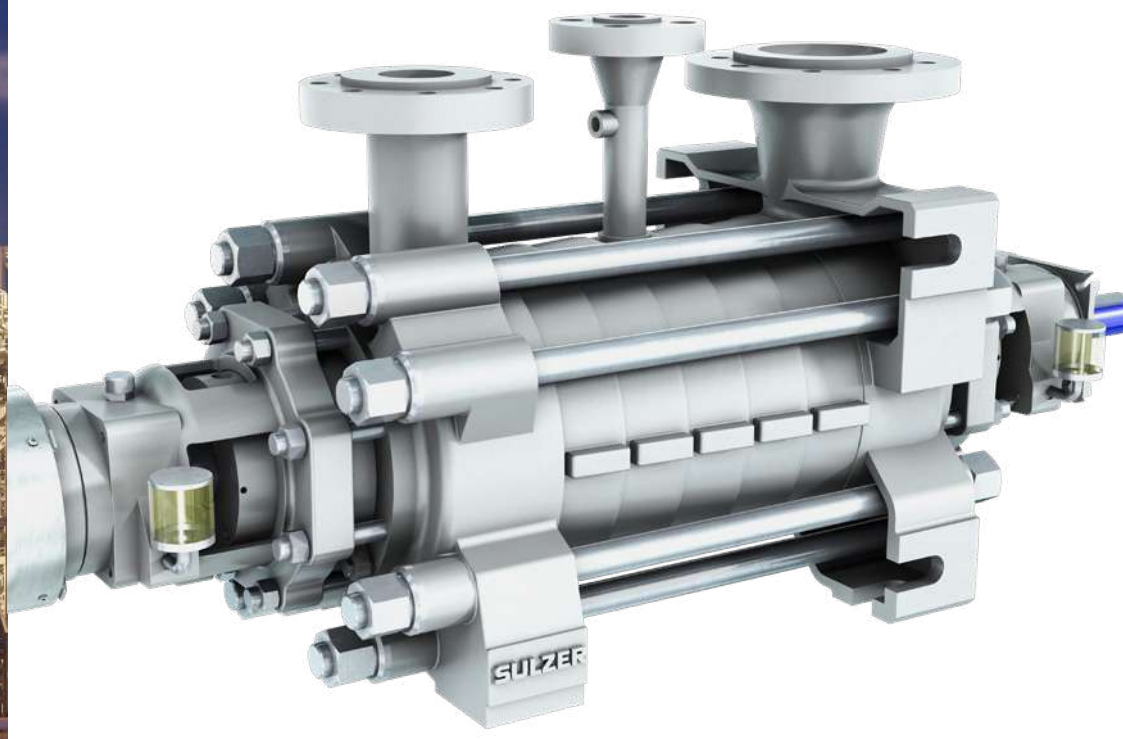
SULZER

Pumps and pumping systems

MC high pressure stage casing pump





Main industries and applications

The MC pump is primarily designed for power applications, such as auxiliary boiler feed, nitrogen oxides (NOx) abatement and fuel injection in combined cycle, boiler feed for biomass fired and industrial power plants and steam generator feed in concentrated solar. The design is ideal for:

