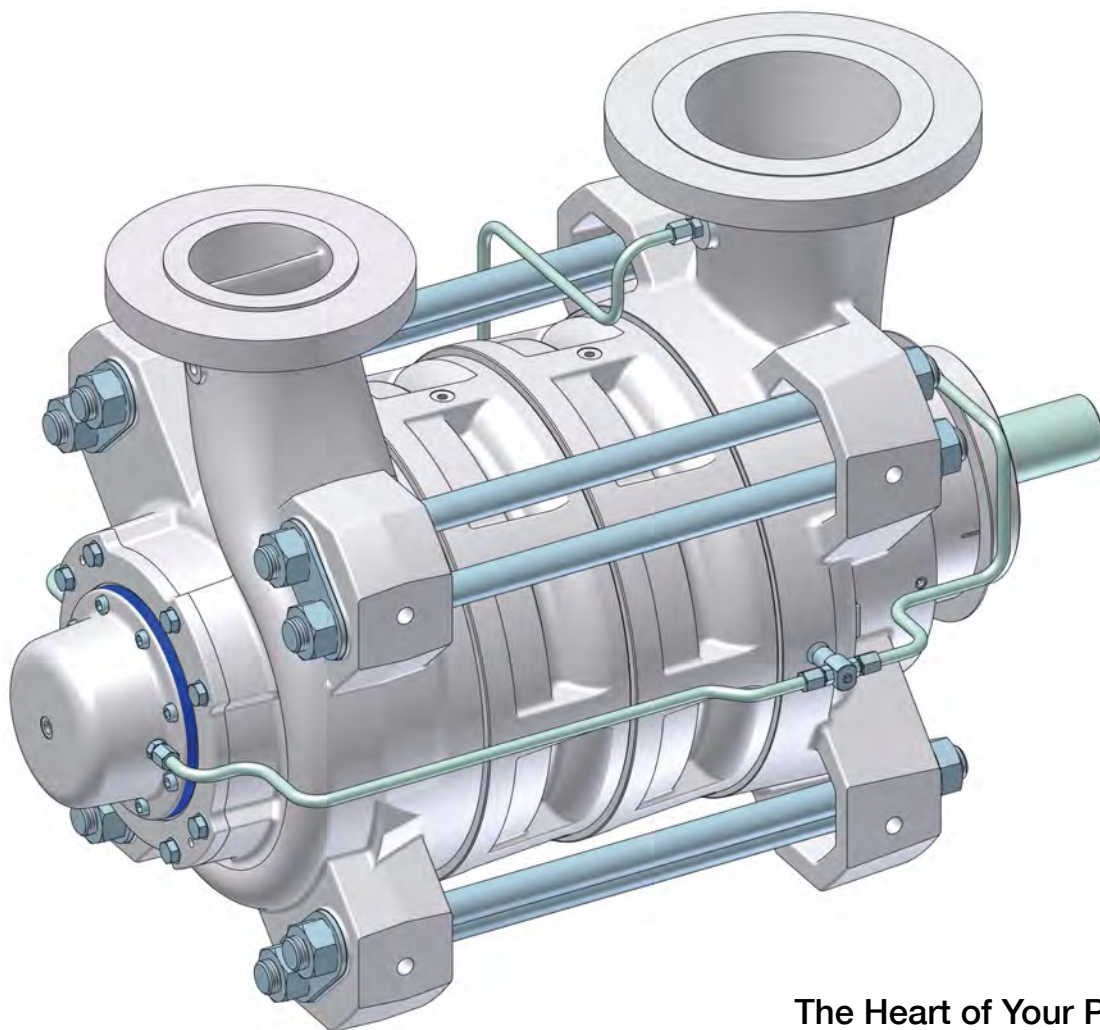


SULZER

Sulzer Pumps

MBN-RO Multistage Ring Section Pumps



The Heart of Your Process

Sulzer Pumps – Your Partner for Pumping Solutions

Sulzer Pumps is one of the world leaders in state-of-the-art pumping solutions. Combining engineering and application expertise, our solutions add value and strengthen the competitive position of our customers.

