RHEINHÜTTE PUMPEN

An ITT Company

Molten Sulphur

Vertical and Horizontal Pumps

Special Pumps For Molten Sulphur

Rheinhütte Pumpen is a specialist in sulphur applications and has decades of experience pumping molten sulphur and sulphuric acid.

Typical customers use our sulphur pumps in refineries, tank farms, loading and unloading transport cars and in sulphuric acid production.

Our molten sulphur pumps meet the highest of requirements. They are used in the following applications:

- Sulphur degassing
- Sulphur transport
- Sulphur granulation/palletising

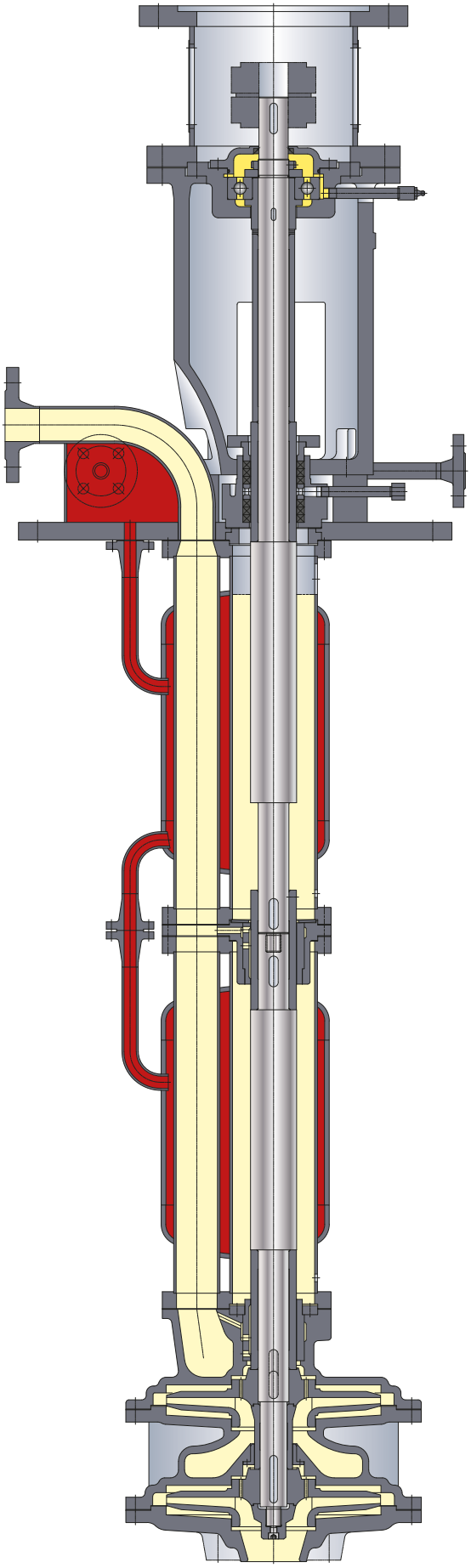
We consider ourselves solution providers - we work closely with our customers to develop a solution that can be implemented to meet all requirements. We develop customized solutions to meet unusual requests and address special problems.
We offer flexible installation lengths and alternative designs for all vertical submersible pumps, along with reliable sealing options that go far beyond mechanical seals. In addition to the manufacturing of pumps, we provide a broad range of services including testing, on site training, and pump repairs. Every customer receives our standard, comprehensive documentation for their project. Additional documentation can be supplied to meet the most stringent customer requirements.

GVSO Vertical Metal Pump

Sophisticated pump design provides users flexibility and security. 25 different pump sizes offer maximum freedom when it comes to choosing the right pump for your duty point. With its special design and innovative details the GVSO has provides users with the best possible corrosion resistance, reliability and quality. The GVSO pump design meets the pump-type VS 4 standard.

