

**BBS Double Suction Between Bearings
Single Stage Process Pump
ISO 13709 (API 610)**



The Heart of Your Process

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 and Wastewater

Know-How for Better Efficiency

Sulzer Pumps' success is founded on expertise. Our know-how and competitiveness is based on many years of experience in the manufacturing of pumps. Sulzer Pumps offers a broad range of pumps for the Hydrocarbon Processing Industry. All our pumps are engineered in accordance with the latest standards issued by ISO, API and ANSI to ensure reliable operation at your site. Hydrocarbon processes require the highest standards of safety and emission control.

Improvements for better efficiency in equipment, Mean Time Between Failure (MTBF) and lower Total Life Cycle Cost (TLCC) continue to be high priority issues. Sulzer Pumps is your best choice for every pumping application in your plant.

Following industry practice, we further subdivide the segment into:

- Synfuels
- Refining
- Gas Processing
- Petrochemicals
- Nitrogenous Fertilizers



Design

Sulzer Pumps' BBS is the culmination of 40 years of design refinement and thousands of installed pumps. Over the years, heavier casings for additional nozzle load capability and more features for higher temperature operation were added. Shaft diameters grew for more rigidity. Design improvements and hard coatings were made for severely abrasive services in applications to enhance life cycle.

The BBS pump offers constant refinements and improved hydraulic performance. Seal chamber size increased for compliance with ISO 13709 (API 610) to accommodate ISO 21049 (API 682) cartridge seals. Impeller design improvements further reduced vibration and pulsations. Heavier baseplate designs again improved rigidity for higher loads - even in the non-grouted condition for offshore platform installations.



Solutions Engineered to Last

BBS pumps are designed for a wide variety of pumping applications covering a full range of higher pressure applications. Sour water, propane, light hydrocarbons, hot and corrosive naphthanic crude oil, hot sandy crude oil and vacuum bottoms are all services that have been proven to need the robust construction and service reliability provided by the BBS product range. Its double suction impeller minimizes NPSH.

For higher pressure ratings, very high energy, side-side nozzles and other special applications the BBS is supplemented by the complete CD product line, which can be modified to suit virtually any application.

The engineered version of the BBS is the CD type. Over the past 40 years, pump sizes have been added to the CD product line for flows in excess of 6,800 m³/h

(30,000 USgpm) and head up to 830 m (2,700 ft) with power levels exceeding 15 MW (20,000 HP) and speeds greater than 5,000 rpm. CD pumps are commonly found in a variety of some of the world's largest pipeline and crude shipping applications, as well as in special, high temperature applications for solar power fields. Many of the experiences from those applications are found in the BBS product range.



Materials

All common API 610 Material Classes like S-5, S-6, S-8, C-6, A-8, D-1, D-2 and 317L. Other material combinations are readily available.

BBS Design Features and Benefits

Flanges

300# RF flanges with required ISO 13709 back facing and serrations.

Mounting Feet

Extra heavy casing feet for minimum distortion even when subjected to 2 times API nozzle loads.

