SJD Vertical Multistage Can Pumps
ISO 13709 (API 610) for Process Applications
Sulzer Pumps

Sulzer Pumps is a leading global supplier of reliable products and innovative pumping solutions for end users. Our active research and development, detailed process and application knowledge together with a comprehensive understanding of market demands keeps us consistently at the leading edge of technical development. Our global network of modern manufacturing and packaging facilities together with sales offices, service centers and representatives located close to major markets provide fast responses to customer needs.

Sulzer Pumps has a long history of providing innovative pumping solutions to business partners in the following industries:
- Oil and Gas
- Hydrocarbon Processing
- Pulp and Paper
- Power Generation
- General Industry
- Chemical Process Industry
- Water

Extensive Product Range

Vertically suspended pumps are used in many applications where mounting of the driver and discharge piping is well above the liquid level. They are mounted in suction cans or suction tanks, where available NPSH is too low for the amount of fluid to be pumped. NPSH requirements of the pump are met by simply adjusting the length of the pump and can. Advantages are minimal floor space usage and ideal operating conditions provided within the normal operating envelope.

Applications

Sulzer SJD process pumps are specified wherever limited NPSH is available, either due to system constraints or liquids operating near their vapor pressure. Typical applications include liquefied petroleum gas booster, cryogenics as well as general refining and other medium to high pressure applications. The design of the pump has evolved from many years of experience and includes technology which is now exclusive to Sulzer.
Design

The SJD product range is typically used in power generation, oil and gas, hydrocarbon processing and general industrial applications with a broad range of performances. Type SJD process pumps are often built to the requirements of ISO 13709 (API 610). A variety of suction stage performances is available including those meeting Nss ≤11,000. On larger sizes, where extra can depth may be an issue, a double suction first stage is offered.

Series stages offer a variety of hydraulics and can be matched with the first stage for optimum selection and curve shape. SJD process pump stages are typically known for their high head per stage which results in fewer stages and a shorter pump. For applications where high axial thrust is generated, thrust balanced impellers are offered to reduce thrust load. Bowls and column sections are flanged. Column bushings are carbon and bearing spacing meets ISO 13709 (API 610) requirements.

The suction can is fabricated to meet the application requirements and includes an antiswirl brake. Discharge head typically includes both suction and discharge flanges and is cast or fabricated to meet order requirements. ISO 13709 (API 610) nozzle loads are standard.

Engineered for Application Flexibility

When the motor thrust bearing is not preferred or is insufficient, a separate oil lubricated thrust bearing may be furnished. Air, water or pumpage cooling of the thrust bearing is available. Where through bolting of the discharge head to suction can joint is required, a separate mounting plate can be provided as an option.

The pressure boundary components of SJD process pumps can be designed to 25% of ultimate tensile strength with another 3mm (0.12 inches) corrosion allowance added for compliance with ISO 13709. Cast discharge heads are designed for 300# R.F. flange rating. Suction can flange rating is typically designed for suction pressures up to 15 bar (225 psi). Higher MAWP and flange ratings are available.

Materials

<table>
<thead>
<tr>
<th>Component</th>
<th>A-8</th>
<th>D-1</th>
<th>D-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge head</td>
<td>316LSS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Suction can</td>
<td>316LSS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Bowls</td>
<td>316LSS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Impellers</td>
<td>316LSS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Bowl shaft</td>
<td>316 SS *</td>
<td>Duplex or Monel</td>
<td>S D or Monel</td>
</tr>
<tr>
<td>Column</td>
<td>316LSS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Wear parts</td>
<td>316SS-HF</td>
<td>Duplex-HF</td>
<td>Super Duplex-HF</td>
</tr>
<tr>
<td>Bushings</td>
<td>Carbon</td>
<td>Carbon</td>
<td>Carbon</td>
</tr>
<tr>
<td>Gaskets</td>
<td>Oring</td>
<td>Oring</td>
<td>Oring</td>
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*Nitronic 50 or Duplex may be substituted depending upon application
Other material combinations available, including materials for sour services under NACE MR 0175 or MR 0103
SJD Design Features and Benefits

**Driver**
Drivers to meet a variety of customer and industry specifications.

**Jack Bolts**
Driver jack bolts are standard.

**Spacer Coupling**
Rigid adjustable spacer couplings for simple mechanical seal maintenance and rotor lift adjustment.

**Shaft**
One piece shaft required by ISO 13709 up to about 3.5 m (18 feet). 416 SS is standard with a variety of optional materials.

