</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Booster module</td>
<td>K*</td>
</tr>
<tr>
<td>2. Boiler</td>
<td>DKC</td>
</tr>
<tr>
<td>3. Engine and gear lubrication</td>
<td>K*</td>
</tr>
<tr>
<td></td>
<td>C*</td>
</tr>
<tr>
<td>4. Cargo, tank transfer and bunkering</td>
<td>Z</td>
</tr>
<tr>
<td>5. Hydraulic steering system</td>
<td>C*</td>
</tr>
<tr>
<td>6. Hydraulic propeller adjustment</td>
<td></td>
</tr>
<tr>
<td>7. Hydraulic anchor windlass</td>
<td>W*</td>
</tr>
</tbody>
</table>

* available with magnetic coupling
<table>
<thead>
<tr>
<th>Applications</th>
<th>Delivery rate</th>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster module K</td>
<td>5 to 2,900 l/min</td>
<td>16 bar</td>
<td>-20 to +180 °C</td>
</tr>
<tr>
<td></td>
<td>5 to 200 l/min</td>
<td>40 bar</td>
<td>-20 to +180 °C</td>
</tr>
<tr>
<td>Boiler DKC</td>
<td>DLC</td>
<td>5 to 2,900 l/min</td>
<td>16 bar</td>
</tr>
<tr>
<td>Engine and gear lubrication K</td>
<td>5 to 3,550 l/min</td>
<td>100 bar</td>
<td>-20 to +180 °C</td>
</tr>
<tr>
<td></td>
<td>5 to 3,550 l/min</td>
<td>100 bar</td>
<td>-20 to +180 °C</td>
</tr>
<tr>
<td>Cargo, tank transfer and bunkering Z</td>
<td>1,300 to 11,000 l/min</td>
<td>25 bar</td>
<td>-40 to +300 °C</td>
</tr>
<tr>
<td></td>
<td>5 to 3,550 l/min</td>
<td>100 bar</td>
<td>-20 to +180 °C</td>
</tr>
<tr>
<td></td>
<td>15 to 290 l/min</td>
<td>120 bar</td>
<td>-20 to +180 °C</td>
</tr>
</tbody>
</table>

* available with magnetic coupling
### Booster Module – K Series

The KRAL K series is ideally suited for use in booster modules due to its high power density and compact design.

The booster module is the heart of a ship’s fuel supply. It filters fuel and sets the correct pressure and viscosity. The properties of the fuels used place high demands on the booster module pumps. Heavy fuel oil must be pumped at high temperatures. Critical substances may be present in the fuel. Despite extensive filtering, abrasive foreign particles are not completely removed.

KRAL screw pumps from the K series are self-priming positive displacement pumps. They convey fuel over a wide pressure range with high efficiency, even if the viscosity changes.

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**Product information**
- **Housing:** Spherulitic graphite iron EN-GJS-400
- **Screws:** Nitride steel
- **ATEX:** II 2 GD b/c group II, category 2
- **Heating:** Electrical, media or steam
- **Approvals:** ABS, BV, CCS, DNV/GL, KR, LRS, MRS, NK, RINA

**Green Shipping Technology by KRAL**
- Available with magnetic coupling
- Fit for low sulfur
- Up to 1.1 mm²/s

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<table>
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<tr>
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<th>Delivery rate</th>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster module</td>
<td>K</td>
<td>5 to 2,900 l/min, 0.3 to 174 m³/h</td>
<td>16 bar</td>
<td>-20 to +180 °C</td>
</tr>
</tbody>
</table>
Boiler – Double Station DKC | DLC Series

When uninterrupted oil supply must be guaranteed

The double stations of the KRAL DKC | DLC series are characterised by their ready-to-connect, compact design. The two mounted KRAL screw pumps are self-priming, low in pulsation and operate quietly.

The optional switchover from the operating to the reserve screw pump can be carried out electrically or manually on the device. Pump maintenance and filter cleaning are possible without interrupting operation.