Stiff Shaft Design

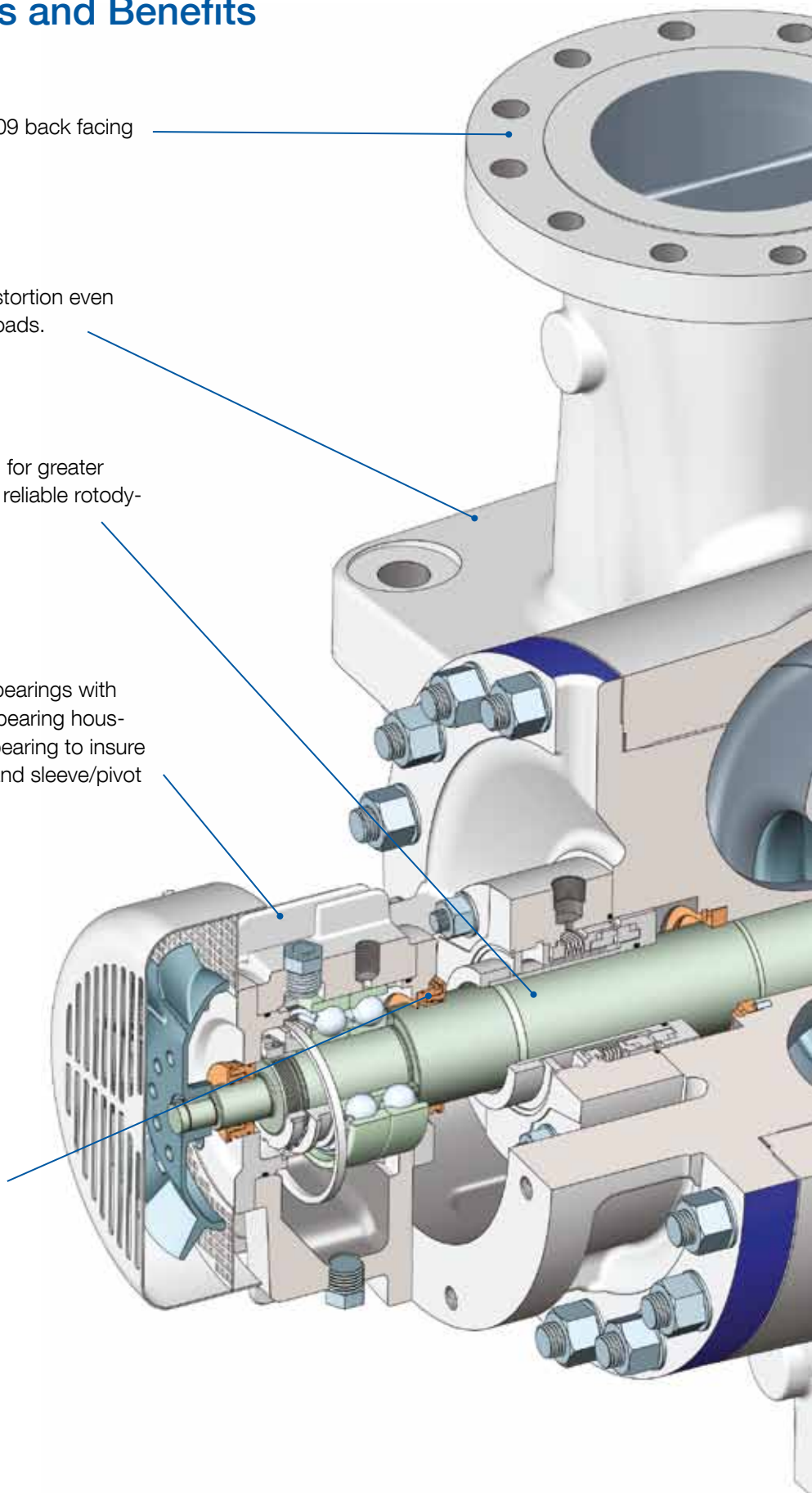
Minimized deflection at mechanical seal for greater mechanical seal life. Rugged design for reliable rotodynamic performance and low vibration.

Thrust Bearing Assembly

Fan cooled 40° angular contact thrust bearings with ring oil lubrication. Carbon steel finned bearing housing provides oil to both sides of thrust bearing to insure low bearing temperatures. Sleeve/ball and sleeve/pivot shoe bearing system available.

Isolators

INPRO™ isolators are standard. Non-metallic or magnetic type oil seals are available to meet a variety of customer requirements.





Full Cartridge Mechanical Seal

Seal chamber dimensions per ISO 13709 (API 610). Positively registered seal gland plate. Single, dual pressurized and dual unpressurized seals as required to meet the application.

Radial Bearing Assembly

Deep groove ball bearing with ring oil lubrication. INPRO™ shaft seals and finned carbon steel bearing housing insure low bearing temperatures. Sleeve bearing available.

Tapered Shaft

Standard tapered shaft extension for ease of seal maintenance.

