



Sulzer state-of-the-art pump portfolio meets your specific needs with technically suitable and cost-effective solutions

Pumped Hydro Storage Power

Sulzer is recognized for excellent product quality, performance reliability and technical innovation required for a wide range of applications in the power generation industry. As a global leader, our knowhow and competitiveness is based on many years of experience in the manufacturing of pumps.

Pumped hydro storage history

Sulzer has a long history with pumped storage projects. Since 1894, Sulzer supplied pump turbines for projects mainly in Europe, but also India and Colombia with Total Differential Head (TDH) up to 1,100 m and flows up to 29,000 l/s.

With the rapidly increasing renewable energy capacity in the grid, Sulzer now focuses on small decentralized pumped storage plants schemes that fall within the range of 2 and 20 MW, with flows up to 10 m³/s and TDH up to 1,000 m.

Pumped storage projects

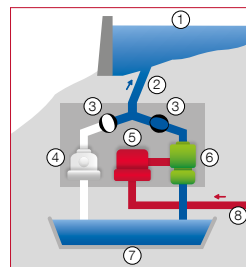
Sulzer's experience in designing, building, repairing, and retrofitting very large pumps for water transport schemes has strengthened its presence within the pumped-storage business. As well as the significant pump based installations, Sulzer's references also extend to pump as turbine installations. Pumps as turbine offer a cost-effective solution with a technically viable implementation and shorter delivery times when compared to the turbine counterparts that operate in the same range.

A pump can be installed as a turbine to generate power in several applications including within pumped-storage plants, small hydroelectric schemes, and as energy recovery devices in various municipal and industrial applications.

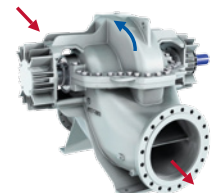
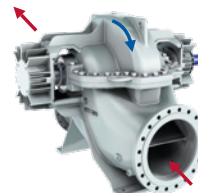
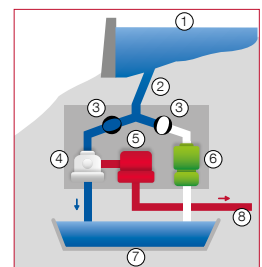
Operating principle of a PHS plant

- | | |
|---------------------|--------------------|
| 1 Upper reservoir | 5 Motor/generator |
| 2 Pressure shaft | 6 Storage pump |
| 3 Valve open/closed | 7 Lower reservoir |
| 4 Pump turbine | 8 Electric current |

Pump mode

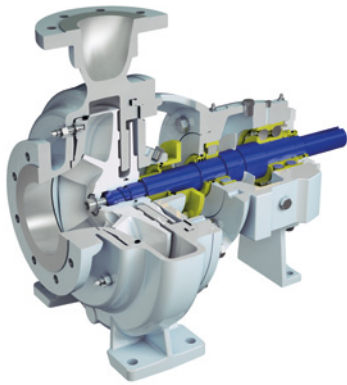
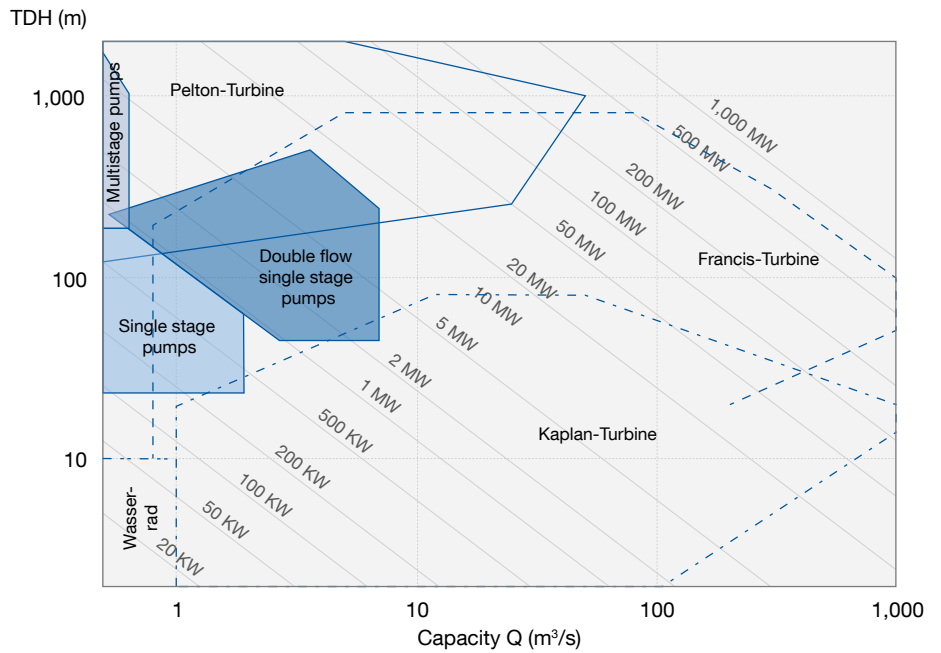


Turbine mode



Turbine or pump turbine operating range

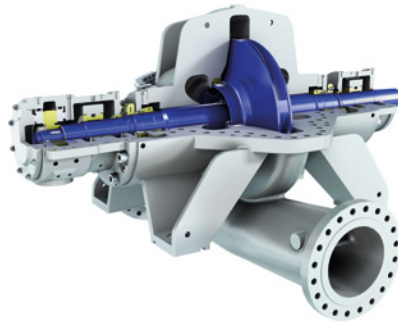
Performance range of pumps running in turbine mode or in pump turbine mode. The best efficiency point (BEP) capacity is lower for the pump mode operation. The coverage below represents both pump and turbine mode.



Single stage pumps

Sulzer's range of single-stage pumps can be designed using the end suction overhung impeller design method. These pumps comply with either ISO 5199/ISO 2858, ASME B73.1 or API 610 standards and guarantee reliable pumping processes.

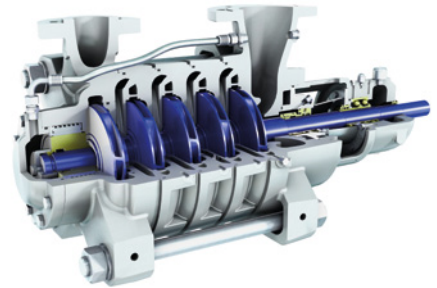
A typically used single stage pump: AHLSTAR



Double flow single stage pumps

Double suction single stage pumps are available if low Net Positive Suction Head Required (NPSHR) is required.

A typically used double flow single stage pump: HPDM



Multistage pumps

Multistage pumps are used in applications where higher head is required. They ensure more reliable, high efficiency process and lower operating costs instead of serial pumping system.

A typically used multistage pump: MBN