Technical Data

Size DN	40 to 250
Q_{max} m^3/h (gpm)	900 (3960)
H_{max} m (ft)	180 (591)
Submersion $depth_{max}$ m (ft)	17,5 (57)
Temperature °C (°F)	-40 to +600 (-40 to +1112)
PN	up to 25 bar
Standards	ISO 5199
Flange motor design	✓
Closed impeller	✓
Heatable	✓
Foot bearing	✓
Options	▪ High Pressure Multistage Design ▪ Double acting mechanical seals, (gas-lubricated API Plan 74)
Material	▪ Carbon steel (1.0619 / A216 (WCB)) ▪ Stainless steel (1.4408 / 316 A)
Seal	Stuffing box packing

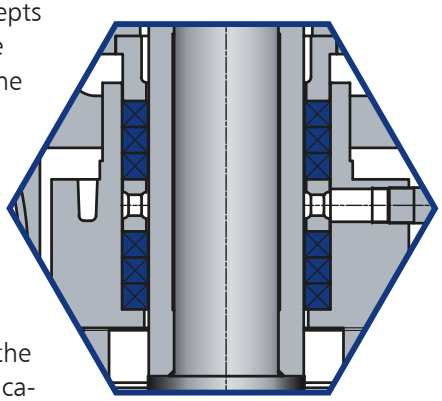


The compact construction is suited to fit in small container openings. Thanks to the grease-lubricated roller bearing system above the mounting flange, even high temperature applications can be handled. The casing design minimizes pressure losses and thus operates in a highly efficient way.

Pump removal is easy thanks to extended pipe connections outside of the sole plate area. Changing the roller bearings can be done with the pump still installed. The thermally optimized pump design offers low heat loss to surroundings.

Closed radial hydraulics with double volute casings minimize radial forces that occur. The separation of the pressure and shaft tubes enable optimum lubrication of the sleeve bearings and guarantees uniform thermal expansion of the medium in the casing. In addition, defined shaft connections which are independent of the direction of rotation allow pipes to be emptied and the pumping medium to flow back when the pump is switched off without any additional forced cooling.

Closed radial hydraulics with double volute casings minimise the radial forces that occur. The separation of the pressure and shaft guide tube enables optimum lubrication of the sleeve bearings and guarantees uniform thermal expansion of the medium in the casing. In addition, defined shaft connections which are independent of the direction of rotation allow pipes to be emptied and the pumping medium to flow back when the pump is switched off without any additional forced cooling.



Shaft sealing concepts that do not involve any contact with the medium and the self-emptying design increases the level of reliability. The unique sleeve bearing principle lubricates the bearings with the fluid (external lubrication is also possible) and thus ensures a low level of sleeve bearing wear during constant pump operation. Costly oil lubrications or additional cooling which have an impact on safety are not necessary. The pump is fitted with a heating jacket to maintain the pumped sulphur at a constant temperature and, consequently, unchanged viscosity. Each individual segment of the pipe string is encased in its own heating jacket in this respect.

