

Cutting-edge pumping solutions for the biomass power generation





SULZER

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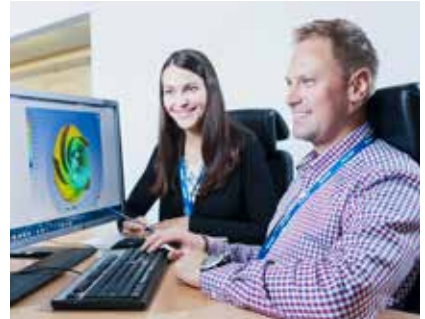
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The Sulzer advantage

Biomass constitutes an environmentally-friendly solution to energy needs of today and tomorrow. Sulzer has been working with customers to provide reliable and cost-efficient pumping solutions for biomass power plants.

Customer partnership

- With its extensive portfolio of products and services, Sulzer is a single-supplier and supports leading biomass technologies and all major processes within biomass plants
- From a single pump to a complete system, Sulzer works in close cooperation with each customer to develop the most optimized solution
- We focus on delivering efficient and total life cycle performance to enable competitive and profitable biomass power production



Technology leadership

- Combining our expertise in biomass power and other renewable technologies with our experience in industrial power, we develop and tailor pumps and auxiliaries that meet the unique demands of biomass power generation



The right product

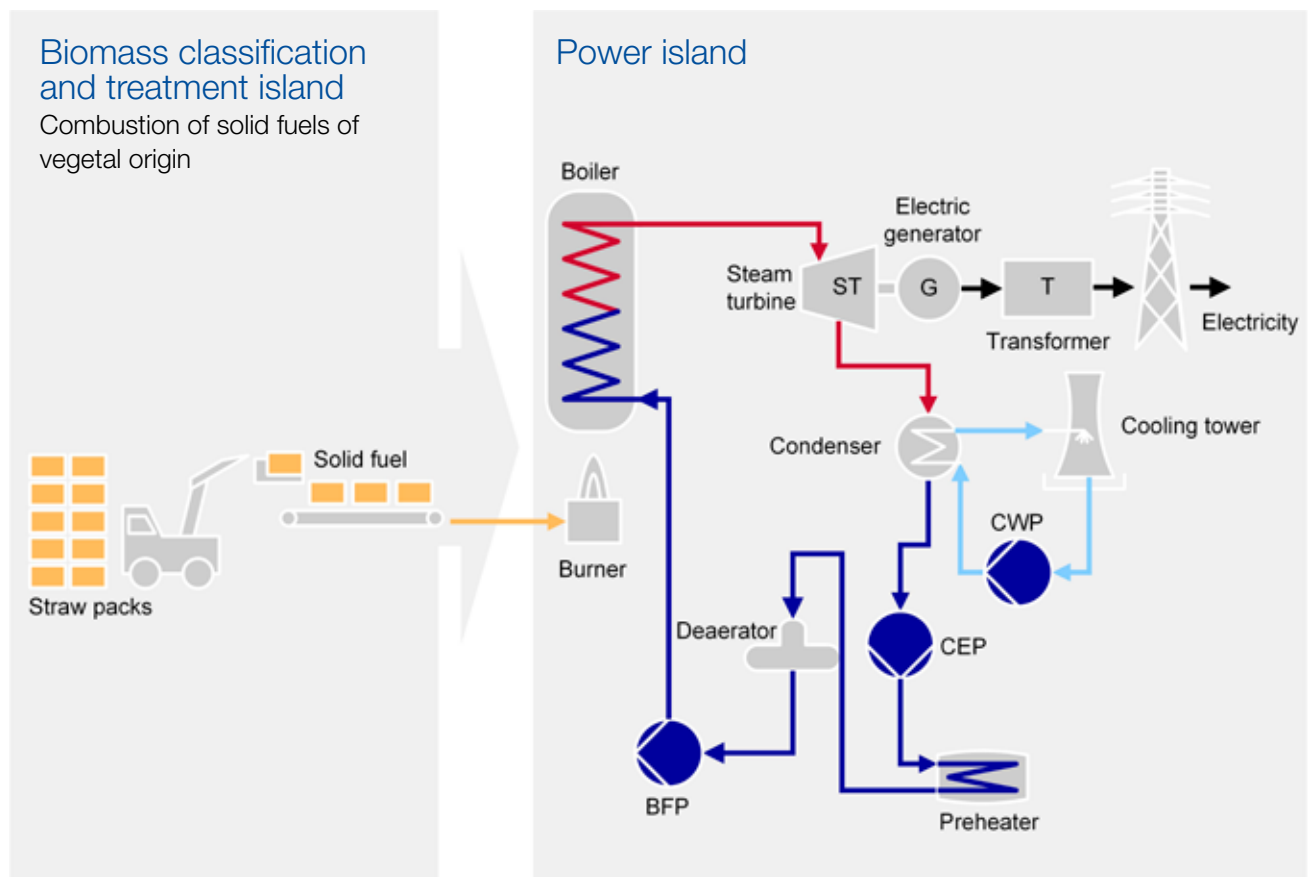
- Sulzer understands the constant challenges and needs for increased efficiency in biomass energy production. Because the pump selection is one key factor for boosting operational efficiency, Sulzer is the specialist to provide you with the right pumping solutions answering even the most stringent demands
- Through dedicated research and development efforts, we are able to “custom-fit” almost any process with the right pump



