SJS Submersible Pump
Main Applications

The Sulzer SJS represents the state-of-the-art in submersible pump design and meets the requirements of the following applications:

- Seawater lift
- Ballast water
- Mine dewatering
- Cooling water
- Municipal water supply
- Offshore firewater

Features and Benefits

1. **Surface plate and discharge flange**
   - Fabricated to meet customer connection requirements

2. **Column pipe**
   - Lineshaft and bearings are eliminated which allows the submersible motor and bowl assembly to operate at higher speeds possibly reducing pump and caisson size
   - Column connections are flanged and designed to reduce friction and support the unit

3. **Bowls and impellers**
   - Thousands of proven Sulzer hydraulic combinations to meet customer requirements

4. **Bowl bearings**
   - Provide radial support and act to dampen vibration

5. **Single piece cable**
   - No cable splices. Terminations at terminal box and inside motor only

6. **Inverted configuration**
   - When lower submergence or lower Net Positive Suction Head (NPSH) is required, the bowl assembly can be mounted below the motor
   - The motor is then constructed with a flow sleeve outside of the motor frame to route flow from the bowl assembly, past the motor, and into the column pipe

7. **Cathodic and anti-fouling protection**
   - Reduces marine growth and prolongs the Mean Time Between Removals (MTBR)
Motor Features and Benefits

Motors are water-glycol filled submersible three phase, squirrel-cage induction type with IP-68 protection.

All motors are designed for across the line starting and suitable for Variable Frequency Drive (VFD) operation.

Motor performance range

<table>
<thead>
<tr>
<th>Motor performance range</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 KW TO 2,200 KW</td>
</tr>
<tr>
<td>2 to 8 pole speeds</td>
</tr>
<tr>
<td>220 to 11,000 V</td>
</tr>
<tr>
<td>3 phase</td>
</tr>
<tr>
<td>50 Hz or 60 Hz</td>
</tr>
</tbody>
</table>

1. **Stator and windings**
   - Stator laminations and winding wire are held securely in the motor frame
   - Polymer insulation and polyamide (PA) sheathing encapsulate the windings for operation in the water-glycol environment
   - Squirrel cage rotor laminations are mounted on a ground stainless steel shaft designed to run well away from critical speeds

2. **Motor radial and thrust bearings**
   - Motor rotor supported in spiral grooved carbon sleeve radial bearings
   - High capacity, hydrodynamic thrust bearing designed for high temperature service and suitable for rotation in both directions
   - Hardened steel ground, key driven thrust collar to assure flatness
   - Graphite-composite thrust bearing shoes or pads sized for the pump thrust and motor / pump rotor weight
   - Thrust bearing pedestal utilizes a central pivot to allow the entire thrust bearing to self-align and absorb any misalignment

3. **Motor shaft seal**
   - To prevent contamination of the motor by the pumpage, a mechanical seal is provided at the motor shaft extension
   - The expansion tank or accumulator assures the pressure in the motor is higher than in the pumpage

4. **Motor lubrication and cooling**
   - High energy motors are filled with an environmentally friendly water-glycol solution to provide lubrication of the bearings and cooling of the motor's internal components
   - Heat radiated out through the motor frame is taken away by pumpage flow outside of the motor
   - If the inverted motor is supplied above the pump, the fluid passage around the outside of the motor is sized in this manner

5. **Motor pressure compensation**
   - As the motor comes up to operating temperature, the water-glycol solution will expand. To avoid over-pressuring the mechanical seal, an external tank or accumulator (inverted motor) is provided to compensate for this expansion
SJS Submersible Pump

Operating Data

<table>
<thead>
<tr>
<th></th>
<th>50 Hz</th>
<th>60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump sizes</td>
<td>up to 915 mm</td>
<td>up to 36 inches</td>
</tr>
<tr>
<td>Capacities</td>
<td>up to 10,000 m³/h</td>
<td>up to 44,000 USgpm</td>
</tr>
<tr>
<td>Heads</td>
<td>up to 230 m</td>
<td>up to 750 feet</td>
</tr>
<tr>
<td>Pressures</td>
<td>up to 40 bar</td>
<td>up to 600 psi</td>
</tr>
<tr>
<td>Temperatures</td>
<td>up to 80°C</td>
<td>up to 180°F</td>
</tr>
</tbody>
</table>

Performance Ranges

<table>
<thead>
<tr>
<th></th>
<th>50 Hz</th>
<th>60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head H (m)</td>
<td>up to 1,000</td>
<td>up to 1,000</td>
</tr>
<tr>
<td>Capacity Q (m³/h)</td>
<td>up to 10,000 m³/h</td>
<td>up to 10,000 m³/h</td>
</tr>
<tr>
<td>Head H (ft)</td>
<td>up to 330</td>
<td>up to 330</td>
</tr>
<tr>
<td>Capacity Q (USgpm)</td>
<td>up to 44,000 USgpm</td>
<td>up to 44,000 USgpm</td>
</tr>
</tbody>
</table>

Materials

<table>
<thead>
<tr>
<th>Pump part</th>
<th>I-1</th>
<th>I-2</th>
<th>S-1</th>
<th>S-6</th>
<th>A-8</th>
<th>D-1</th>
<th>D-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowls</td>
<td>C.I.</td>
<td>C.I.</td>
<td>C.S.</td>
<td>C.S.</td>
<td>316SS</td>
<td>Duplex SS</td>
<td>Super Duplex SS</td>
</tr>
<tr>
<td>Impellers</td>
<td>C.I.</td>
<td>Brz</td>
<td>C.I.</td>
<td>12% Chr.</td>
<td>316SS</td>
<td>Duplex SS</td>
<td>Super Duplex SS</td>
</tr>
<tr>
<td>Column and heads</td>
<td>C.S.</td>
<td>C.S.</td>
<td>C.S.</td>
<td>C.S.</td>
<td>316SS</td>
<td>Duplex SS</td>
<td>Super Duplex SS</td>
</tr>
</tbody>
</table>
We Do What We Say

Customer Partnership
• We are reliable partners.
• We provide a high level of service.
• We make our customers more competitive.

Committed People
• We drive accountability.
• We are open and transparent.
• We are team players.

Operational Excellence
• We focus on results.
• We take initiative and work within established processes.
• We act safely.

A Global Specialist at Your Doorstep

Sulzer is recognized for excellent product quality, performance reliability and technical innovation. A truly global company, we are close to customers with:
• a network of 22 manufacturing facilities
• more than 60 service centers
• worldwide sales office presence

Sulzer Headquarters,
Winterthur, Switzerland