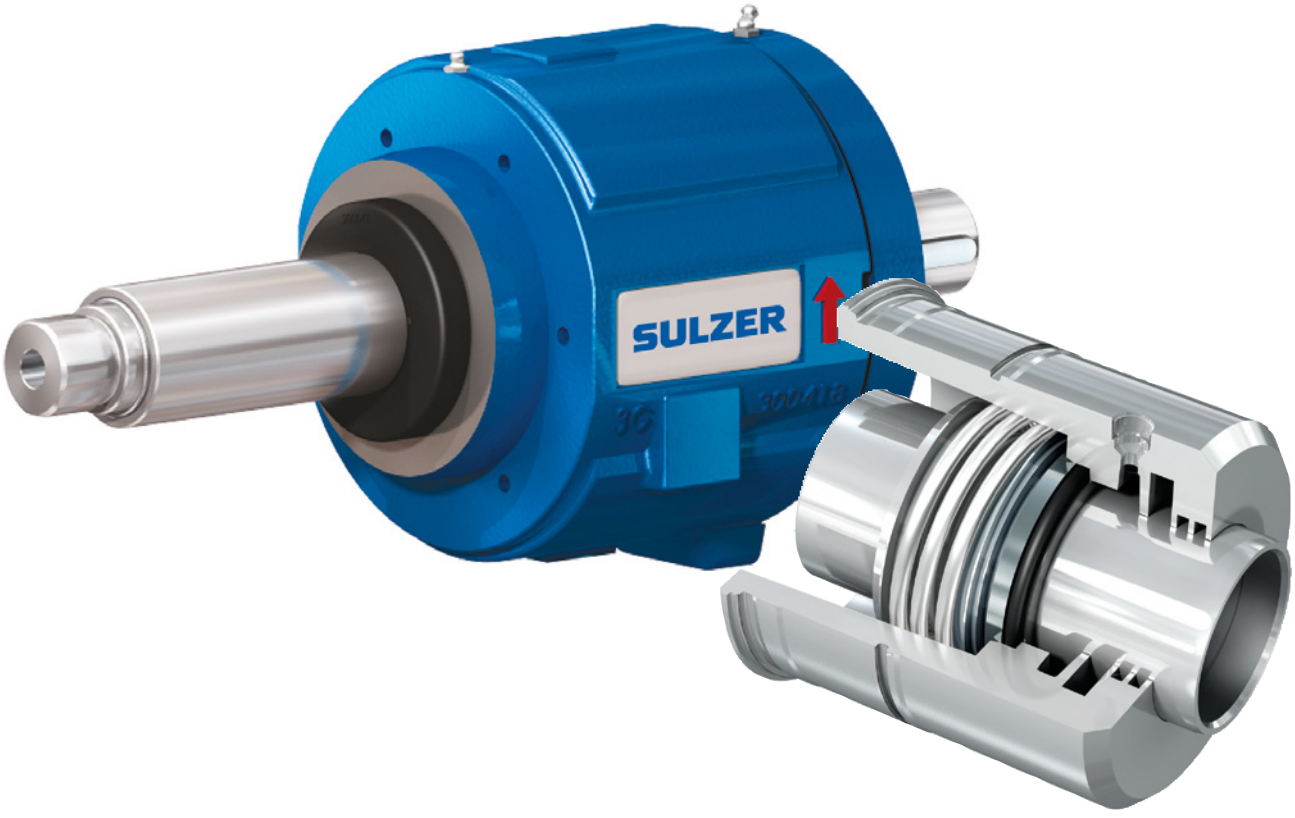
SULZER

Sulzer Pumps

System PSI for Single Mechanical Seals
Pump Series BE, BA/NB/FB and BK/NK



The Heart of Your Process

Turning a Weak Point to a Strong One – System PSI

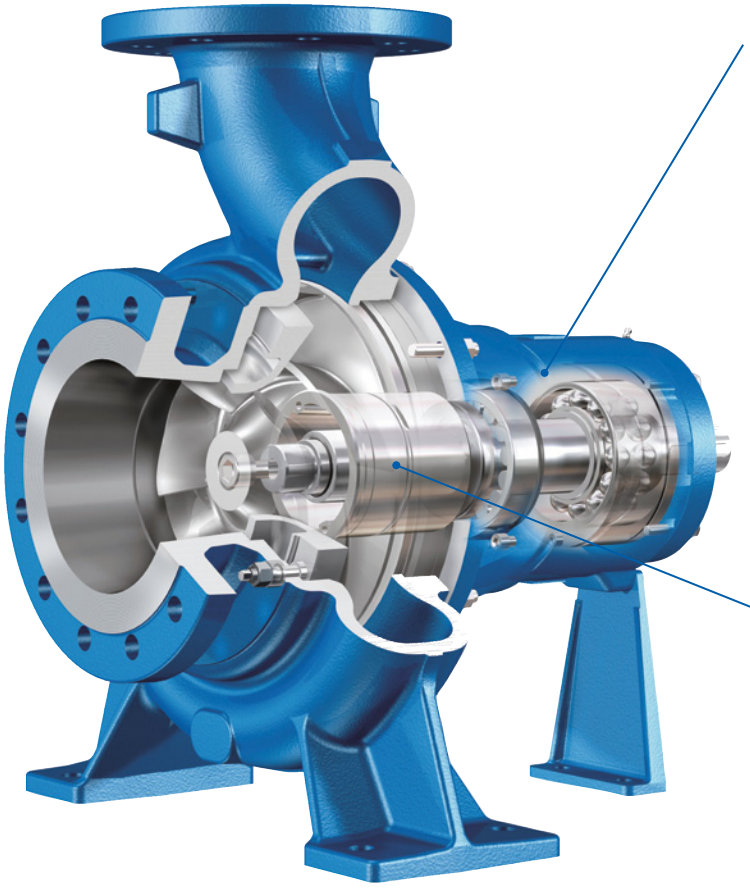
Traditionally, the Achilles' heel of a pump is the shaft seal. The majority of pump failures in the process industry are the result of shaft seal failures.

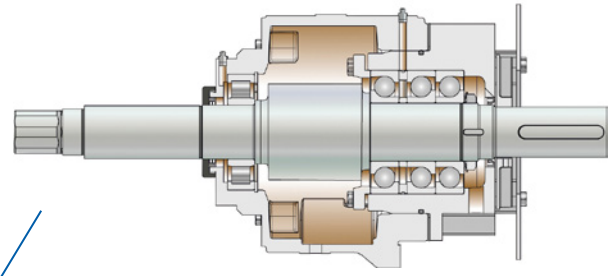
But by integrating the seal arrangement into the pump design, Sulzer can supply pumps giving ideal operating conditions for the seal. The result is high reliability for lowest total cost – thanks to the System PSI (Pump Seal Integration) which is built on the interaction between the pump and its seal.

In close co-operation with our customers Sulzer has gained a wealth of experience and thorough knowledge of operating conditions of shaft seals in pumps.

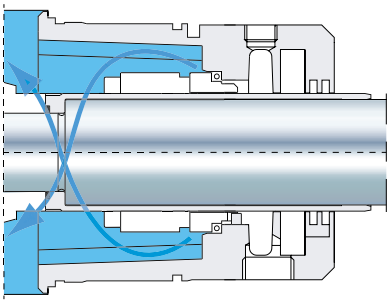
Part of BE Modular System

The seal cartridge is part of our well-known BE Modular System for process pumps, which offers flexibility and full interchangeability with the cartridges. When changing from a gland packing to a single mechanical seal, the only part that has to be changed is the seal cartridge.





The Sulzer BE process pumps are of a very robust design. The sturdy Bearing Assembly gives minimum shaft deflection at the shaft seal and vibration-free running minimizing seal failures.



The design of the PSI cartridge and the hydraulic parts interact, so that gas and solids are immediately expelled from the seal area. The seal therefore always operates with clean sealing liquid, which prolongs the life time of the seal.

Applications

Single mechanical seals with PSI cartridge are often used for a vast area of general duties like fibrous liquids, and slurries, but also for corrosive or clean media.

For tough applications with higher system pressures and temperatures, e.g. around digesters, or hazardous liquids, double mechanical seals are selected.

The PSI cartridges are available in various materials, e.g. stainless steel or higher graded alloys.

Sulzer Wide Range of Seal Arrangements

To suit every customer demand, besides the mechanical seals, there is a wide range of different seal arrangements available.

These seal arrangements are gland packings, which can be used for a variety of liquids.

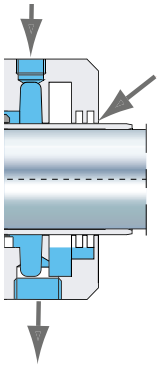
For clean or fibrous liquids, dynamic seals are an alternative, such as MasterSeal.