You set out the challenge, we present the solutions

Solid organic fuel biomass power plant

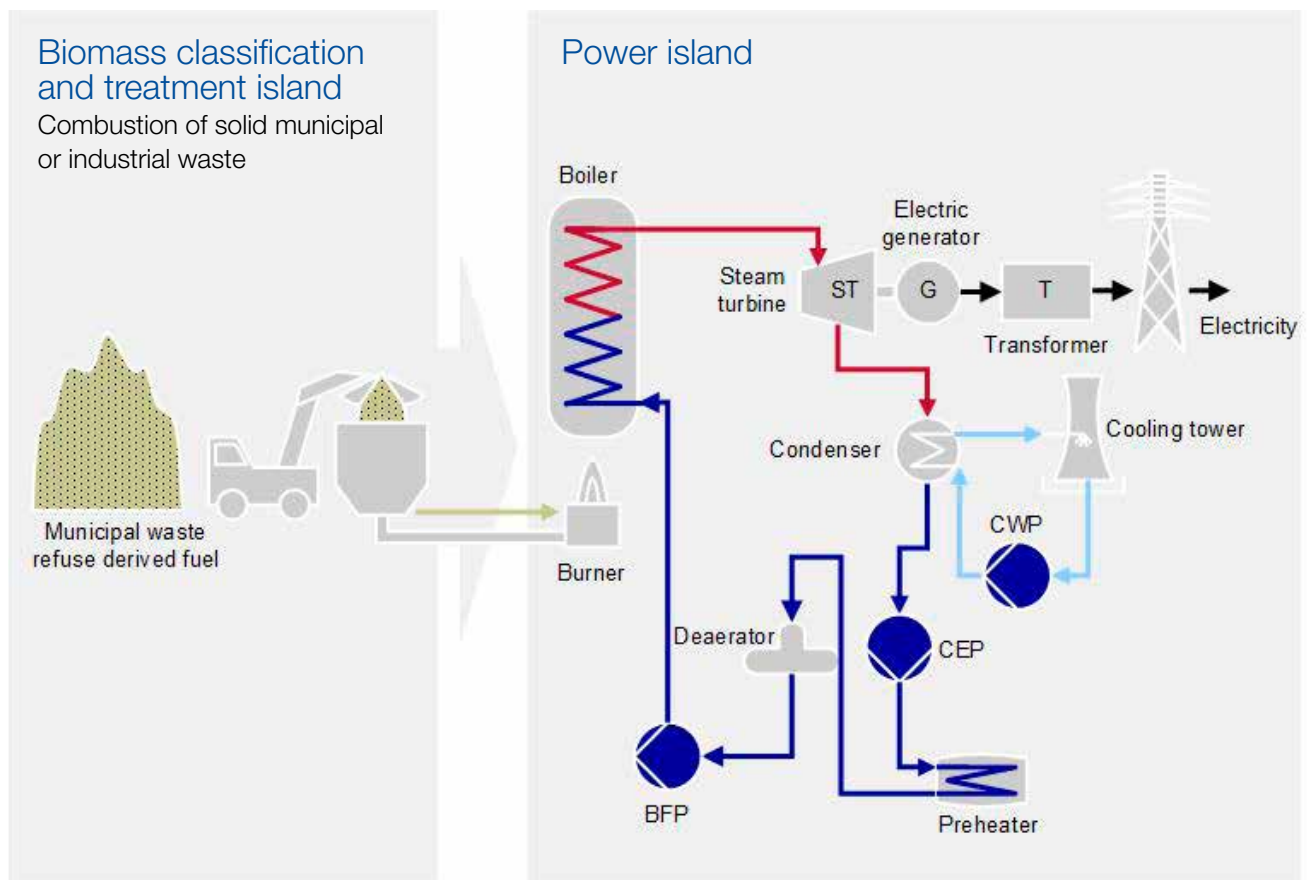
A solid organic fuel mainly of vegetal origin like agricultural waste (bagasse, straw, rice husk, cotton stalk, etc.), forest waste (sawmill residue, forest residue, waste wood, eucalyptus, etc.) or energy crops (sorghum, elephant grass, tall grass, etc.) is combusted in a burner to generate steam in an appropriate boiler. The steam is directly sent to a turbine/generator unit to produce electricity, then passed through a condenser to convert it into water again. Sulzer supports these processes with pumps for power island such as Boiler Feed Pumps (BFP), Condensate Extraction Pumps (CEP), Cooling Water Pump (CWP), make-up and other auxiliary pump services.



