Cutting-Edge Pumping Solutions for the Biomass Power Generation
The Sulzer Advantage

Taking on new challenges

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
Whatever the Process, We Have the Pumping Solutions

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.

Biomass classification & treatment island

Combustion of solid fuels of vegetal origin

Power island

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.
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.

CWP = Cooling Water Pump
Aux = Auxiliary Pump
<table>
<thead>
<tr>
<th>Biomass power plant type</th>
<th>Applications</th>
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<tbody>
<tr>
<td></td>
<td>Boiler Feed Pump (BFP)</td>
<td>Condensate Extraction Pump (CEP)</td>
<td>Cooling Water Pump (CWP)</td>
<td>Auxiliary pump</td>
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<tr>
<td></td>
<td>MBN</td>
<td>TTMC</td>
<td>AHLSTAR</td>
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<td></td>
<td>MC</td>
<td>SJD (CEP)</td>
<td>CPT</td>
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<td></td>
<td>MC-PLB</td>
<td>ZE/ZF</td>
<td>SMD</td>
<td>AFP</td>
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<td>MD</td>
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<td>SMN</td>
<td>AFLX</td>
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<td>MSD</td>
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<td>ZPP</td>
<td>XFP</td>
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<td>Z22</td>
<td>NPV/NVT</td>
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<td></td>
<td></td>
<td></td>
<td>NKP/NKT</td>
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<tr>
<td>Power island</td>
<td>Solid organic fuel combustion</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td></td>
<td>Solid municipal or industrial waste fuel combustion</td>
<td>✓</td>
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<td>✓</td>
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<tr>
<td></td>
<td>Liquid or gaseous organic fuel combustion</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Biomass treatment island</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Product Overview

Boiler feed pumps

MBN MEDIUM PRESSURE STAGE CASING PUMP

FEATURES AND BENEFITS
• Ideal choice for medium pressure pumping application
• Offered in a wide range of materials including chrome steel and duplex stainless steel grades
• Integrated diffusers and product-lubricated Non-Drive End (NDE) bearing to simplify construction, minimize dimensions and reduce costs

KEY CHARACTERISTICS
- Capacities: up to 700 m³/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

APPLICATIONS
- Boiler feed
- Medium pressure pumping applications

MC HIGH PRESSURE STAGE CASING PUMP

FEATURES AND BENEFITS
• Primarily designed for power applications
• Modular construction
• Optimized hydraulic design enables best efficiency

KEY CHARACTERISTICS
- Capacities: up to 1,000 m³/h / 5,000 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

APPLICATIONS
- Boiler feed
- Condensate extraction

MC-PLB HIGH PRESSURE STAGE CASING PUMP

FEATURES AND BENEFITS
• Suitable for pumping clean or slightly polluted, hot or cold, chemically neutral or aggressive liquids
• Product-lubricated bearings
• Environmental friendly; lubricating oil not required

KEY CHARACTERISTICS
- Capacities: up to 300 m³/h / 1,500 USgpm
- Heads: up to 1,500 m / 6,000 ft
- Pressures: up to 160 bar / 2,320 psi
- Temperatures: up to 180°C / 355°F

APPLICATIONS
- Boiler feed
- Condensate extraction
MD HIGH PRESSURE STAGE CASING PUMP

FEATURES AND BENEFITS

- Mainly designed for power applications
- Modular construction
- Optimized design enables best efficiency

KEY CHARACTERISTICS

| Capacities     | up to 1,000 m³/h / 4,400 USgpm |
|               | Heads up to 2,400 m / 8,200 ft |
| Pressures     | up to 350 bar / 5,080 psi      |
| Temperatures  | up to 210°C / 410°F            |

APPLICATIONS

- Boiler feed

MSD AXIALLY SPLIT MULTISTAGE PUMP

FEATURES AND BENEFITS

- Broad range of standard hydraulics and mechanical design options to ensure optimum fit to customers’ duty requirements

KEY CHARACTERISTICS

| Capacities     | up to 3,200 m³/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             |

APPLICATIONS

- Boiler feed

Condensate extraction pumps

TTMC VERTICAL CAN MOUNTED STAGE CASING TYPE PUMP

FEATURES AND BENEFITS

- Specifically designed when limited Net Positive Suction Head (NPSH) is available, either due to system constraints or liquids operating near to their vapor pressure

KEY CHARACTERISTICS

| Capacities     | up to 850 m³/h / 3,000 USgpm |
|               | Heads up to 300 m / 900 ft   |
| Pressures     | up to 40 bar / 580 psi       |
| Temperatures  | up to 150°C / 302°F          |

APPLICATIONS

- Condensate extraction

10
SJD (CEP) VERTICAL CAN MOUNTED TURBINE TYPE PUMP

FEATURES AND BENEFITS

- Ideal for applications when Net Positive Suction Head Available (NPSHA) is limited