Thanks to a global network of manufacturing facilities, sales offices, service centers and representatives, we can provide fast responses to customer needs.

Sulzer Pumps is a well-recognized player in the following industries:

- Oil and Gas
- Hydrocarbon Processing
- Pulp and Paper
- Power Generation
- Water
- General Industry
- Chemical Process Industry

MBN-RO Global Manufacturing Facility

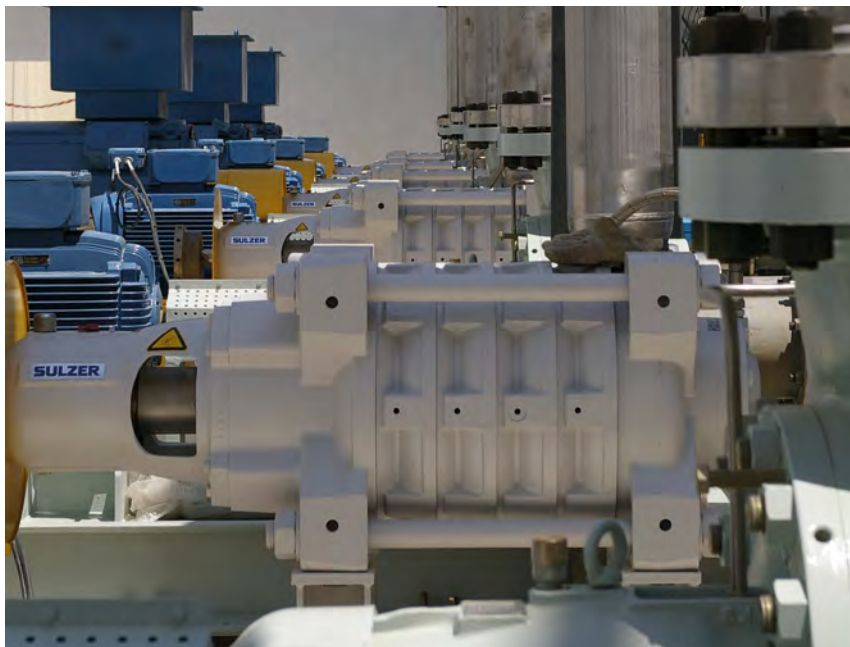


Karhula, Finland

Extensive Knowhow in Reverse Osmosis

The development of the MBN-RO pump is based on the existing Sulzer Pumps MBN ring section pump developed for the Power Generation, Water and Pulp and Paper industries.

The MBN-RO fulfills the most stringent needs of a highly pressure pump and is particularly fit for the desalination market.

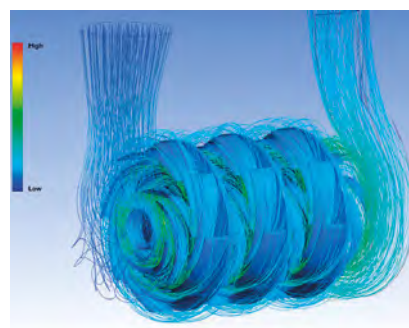


MBN-RO pump at Uramin SWRO plant, Namibia

Highly Efficient Hydraulic Performance

The MBN-RO is a pre-engineered, ring section, multistage pump, specifically designed for high pressure membrane feed service in Sea Water Reverse Osmosis (SWRO) applications. Its improved hydraulic performance makes it suitable for any other high pressure application with clean liquids. Besides, by using improved,

high efficiency, low Net Positive Suction Head (NPSH) impellers for every stage, the pump modularity increases. Maintenance is also made easy with a quick and easy access to main wear parts such as mechanical seals or bearings without disassembling the suction and discharge nozzle.



CFD optimization of flow pattern and pressure recovery inside volute

Material Selection

The MBN-RO range is manufactured in Duplex or Superduplex as standard materials for a variety of sea water qualities to avoid pitting and crevice corrosion.