- BFP = Boiler Feed Pump
- CEP = Condensate Extraction Pump
- CWP = Cooling Water Pump

Solid municipal or industrial waste fuel biomass power plant

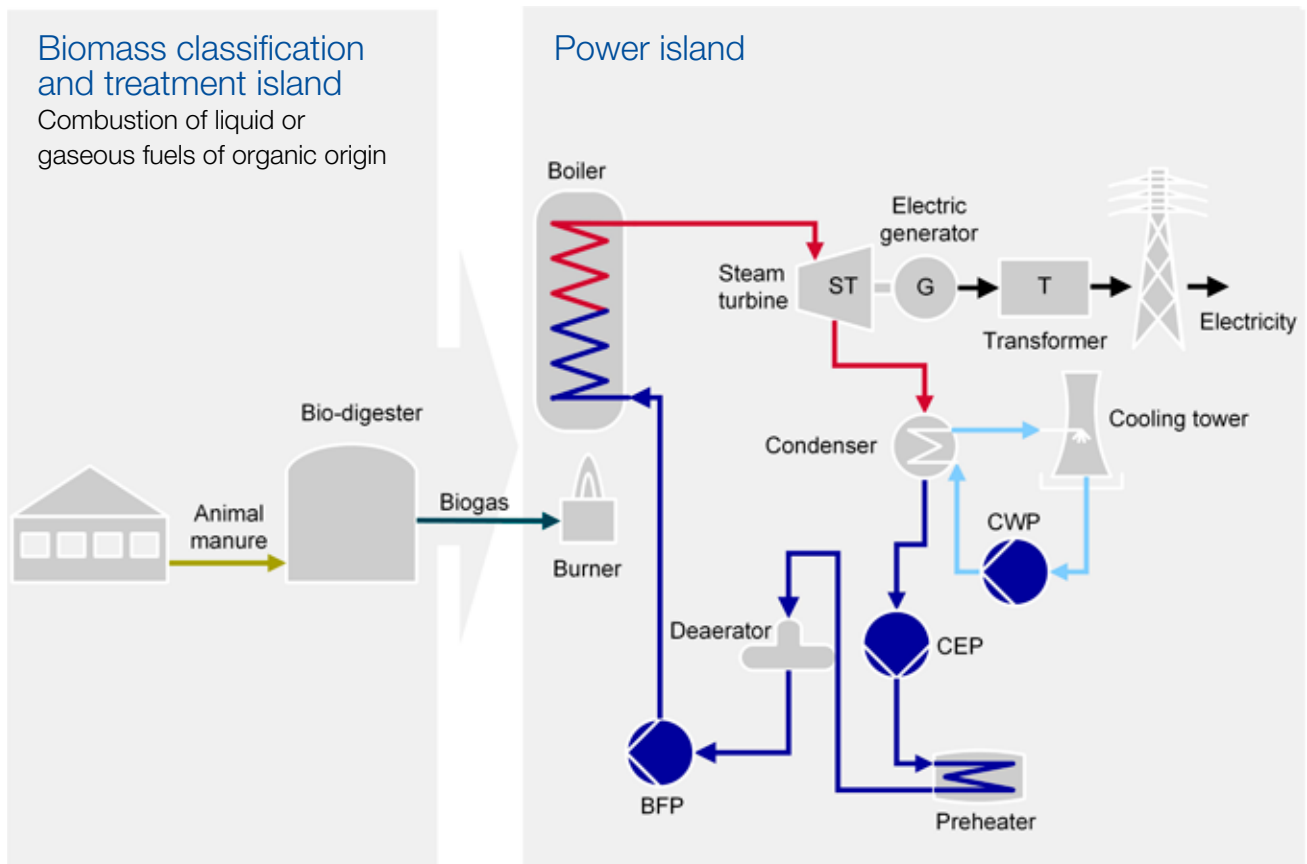
A solid recovered fuel of municipal or industrial waste origin (like garbage, paper sludge, waste tires, etc.) is combusted in a burner to generate steam in an appropriate boiler. The steam is directly sent to a turbine/generator unit to produce electricity, then passed through a condenser to convert it into water again. Sulzer provides Boiler Feed Pumps (BFP), Condensate Extraction Pumps (CEP), Cooling Water Pump (CWP) and auxiliary pump services for such processes.



BFP = Boiler Feed Pump
CEP = Condensate Extraction Pump
CWP = Cooling Water Pump

Liquid or gaseous organic fuel biomass power plant

A liquid or gaseous organic derived fuel of vegetal or animal origin like black liquor, palm oil, bioethanol, landfill gas or biogas coming from the anaerobic digestion processes (i.e. treating pig manure, poultry litter, sewage sludge, etc.) is combusted in a burner to generate steam in an appropriate boiler. The steam is directly sent to a turbine/generator unit to produce electricity, then passed through a condenser to convert it into water again. Sulzer supplies Boiler Feed Pumps (BFP), Condensate Extraction Pumps (CEP), Cooling Water Pump (CWP), make-up and other auxiliary pump services specifically designed for these processes.

