PLEUGER INDUSTRIES

PLEUGER Solutions for Water Industries

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Since 1929, PLEUGER have designed and developed submersible pumps and motors, reciprocating pumps and marine propulsion systems to the highest of industry standards.

When Friedrich Wilhelm Pleuger patented his first submersible pump 90 years ago, it broke new ground. The water-filled motor, which could pump water from great depths and narrow wells, was used in the construction of the Berlin subway in the 1930s. PLEUGER has since specialised in built-for-purpose products that continue to draw upon his pioneering designs.

PLEUGER solutions are used throughout the world in water supply systems, offshore and seawater desalination plants, refineries and district heating systems. Thousands of ships and platforms use PLEUGER pumps and manoeuvring systems to increase safety, performance and efficiency.

PLEUGER products perform even in the most extreme and harshest of environments. That's why the PLEUGER brand is renowned worldwide for quality and reliability.

Our most famous pump is the landmark Alster Fountain Hamburg.

It is economically and ecologically friendly,
jetting water to over 60m high and aerating the water.
Fitted with our permanent magnet motor has cut
Hamburg's electricity costs by around 10,000 euros per annum.

INTERNATIONAL STANDARDS FOR PLEUGER PUMPS & MOTORS

Design Standards: API 610 ANSI / ASTM / CE marking / DIN / Hydraulic Institute / SO / NORSOK / Customer specific or tailored

Hydraulic Standards: API610 / ANSI/HI / EN ISO / NFPA20

Electrical Standards: EC / IEEE / NEMA. Certifications: ACS / ABS / CSA / DNV GL

PERFORMANCE ENGINEERING AND DESIGN FOR THE WATER INDUSTRY

PLEUGER has supplied over 13,000 specialist submersible pumps to the global water industry in the last 20 years. The water industry recognises PLEUGER as some of the most reliable, efficient and durable units you can buy. Submersible pumps and motors are relied upon worldwide for Municipal water supply, Agricultural irrigation, Flood control & Groundwater management, Desalination and Geothermal applications.

Our 4" to 40" diameter standardised pump range is designed for ultra-low maintenance and reliability. Hand-built, they feature a best-in-class service life of 30+ years. These are readily available to rapidly deploy anywhere in the world.

PLEUGER's engineered-to-order solutions can be up to 50" diameter and engineered to specific performance capabilities with different materials based on the application and budget.

PLEUGER submersible asynchrous induction motors are highly reliable and efficient, available in 6" - 50" diameter with output capabilities between 0.37kW to 5 MW. Our range of 6" - 8" synchronous Permanent Magnet Motors are fitted with VFD capabilities, designed for even greater efficiency and capable of reducing energy consuption by 14 percentage points when compared to other options.

PLEUGER products are designed and hand built at our Centre of Excellence in Hamburg, Germany. PLEUGER sales and support facilities are located throughout the world, and backed by a network of accredited service partners to ensure a PLEUGER specialist is always on hand and nearby.

- 90+ years of experience, quality engineering from Germany
- Reliable, durable, very low maintenance solutions
- Dedicated after market and global support solutions

PLEUGER. Reliable. Always.

A BOOST TO URBAN AND MUNICIPAL WATER SUPPLIES

The World Health Organization notes that economic losses due to inadequate water and sanitation cost $260 billion per year. These issues make water supply a crucial strategic challenge for community leaders dealing with public health.

Pleuger Industries has extensive knowledge and experience providing solutions for municipal water supplies. The French metropolis of Montpellier uses our deep well pumps to supply drinking water to over 400,000 citizens.

PLEUGER pumps and motors are designed to be highly reliable, durable, and efficient to run, enabling water suppliers to cost-effectively deliver water safely and reliably.