KEY CHARACTERISTICS

<table>
<thead>
<tr>
<th>Capacities</th>
<th>up to 4,900 m³/h / 21,560 USgpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads</td>
<td>up to 400 m / 1,300 ft</td>
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<tr>
<td>Pressures</td>
<td>up to 94 bar / 1,360 psi</td>
</tr>
<tr>
<td>Temperatures</td>
<td>up to 100°C / 212°F</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Condensate extraction
- Heater drain in power plants

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

KEY CHARACTERISTICS

<table>
<thead>
<tr>
<th>Capacities</th>
<th>up to 2,600 m³/h / 11,440 USgpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads</td>
<td>up to 300 m / 1,000 ft</td>
</tr>
<tr>
<td>Pressures</td>
<td>up to 100 bar / 1,450 psi</td>
</tr>
<tr>
<td>Temperatures</td>
<td>up to 425°C / 800°F</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Condensate extraction

Cooling water pumps

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

KEY CHARACTERISTICS

<table>
<thead>
<tr>
<th>Capacities</th>
<th>up to 11,000 m³/h / 48,400 USgpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads</td>
<td>up to 160 m / 525 ft</td>
</tr>
<tr>
<td>Pressures</td>
<td>up to 16/25 bar / 230/360 psi</td>
</tr>
<tr>
<td>Temperatures</td>
<td>up to 180°C / 355°F</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Cooling water services in power plants
- Auxiliary applications

AHLSTAR END SUCTION SINGLE STAGE CLOSE COUPLED CENTRIFUGAL PUMP

KEY CHARACTERISTICS

<table>
<thead>
<tr>
<th>Capacities</th>
<th>up to 600 m³/h / 2,600 USgpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads</td>
<td>up to 160 m / 525 ft</td>
</tr>
<tr>
<td>Pressures</td>
<td>up to 16/25 bar / 230/360 psi</td>
</tr>
<tr>
<td>Temperatures</td>
<td>up to 130°C / 266°F</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Cooling water services in power plants
- Auxiliary applications
CPT END SUCTION SINGLE STAGE PUMP ANSI B73.1

FEATURES AND BENEFITS

- Exceeds standard requirements of ANSI/ASME B73.1 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

KEY CHARACTERISTICS

<table>
<thead>
<tr>
<th>Capacities</th>
<th>up to 1,600 m³/h / 7,000 USgpm</th>
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</thead>
<tbody>
<tr>
<td>Heads</td>
<td>up to 220 m / 720 ft</td>
</tr>
<tr>
<td>Pressures</td>
<td>up to 26 bar / 375 psi</td>
</tr>
<tr>
<td>Temperatures</td>
<td>up to 260°C / 500°F</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Auxiliary applications

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

KEY CHARACTERISTICS

<table>
<thead>
<tr>
<th>Capacities</th>
<th>up to 16,000 m³/h / 70,000 USgpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads</td>
<td>up to 260 m / 850 ft</td>
</tr>
<tr>
<td>Pressures</td>
<td>up to 34 bar / 490 psi</td>
</tr>
<tr>
<td>Temperatures</td>
<td>up to 140°C / 280°F</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Cooling water in power plants

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

KEY CHARACTERISTICS

<table>
<thead>
<tr>
<th>Capacities</th>
<th>up to 10,000 m³/h / 44,000 USgpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads</td>
<td>up to 200 m / 650 ft</td>
</tr>
<tr>
<td>Pressures</td>
<td>up to 30 bar / 435 psi</td>
</tr>
<tr>
<td>Temperatures</td>
<td>up to 50°C / 120 °F</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Cooling water in power plants
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

**KEY CHARACTERISTICS**
- Capacities: up to 25,000 m³/h / 130,000 USgpm
- Heads: up to 160 m / 525 ft
- Pressures: up to 25 bar / 360 psi
- Temperatures: up to 120 °C / 250 °F

**APPLICATIONS**
- Cooling water services in power plants

Z22 DOUBLE SUCTION AXIALLY SPLIT SINGLE STAGE PUMP

**FEATURES AND BENEFITS**
- Long and trusted experience in all industrial segments
- Unique, patented and superior design features minimize life cycle costs
- Quick and easy installation, reliable operation, easy maintenance and service

**KEY CHARACTERISTICS**
- Capacities: up to 17,000 m³/h / 75,000 USgpm
- Heads: up to 220 m / 720 ft
- Pressures: up to 25 bar / 360 psi
- Temperatures: up to 140 °C / 280 °F

**APPLICATIONS**
- Cooling water services in power plants

Auxiliary pumps

**AHLSTAR END SUCTION SINGLE STAGE LONG COUPLED 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

**KEY CHARACTERISTICS**
- Capacities: up to 11,000 m³/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

**APPLICATIONS**
- Cooling water services in power plants
- Auxiliary applications

**AHLSTAR END SUCTION SINGLE STAGE CLOSE COUPLED PUMP**

**KEY CHARACTERISTICS**
- Capacities: up to 600 m³/h / 2,600 USgpm
- Heads: up to 160 m / 525 ft
- Pressures: up to 16/25 bar / 230/360 psi
- Temperatures: up to 130 °C / 266 °F