The System PSI Concept = Lowest Total Cost

High Reliability	**The PSI cartridge is designed to ensure that gas and solids are immediately evacuated from the seal housing. This is achieved by using a strong bearing assembly and a hydraulic design which gives control of the pressure – all this to secure a high reliability.**
Lowest Power Consumption	**Minimum backvanes are the base of a secured sealing solution within the System PSI, resulting in the lowest power consumption.**
Easy Service	**The PSI cartridge can be quickly replaced, which minimises the down-time and costs.**
Minimum Water Consumption	**In most applications, external sealing or quench liquid can be eliminated which ensures cost savings.**
DIN Size Seals	**The PSI cartridge will accept all single mechanical seals built to DIN, i.e. easy access to spare parts.**
Personnel Safety	**To ensure the highest personnel safety a collector is integrated in the secondary seal of labyrinth type and will handle any leakage from the shaft seal.**

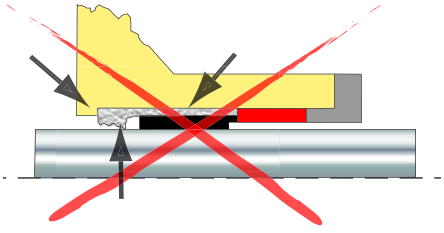
Sturdy and Reliable

When designing the PSI cartridge and the hydraulic parts – pump casing and impeller, we also carried out comprehensive tests on various seal alternatives. As a result, we have selected a series of shaft seals in collaboration with internationally well known manufacturers. These sturdy seals will ensure top operational results in a cost-effective way.

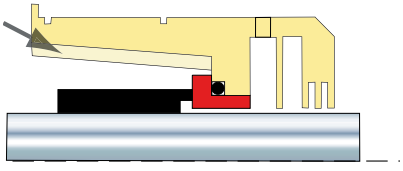


The PSI cartridge is prepared for quench. In applications with crystallising liquids, or any other liquid which could harm the lubrication of the seal a low pressure quench can be used.

The collector integrated in the secondary seal will also handle leakage from the shaft seal - an important safety aspect.



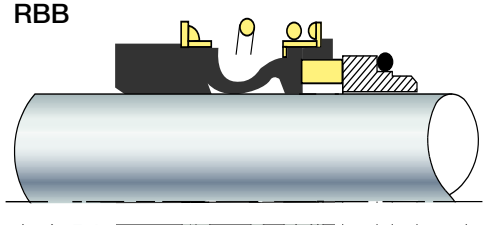
External Seal Cartridges
If the space around the seal is too small, particles and gas block the important function of lubricating the seal.



Sulzer PSI cartridge
The bars and the cartridge design create a vortex circulation outwards.

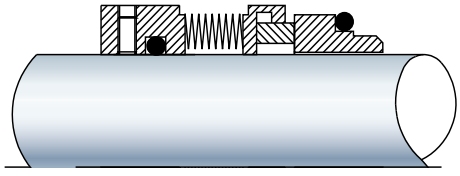
Different Seal Arrangements

RBB



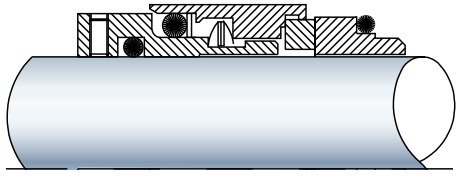
Rubber Bellows seal type RBB.

MBA



Metal bellows seal type MBA.

CSA



O-ring seal type CSA.

The Best Solution Among Mechanical Seals

LCC calculation	Gland packing	Traditional mechanical seal with quench and back-vanes	PSI mechanical seal with quench	PSI mechanical seal without quench	Your seal costs
Initial investment cost	230	850	850	850	
Installation cost (piping)	600	600	600	600	
Weighted average power of equipment in kW	0.8	2.3	0.3	0.3	
Energy cost for 5 years' operation	1,078	3,098	404	404	
Operating cost (E.g. sealing water)	2,654	531	531	0	
Maintenance cost (routine maintenance)	802	401	401	401	
Repair cost every 4th year (gland packing every 2nd year)	955	758	758	758	

All costs in EUR

Total costs, EUR

Net present LCC-value: *)	5,434	5,868	3,174	2,773

*) 5 years' continuous operation

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