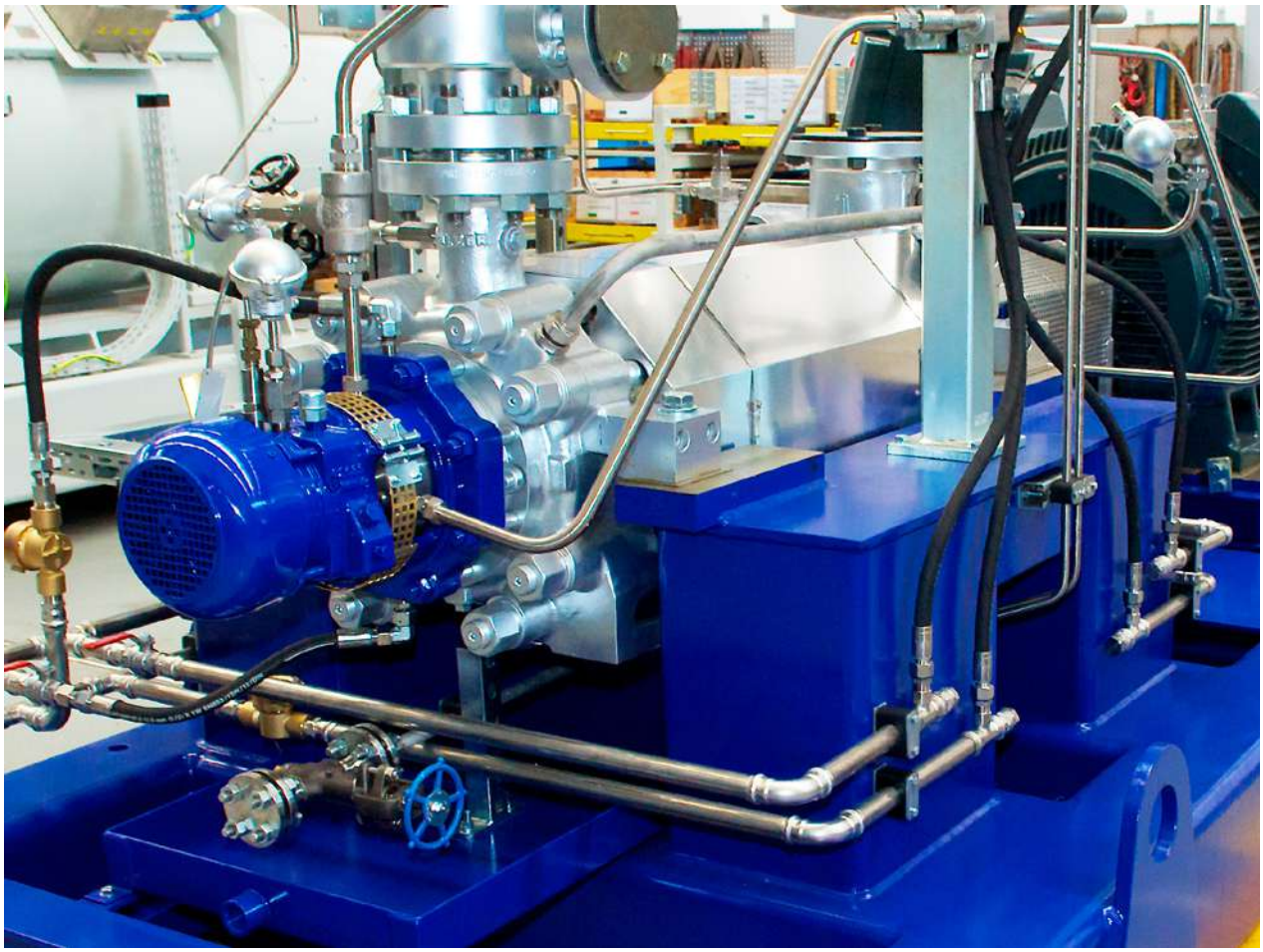
- Boiler feed duties up to 180°C, pre-warming not required
- Condensate extraction service in power stations and industrial power plants (low pressure version with dedicated large sizes)
- Auxiliary services within combined-cycle and industrial power plants
- Hot water service in downstream, pipeline pumps in midstream and small injection pumps in upstream
- High pressure water in the general industry











Features and benefits

1 Casing support
- Foot or shaft centerline mounted for large sizes and high temperatures

2 Branches
- Large suction branches optimize inlet flow
- Reduce noise levels through low branch velocities
- Allow higher forces and moments

3 Impellers
- Modular hydraulics for high efficiency in a wide range of operating conditions
- Low net positive suction head required (NPSHR) first stage; double suction first stage can be provided for selected sizes