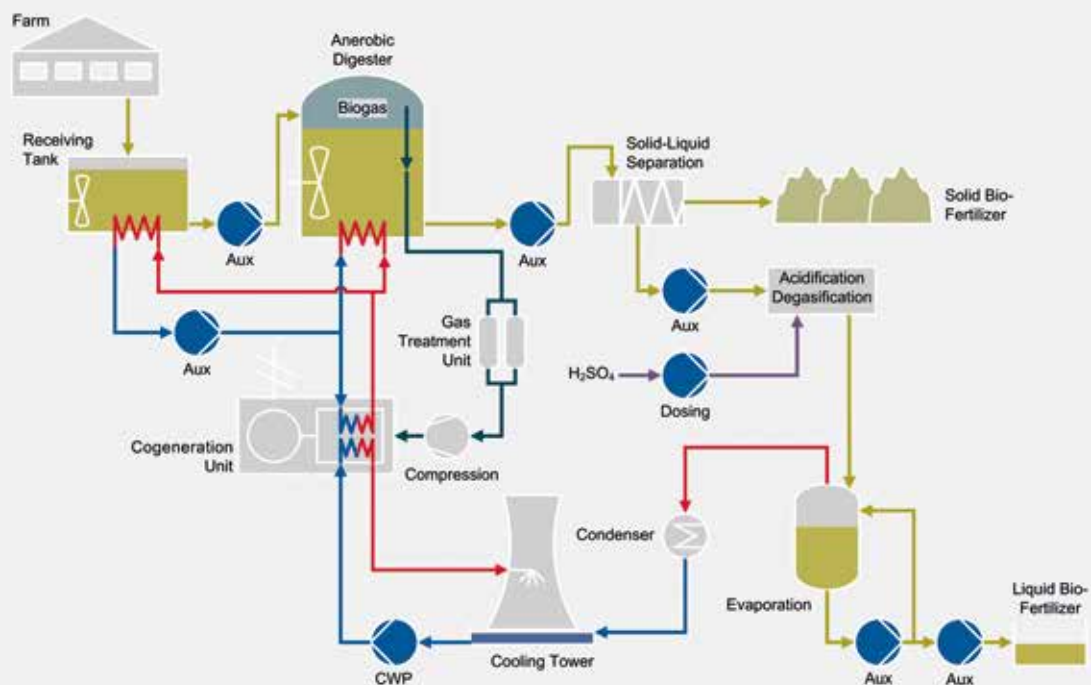


BFP = Boiler Feed Pump
CEP = Condensate Extraction Pump
CWP = Cooling Water Pump

Biomass treatment island for gaseous organic fuel power plant / biomass anaerobic digestion

Occasionally, the biogas obtained through the anaerobic digestion treatment of animal litter is mixed up with natural gas and burnt in an engine to generate electricity. In such cases, the thermal process is much simpler as there is no boiler or steam on it. After the digestion stage, solids and liquids are separated in a centrifugal decanter to obtain solid bio fertilizer. The liquids are pumped through an acidification/degasification unit to the evaporation/concentration tank in order to get liquid bio fertilizer. The vapor generated during this stage is condensed and used for the cooling water circuit of the cogeneration units. Sulzer provides pumps and agitators for biomass treatment islands.

Animal litter treatment plant



CWP = Cooling Water Pump
Aux = Auxiliary Pump



Our comprehensive product portfolio

Power plant type	Applications				
	Boiler Feed Pump (BFP)	Condensate Extraction Pump (CEP)	Cooling Water Pump (CWP)	Auxiliary pump	
	Pump type				
	HPT GSG MD MC MBN MSD	SJD(CEP) SJD-API ZE/ZF PRE	SJT/SJM CWP SJT SJM SMD SMN ZPP AHLSTAR CPE	AHLSTAR CPE SNS PRE/PRER/PRETR AFP AFLX XFP CVT NKP/NKT NVP/NVT	
	Solid organic fuel combustion	✓	✓	✓	✓
Power island	Solid municipal or industrial waste fuel combustion	✓	✓	✓	✓
	Liquid or gaseous organic fuel combustion	✓	✓	✓	✓
	Biomass treatment island				✓

Product overview

Barrel casing pumps

HPT high pressure barrel casing pump

Features and benefits

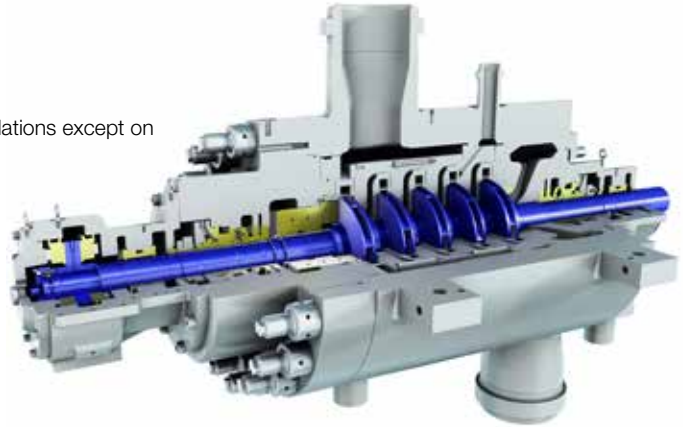
- Maximum safety due to double casing design
- Pipework connections remain undisturbed during disassembly
- High strength barrel material to accept thermal shock
- Full cartridge pull-out for rapid changeover
- Design features to eliminate the need for pre-warming in most installations except on larger sizes
- Long operating life regardless of the operating mode

Applications

- Boiler feed

Key characteristics

Capacities	up to 4'000 m ³ /h / 17'600 USgpm
Heads	up to 4'200 m / 13'800 ft.
Pressures	up to 545 bar / 7'905 psi
Temperatures	up to 220°C / 428°F