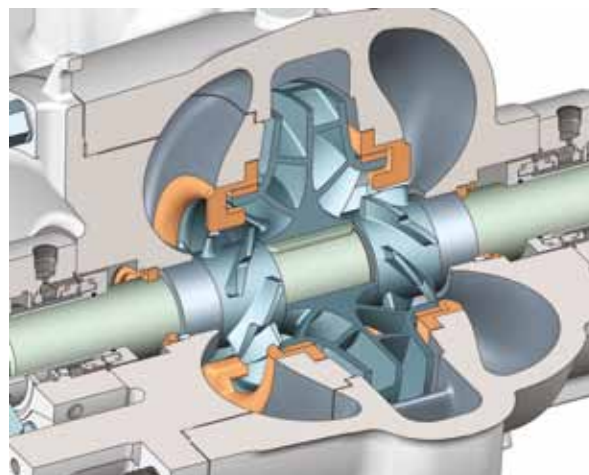
Impeller

Staggered vane design on higher specific speed, higher energy sizes to reduce vane pass pulsations. Double suction impeller is positively retained. Impeller is dynamically balanced.

BBS Optional Design Features and Benefits

Coke Crusher Design

For applications where coke particulate is potentially larger than the maximum particle size that a pump will pass without clogging, Sulzer Pumps' unique coke crusher feature is added. Smaller coke particles pass between the rotor blades and through the impeller. Larger particles are impaled on the rotor blade notches and rotated around to the stator lugs. The large particles are then crushed into smaller particles and they pass through the pump. Years of coke crusher experience at Sulzer Pumps have resulted in a design that doesn't block the impeller eyes and has little effect on NPSHr.



Ball-Ball Bearing

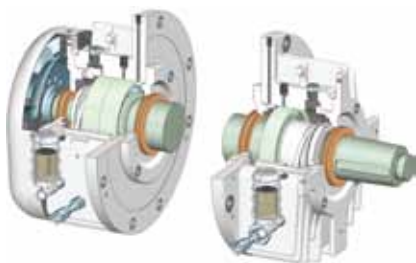
The Sulzer Pumps standard ball radial, ball thrust bearing system utilizes finned carbon steel bearing housings with an aluminum cooling fan on the thrust bearing. Oil rings bring oil from the sump to the shaft to lubricate the bearings and avoid foaming. Thrust bearings are 7300 series with machined brass cages. The thrust bearing housing is supplied with a trough which feeds oil to both sides of the bearing to avoid overheating. Provisions for pure or purge oil mist are standard and the standard oiler is pressure balanced. INPRO™ VBX isolators are standard. For high temperature services a variety of features is available such as inboard heat sink fans, slotted bearing brackets, finned coolers as well as cooled secondary seal flush pots to suit the application.