**Product information**
- Housing: Spherulitic graphite iron EN-GJS-400
- Screws: Nitride steel
- ATEX: II 2 GD b/c group II, category 2
- Heating: Electrical, media or steam
- Approvals: ABS, BV, CCS, DNV/GL, KR, LRS, MRS, NK, RINA

**Applications**

<table>
<thead>
<tr>
<th>Type</th>
<th>Delivery rate</th>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer</td>
<td><strong>DKC</strong> 5 to 280 l/min 0.3 to 16.8 m³/h</td>
<td>16 bar</td>
<td>-20 to +180 °C</td>
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<tr>
<td>Boiler</td>
<td><strong>DLC</strong> 5 to 200 l/min 0.3 to 12 m³/h</td>
<td>40 bar</td>
<td>-20 to +180 °C</td>
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</tbody>
</table>

**Green Shipping Technology by KRAL**

- Available with magnetic coupling
- Fit for low sulfur
- Up to 1.1 mm²/s
Engine and Gear Lubrication – K | C Series

For efficient, reliable and long-lasting operation

Compared to other pump designs, KRAL screw pumps offer a high delivery rate and take up less space. The pumps feed product-conservingly. The pumped liquid is not pressed, there are no pressure pulses that damage the pipeline and other components or cause vibrations. KRAL screw pumps are also very quiet.

### Product information K series
- Housing: Spherulitic graphite iron EN-GJS-400
- Screws: Nitride steel
- ATEX: II 2 GD b/c group II, category 2
- Heating: Electrical, media or steam
- Approvals: ABS, BV, CCS, DNV/GL, KR, LRS, MRS, NK, RINA

### Product information C series
- Housing: Spherulitic graphite iron EN-GJS-400, steel (welded)
- Screws: Nitride steel
- ATEX: II 2 GD b/c group II, category 2
- Heating: Electrical, media or steam
- Approvals: ABS, BV, CCS, DNV/GL, KR, LRS, MRS, NK, RINA

<table>
<thead>
<tr>
<th>Applications</th>
<th>Type</th>
<th>Delivery rate</th>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine and gear lubrication</td>
<td>K</td>
<td>5 to 2,900 l/min 0.3 to 174 m³/h</td>
<td>16 bar</td>
<td>-20 to +180 °C</td>
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<tr>
<td></td>
<td>CK</td>
<td>5 to 1,750 l/min 0.3 to 105 m³/h</td>
<td>70 bar</td>
<td>-20 to +150 °C</td>
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<tr>
<td></td>
<td>CL</td>
<td>5 to 1,750 l/min 0.3 to 105 m³/h</td>
<td>70 bar</td>
<td>-20 to +180 °C</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>5 to 3,550 l/min 0.3 to 213 m³/h</td>
<td>100 bar</td>
<td>-20 to +180 °C</td>
</tr>
</tbody>
</table>

Available with magnetic coupling
Fit for low sulfur
Up to 1.1 mm²/s
**Cargo, Tank Transfer and Bunkering – Z Series**

KRAL Z series is dry-run safe in all areas and offers optimum operating performance.

The KRAL series Z is a synchronised two screw pump with a double-flow design. Due to the synchronised and thus non-contact operation of the screws, aggressive, contaminated and low to non-lubricating liquid can also be conveyed reliably and with low pulsation. Dry running times are also possible. The double-flow design also enables very high delivery rates and axial pressure compensation in the pump housing, which ensures long service life for the pump. In this series, the connection arrangement are unlimitedly variable.

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**Product information**

- Housing: Spherulitic graphite iron or steel (welded)
- Screws: One-piece (solid) or multi-piece (engineered)
- ATEX: II 2 GD b/c group II, category 2
- Heating: Electrical, media or steam
- Approvals: ABS, BV, DNV/GL, LRS, RINA
- Higher delivery rates
- Pumps low-viscosity medium from 0.7 mm²/s
- Pumps medium with up to 80% gas content, light chemicals

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<table>
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<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo, tank transfer and bunkering</td>
<td>Z</td>
<td>1,300 to 11,000 l/min 80 to 660 m³/h</td>
<td>25 bar</td>
<td>-40 to +300 °C</td>
</tr>
</tbody>
</table>
**Hydraulics – Steering System, Propeller Adjustment, Anchor Windlass – C | W Series**

KRAL C | W series are the optimal solution for hydrodynamic know-how on deep-sea vessels.

