Vertical sulfuric acid pump
type Ensival Moret VAS
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The VAS pump range has been specifically designed for sulfuric acid pumping applications. Its proven and reliable design ensures higher mean time between maintenance (MTBM) while offering high mechanical performance. A specific VAS vertical turbine pump design for heat recovery systems is also available and offers the most reliable and safest pumping solutions for high-temperature sulfuric acid media.

Main applications

The VAS acid pump range has been designed to meet the requirements in H₂SO₄ production plants such as
• absorption tower
• drying tower
• heat recovery system

Features and benefits

Sulzer’s VAS pumps offer high efficiency and durability. The advanced design combined with high-quality materials make the pumps more reliable allowing a significant reduction in the plant down time while increasing the operation efficiency. Key benefits include:

High corrosion resistance and durability
• Wide range of highly corrosion-resistant materials ensures exceptional resistance against wear in sulfuric acid pumping applications and guarantees high durability of the pump
• Highly efficient non-contacting sealing system which reduces head pressure ensuring minimized corrosion
• Unique and compact design with totally flooded single rise discharge column featuring only one air/liquid interface

High reliability
• Superior operational performance proven with longer maintenance-free operation, up to four years from first start-up
• Symmetrical design of diffuser casing minimizes radial loads and shaft deflection which ensures longer pump service life

Easy assembly and maintenance
• Bolts are fully protected against corrosion which allows easy dismantling/reassembling and facilitates maintenance of the pump
• Symmetric design with circumferential mounting plate ensures easy assembly and installation of the pump and bolting to the tank

Safety
• Highest standard requirements of safety for staff and environment exceeded due to the unique design which reduces and prevents acid vapors
Design

1. Heavy duty bearing frame
   - Extended pump lifetime
2. Auxiliary packing rings
   - Prevent acid vapors and minimize corrosion
3. Sealing with throttle bushing
   - Non-contacting shaft seal which reduces head pressure and minimizes leakage overflow
4. Pump column totally flooded
   - Only one air/liquid interface outside the discharge column to minimize corrosion damage
5. FEP (fluorinated ethylene propylene) lined shaft
6. Closed impeller
   - Offers high efficiency and low net positive suction head (NPSH)
7. Axial loads fully balanced by front/back casing wear rings and balancing holes
   - Extended bearing lifetime
8. Symmetrical diffuser casing
   - Lower level of radial thrust on a wide operation range

![Diagram of pump design features](image-url)
**Construction details**

Collector pipe takes leakage overflow back to the tank without contact with support column

Symmetrical diffuser casing ensures lower radial loads on a wide range of operation

Axial balancing by front/back wear rings and balancing holes

Mating faces fully protected against corrosion by three-fold sealing

**Additional design features**

**VAS pump range for heat recovery systems**

Specific construction for high-temperature sulfuric acid applications up to 250°C / 480°F:

- Efficient air-cooled bearing housing system with air fins and bearing fan significantly reduces temperature and avoids risks of overheating (A)
- Oil-lubricated bearing (B)
- Reliable design by single mechanical seal with flushing API 32
- Innovative design with back-to-back dual pressurized mechanical seal ensures maximum safety and reliability due to the absence of contact with the pumped liquid (C)
- Flow and pressure always controlled through a monitoring panel
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Operating data

<table>
<thead>
<tr>
<th>50 Hz</th>
<th>60 Hz</th>
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</thead>
<tbody>
<tr>
<td>Capacities</td>
<td>Capacities</td>
</tr>
<tr>
<td>up to 4'000 m³/h</td>
<td>up to 17'500 USgpm</td>
</tr>
<tr>
<td>up to 45 m</td>
<td>Heads</td>
</tr>
<tr>
<td>up to 20 bar</td>
<td>up to 148 ft</td>
</tr>
<tr>
<td>up to 150°C</td>
<td>Pressures</td>
</tr>
<tr>
<td>up to 20 bar</td>
<td>up to 290 psi</td>
</tr>
<tr>
<td>up to 1'500 rpm</td>
<td>Temperatures</td>
</tr>
<tr>
<td>up to 1'500 rpm</td>
<td>up to 291°F</td>
</tr>
<tr>
<td>up to 1'500 rpm</td>
<td>Maximum speed of rotation</td>
</tr>
<tr>
<td>up to 1'800 rpm</td>
<td></td>
</tr>
</tbody>
</table>

Performance range

Higher capacities and heads available upon request.

Materials

<table>
<thead>
<tr>
<th>Pump part</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump casing</td>
<td>Acid-proof cast iron or special stainless steel</td>
</tr>
<tr>
<td>Impeller and wear rings</td>
<td>Special stainless steel</td>
</tr>
<tr>
<td>Sleeve bearings</td>
<td>Ferro-silicium or special alloy</td>
</tr>
<tr>
<td>Shaft</td>
<td>Duplex stainless steel with FEP lining</td>
</tr>
</tbody>
</table>