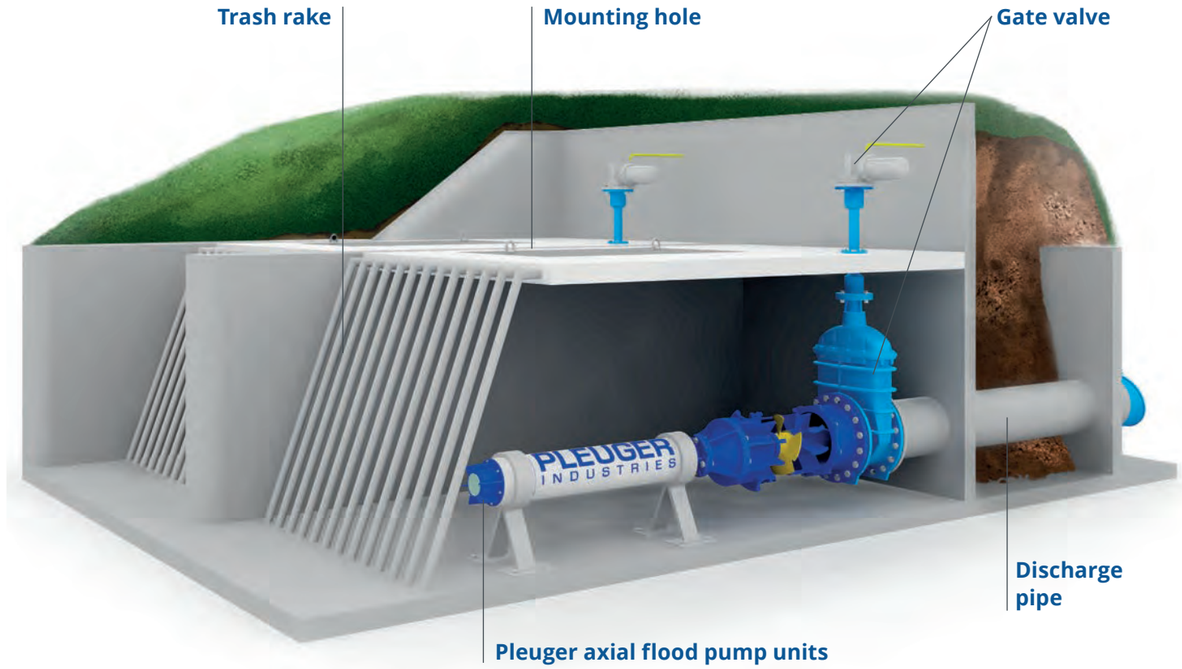
Our broad range of bore well pumps, bottom intake pumps and booster pumps are available in standard and customised designs.

FIRST DEFENCE AGAINST FLOODING

Global warming and changes in rainfall patterns make protection against flooding a key concern for many at-risk communities, particularly coastal and low-lying regions.

PLEUGER pumps play a central role in flood protection and drainage in projects across the globe. We offer both standard and engineered pump units based on the application requirements. Our highly reliable flood-proof single- or multi-stage pumps feature axial hydraulic designs and water-filled motors. They have flow rates from 100 m³/h to 90,000 m³/h (440 to 396,258 USGPM) to pump high volume water at low pressure.

PLEUGER designs to the highest standards for environmental protection to reduce environmental impact.



A typical pumping station with horizontal PLEUGER flood pump units

Main advantages:

- Cost-effective and ultra-low maintenance
- Durable and highly reliable
- Environmentally friendly design
- Flood-proof
- Flow rates from 100 m³/h to 90,000 m³/h (440 to 396,258 USGPM)

Applications

- Coastal protection
- Flood protection
- Lowland drainage
- Dry docks
- River-flow control
- Cooling and process water
- Agricultural irrigation

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RELIABILITY AND EFFICIENCY FOR AGRICULTURAL IRRIGATION AND DRAINAGE

As worldwide competition for water escalates, the economic draws of irrigation are clear. However, the processes can be costly, labour-intensive and damaging to the environment, especially when companies use unsuitable equipment.

The key to irrigation efficiency is fit-for-purpose equipment. Our durable pumps are specially designed for narrow deep wells, which make them the smart solution for irrigation and drainage.