KRAL screw pumps of the C | W series operate according to the displacement principle and are therefore ideal for hydraulic applications with high system pressures. The KRAL screw pumps feed product-conservingly and constantly without pressing the liquid. In contrast to many other functional principles, KRAL screw pumps have a linear delivery rate characteristic. They can thus be controlled easily and cost-effectively with a frequency converter.

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**Product information C series**
- Housing: Spherulitic graphite iron EN-GJS-400, steel (welded)
- Screws: Nitride steel
- ATEX: II 2 GD b/c group II, category 2
- Heating: Electrical, media or steam
- Approvals: ABS, BV, CCS, DNV/GL, KR, LRS, MRS, NK, RINA
- Tank design possible

**Product information W series**
- Housing: Spherulitic graphite iron EN-GJS-400 or other material options
- Screws: Nitride steel
- Heating: Electrical, media or steam
- Approvals: ABS, BV, CCS, DNV/GL, KR, LRS, MRS, NK, RINA
- Tank design possible

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### Applications Type Delivery rate Pressure Temperature

<table>
<thead>
<tr>
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<th>Type</th>
<th>Delivery rate</th>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulics</td>
<td>CK</td>
<td>5 to 1,750 l/min 0.3 to 105 m³/h</td>
<td>70 bar</td>
<td>-20 to +150 °C</td>
</tr>
<tr>
<td></td>
<td>CL</td>
<td>5 to 1,750 l/min 0.3 to 105 m³/h</td>
<td>70 bar</td>
<td>-20 to +180 °C</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>5 to 3,550 l/min 0.3 to 213 m³/h</td>
<td>100 bar</td>
<td>-20 to +180 °C</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>15 to 290 l/min 0.9 to 17.4 m³/h</td>
<td>120 bar</td>
<td>-20 to +180 °C</td>
</tr>
</tbody>
</table>

* tank design possible
KRAL Screw Pump With Magnetic Coupling
Optimum safety and significantly reduced operating costs

Reduced lifecycle costs
Spare part and maintenance costs for mechanical seals increase lifecycle costs. Mechanical seals in KRAL screw pumps have a high technological standard. Even when properly operated, however, they are a wearing part. This results in spare parts and maintenance costs. KRAL magnetic couplings are maintenance free. Magnetically coupled pumps pay for themselves after just a few years.

Prevent pump failures
Heavy oil residues can cause a pump failure. In order to reduce friction, the sealing faces require lubrication through the pumped liquid. The liquid comes into contact with air at the sealing surfaces. Heavy oil reacts with atmospheric oxygen and forms coking in pump carriers and ball bearings that goes unnoticed. Damaged ball bearings are hot. The elastomer coupling melts. The pump fails. KRAL magnetic couplings are hermetically sealed. The fuel has no air contact and forms no residues.

Product information
- Leakage-free – no accumulation of residues
- Wear-free – no maintenance, no wear
- Hermetically sealed – prevents contact of the liquid with the atmosphere
- Temperature resistance up to 300 °C
- High delivery rates for all motor sizes

Green Shipping Technology by KRAl
- With magnetic coupling
- Fit for low sulfur
- Up to 1.1 mm²/s

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<tbody>
<tr>
<td>Booster module and boiler</td>
<td>K</td>
<td>L</td>
<td>C</td>
<td>5 to 3,550 l/min 0.3 to 213 m³/h</td>
</tr>
</tbody>
</table>

KRAL Screw Pump With Magnetic Coupling
Optimum safety and significantly reduced operating costs
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 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.