Duplex Materials

The Duplex material is used for lower salinity water with lower Chloride content and / or with lower requirements regarding the Pitting Resistance Equivalent Number (PREN). According to Sulzer recommendations, the Duplex material is suitable for Chloride content up to 20,000 ppm, for temperatures lower than 40 °C and for a pH value from 6.5 -7.5. For lower pH, values, the according Chloride content limit will be lower.

Superduplex Materials

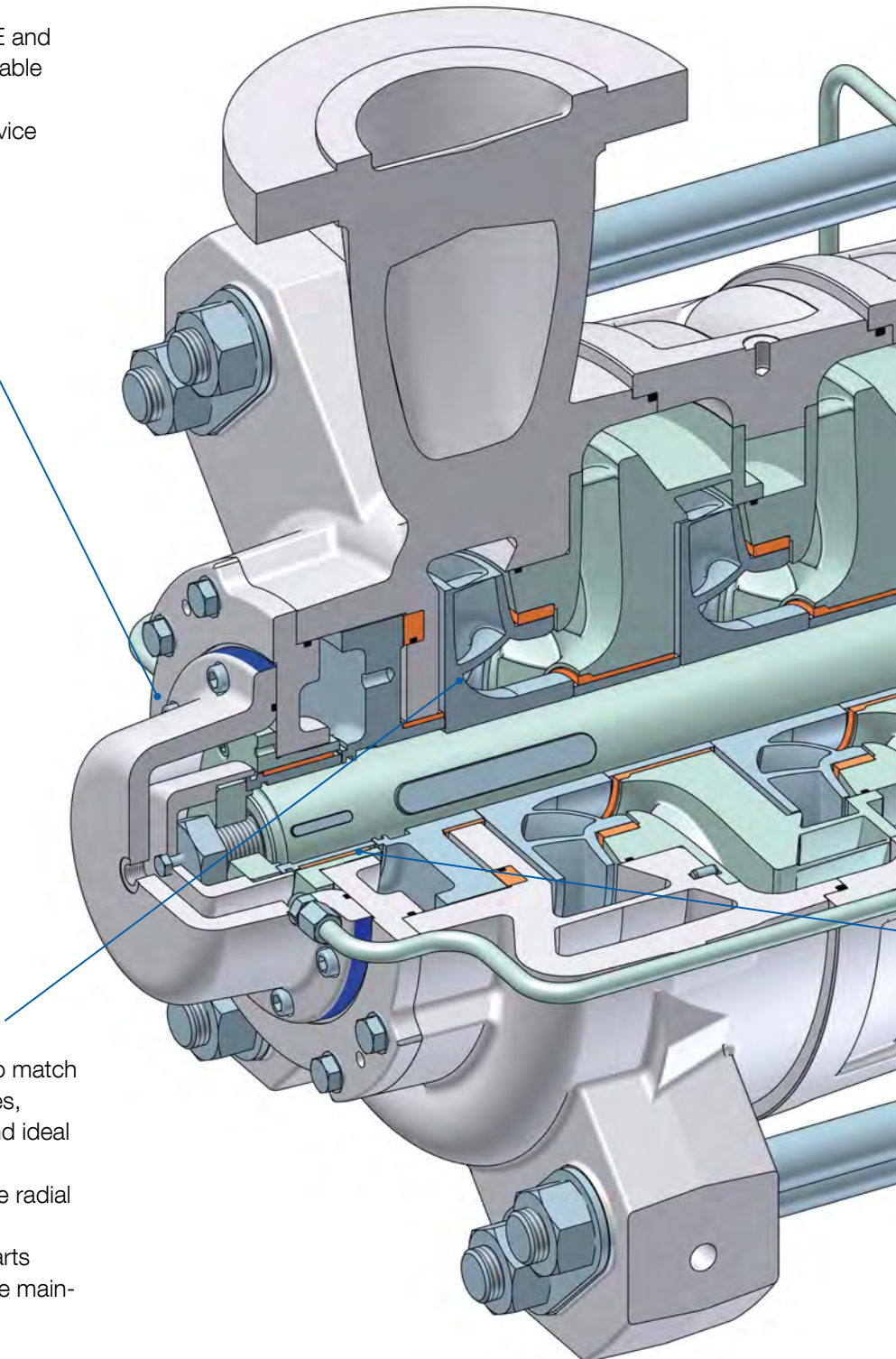
The Superduplex material is used for higher salinity sea water and for our most exigent customers, to ensure no corrosion / erosion and allow high reliability of our pumps during the plant operation life cycle.

