PLEUGER® Electrical Submersible Pumps and Water-Filled Motors

Edition 10.18
Trusted Supplier of Choice for Water Resources

Since 1929 Pleuger Industries GmbH is in the forefront of virtually every significant advancement in pumping technology to meet water-handling challenges. Today, Pleuger offers a wide range of submersible pumps with water-filled motors and systems (Pleuger design) for water applications along with a comprehensive technical service and support.

Hamburg – Germany
Headquarter and Design Center for Submersible Pumps and Motors

Orleans – France
Assembling and Service Center
PLEUGER Submersible Pump End

Pleuger submersible pump units are one- or multistage centrifugal units which operate below water level and are driven by water-filled three-phase asynchronous induction submersible motors*. Pumps and motors form a single enclosed unit. The units are installed below the water level in deep wells, caissons, tanks etc. The pumps are equipped with a non-return valve to guarantee optimal functional safety (water hammer).

Pleuger submersible pump units are vertically connected to a discharge pipe at the non-return valve or discharge casing.

Pleuger submersible pump units can be offered for a wide range of applications. Pumps are available with capacities up to 6000 m³/h (26000 gpm) and heads up to 800 m (2600 ft).

Pleuger submersible pump units are designed and manufactured to the highest quality with high pump efficiencies and long working life under the most adverse conditions. They are extensively tested and inspected to ensure operational safety.

Pleuger submersible pump units are designed on the principle of a modular structure to ensure an economical manufacturing process. In addition to this, different tailor-made units can be offered.

Pleuger submersible pump units provide economic solutions for almost every user requirement.

High-quality submersible pump and motorproduction requires both, specialized know-how and continually evolving manufacturing processes. All submersible pump products are produced using the most advanced manufacturing techniques – from initial CAD development to quality-controlled CNC production.

It is not by chance that among experts Pleuger has been a byword for excellence since decades.

* up to 200 kW also available as synchronous Permanent-Magnet-Motor (PMM)
Tested and proven over many years, PLEUGER pumps can ensure a high degree of reliability and suitability for a wide range of applications. For more specialized requirements and applications, special materials and combinations of materials are available that are designed to ensure optimum efficiency and a long service life.

**Sample Material Combinations - Pump:**

- Bowl Cast Iron – PPE Polymer Impeller
- Bowl Stainless Steel (1.4571) – PPE Polymer Impeller
  (only for special pump types)
- Bowl Cast iron – Bronze or NiAlBz impeller
- Bowl Bronze or NiAlBz – Bronze or NiAlBz impeller
- Bowl Stainless Steel (1.4408) – Stainless Steel Impeller (1.4408)
- Bowl Stainless Steel Super Duplex – Super Duplex Impeller

**Sample Material Combinations - Motor:**

- Stator Stainless Steel (1.4571 / 1.4404) – Cast Iron Housings
- Stator Stainless Steel (1.4571 / 1.4404) – Bronze or NiAlBz Housings
- Stator Stainless Steel (1.4571 / 1.4404) – Stainless Steel Housings
- Stator Stainless Steel (1.4571 / 1.4404) – Stainless Steel Housings Super Duplex
- Stator Stainless Steel (1.4547) – Stainless Steel Housings Super Duplex

**Pump Shaft**

Stainless Steel (1.4057); Stainless Steel Duplex or Stainless Steel Super Duplex

**Motor Shaft End**

Stainless Steel Duplex or Stainless Steel Super Duplex
PLEUGER Submersible Motor

PLEUGER submersible motors provide successful and reliable service since 1929. The three-phase AC squirrel cage induction motors\(^1\) are water / glycol filled (65 volume % potable water and 35 volume % glycol).

The water / glycol motor filling provides lubrication of motor bearings and motor cooling. The mixture is environmentally safe and prevents freezing of the motor filling liquid, while mitigating corrosion.

The motor windings consist of fully waterproof / high di-electric strength windings (PVC, PE2+PA or special insulating material for special applications). The insulation class of the motor winding is Y (90°C) according to IEC. The motors can be rewound. The electrical power supply is provided by a submersible cable, directly connected to the winding.

The power and signal cable(s) are sealed at the motor with special designed cable glands.

The dynamically balanced rotor is guided in oversized twin bearings in each bearing housing (top and bottom of motor). An internal breather diaphragm in the lower motor housing provides pressure & volume compensation and ensures, that the motor is operating without differential pressure.

A high-quality mechanical seal prevents the ingress of ambient liquid into the motor, fully protecting the motor against contamination. A high-quality self-aligning thrust bearing allows high thrust and a long bearing life, even under the heaviest pump duty conditions. PLEUGER submersible motor designs are available for vertical or horizontal installations.

In maintaining our reputation as a leading supplier of pumping systems for the water industry, PLEUGER Industries continues improve PLEUGER submersible motors.