**Suction Can / Column Pipe**
O-ring sealed suction can fabricated with full penetration welds and swirl brake for uniform suction flow to first stage. Optional o-ring sealed column and bowl joints. Column joints are flanged.

**Can Drain**
Can drain is attached to pumping unit and has only one penetration at the discharge head. Reduces chance of external drain damage.

**First Stage Impeller**
Mounted between bearings on all but smaller sizes where shaft is a large percentage of impeller eye area and impeller is less than 150 mm (6 inches) diameter. Nss is 11,000 or less. High Nss is optional.

**Discharge Head**
Cast discharge head with separate motor stand for rigidity. Other configurations are provided using fabricated discharge heads.

**Shaft Sealing**
Seal chambers meet ISO 13709 (API 610) dimension requirements to accommodate ISO 21049 (API 682) cartridge type mechanical seals.

**Column Bearings**
On 14” column and smaller, column bearings are mounted in a reversible bearing spider that may be flipped to run the bearing on a different shaft surface. Integral bearing spiders are optional and are standard on > 14” column.

**Bowl Assembly**
Flanged bowls are standard. Wear rings on the impeller are standard with bowl rings optional.

**Impellers**
Impellers are held and driven by split ring and key design. Thrust balanced impellers are optional for reduced thrust bearing load.
SJD Optional Design Features and Benefits

**Driver Stand**
Discharge head and driver stand checked for natural frequency coincidence. Installed vibration levels meet or exceed ISO 13709 requirements.

**Thrust Bearing**
Bearings are designed to meet ISO 13709 requirements to avoid overheating. Oil level is kept below the bearings to avoid churning and foaming common in other designs. Temperature rise during performance test is measured and meets ISO 13709. Optional fan, water or pumpage cooled thrust bearing with CS bearing housing and high or extra high thrust bearings.

**Mounting Plate**
Optional separate mounting plate to allow for through bolting on main flange when required by specification or higher loading for spiral wound gasket compression.

**Suction Can**
Specially designed suction cans are available with dished, semi-spherical can bottom, external can drains, below ground suction and many more options.

**J-Unit for Cryogenic Services**
A proven and reliable design to seal the pump shaft on cryogenic applications.

**Double Suction Impeller for Low NPSH**
Provides nominal 30% reduction in NPSH required with Nss ≤ 11,000. Impeller mounted between bearings.
SJD Performance Ranges

Operating Data

<table>
<thead>
<tr>
<th></th>
<th>50 Hz</th>
<th>60 Hz</th>
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</thead>
<tbody>
<tr>
<td><strong>Capacities</strong></td>
<td>10 to 3,800 m³/h</td>
<td>10 to 20,000 USgpm</td>
</tr>
<tr>
<td><strong>Heads</strong></td>
<td>up to 700 m</td>
<td>up to 3,000 feet</td>
</tr>
<tr>
<td><strong>Pressures</strong></td>
<td>up to 75 bar</td>
<td>up to 1,100 psi</td>
</tr>
<tr>
<td><strong>Max operating pressures</strong></td>
<td>up to 150 bar</td>
<td>up to 2,150 psi</td>
</tr>
<tr>
<td><strong>Temperatures</strong></td>
<td>-75 °C to 205 °C</td>
<td>-100 °F to 400 °F</td>
</tr>
</tbody>
</table>
Maintaining and Improving Pump Performance

Sulzer Pumps – Customer Support Services

The continuous availability and high operating performance of pumps is the key target for our customer support service organization. Through our highly experienced personnel and application knowledge, we provide a full range of innovative service solutions to our customers to keep their pumps running including:

- Spare Parts
- Field Services
- Repair Services
- Retrofits
- Maintenance Agreements
- Operation Agreements

Flexibility

With services ranging in scope from supplying a spare part to operating the pump under contract, we are uniquely placed to make your process run smoother. Service specialists based at either our manufacturing facilities or one of over 60 service centers around the world are dedicated to maintaining the performance of our customers’ pumps and associated equipment. This service is not just limited to Sulzer products, all the pumps our customers operate can benefit from the support of Sulzer Pumps.

Network of Locations

- Divisional Headquarters
- Manufacturing Facility
- Customer Support Service Center (CSS)
- Sales Office
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