PLEUGER's permanent magnet motor technology results in up to 14% points more efficiency than conventional induction motors. Since 90% of a submersible motor pump's lifecycle costs are directly related to power consumption, our technologies deliver significant financial savings lowering power consumption and benefiting the environment.

Applications

- Irrigating farms
- Irrigating recreation sites
- Drainage of various sites

CUSTOM ENGINEERED SOLUTIONS

DESALINATION PUMPS FOR POTABLE WATER

The Food and Agriculture Organization estimates that nearly 2 billion people will not have enough drinking water by 2025. This is mainly due to freshwater shortages, environmental change, desertification and habitat destruction.

The global demand for water is a critical environmental and social issue. We are proud of our achievements in creating robust, energy-efficient pumps such as PLEUGER's borehole, beach well and booster pumps. These pumps are durable, cost-effective units, relied upon throughout the world for water supply and distribution.

Our desalination pumps are designed to withstand constant use. Fitted with Permanent Magnet Motors (PMM) they are highly efficient, saving considerable amounts of energy when running the pumps. They are also designed for ulta-low maintenance, giving peace of mind to the operators who count on our reliable pumps for their systems.

GENERAL INDUSTRY

As the reliability experts in submersible pumping solutions, PLEUGER pumps are high performing, durable solutions used in many industrial processing applications. Designed for reliability, these pumps are ultra-low maintenance with a service life of 30+ years.

For every need, we have a solution. Our application engineers design bespoke pump solutions made with specific performance capabilities as well as application specific materials to ensure resistance to corrosive or high-temperature water. PLEUGER engineers have decades of specialist experience designing pumps for cooling or process applications in the metal, alloy or copper industry.

Examples for water process applications:

- Water supply
- Cooling water
- Processing plants
- Firefighting

HOT WATER AND GEOTHERMAL APPLICATIONS

Tapping natural Geothermal energy reservoirs, our custom designed hot water submersible pumps are highly efficient and reliable units. PLEUGER pumps are used worldwide in a range of district heating projects, including the Netherlands, Slovenia and Iceland.

Built for harsh environments and using only high-grade materials, PLEUGER pumps guarantee operation, even in the most extreme conditions.

Applications

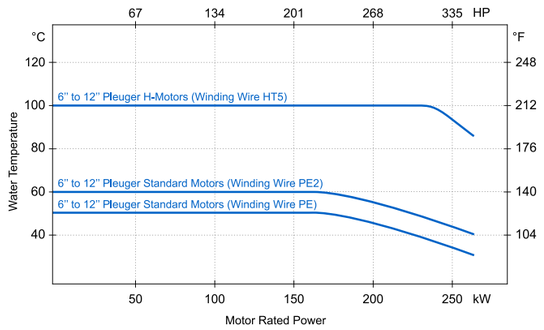
- District heating
- Geothermal energy
- All-weather greenhouse energy
- Cooling water and process pumps
- Thermal spas

Technical Data

- Up to 270 kW (362 HP)
  - 200 to 1000V / 3PH ~/ 50Hz or 60Hz / 2 pole
- Motor sizes 6" to 12"
- Starting method DOL, Star-Delta (on request)

Features

- 235 kW (315 HP) up to 100°C (212°F) water temperature
- 270 kW (362 HP) up to 85°C (185°F) water temperature
- Rewindable submersible motor



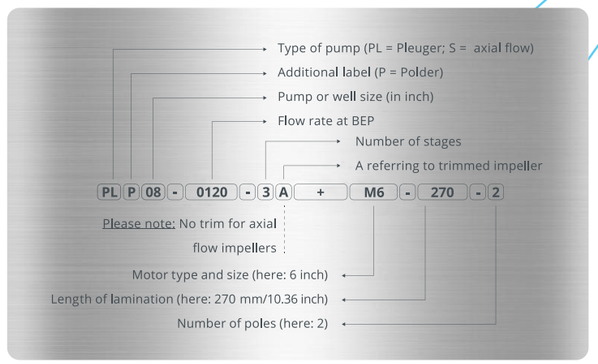
PLEUGER SUBMERSIBLE PUMPS

PLEUGER pumps come in sizes from 4" to 40" as single- or multi-stage pumps to fit all specifications. The water industry recognises them as some of the most reliable, efficient and durable units you can buy.