Part	MBN-RO Material Classes	
	41 (Duplex)	4T (Superduplex)
Casing	ASTM A890 Gr 3A	ASTM A890 Gr 5A
Impeller		
Diffuser		
Wear Ring	PEEK	
Shaft	EN 1.4462	EN1.4410
Slide Bearings	EN 1.4462 + PEEK/SUME	EN 1.4410+PEEK/SUME
Cover	ASTM A890 Gr 5A	

MBN-RO Design Features and Benefits

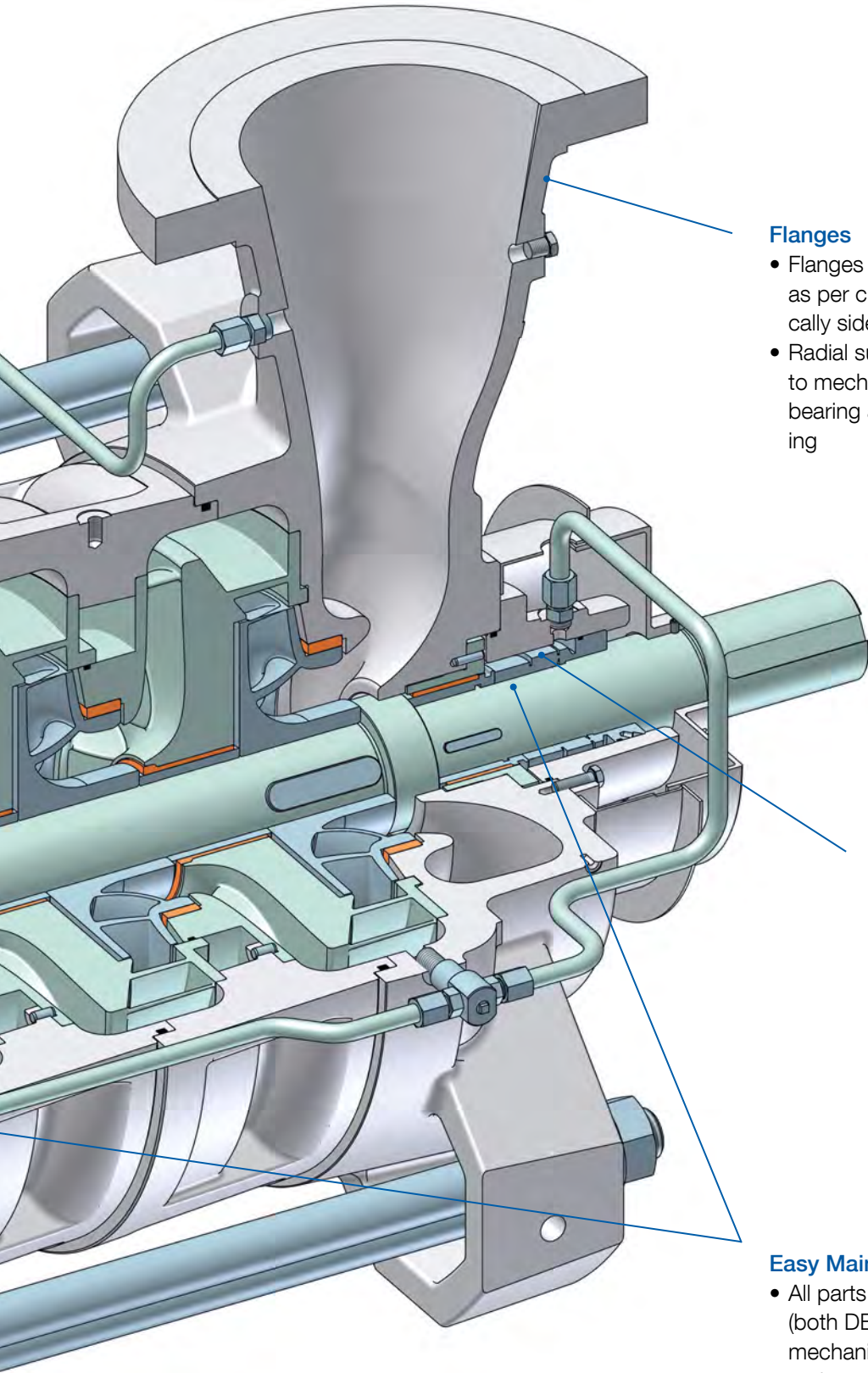
Bearing Assembly

- Product lubricated bearing at both DE and NDE to make the pump compact, reliable and easy to maintain
- Balance disc at NDE as balancing device ensures optimum efficiency



Hydraulics

- High efficiency, low NPSH impellers to match customer needs are used for all stages, providing modularity, top efficiency and ideal suction performance
