

## VAS vertical sulfuric acid pump

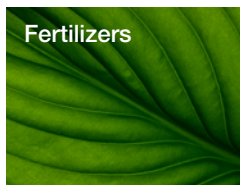


# Main industries and applications

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

The VAS acid pump range has been designed to meet the requirements in sulfuric acid production plants such as

- drying tower circulation (DT)
- intermediate and final absorption tower circulation (IAT/FAT)
- heat recovery system circulation



## Features and benefits

Sulzer's VAS pumps offer high efficiency and durability. The advanced design combined with specific high-quality materials make the pumps more reliable allowing a significant reduction in the plant downtime 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 thanks to increased wall thickness
- Specific sealing adapted to pumping conditions to ensure safe operation with high reliability
- 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 increases reliability and lifetime

### 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 handling and installation of the pump and sealing of the tank

### Safety

- Highest requirements of safety are exceeded thanks to the unique design which ensures self draining of the pump and prevents acid vapors

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# Design

## 1 Heavy-duty bearing frame

- Extended pump lifetime due to strong and robust design

## 2 Sealing with throttle bushing

- Non-contacting shaft seal which reduces head pressure and minimizes leakage overflow

## 3 Auxiliary packing rings

- Prevent acid vapors and minimize corrosion

## 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

- Ensures high durability and corrosion resistance of the shaft

## 6 Closed impeller

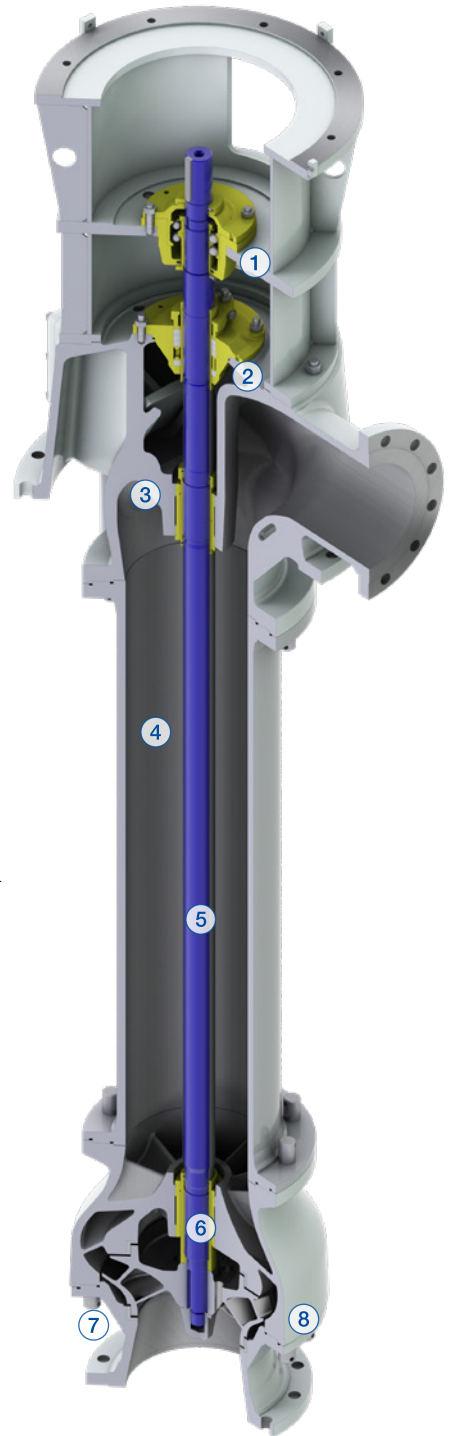
- Offers high efficiency and low net positive suction head (NPSH)

## 7 Axial loads fully balanced by front/back casing wear rings and balancing holes

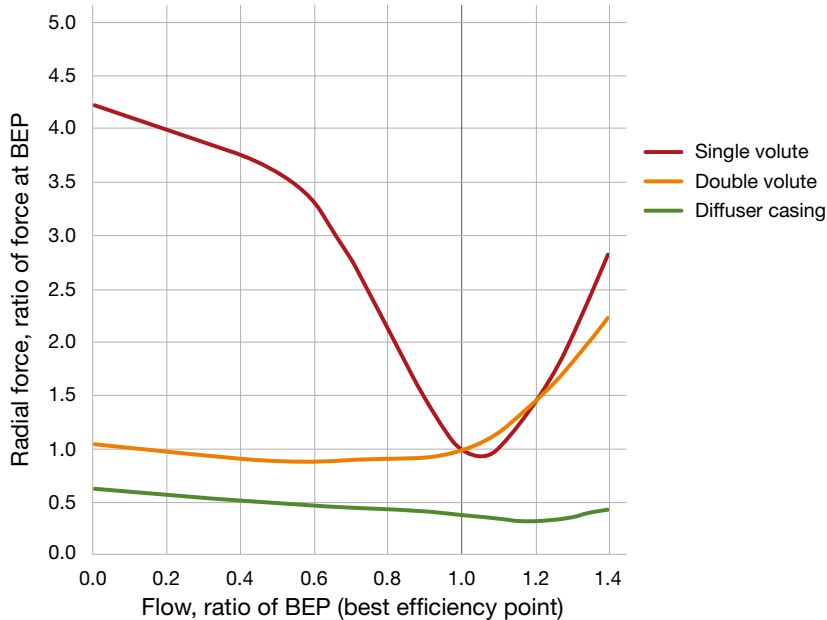
- Extended bearing lifetime
- Ensures pump self-draining