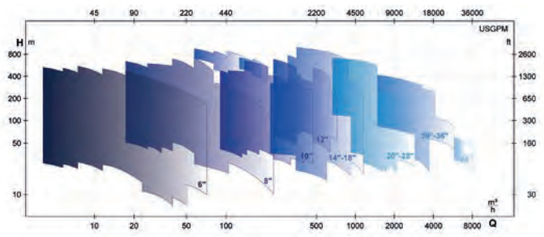
Our reliability engineers design, manufacture and test to ensure our products perform reliably and safely across a range of water applications. We use a variety of materials, from cast iron, bronze and NiAlBz, to stainless steel 316 and super duplex stainless steel.

- Highly efficient motors and pump hydraulics
- Highly reliable with ultra-low maintenance
- Cost-effective lifecycle ownership
- Drinking water safe
- Space-efficient installation in wells
- Flood-proof, Freeze-proof
- Reduced noise and vibration
- Range of material grades
- Optional installation accessories
- Optional Permanent Magnet Motor (PMM) technology

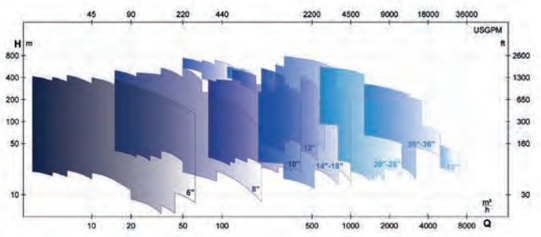
The ID-Codes on each of Pleuger's submersible pumps help you select a unit for your specifications:



Radial & semi-axial impeller working ranges (60 Hz)



Radial & semi-axial impeller working ranges (50 Hz)



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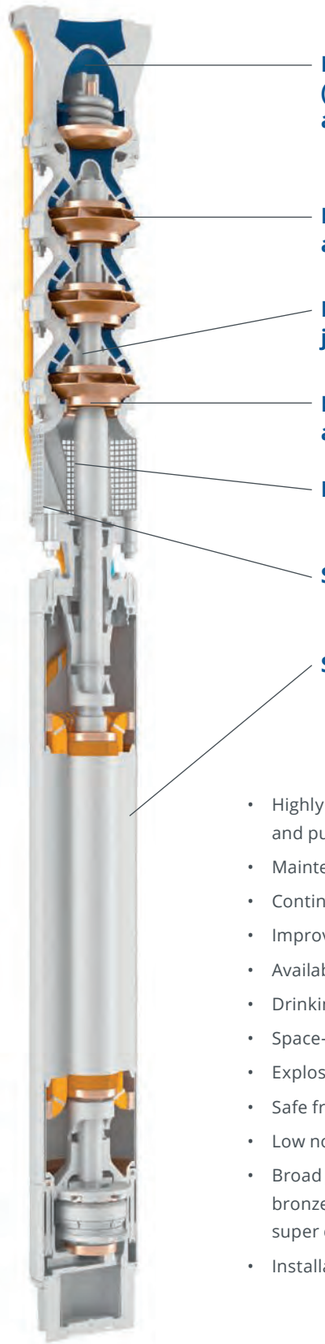
SUBMERSIBLE PUMP TYPES

Deep well or Bore well

Our single- and multi-stage centrifugal pumps use standard water-filled motors as standard, or oil-filled motors on request. For these middle intake pump units, we assemble the suction in-between the motor (below) and the hydraulic (above). Motor sizes are available from 4” to 50”.