GSG diffuser style barrel pump

Features and benefits

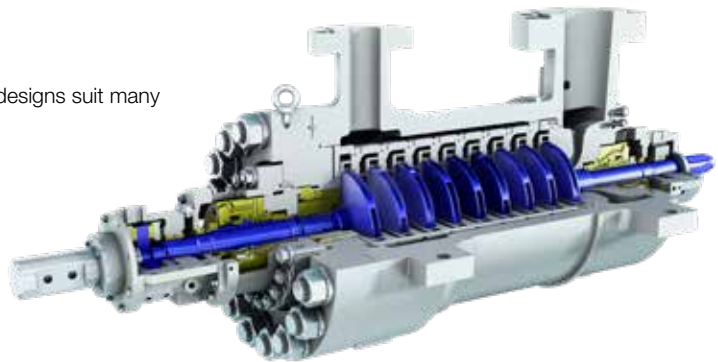
- Direct drive options to 6 MW
- Back-to-back rotor stack option allows up to 16 stages
- Multiple sizes cover a broad hydraulic range
- Low-pressure, high-pressure, twistlock, and high-temperature designs suit many applications

Applications

- Boiler feed

Key characteristics

Capacities	up to 900 m ³ /h / 4'600 USgpm
Heads	up to 2'600 m / 10'000 ft.
Pressures	up to 300 bar / 4'500 psi
Temperatures	up to 425°C / 800°F



Ring section pumps

MD high pressure stage casing pump

Features and benefits

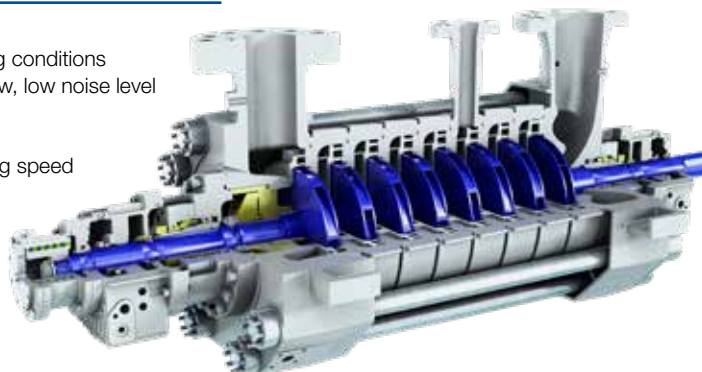
- Modular hydraulics for high efficiency in a wide range of operating conditions
- Centerline mounted with large branch sizes for optimized inlet flow, low noise level and higher allowable forces and moments
- Unaffected by rapid temperature variations
- Stiff shaft design for critical speeds above the maximum operating speed
- Multiple screws mechanical tensioners are used on large sizes to allow simpler tightening and loosening

Applications

- Boiler feed

Key characteristics

Capacities	up to 1'200 m ³ /h / 5'300 USgpm
Heads	up to 2'800 m / 9'200 ft.
Pressures	up to 350 bar / 5'080 psi
Temperatures	up to 210°C / 410°F (higher temperature upon request)



MC high pressure stage casing pump

Features and benefits

- Modular hydraulics for high efficiency in a wide range of operating conditions
- Large branch sizes for optimized inlet flow, low noise level and higher allowable forces and moments
- Unaffected by rapid temperature variations
- Easy access for cleaning to the seal cooling chambers
- Stiff shaft design for critical speeds above the maximum operating speed
- Low pressure version with dedicated large sizes for condensate extraction service

Applications

- Boiler feed

Key characteristics

Capacities	up to 1'700 m ³ /h / 8'500 USgpm
Heads	up to 1'750 m / 5'500 ft.
Pressures	up to 180 bar / 2'610 psi
Temperatures	up to 180°C / 355°F



MBN medium pressure stage casing pump

Features and benefits

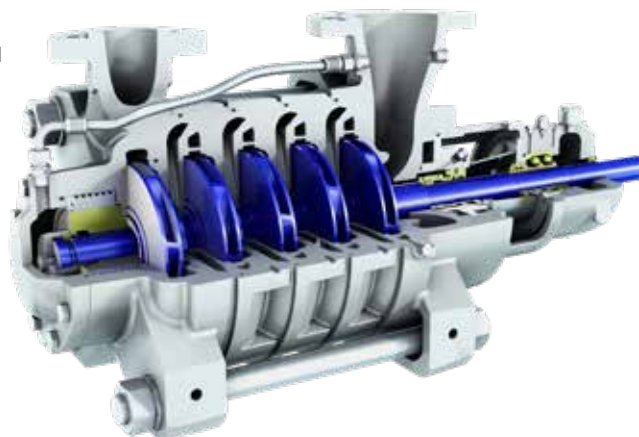
- Simple construction to minimize dimensions and reduce investment and maintenance costs
- High quality investment cast impellers and diffusers for better efficiency
- Fast and easy impeller mounting
- Bearing unit can be serviced without disassembling the pump
- Wide range of materials including duplex stainless steel grades

Applications

- Boiler feed

Key characteristics

Capacities	up to 700 m ³ /h / 3'080 USgpm
Heads	up to 900 m / 2'950 ft.
Pressures	up to 100 bar / 1'450 psi
Temperatures	up to 180°C / 355°F