- Double volute a last stage reduces the radial thrust and increases overall efficiency
- Replaceable stationary PEEK wear parts used to increase efficiency and reduce maintenance



Flanges

- Flanges can be installed side or top position as per customer convenience, ensuring typically side-side orientation
- Radial suction flange allows accessibility to mechanical seal and product lubricated bearing at DE without disassembling the piping

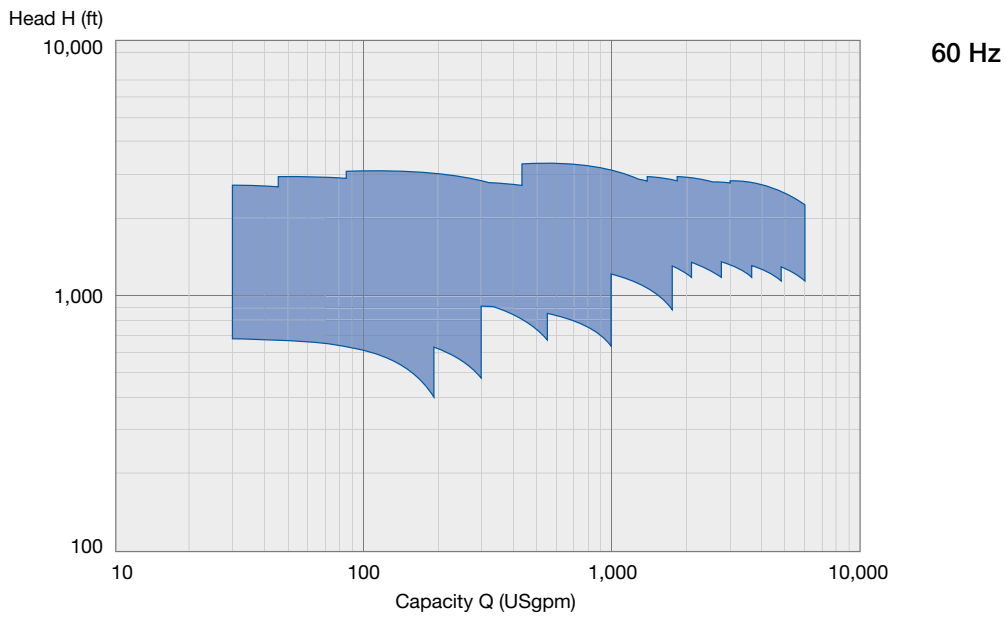
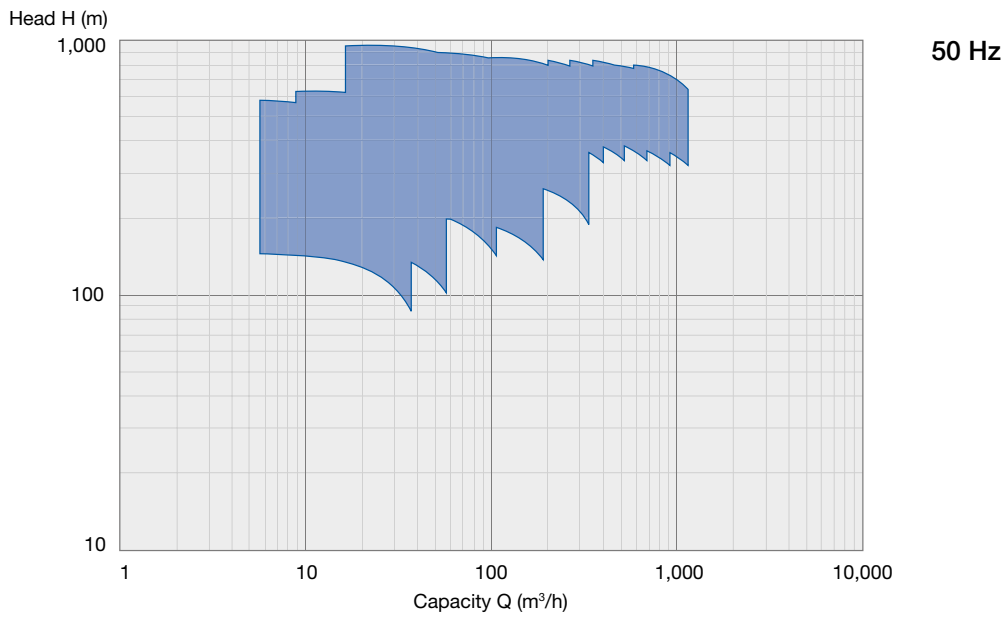
Seal Chambers