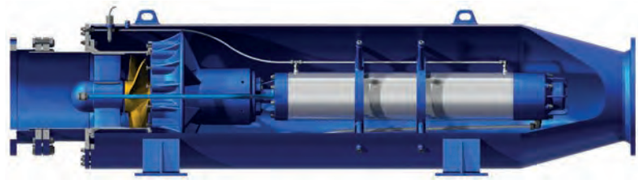
- Highly efficient motors and pump hydraulics
- Maintenance free and reliable
- Continuous operation proofed
- Improved life cycle cost
- Available with PMM motor technology
- Drinking water safe
- Space-saving installation in wells
- Explosion proof
- Safe from flooding and freezing
- Low noise and low vibration
- Broad grades of materials like cast iron, bronze, NiAlBz, stainless steel 316, super duplex stainless steel
- Installation accessories available

Bottom Intake Pump

Our MAP units (motor above the pump) are single and multi-stage centrifugal bottom intake pumps using water-filled motors. The intake is in the unit’s lower part, so the pump continues to operate even when the water line reaches low levels. These pumps are used for vertical or inclined installation – PLEUGER can customise them to fit your required specifications.

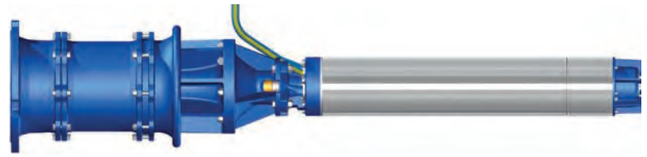
Booster Pump

The casings on our booster pump units double up as pressure shrouds and can be integrated either horizontally or vertically into the pump system to increase pressure in the pipeline networks. Booster pumps come as standard or engineered units – call us for advice on the best solution for your project.

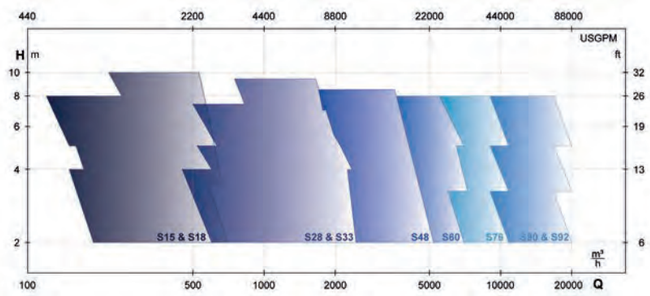


Flood Pump

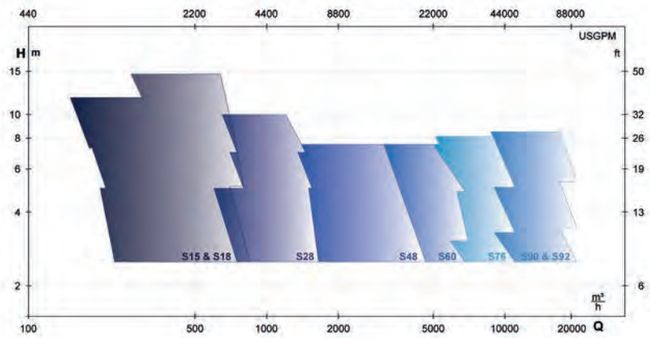
Our single- and multi-stage flood pumps operate with axial hydraulic designs and water-filled motors. These units are designed to process large volumes of water at low pressures. They can cover flow rates from 100 m³/h to 90,000 m³/h (440 USGPM to 396,258 USGPM).



Axial flow - working ranges (50 Hz)



Axial flow - working ranges (60 Hz)



PLEUGER. Reliable. Always.

SPECIALIST MOTOR TECHNOLOGIES

Customized Motor Solutions

High efficiency submersible electric motors, with customized corrosion protection and extended power ranges.

PLEUGER's unique motor designs are manufactured to the highest quality standards in our Centre of Excellence in Germany.