Axially split pumps

MSD axially split multistage pump

Features and benefits

- Broadest hydraulic coverage of any BB3 type multistage pump in the market
- Axially split casing means rotor balance is not disturbed when rotor is installed
- Opposed impellers balance axial thrust, saving lube system costs on most applications
- Double suction, first-stage available on most sizes for reduced Net Positive Suction Head (NPSH)

Applications

- Boiler feed

Key characteristics

Capacities	up to 3'200 m ³ /h / 14'000 USgpm
Heads	up to 2'900 m / 9'500 ft.
Pressures	up to 300 bar / 4'400 psi
Temperatures	up to 200°C / 400°F



SMD axially split casing double suction pump

Features and benefits

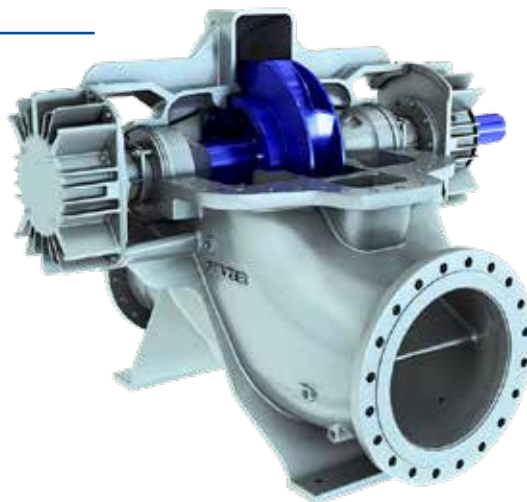
- Optimum hydraulic fit with high efficiency maintained over a wider flow range
- Exceptionally low Net Positive Suction Head Required (NPSHR) value not only at the best efficiency point but also on overload
- Maintenance-friendly features; excellent interchangeability of parts
- Horizontal and vertical constructions

Applications

- Cooling water services

Key characteristics

Capacities	up to 25'000 m ³ /h / 110'000 USgpm
Heads	up to 260 m / 850 ft.
Pressures	up to 34 bar / 490 psi
Temperatures	up to 140°C / 280°F



SMN axially split casing double suction pump

Features and benefits

- Broad hydraulic coverage through over 50 different sizes
- High efficiency
- Robust design for long service life
- Easy maintenance
- Flexible layout enabled by clockwise and counterclockwise rotation / vertical and horizontal arrangements

Applications

- Cooling water services

Key characteristics

Capacities	up to 10'000 m ³ /h / 44'000 USgpm
Heads	up to 200 m / 650 ft.
Pressures	up to 30 bar / 435 psi
Temperatures	up to 150°C / 302°F



ZPP double suction axially split single stage pump

Features and benefits

- Exceeds requirements of international ISO 5199 standard
- Unique, patented and superior design features minimize life cycle costs
- Quick and easy installation, reliable operation, easy maintenance and service

Applications

- Cooling water services

Key characteristics

Capacities	up to 25'000 m ³ /h / 110'000 USgpm
Heads	up to 160 m / 525 ft.
Pressures	up to 20 bar / 290 psi
Temperatures	up to 120°C / 250°F



Single stage pumps

ZE /ZF end suction pump

Features and benefits

- Designed for hot or cold water medium design pressure applications with relatively low NPSH available
- Modular construction to provide maximum interchangeability of spares

Applications

- Condensate extraction

Key characteristics

Capacities	up to 2'600 m ³ /h / 11'440 USgpm
Heads	up to 300 m / 1'000 ft.
Pressures	up to 100 bar / 1'450 psi
Temperatures	up to 425°C / 800°F



PRE/PRER/PRETR end suction pumps

Features and benefits

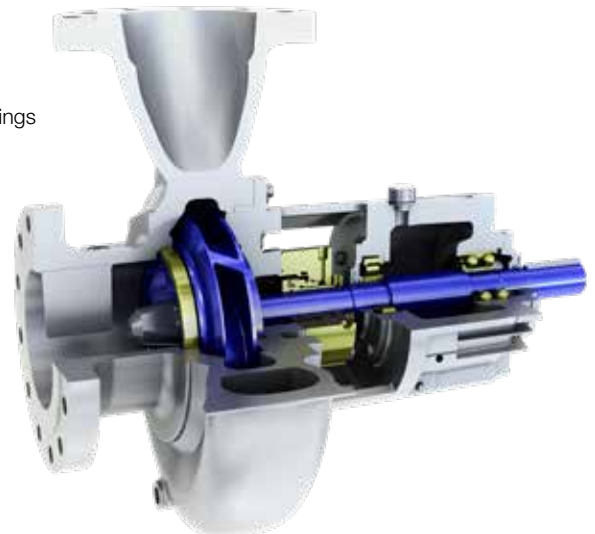
- Centerline mounted to allow thermal expansion without jeopardizing the shaft alignment
- Wear rings and balance holes optimized to maximize seal and bearing life
- Extra heavy-duty shaft for low shaft deflection and long life of seal and bearings
- PRER/PRETR reinforced designs available for very high pressure services (up to 200 bar)

