Axial and mixed flow pumps for high volume water handling
Customised solutions!

Grundfos is prepared to offer you a solution in handling large amounts of water from a wide range of submersible axial flow propeller pumps and mixed flow pumps depending on the demands with a motor range from 15 kW up to 1000 kW.

Whatever you choose, your pump will be optimised for your specific task.

**Engineered to suit your application**
Every KPL and KWM pump is individually engineered to suit your requirements, ensuring cost-efficient performance. For the best results, contact us during your planning stages – that allows us to consider aspects such as pumping station design, pump selection, future requirements, and the total Life Cycle Costs.

**Reliability meets excellent value**
- Quality products
- Robust, reliable and cost-effective
- Maximum value for money

**Minimal, easy service**
- Simple pump design ensures lasting trouble-free operation
- All pumps are individually tested and registered, so the right spare parts can be supplied very efficiently. Even after many years.

**Wide choice**
- All models available in cast iron or stainless steel
- 50 or 60 Hz
- Special materials (E.g. propeller in aluminium bronze is standard. Stainless steel available on request)
- High voltage (up to 10KV by special request) models available
- Pump and motor size up to 1MW by special request
Large flows handled with ease

KPL and KWM pumps are designed for extremely large flows at relatively low head. The range covers:
- Flows up to 11,700 l/s
- Heads up to 40 m

Features and benefits

1. Reliability
   One-piece molded type cable entry with triple compression sealing and anti-wicking block that ensures water-tightness.

2. High Efficiency
   Heavy duty, insulation class F (H as an option), air-filled (oil-filled as an option) with IP 68 protection motor ensures efficient and low-cost operation.

3. Customer-oriented
   Wear-resistant propellers with adjustable vanes machined precisely to maintain exact tolerances for maximum hydraulic efficiency, and dynamically balanced to avoid vibration.

4. Easy to install and maintain
   Bumper ring around guide casing secures easy installation and removal. Simple and compact rotation stopper that prevents from tilting and guarantees fast installation.

5. Checks on everything
   Pumps are always a part of a bigger picture. By incorporating sensors in the KPL and KWM, we make sure that the pumps perform their part reliably - they warn you of potential problems so that you take appropriate measures in due time.
**Performance overview**

**KPL Axial Flow Pumps**

![Graph showing the relationship between capacity and head for different models of KPL Axial Flow Pumps.](image)

*Number after model name states the tube diameter (mm).*

<table>
<thead>
<tr>
<th>Material specification</th>
<th>Description</th>
<th>Material</th>
<th>DIN / EN</th>
<th>ASTM / AISI</th>
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KWM Mixed Flow Pumps

**OPERATING CONDITIONS**

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<tr>
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<tr>
<td>Maximum liquid temperature</td>
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<tr>
<td>Storage temperature</td>
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<td>(-30 to +60°C)</td>
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<td>Maximum submergence</td>
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<tr>
<td>Insulation class</td>
<td>Class F</td>
<td>Class H</td>
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<td>Mechanical shaft seal</td>
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<td>TC/TC</td>
</tr>
</tbody>
</table>

*Number before model name states the discharge diameter (mm).

*No. of start is depended on motorsize
Trouble-free junction box
Water-tight enclosed connection chamber with IP 68 protection. Cable inlet with strain-relief, anti-kink device and double seal.

Durable motor
Trouble-free, low-cost operation is ensured by the air-filled squirrel-cage induction motor – which includes thermal protection embedded in each phase. From 4 to 18 poles designed for class S1 duty. NEMA Design B, Class F and Class H insulation windings as standard. (Explosion-proof version also available: Class 1, Div. 1, Groups C&D).

Oil chamber gives added safety
Oil-filled chamber lubricates and cools mechanical seal units – and provides an additional leakage barrier.

KPL propeller
The KPL features a pump bowl equipped with diffuser vanes and an axial propeller. The wear-resistant impellers are precision-machined to ensure exact tolerances for maximum hydraulic efficiency – and dynamically balanced to avoid vibration. Adjustable pitch propeller also available.
The submersible KPL propeller pumps and KWM mixed flow pumps combine quality elements inside a compact design. Despite their power, they require little space and are easily installed – allowing you to drastically reduce your construction costs.

Water-tight cable entry
Leaks are prevented by this single-piece, moulded cable entry point with triple compression sealing and anti-wicking block.

Sensors maximise protection
Depending on motor size, each pump incorporates sensors for maximum protection at reasonable cost. Your choice includes sensors to monitor winding temperature, seal condition, moisture, water-in-oil, and bearing temperature.

- Moisture sensor
- Stator winding temperature sensor
- Upper bearing temperature sensor
- Lower bearing temperature sensor
- Moisture / Seal sensor

Shaft and bearings for smooth, long-term operation
Enjoy smooth, vibration-free operation thanks to the oversized stainlesssteel shaft and oversized ball-type thrust and radial bearings. The maintenance-free antifriction bearings have built-in permanent-grease lubrication. Minimum 100,000 hours of bearing life (L-10 Life).

Mechanical seals prolong pump life
The double mechanical shaft seal, mounted in an oil chamber with an additional lip seal, ensures long life even in the most demanding conditions.

Rotation stopper for easy handling
Simple, compact rotation stopper prevents the pump from tilting and ensures fast installation and removal.
Choose the installation set-up that suits you

With the Grundfos KPL and KWM, installation has the same scope for customisation as the pumps themselves. Installed directly in the column pipe, KPL and KWM pumps seriously reduce the need for construction works – so they can even save you money before they prove their efficiency in day-to-day operation. Choose between different installation types. Ask us for installation recommendations. We can often help you create a more efficient, more durable system.