Technical Specifications:

- Water-filled motors as standard
- Oil-filled motors on request
- Sizes: 4 to 50 inch
- Power output: 0.37 kW to 5 MW (0.5 HP to 6,700 HP)
- 230V to 6.6kV
- 3PH - 50Hz & 60Hz
- 2 pole (standard) to 12 pole available
- Suitable for VFD operation
- Operating temperature up to 100°C (212°F)

Standards:

- Design Standards: ANSI / ASTM / DIN / ISO / Hydraulic Institute / CE marking / API 610
- Hydraulic Standards: ANSI/HI / EN ISO / API610 / NFPA20
- Electrical Standards: NEMA / IEC / IEEE
- Certifications: DNV GL / ABS / CSA / ATEX
- Approvals: ISO 9001

Life-cycle Cost Solutions

Typically, 90% of the total life-cycle cost (LCC) of a pumping system is accumulated after the equipment is purchased and installed.

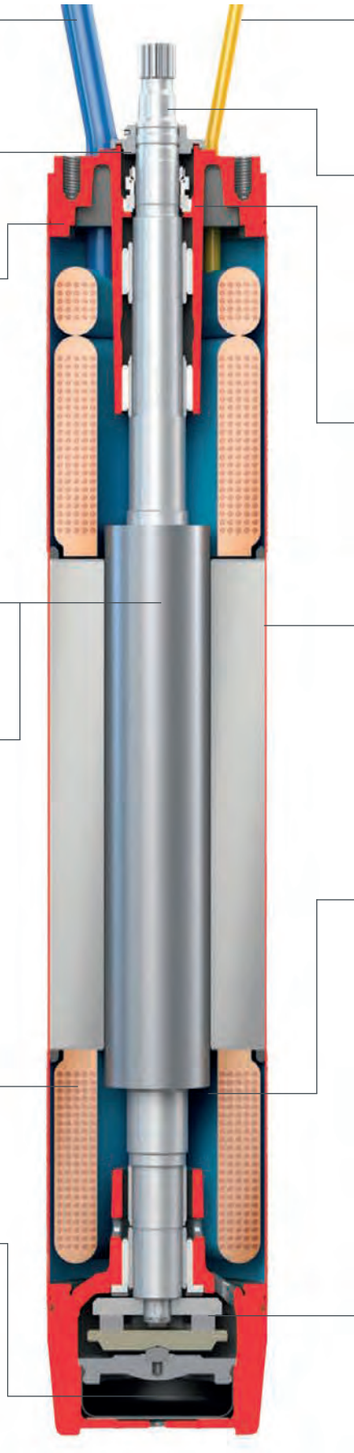
PLEUGER has created an extensive suite of solutions to provide unprecedented value and cost savings to customers throughout the lifespan of the pumping system.

These solutions account for all facets of the life-cycle, including capital and operating costs.

PLEUGER's Permanent Magnet Motor technology (PMM) and high efficiency hydraulics are driving down the cost of owning and operating pumps.

MOTOR FEATURES AND BENEFITS

Designed for performance and built for reliability, PLEUGER motors reduce life-cycle costs and won't let you down.



Flat or Round Cable

Space-saving cable design for installation with limited space

NEMA Flange Connection

Offers easy connection to standard hydraulics

Motor Housing

Robustly designed cast housing ensures reliable strength, rigidity, corrosion resistance and durability

Induction Motor: Squirrel Cage Rotor for Asynchronous Motor

or

Permanent Magnet Motor: Rotor equipped with Permanent Magnets for Synchronous Motor

- Up to 14 % points higher motor efficiency compared to asynchronous motors, through reduction in copper loss
- Hermetically sealed rotor ensures protection of magnets against corrosion and mechanical damage
- Up to 200 kW (268 HP) available

Rewindable Winding

Provides maintenance cost savings, PE insulation as standard

Rubber Diaphragm

Guarantees pressure and volume compensation of liquid inside and outside the motor to extend mechanical seal and O-ring service life

Signal Cable (optional)

Combined with the PT100 temperature sensor for monitoring motor temperature

Motor Shaft End

Standard duplex stainless-steel construction provides the best combination of corrosion resistance, mechanical strength and rigidity. Special materials available on request

Mechanical Seal

High-grade SIC/SIC/Viton® as standard ensures wear resistance and ultra-low maintenance operation

Stator Tube

Standard 316 stainless-steel construction offers excellent corrosion resistance over the service life. Special materials available on request