Sleeve-Ball Bearing

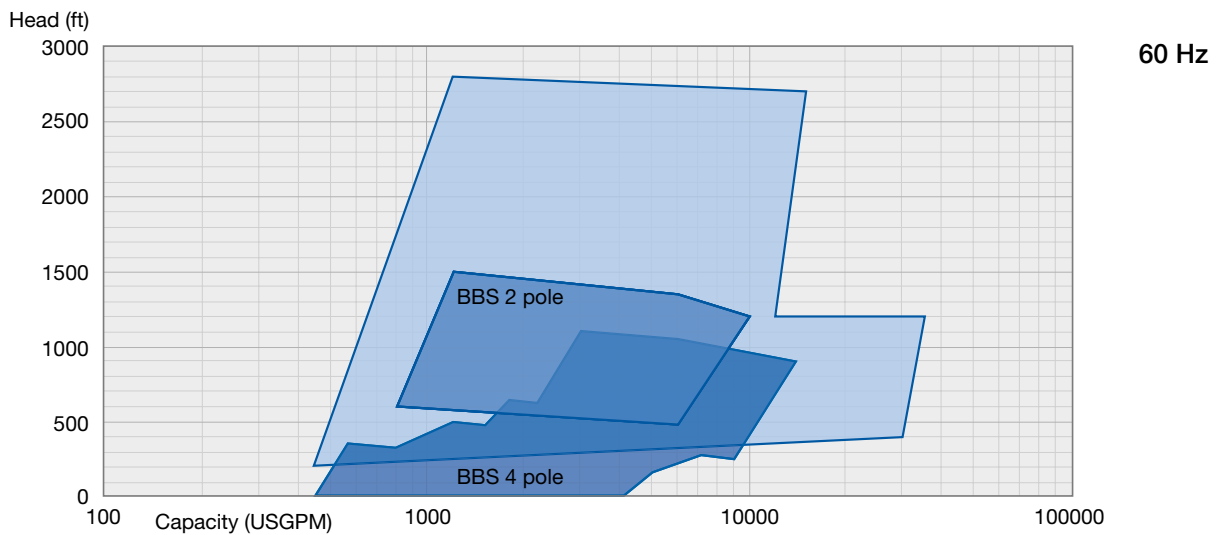
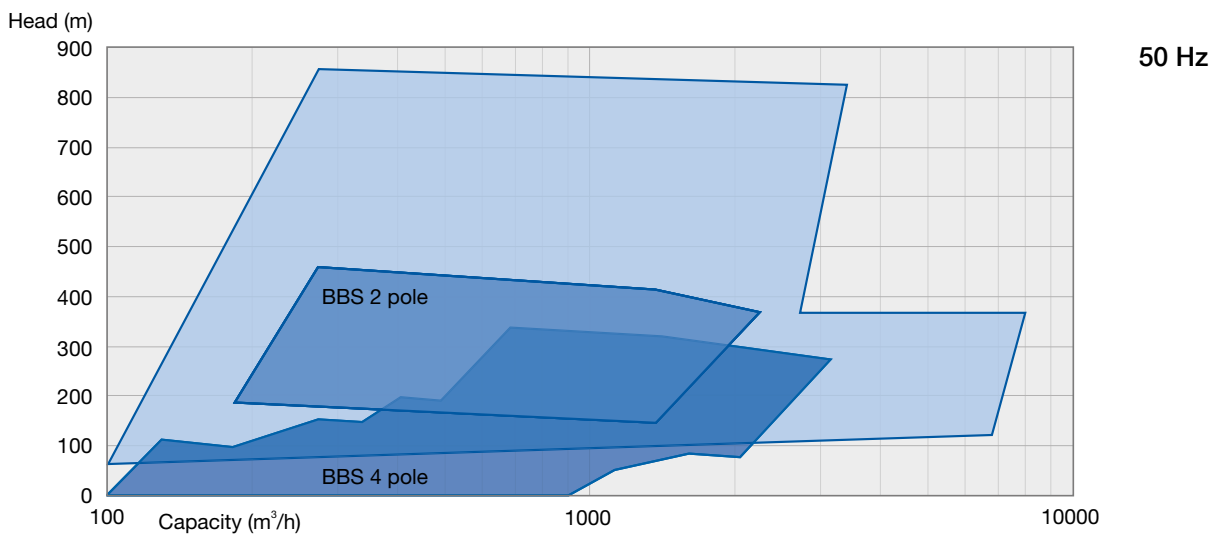
For higher speeds, higher loads and off peak operation, sleeve radial bearings with 7300 series ball type thrust bearing are available for a nominal adder. All the features available in the ball/ball bearing system are supplied or available with the sleeve/ball system except pure oil mist. For pipeline applications the optional cartridge mounted ball thrust bearing for rapid seal change and reuse of the thrust bearing is sometimes preferred. Piping to cool or warm the bearings using the pumpage is also available.

Sleeve/Pivot Shoe Bearing

Where hydrodynamic radial and thrust bearings are required by ISO 13709 (API 610) or preferred by the purchaser, Sulzer Pumps' sleeve/pivot shoe bearing system provides the ultimate in bearing life. A pressurized oil lubrication system is required. A variety of standardized instrumentation packages for bearing temperature and vibration measurement is available.



BBS Performance Ranges



BBS product range
 CD product range

Operating Data

	50 Hz	60 Hz
Pump size	150 to 300 mm	6 to 12 inches
Capacity	up to 3,200 m ³ /h	up to 14,000 USgpm
Head	up to 350 m	up to 1,500 feet
Pressure	up to 50 bar	up to 740 psi
Temperature	up to 425° C	up to 800° F

Check our worldwide offices at
www.sulzerpumps.com