**APPLICATIONS**
- Cooling water services in power plants
- Auxiliary applications
APPLICATIONS
• Clean water, polluted water and effluent
• Designed where large volumes of process water or wastewater containing solids and fibrous material must be pumped

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

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
• Auxiliary applications

KEY CHARACTERISTICS
- Capacities: up to 1,600 m³/h / 7,000 USgpm
- Heads: up to 220 m / 720 ft
- Pressures: up to 26 bar / 375 psi
- Temperatures: up to 260°C / 500°F

KEY CHARACTERISTICS
- Capacities: up to 9,000 m³/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

KEY CHARACTERISTICS
- Capacities: up to 10,800 m³/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

FEATURES AND BENEFITS
• Exceeds standard requirements of ANSI/ASME B73.1 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
• Exceeds standard requirements of ANSI/ASME B73.1 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

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

CPT END SUCTION SINGLE STAGE PUMP ANSI B73.1

SUBMERSIBLE MIXED FLOW COLUMN PUMP TYPE ABS AFLX

SUBMERSIBLE SEWAGE PUMP TYPE ABS AFP

KEY CHARACTERISTICS
- Capacities: up to 1,600 m³/h / 7,000 USgpm
- Heads: up to 220 m / 720 ft
- Pressures: up to 26 bar / 375 psi
- Temperatures: up to 260°C / 500°F

KEY CHARACTERISTICS
- Capacities: up to 9,000 m³/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

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- Capacities: up to 10,800 m³/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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SUBMERSIBLE SEWAGE PUMP TYPE ABS AFP

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- Capacities: up to 1,600 m³/h / 7,000 USgpm
- Heads: up to 220 m / 720 ft
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- Temperatures: up to 260°C / 500°F

KEY CHARACTERISTICS
- Capacities: up to 9,000 m³/h / 43,000 USgpm
- Heads: up to 70 m / 300 ft
- Pressures: up to 7 bar / 101.6 psi
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KEY CHARACTERISTICS
- Capacities: up to 10,800 m³/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

CPT END SUCTION SINGLE STAGE PUMP ANSI B73.1

SUBMERSIBLE MIXED FLOW COLUMN PUMP TYPE ABS AFLX

SUBMERSIBLE SEWAGE PUMP TYPE ABS AFP

KEY CHARACTERISTICS
- Capacities: up to 1,600 m³/h / 7,000 USgpm
- Heads: up to 220 m / 720 ft
- Pressures: up to 26 bar / 375 psi
- Temperatures: up to 260°C / 500°F

KEY CHARACTERISTICS
- Capacities: up to 9,000 m³/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

KEY CHARACTERISTICS
- Capacities: up to 10,800 m³/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

CPT END SUCTION SINGLE STAGE PUMP ANSI B73.1

SUBMERSIBLE MIXED FLOW COLUMN PUMP TYPE ABS AFLX

SUBMERSIBLE SEWAGE PUMP TYPE ABS AFP

KEY CHARACTERISTICS
- Capacities: up to 1,600 m³/h / 7,000 USgpm
- Heads: up to 220 m / 720 ft
- Pressures: up to 26 bar / 375 psi
- Temperatures: up to 260°C / 500°F

KEY CHARACTERISTICS
- Capacities: up to 9,000 m³/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

KEY CHARACTERISTICS
- Capacities: up to 10,800 m³/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

CPT END SUCTION SINGLE STAGE PUMP ANSI B73.1

SUBMERSIBLE MIXED FLOW COLUMN PUMP TYPE ABS AFLX

SUBMERSIBLE SEWAGE PUMP TYPE ABS AFP

KEY CHARACTERISTICS
- Capacities: up to 1,600 m³/h / 7,000 USgpm
- Heads: up to 220 m / 720 ft
- Pressures: up to 26 bar / 375 psi
- Temperatures: up to 260°C / 500°F

KEY CHARACTERISTICS
- Capacities: up to 9,000 m³/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

KEY CHARACTERISTICS
- Capacities: up to 10,800 m³/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

CPT END SUCTION SINGLE STAGE PUMP ANSI B73.1

SUBMERSIBLE MIXED FLOW COLUMN PUMP TYPE ABS AFLX

SUBMERSIBLE SEWAGE PUMP TYPE ABS AFP

FEATURES AND BENEFITS
• Exceeds standard requirements of ANSI/ASME B73.1 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

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

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 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 m³/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

### 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

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### APPLICATIONS

- All sump applications with moderate solid content

### KEY CHARACTERISTICS

- Capacities up to 750 m³/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

### 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

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### APPLICATIONS

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

### KEY CHARACTERISTICS

- Capacities up to 430 m³/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

### 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

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### APPLICATIONS

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

### KEY CHARACTERISTICS

- Capacities up to 1,200 m³/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

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### 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

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