Applications

- Condensate extraction
- Auxiliary services
- Boiler circulation

Key characteristics

Capacities	up to 4'500 m ³ /h / 19'800 USgpm
Heads	up to 320 m / 1'050 ft.
Pressures	up to 60 bar / 870 psi
Temperatures	up to 400°C / 752°F



AHLSTAR end suction single stage long coupled centrifugal pump

Features and benefits

- Exceeds standard requirements of international ISO 5199 and ISO 2858 standards
- Suitable for the most demanding industrial applications
- Unique, patented and superior design features minimize life cycle costs
- Quick and easy installation, reliable operation, easy maintenance and service

Applications

- Cooling water services
- Auxiliary applications

Key characteristics

Capacities	up to 11'000 m ³ /h / 48'400 USgpm
Heads	up to 160 m / 525 ft.
Pressures	up to 16/25 bar / 230/360 psi
Temperatures	up to 180°C / 355°F



CPE end suction single stage centrifugal pump

Features and benefits

- Designed to exceed the strictest energy regulations for all the industries as well as the requirements of ASME B73.1
- Revolutionary hydraulics and high efficiency to offer the lowest life cycle costs
- Improved reliability
- Minimized total cost of ownership

Applications

- Cooling water services
- Auxiliary applications

Key characteristics

Capacities	up to 1'650 m ³ /h / 7'000 USgpm
Heads	up to 275 m / 900 ft.
Pressures	up to 27.5 bar / 400 psi
Temperatures	up to 260°C / 500°F



SNS end suction single stage centrifugal pump

Features and benefits

- Designed to meet the design requirement of EN ISO 5199 international standard
- Exceeding EU's (European Union) requirements for energy-related products (ErP)
- Highest efficiency across the whole pump range, exceeding the benchmark efficiency index MEI 0.7 (Minimum Efficiency Index)
- New, state-of-the art hydraulics ensure optimum capacity with low net positive suction head required (NPSHr)
- Low energy consumption, high standardization, easy installation and unique construction also equate to lower maintenance and operating costs

Applications

- Auxiliary services

Key characteristics

Capacities	up to 1'400 m ³ /h / 6'000 USgpm
Heads	up to 160 m / 525 ft.
Pressures	up to 16 bar / 230 psi
Temperatures	up to 120°C / 250°F



Vertical pumps

SJD (CEP) vertical can mounted turbine type pump

Features and benefits

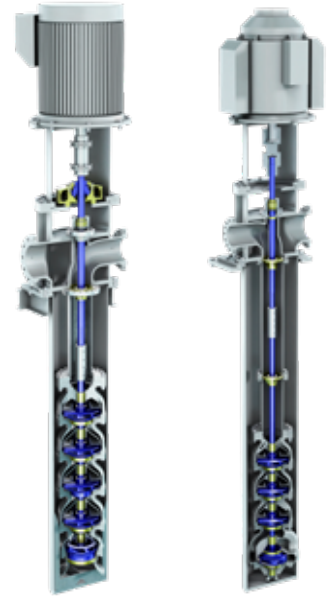
- Carbon graphite product lubricated bearing in bowls and columns for long maintenance-free periods
- Removable seal housing allows servicing throttle bushing without removing the head
- Separate fabricated driver stand allows using one suction and discharge head per pump size
- Spacer coupling allows servicing the mechanical seal and thrust bearing as needed
- Can is provided with lateral and anti-rotational ribs uniform inlet velocity along the can length
- Various options available for the first stage impeller hydraulics, including double suction impeller allowing optimum sizing of pump

Applications

- Condensate extraction

Key characteristics

Capacities	up to 4'900 m ³ /h / 21'560 USgpm
Heads	up to 470 m / 1'540 ft.
Pressures	up to 47 bar / 680 psi
Temperatures	up to 100°C / 212°F



SJD (API) vertically suspended process pump

Features and benefits

- Reduced number of stages results in shorter and more reliable pumps
- Double suction first stage impeller on larger sizes can reduce pump length
- High efficiency with reduced power consumption
- Modular construction to fit project nozzle location requirements
- High head per stage means process conditions can be reached with slower speeds

Applications

- Condensate extraction

Key characteristics

Capacities	up to 3'800 m ³ /h / 20'000 USgpm
Heads	up to 700 m / 3'000 ft.
Pressures	up to 75 bar / 1'100 psi
Temperatures	up to 205°C / 400°F



SJT/SJM CWP vertical pump

Features and benefits

- Modern fabricated suction bell and bowl casing incorporating swirl break for stable pump performance curve
- Semi-open or closed cast impeller design for best fitting and optimum efficiency
- Segmented elbow to reduce the internal losses
- Optional full pull-out construction to reduce lifting crane capacity and ease maintenance

Applications

- Cooling water pumps

Key characteristics

Capacities	up to 90'000 m ³ /h / 396'000 USgpm
Heads	up to 60 m / 200 ft.
Pressures	up to 8.6 bar / 125 psi
Temperatures	up to 50°C / 122°F



SJT vertical turbine pump

Features and benefits

- Optimized hydraulics for high efficiency
- Packed stuffing box for reliable sealing and simple maintenance; mechanical seal available as an option
- Rubber-lined product-lubricated bearing in bowls and columns for long maintenance-free periods; other bearing materials are also available
- Optional spacer coupling allows servicing of seal and thrust bearing as required