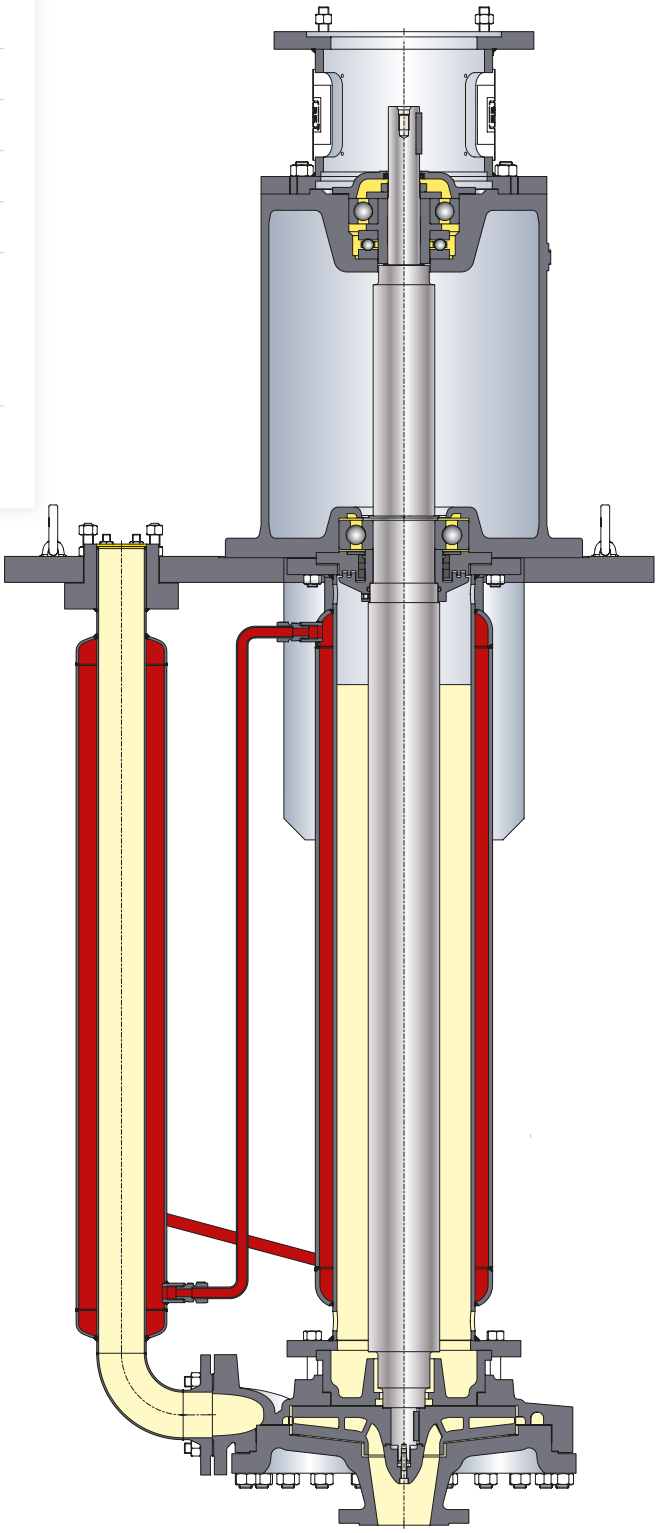
RCEV Vertical Metal Pump

The sophisticated pump design provides users and designers flexibility and security. 25 different pump sizes offer maximum freedom when it comes to the choice of hydraulics.
Due to its impeller design, equipped with front and rear blades, the RCEV pump type is highly suitable for handling liquids containing solids.

Rheinhütte pump type RCEV is a cantilever pump, designed without a foot sleeve bearings. Therefore, this pump type will be used mainly for dirty sulphur applications. Special design and pump material providing protection from wear and tear. Impeller design makes it possible to handle sulphur with up to 35% solids.
Due to the cantilever design, maximum submergence length is limited to 2000 mm. Suction pipes can be supplied to extend the pump length.
The standard sealing is a lip ring seal.

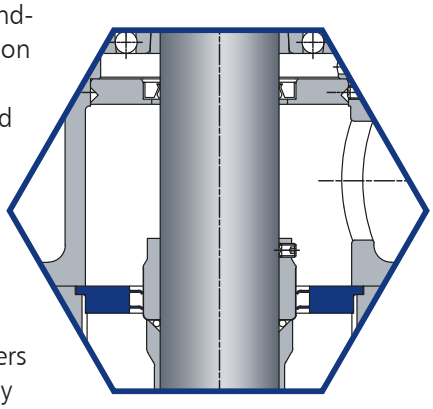
Technical Data

Size DN	32 to 300
Q_{max} m³/h (gpm)	900 (3960)
H_{max} m (ft)	85 (279)
Submersion $depth_{max}$ m (ft)	2 (6,56)
Temperature °C (°F)	-40 to +200 (-40 to +392)
PN	up to 25 bar
Standards	ISO 5199
Flange motor design	✓
Closed impeller	✓
Heatable	✓
Options	▪ Open impeller
Material	▪ Carbon steel (1.0619 / A216 (WCB)) ▪ Stainless steel (1.4408 / 316 A)
Seal	Lip ring seal, Stuffing box packing



Lip Ring Seal

This type of shaft seal is used mainly on vertical pumps, to protect the anti-friction bearings from fluid splashes. Different lip rings made of different materials can be used.
For example a friction optimized shaft seal is used, and also pretensioned PTFE lips, which rotate on hardened shaft sleeves. Depending on the application several lip rings can be fitted one behind the other. The spaces in between can then also be filled with a grease lock. For horizontal pumps the quench chambers are usually sealed by single acting mechanical seals with a lip ring. This sealing principle is also applied as stationary sealing for hydrodynamic shaft seals.