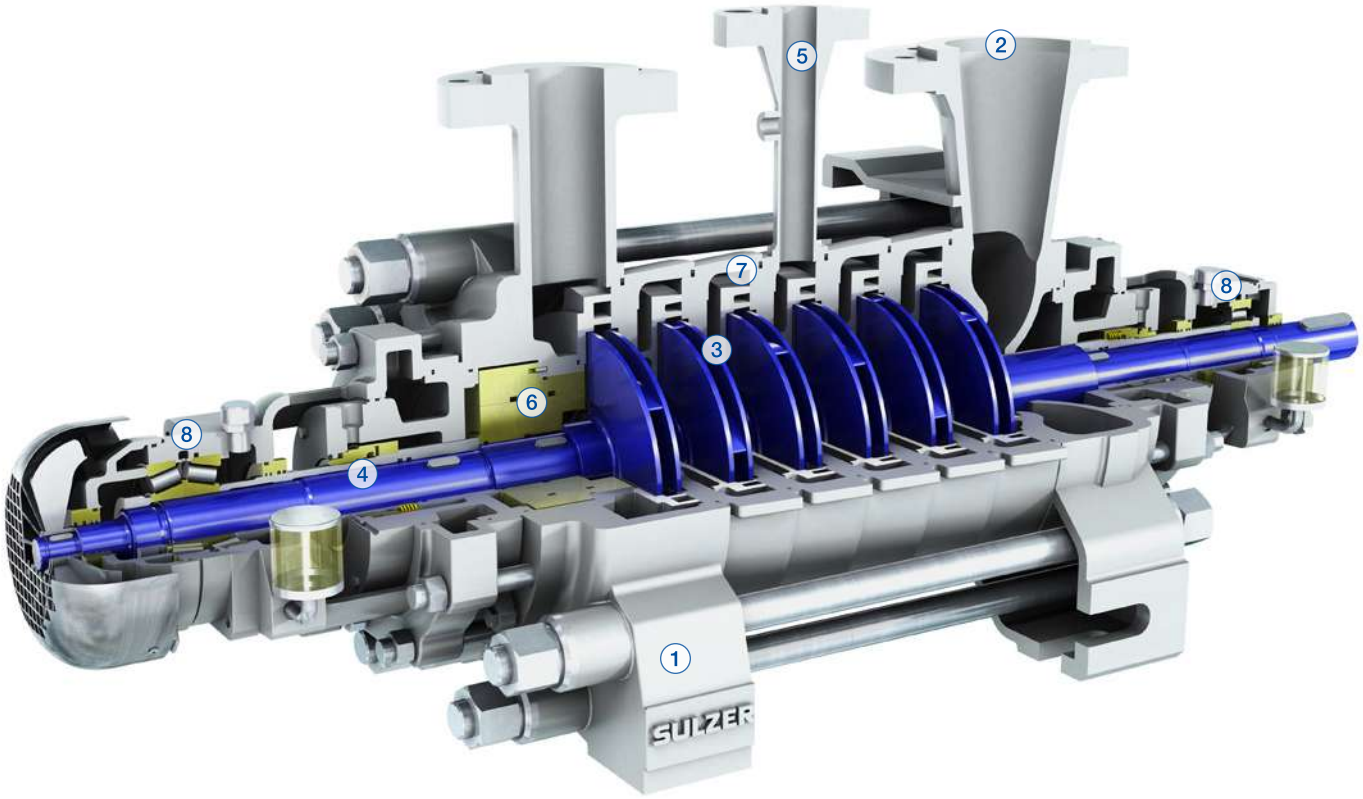
4 Shaft
- Stiff design resulting in higher critical speed than running speed and small shaft deflection
- Areas subject to wear are protected

5 Intermediate take-off
- Up to two bleed-off nozzle are possible

6 Hydraulic thrust balancing system
- Axial thrust can be balanced by balance drum with thrust bearing or by balance disc without thrust bearing

7 O-rings
- Casing sealing by confined O-rings, therefore unaffected by rapid temperature variations and high pressures

8 Multiple bearing types
- Antifriction bearings for low cost and hydrodynamic bearings for higher energy services



Specifications

Materials

Pump part	Material
Suction, stage and discharge casings	Carbon steel, chrome steel, duplex steel
Impellers and diffusers	Carbon steel, chrome steel, duplex steel
Shaft	Chrome steel, duplex steel
Balancing system	Chrome steel, duplex steel

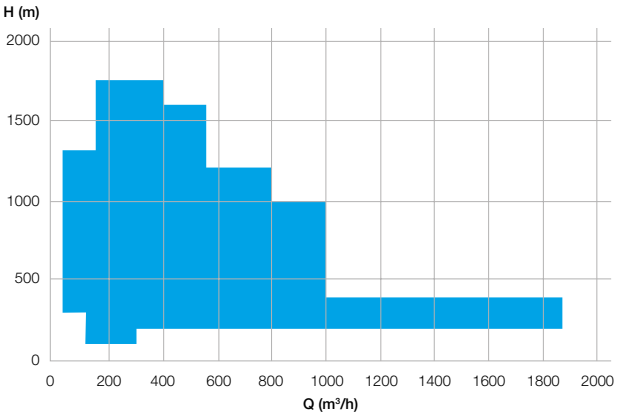
Operating data

	50 Hz	60 Hz
Pump sizes	up to 350 mm	up to 14 in.
Capacities	up to 1’860 m^3/h	up to 9’720 USgpm
Heads	up to 1’750 m	up to 5’500 ft.
Pressures	up to 180 bar	up to 2’610 psi
Temperatures	up to 180°C	up to 356°F