Suitable where the liquid is pumped to a tunnel, channel or basin with a water level that is nearly constant so that shut-off devices are not required. This arrangement involves the smallest number of steel components; it consists of a circular concrete tube and a short pipe grouted in place as a base for the pump. Because the top of the tube is placed at a level slightly above the maximum water level in the outlet channel, water cannot run back to the sump when the pump is shut off.

In this case the pump is placed in a suspended steel column with a collar that rests on a supporting frame.

If the water level on the outlet side of the pump varies considerably, flap valves can be installed. Normally the pump works against the head in the discharge channel or basin; when the pump is not in operation, the water is prevented from running back to the sump by the automatic closure of the valve. In this way, the pump always operates against the minimum head.

If odors require a closed system, this arrangement can be used with a free discharge, as shown, in order to prevent from water backflash.

If the pump is to work in combination with a siphon or a discharge line, a pressure-tight discharge elbow must be used. The elbows recommended here permits both fast installation and easy retrieval of the pumps.

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## KPL – 50Hz & 60Hz/Dimensions & weight

<table>
<thead>
<tr>
<th>Product</th>
<th>øE</th>
<th>øD</th>
<th>H</th>
<th>Smin</th>
<th>C</th>
<th>K</th>
<th>Weight</th>
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<tbody>
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<td>KPL 600</td>
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## KWM – 50Hz & 60Hz/Dimensions & weight

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<td>1600</td>
<td>7000 - 10000</td>
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</tbody>
</table>
Applications

Suitable for many different tasks

Built to handle large quantities of raw water, the pumps are ideal for a wide range of applications.

- Flood and storm water control
- Large-volume drainage and irrigation
- Raw water intake
- Circulation of large quantities of water, e.g. in water parks
- Water-level control in coastal and low-lying areas
- Filling and emptying of dry docks and harbour installations
- Filling or emptying of reservoirs
- Treated sewage
- Cooling water intake in power stations
- Process and discharge water
- - and other low to medium head/high flow applications

Flood control pumping station

Irrigation

Drydocks

Wastewater Treatment Plant
Dubai, United Arab Emirates

Drydocks World – Dubai, is located on the Dubai Waterfront and is one of the largest shipyards in the world. The shipyard employs nearly 10,000 workers and over 1000 subcontractors. More than 5000 vessels and oilrigs have been repaired and maintained at the facility, since it opened in 1983.

The situation

As a part of their extensive yard development initiative, which included creating new facilities for new shipbuilding and offshore modules fabrication, Drydocks World – Dubai (Client) launched the SAFINA PROJECT, a “Hydrolift” ship launching and recovery facility. The Hydrolift facility requires pumping of seawater to raise levels from mean sea level to the impounding level of +9.5 m CD within four hours. The Client specified four new pumps with a normal duty of 2.2 m³/sec at 10m head with free passage to allow 40 mm size particles.

Drydocks World – Dubai specified that each pump be supplied with its own power and control cables for termination at the top of each pump’s venting tube. The client would then install a connection box and small console at the top of each venting tube. Four umbilical’s will then run from the four connection boxes to the east abutment and into the control panel. The pumps were specified to be capable of being started (or re-started) and establish symphonic discharge conditions for which the symphonic loop invert level is +10.00, from any level between Highest Astronomical Tide (HAT) and Lowest Astronomical Tide (LAT).

The Grundfos solution

Grundfos was chosen, after series of technical-commercial evaluations, due to low life cycle cost, high level of competence, extensive technical knowledge, short delivery time and continuous support available in the U.A.E.

Grundfos was commissioned to supply 4 units of KWM Mixed Flow Impeller Pumps with 300kW motors. The pumps were installed in chambers (1200 mm dia.) on the seaward face of the new East Abutment. Mr. Rajesh Kumar, Projects Manager, Grundfos Gulf Distribution, quoted “As per tender design the pumps would have been subjected to cavitations, due to siphoning effect, as the discharge end of the pipe was located below the sea level. Based on Grundfos’ suggestions (accepted by consultant), the client modified the discharge pipe level. Another challenge was that the client had the soft starter installed in their facility and we had to carry out minor cable modifications to suit it. This was successfully executed by our Grundfos service team at the site, before the pumps were installed”.

“We are satisfied with the performance of the Grundfos pumps as well as the pre-sales and post-sales support rendered to us continuously by Grundfos engineers. The pumps have been operating successfully for almost 3 years now,” said Mr. Murtaza Rampuri, Manager-Yard Development Department, Drydocks World -Dubai.

The client, with the help of Grundfos service department, carry out the scheduled periodic maintenance checks to ensure that the pumps are kept in good condition.

Finally, Drydocks World – Dubai also awarded Grundfos the contract for supply of SCUTTLE DEWATERING PUMPS, which are used in the Hydrolift Main Gate ballasting operations.
SEE THE BIGGER PICTURE
Grundfos is a global leader within water handling technology. Our passion is to bring you all the products you require to create and operate pump systems that combine reliability, cost-efficiency – and innovation. Our products are for use in water supply and wastewater infrastructure on any scale.

Grundfos has a full line of products and systems for the intake, treatment and distribution of drinking water and for the transport and treatment of wastewater. We also offer expertise and industry insight that can increase reliability and reduce lifecycle costs for water utilities.

Key product areas include:

- Submersible pumps
- Surface pumps
- Sewage pumps
- Mixers, flowmakers & recirculation pumps
- Pumping stations
- Monitoring & controls
- Dosing & disinfection
- Aeration equipment

Our products are the result of decades of engineering expertise. Supported by a worldwide service network. Visit www.grundfos.com/water-utility for more.