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**Power Output**\(^2\)

<table>
<thead>
<tr>
<th>Power Output Range</th>
<th>Two-Pole Submersible Water-Filled Motors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M6</td>
</tr>
<tr>
<td><strong>50 Hz Power Output</strong></td>
<td></td>
</tr>
<tr>
<td>kW</td>
<td>5.5 - 37</td>
</tr>
<tr>
<td>HP</td>
<td>7.5 - 50</td>
</tr>
<tr>
<td><strong>60 Hz Power Output</strong></td>
<td></td>
</tr>
<tr>
<td>kW</td>
<td>6.4 - 45</td>
</tr>
<tr>
<td>HP</td>
<td>8.5 - 60</td>
</tr>
</tbody>
</table>

\(^1\) up to 200kW available as Permanent-Magnet-Motor (PMM)

\(^2\) 4-pole and higher on request
Motor Features and Benefits

- Mechanical seals in different materials for maximum service life
- Motor windings with PVC and PE2+PA insulation for optimized winding lifetime
- Thrust bearings made of high performance polymer for highest axial thrust loads
- Breather diaphragm in different elastomer materials for perfect pressure & volume compensation
Motor Features and Benefits
(10” Motor and Larger Sizes)

Submersible Motors with Internal Forced Cooling System
(1 - Design)

The internal cooling system is manufactured with a highly efficient cooling impeller. The impeller is customized for each motor size and provides an efficient cooling circulation. The design ensures sufficient thermal motor reserves and minimizes energy losses, even under tough operating conditions.
Heavy Duty Thrust Bearings (HDB) for Pleuger – Submersible Motors

Features and Capabilities
The HDB thrust bearing is a pivoting pad thrust bearing based on a stainless steel collar running against pads made of a Pleuger proprietary material.

1. Higher thrust capability (x 2 compared to HDK)
2. Superior robustness against dynamic operating conditions, e.g. water hammer (x 2 compared to HDK)
3. Minimized start-up torque (half compared to HDK)
4. Increased resistance against wear
5. Improved dry running capabilities
6. Higher temperature resistance for maximum operating range

Compatibility
The HDB bearings are designed to replace HDK bearings directly. If adjustments to the motor are required, special replacement kits have been defined.

<table>
<thead>
<tr>
<th>Size</th>
<th>Submersible Motor</th>
<th>Description</th>
<th>Rated Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>M6</td>
<td>THRUST BEARING.Ø80.27,5.HDB.P.R/L.M6.MT.</td>
<td>27,5 kN</td>
</tr>
<tr>
<td>130</td>
<td>M8</td>
<td>THRUST BEARING.Ø130.80.HDB.P.R/L.M8.MT.</td>
<td>80 kN</td>
</tr>
<tr>
<td>130</td>
<td>MI10 &amp; VNI12</td>
<td>THRUST BEARING.Ø130.80.HDB.P.R/L.MI10.MT.</td>
<td>80 kN</td>
</tr>
<tr>
<td>160</td>
<td>VNI12</td>
<td>THRUST BEARING.Ø160.120.HDB.P.R/L.VNI12.MT.</td>
<td>120 kN</td>
</tr>
<tr>
<td>190</td>
<td>VNI14 &amp; MI16</td>
<td>THRUST BEARING.Ø190.150.HDB.P.R/L.VNI14/MI16.MT.</td>
<td>150 kN</td>
</tr>
<tr>
<td>300</td>
<td>MI19 &amp; VNI22 (4, 6 pole)</td>
<td>THRUST BEARING.Ø300.200.HDB.P.R/L.MI19/VNI22.MT.</td>
<td>200 kN</td>
</tr>
<tr>
<td>400</td>
<td>MI30</td>
<td>THRUST BEARING.Ø400.300.HDB.P.R/L.MI30.MT.</td>
<td>300 kN</td>
</tr>
</tbody>
</table>
**Pleuger Hot Water (H) – Motors up to 100°C (6" to 12")**

**Technical Data**
- Up to 270 kW / 200 to 1000V / 3PH ~/ 50Hz or 60Hz / 2 pole

**Motor Sizes**
- 6" to 12"

**Starting Method**
- DOL, Star-Delta (on request)

**Features**
- 235 kW up to 100°C Water Temperature
- 270 kW up to 85°C Water Temperature
- Rewindable

**Applications**
- Geothermal Energy
- Thermal Baths
- Heating of greenhouses, operation during cold Seasons
- Cooling Water - / Process Pumps
- Metal Processing Industry

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**Graph**

- **Water Temperature [°C]**
- **Power Output [kW]**
- 6" bis 12" Pleuger H-Motoren
- 6" to 12" Pleuger Standard - Motoren (PE Wicklung)
- 6" to 12" Pleuger Standard Motoren (PVC Wicklung)
Range Charts

Total Flow-Head Chart of Pleuger Submersible Pumps 50Hz, radial and semi-axial Hydraulics

Total Flow-Head Chart of Pleuger Submersible Pumps 60Hz, radial and semi-axial Hydraulics
Range Charts

Total Flow-Head Chart of Pleuger Submersible Pumps, axial Hydraulics

[Graph showing flow and head relationships for various models of Pleuger submersible pumps.]
Applications

Drinking Water

Irrigation

De-watering, Mining
Applications

Bottom Intake Pumps (Polder Pumps)

Booster Pumps
Applications

Offshore Pumps and Equipment
Applications

Cavern Pumps and Equipment

Ex-junction box main and signal cables

Header tank ex-protected level control

Special gland ex-design

Special armored cables or cable protection hoses

Header tank pipes or hoses connected to motor
Contact

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