- Intergrated single mechanical seal with flushing from first stage

Easy Maintenance

- All parts typically subject to maintenance (both DE & NDE bearings, balancing disc, mechanical seal) are accessible and can be replaced on site, without removal of suction and discharge piping

MBN-RO Performance Ranges



Operating Data

	50 Hz	60 Hz
Pump sizes	from 25 mm to 200 mm	from 1 to 8 inches
Capacities	up to 1,100 m ³ /h	up to 4,800 USgpm
Heads	up to 900 m	up 2,950 feet
Pressures	up to 100 bar	up to 1,450 psi
Temperatures	up to 90 °C	up to 194 °F

Maintaining and Improving Pump Performance

Sulzer Pumps – Customer Support Services

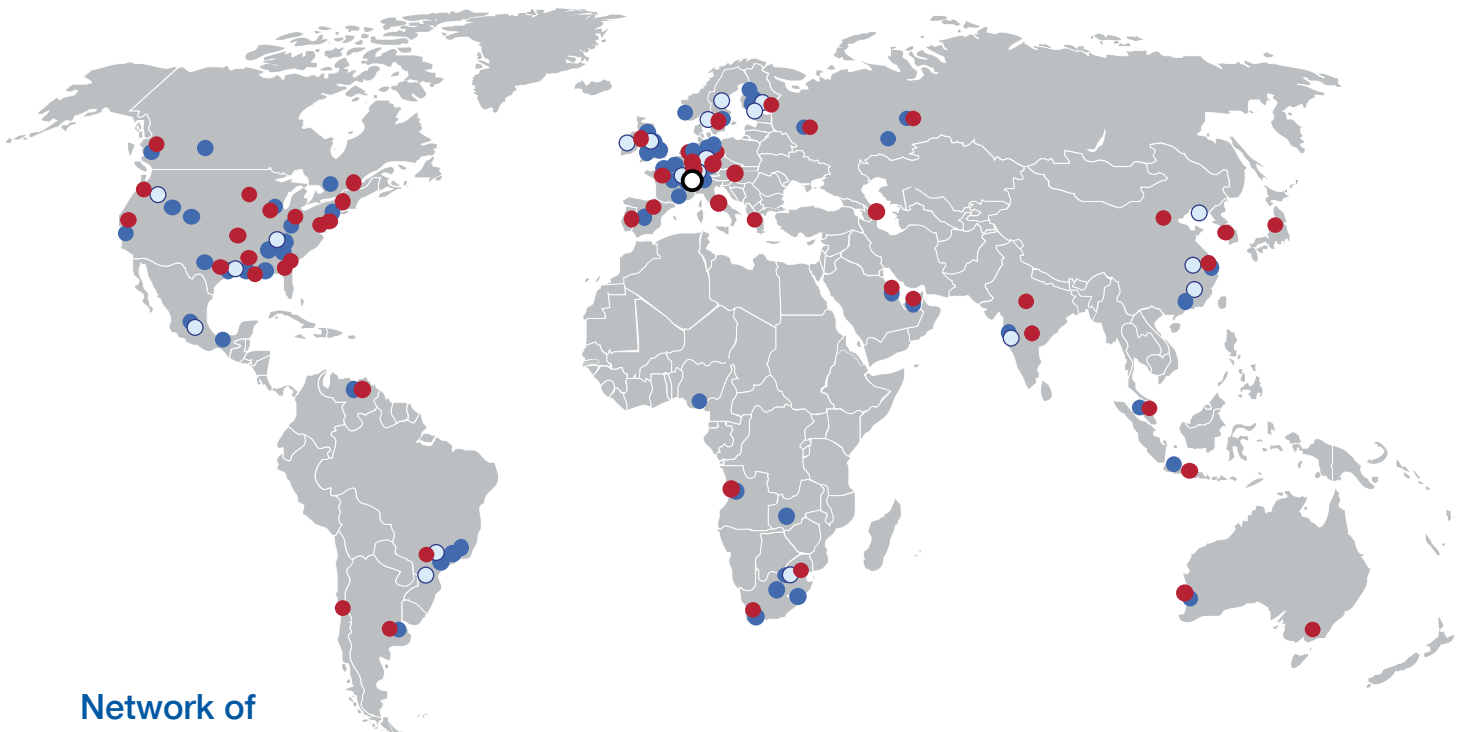
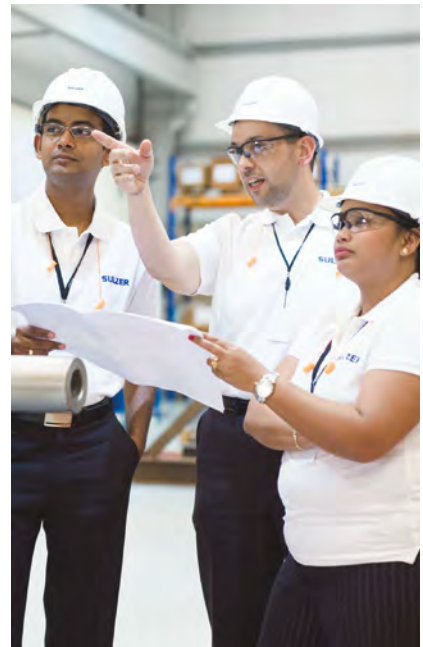
The continuous availability and high operating performance of pumps is the key target for our customer support service organization.

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. A dedicated team of our services specialists based at either our manufacturing facilities or one of over 60 service centers located around the world is dedicated to maintain 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

www.sulzerpumps.com
water.pumps@sulzer.com

E10109 en 4.2012 (1,100), Copyright © Sulzer Pumps

This brochure is a general presentation. It does not provide any warranty or guarantee of any kind. Please, contact us for a description of the warranties and guarantees offered with our products. Directions for use and safety will be given separately. All information herein is subject to change without notice.