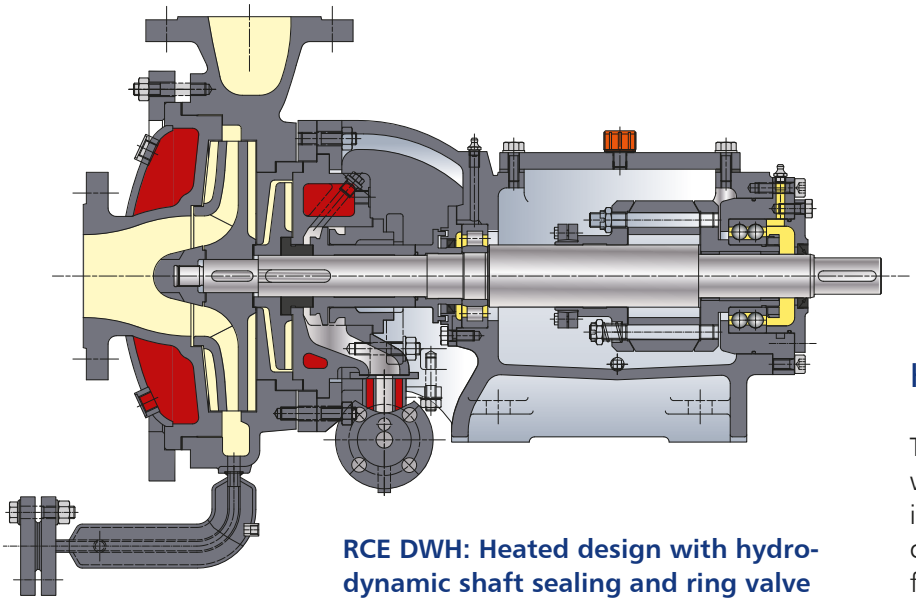


RCE – Horizontale Metall Pump

Thanks to its design and robust construction, the RCE is ideally suitable for pumping molten sulphur.
This heavy duty pump demonstrates a particularly high level of flexibility, as a wide range of materials and more than 36 pump sizes are available.

Technical Data

Size DN	32 to 300
Q_{max} m^3/h (gpm)	1200 (5280)
H_{max} m (ft)	180 (591)
Temperature °C (°F)	-40 to +450 (-40 to +842)
PN	up to 40 bar
Standards	ISO 5199
Closed impeller	✓
Open impeller	✓
Heatable	✓
Options	Single acting mechanical seals with quench
Material	▪ Carbon steel (1.0619 / A216 (WCB)) ▪ Stainless steel (1.4408 / 316 A)
Seal	Hydrodynamic shaft seal



RCE DWH: Heated design with hydro-dynamic shaft sealing and ring valve

Design & Material

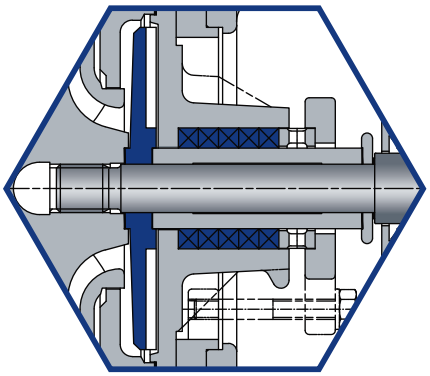
Pump material and design which are selected based on the fluid being pumped provide protection from wear and tear.
Special hydraulics make it possible to pump fluids containing up to 30% solids.
Robust bearing pedestal and reinforced shaft guarantee quiet running with a low amount of vibration at speeds up to 3500 rpm. Comprehensive heating chamber system (RCE DWH) also surrounds the sealing area. Heating ensures that no sulphur residue solidifies and forms deposits in the shaft seal chamber during pump start-up and shutdown.