Motor Filling

Prefilled and tested with water/glycol mixture or potable water on request

Thrust Bearing

Heavy-duty, ultra-low maintenance design to ensure extraordinary motor lifetime, developed by PLEUGER

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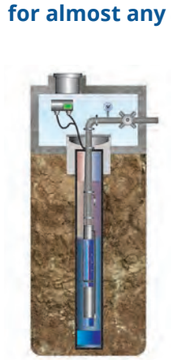
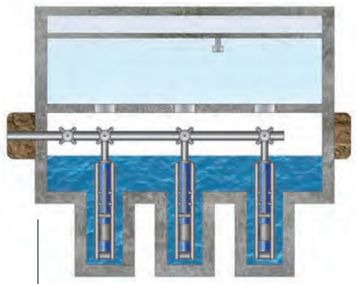
PUMP INSTALLATION OPTIONS

With various installation options, PLEUGER's pump units are the ideal solution for almost any application in the water industry.



Vertical (e.g. bore well installation)

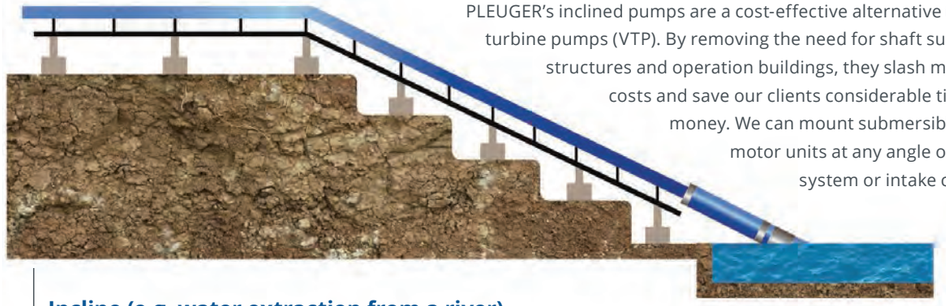


Parallel

Booster pump in pipeline

Horizontal (e.g. bottom of tank)

Inclined pumps for processing and cooling water applications



PLEUGER's inclined pumps are a cost-effective alternative to vertical turbine pumps (VTP). By removing the need for shaft support structures and operation buildings, they slash maintenance costs and save our clients considerable time and money. We can mount submersible pump motor units at any angle on a rail system or intake caisson.

Incline (e.g. water extraction from a river)

PLEUGER TEST SOLUTIONS

PLEUGER's comprehensive test capabilities on our manufacturing sites in Germany and France feature custom designed test stands. All our products undergo stringent testing and quality control to ensure reliability before we pack and dispatch. Production is carried out on-site from the first planning sketches to our final quality tests - as is has been since 1951.

TEST FACILITIES

1 test-stand for submersible pumps, horizontal installation:

Maximum capacity:	40,000 m³/h (176,115 USGPM)
Maximum head:	60 m (197 ft)

5 test-stands for submersible pumps, vertical installation:

Maximum capacity:	4,500 m³/h (19,813 USGPM)
Maximum head:	600 m (1,968 ft)

1 test-stand for Plunger pumps and centrifugal pumps:

Maximum capacity:	1,200 m³/h (5,283 USGPM)
Maximum head:	4,000 m (13,123 ft)

1 test-stand for centrifugal pumps:

Maximum capacity:	8,600 m³/h (37,865 USGPM)
Maximum head:	160 m (525 ft)

AFTERMARKET SERVICES

Dedicated service and solutions from the submersible pump and motor reliability experts.

A comprehensive range of through-life service and support solutions available globally and designed to fit your needs.