Applications

- Cooling water pumps

Key characteristics

Capacities	up to 62'000 m ³ /h / 270'000 USgpm
Heads	up to 110 m per stage / 350 ft. per stage
Pressures	up to 64 bar / 930 psi
Temperatures	up to 50°C / 122°F



SJM vertical mixed flow pump

Features and benefits

- Optimized hydraulics for high efficiency
- Packed stuffing box for reliable sealing and simple maintenance; mechanical seal is optional
- Rubber lined product lubricated bearing in bowls and columns for long maintenance-free periods; other bearing materials are also possible
- Optional spacer coupling allows servicing the seal area and thrust bearing as needed

Applications

- Cooling water pumps

Key characteristics

Capacities	up to 58'000 m ³ /h / 250'000 USgpm
Heads	up to 30 m per stage / 100 ft. per stage
Pressures	up to 18 bar / 260 psi
Temperatures	up to 50°C / 122°F



Vertical sump pumps

CVT vertically suspended sump pump

Features and benefits

- Exceeds requirements of international ISO 5199 standard and fulfills many API 610 features
- Suitable for the most demanding industrial sump pump applications
- Unique, patented and superior design features minimize life cycle costs
- Quick and easy installation, reliable operation, easy maintenance and service

Applications

- All sump applications with moderate solid content

Key characteristics

Capacities	up to 750 m ³ /h / 3'200 USgpm
Heads	up to 120 m / 550 ft.
Pressures	up to 25 bar / 375 psi
Temperatures	up to 205°C / 400°F



NKP/NKT non-clogging cantilever pump

Features and benefits

- Exceeds requirements of international ISO 5199 standard
- Unique, patented and superior design features minimize life cycle costs
- Suitable for all types of severe applications in seal pits and floor channels

Applications

- Waste stock, slurries and waste water containing large solid particles

Key characteristics

Capacities	up to 430 m ³ /h / 1'900 USgpm
Heads	up to 60 m / 200 ft.
Pressures	up to 10 bar / 150 psi
Temperatures	up to 95°C / 205°F



NVP/NVT non-clogging vertical pump

Features and benefits

- Exceeds requirements of international ISO 5199 standard
- Unique, patented and superior design features minimize life cycle costs
- Suitable for all types of severe applications in seal pits and floor channels

Applications

- Waste stock, slurries and waste water containing large solid particles

Key characteristics

Capacities	up to 1'200 m ³ /h / 5'400 USgpm
Heads	up to 85 m / 280 ft.
Pressures	up to 10 bar / 150 psi
Temperatures	up to 95°C / 205°F





SULZER

A close-up photograph of a blue industrial component, likely a pump or motor housing, featuring the brand name 'SULZER' in white, bold, sans-serif capital letters. The component is cylindrical and has a flange-like base. Several screws and a small metal fitting are visible on the lower section. The background is blurred, showing hints of a blue and green environment.

Submersible pumps

Submersible sewage pump type ABS AFP

Features and benefits

- Motors available with ATEX , FM and CSA certification for operation in hazardous explosive atmospheres (zone 1 and 2)
- Specially designed impellers for reliable delivery of wastewater containing solids and fibrous material
- Quick and easy installation, safe operation, easy maintenance and service

Applications

- Clean water and wastewater
- Wastewater with sludge and high content of rags
- Wastewater containing solids and fibrous material
- Industrial raw water

Key characteristics

Capacities	up to 9'000 m ³ /h / 43'000 USgpm
Heads	up to 70 m / 300 ft.
Pressures	up to 7 bar / 101.6 psi
Temperatures	up to 40°C / 104°F



Submersible sewage pump type ABS XFP

Features and benefits

- Premium-Efficiency (IE3) motor to ensure high efficiency and low operating costs
- Motors available with ATEX , FM and CSA certification (zone 1 and 2) for operation in hazardous explosive atmospheres
- Contrablock Plus impeller for blockage protection when pumping wastewater containing solids and fibrous material

Applications

- Clean water and wastewater
- Wastewater with sludge and high content of rags
- Wastewater containing solids and fibrous material
- Industrial raw water

Key characteristics

Capacities	up to 7'200 m ³ /h / 26'500 USgpm
Heads	up to 75 m / 360 ft.
Pressures	up to 7.5 bar / 108.8 psi
Temperatures	up to 40°C / 104°F



Submersible mixed flow column pump type ABS AFLX

Features and benefits

- Premium-Efficiency (IE3) motors to ensure high efficiency and low operating costs
- Motors available with ATEX , FM and CSA certification for operation in hazardous explosive atmospheres (zone 1 and 2)
- Quick and easy installation due to coupling ring

Applications

- Clean water, polluted water and effluent
- Designed where large volumes of process water or wastewater containing solids and fibrous material must be pumped

Key characteristics

Capacities	up to 10'800 m ³ /h / 47'500 USgpm
Heads	up to 35 m / 100 ft.
Pressures	up to 3.5 bar / 50.8 psi
Temperatures	up to 40°C / 104°F





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