The generous dimensioning enables steady, low-maintenance operation with constant levels of pumping performance over many years.
Depending on the application, pump components can be made from a number of different materials. This flexibility means that the pump can be specialized to handle extreme operating conditions.

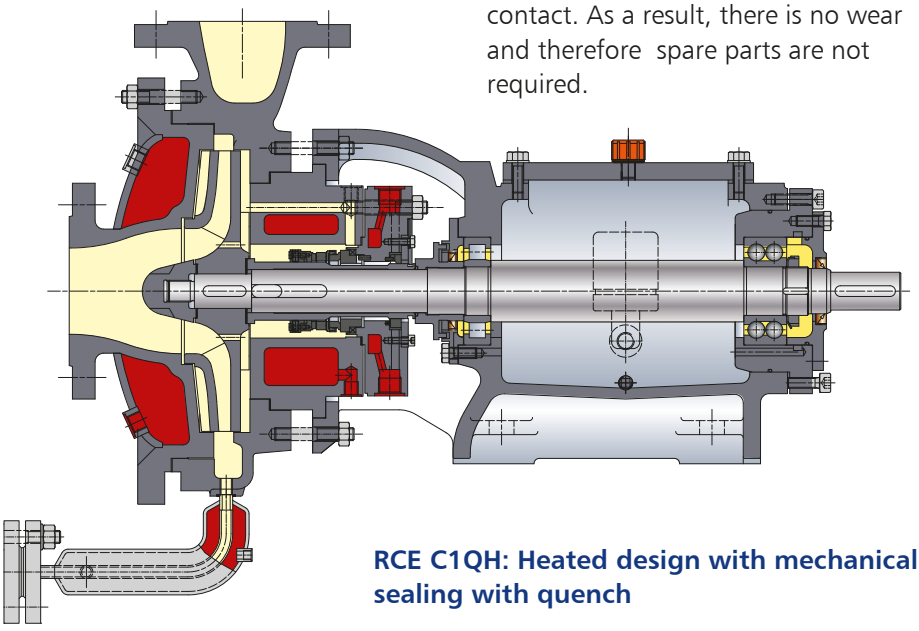
The RCE's hydraulics have been specially designed for pumping aggressive and abrasive liquids, which allows longer life with the best level of efficiency.

Hydrodynamic Shaft Seal

The hydro-dynamic shaft seal works without contact and without wearing parts. It requires no maintenance of any sort and is particularly suitable for continuous operation. With the aid of impeller back blades and a downstream auxiliary propeller the shaft gland is completely relieved hydro-dynamically from the pump and inlet pressure. The medium is kept away from the shaft gland.



Advantages:
During operation the seal has no contact. As a result, there is no wear and therefore spare parts are not required.