- International field service team
- Installation planning andon-site support at customer sites
- Project management
- Installation supervision to start-up and commissioning
- Specialist Transportation

- Advanced design & modelling
- Customer system analysis
- Pump integration into systems
- Site inspections
- Solutions engineers on-site
- Test capabilities / facilities

- New products & capital projects
- Operations & systems

- Care Agreements
- Spare parts & Kitting
- Repairs & Overhauls
- Upgrades
- Customer training

PLEUGER CARE®

EXTENDED WARRANTY

SPARES INVENTORY & STOCKING

PLANNED MAINTENANCE PROGRAMMES

PRIORITY TECHNICAL SUPPORT

RAPID FIELD SERVICE SUPPORT

pleugerindustries.com/aftermarket

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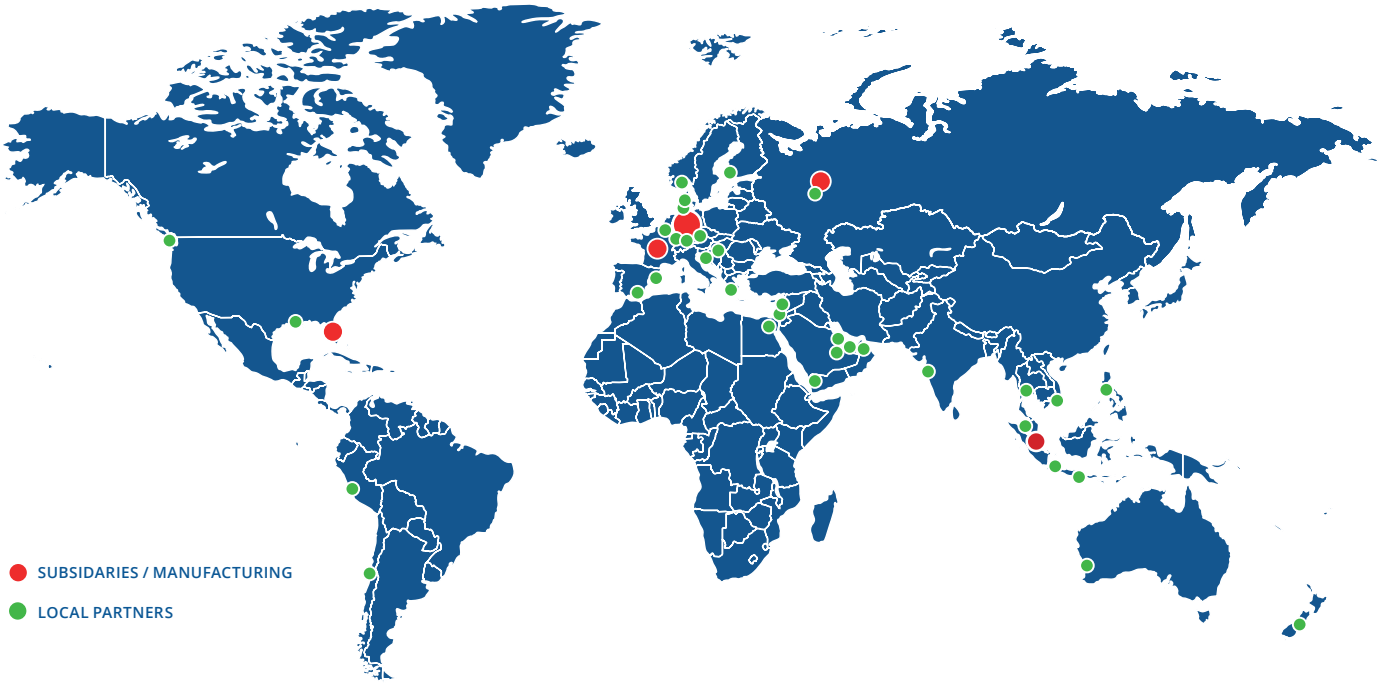
WORLDWIDE SALES, SERVICE AND SUPPORT



THE RELIABILITY EXPERTS

PLEUGER designs, manufactures and services submersible motors, pumps, thrusters and plunger pumps. Renowned worldwide for absolute reliability and outstanding longevity throughout the energy, mining, water, industrial processing and oil & gas industries.

Our products perform in some of the most challenging and harshest of environments. PLEUGER engineers find solutions to some of the toughest challenges and are trusted across the globe as the reliability experts.

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PLEUGER INDUSTRIES

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