## 8 Symmetrical diffuser casing

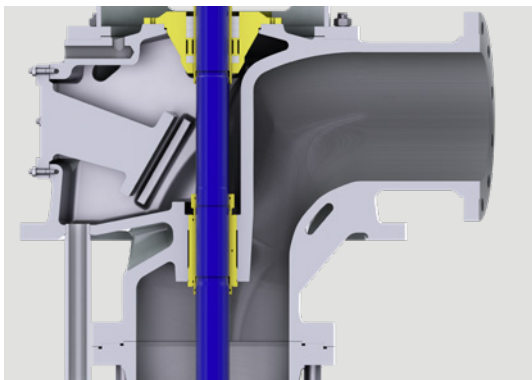
- Lower level of radial thrust on a wide operation range
- Homogeneous thermal expansion



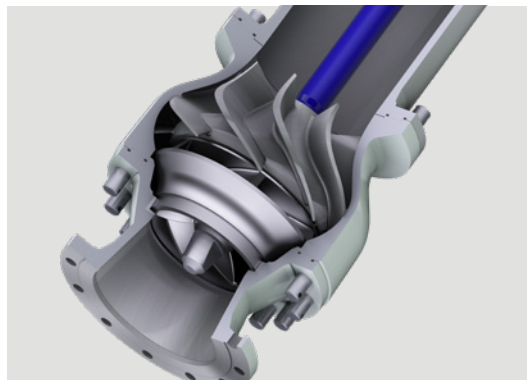
## Radial forces comparison



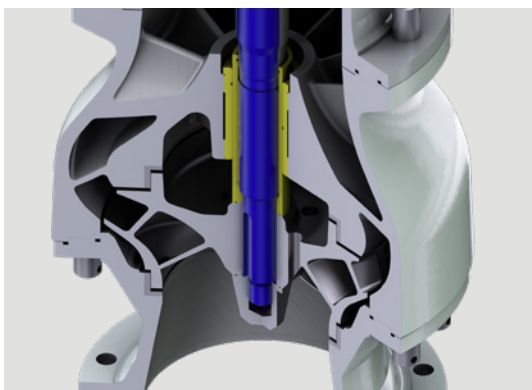
# Construction details



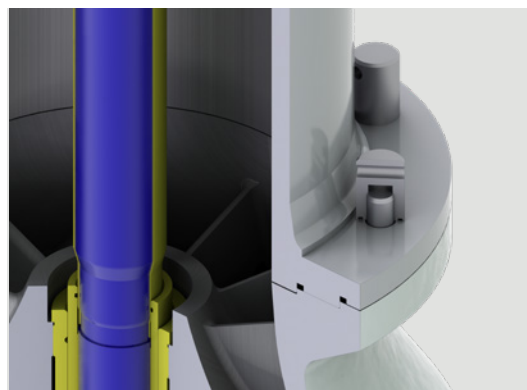
Collector pipe takes leakage overflow back to the tank without contact with support column.



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



Axial balancing by front/back wear rings and balancing holes.

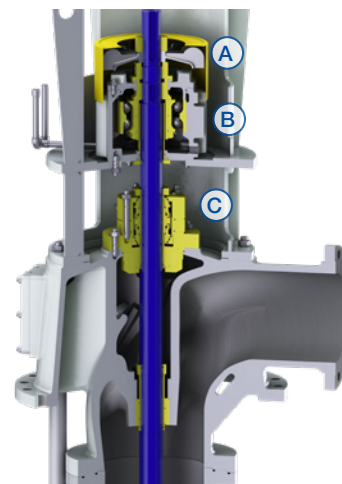


Mating faces fully protected against corrosion by three-fold sealing.

## 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 the use of cooling water (A)
- Oil-lubricated bearing (B)
- Reliable design by single or dual mechanical seal with injection of dry air available at the site 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



# Specifications

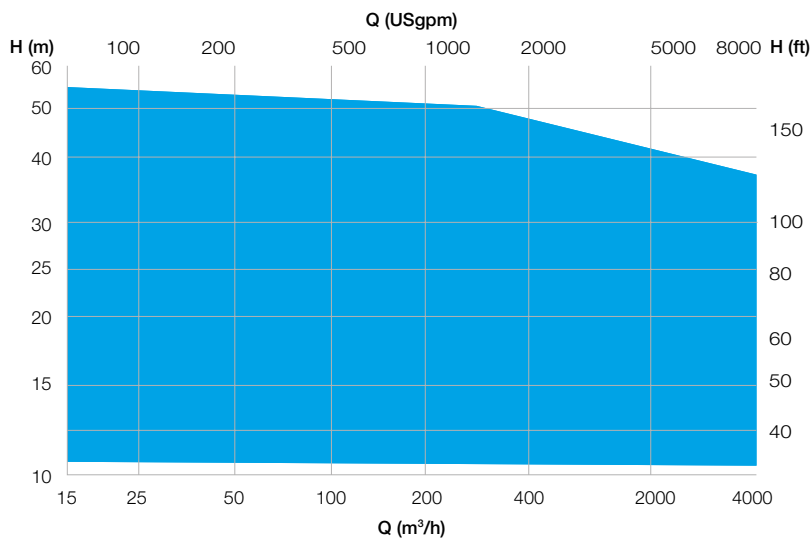
## Materials

Pump part	Material
Pump casing	Chromium iron, acid proof cast iron or special stainless steel
Impeller and wear rings	Special stainless steel
Sleeve bearings	Ferro-silicium or special alloy
Shaft	Duplex stainless steel with FEP lining

## Operating data

	50 Hz	60 Hz
Capacities	up to 4'000 m <sup>3</sup> /h	up to 17'500 USgpm
Heads	up to 45 m	up to 148 ft.
Pressures	up to 20 bar	up to 290 psi
Temperatures	up to 150°C (250°C in heat recovery)	up to 291°F (480°F in heat recovery)
Maximum speed of rotation	up to 1'500 rpm	up to 1'800 rpm

## Performance range



Higher capacities and heads available upon request.

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