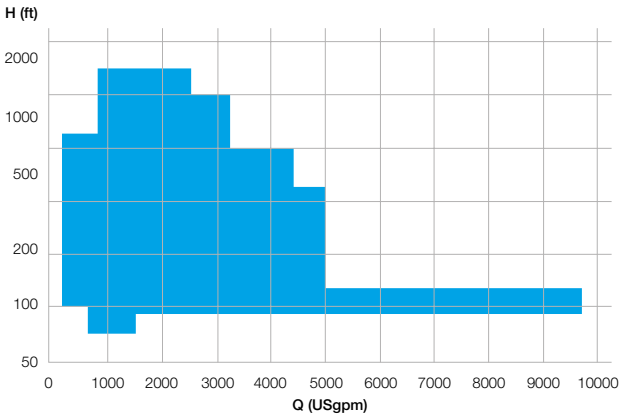
Higher temperatures upon request

Performance range

50 hz



60 hz



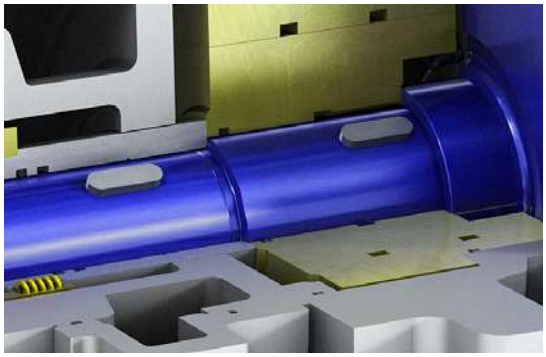
NDE bearing arrangements

NDE bearing arrangement with balance drum

The balance drum device carries the major proportion of the hydraulic thrust. The drum diameters are chosen to minimize the thrust at normal operating point. The residual and additional thrust loads occurring above/below the normal operating point are carried by the thrust bearing, typically a taper roller bearing.

The straight balance drum is suitable for:
- Long life under extreme operating conditions
- Frequent stop-start applications thanks to nearly wear-free device

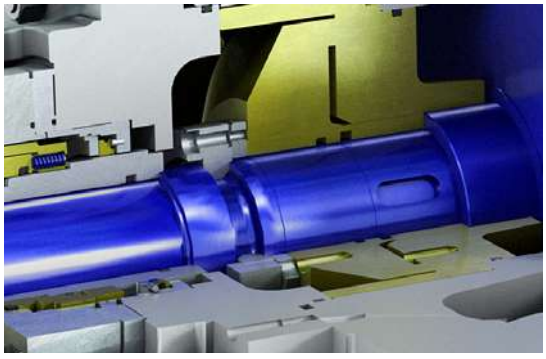




NDE bearing arrangement with balance disc

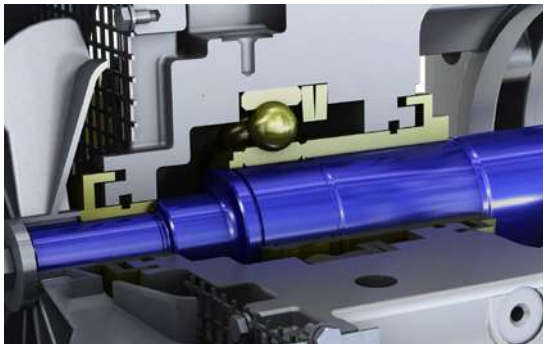
With the balance disc, the axial force is completely compensated, therefore no axial thrust bearing is required. The disc designs are optimized for each hydraulic and size.

For operation with frequent start and stops, the installation of a lift-off device is available (either mechanical or magnetic).



Mechanical lift-off device

Advantages:
- Prevents touching and wearing of the disc/counter disc during operation at low speed, such as start up and shut down
- Self-controlling passive system
- Reduces load on balance disc under normal operation
- Integrated into the radial bearing housing; no additional power consuming bearings required



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