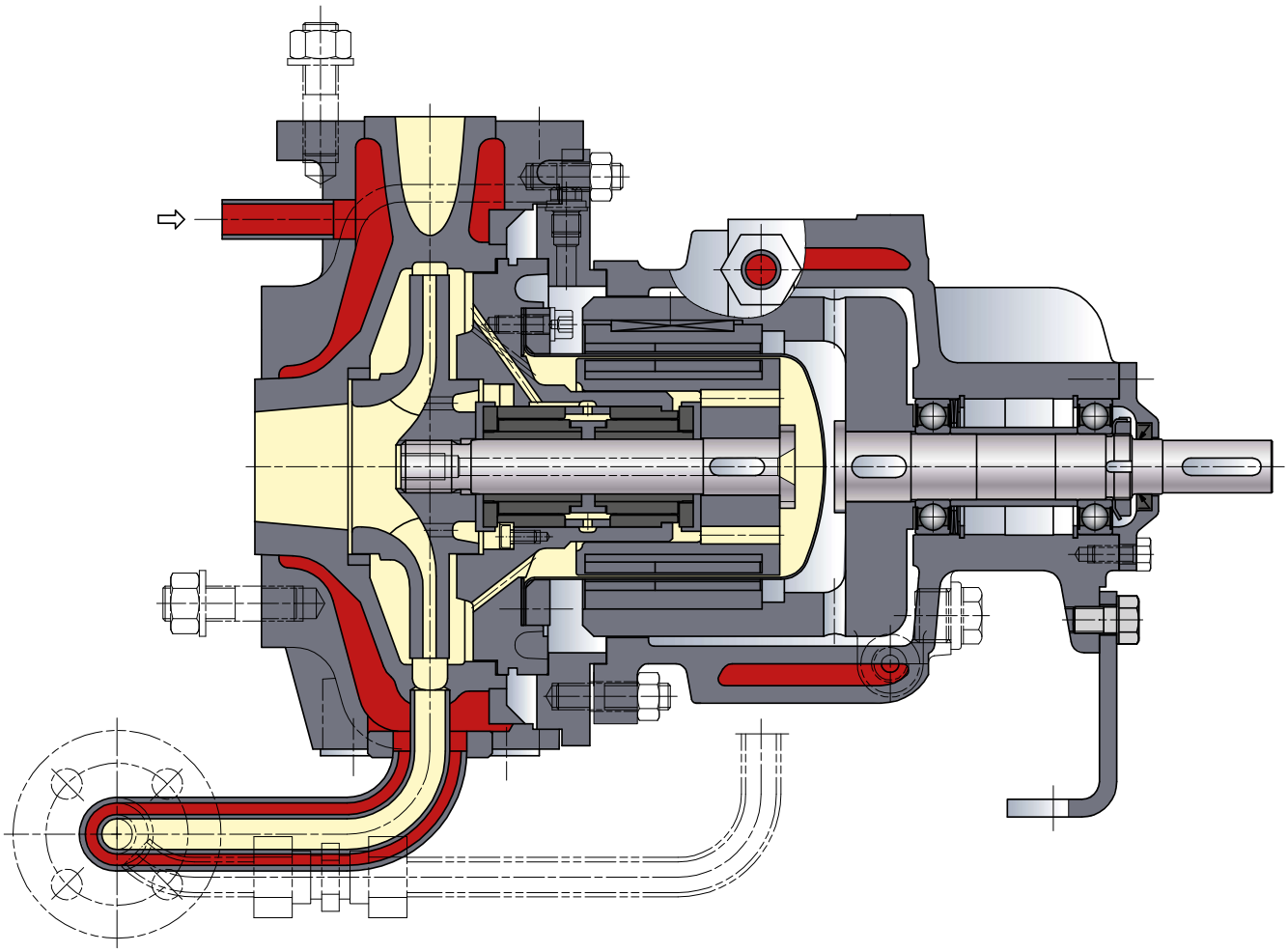


RCE C1QH: Heated design with mechanical sealing with quench

RMKN – Magnetic Drive Pump

The heated version of the RMKN is particularly suitable for sulphur processing where pure sulphur is involved and also in processes where pump usage is intermittent.
The reliable magnetic drive concept, which has proven its worth over many decades, ensures maximum reliability in demanding industrial applications. Energy saving spacer cans and a large selection of pump sizes make it possible to produce cost-effective and reliable solutions.

Service and maintenance-friendly machine concept with simple dismantling and inspection options. Cost-efficient operation and, overall, low life cycle costs. Absolutely leak proof, thanks to the magnetic coupling and hermetic sealing. Heated chambers for casing, casing drains system, bearing bracket and magnet chamber prevent solidification of sulphur. The RMKN meets all the requirements of DIN EN 22858.

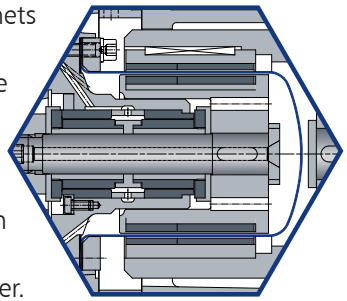


Technical Data

Size DN	32 to 150
Q_{max} m^3/h (gpm)	500 (2200)
H_{max} m (ft)	150 (492)
Temperature °C (°F)	-40 to +250 (-40 to +482)
PN	up to 16 bar
Standards	ISO 5199, DIN EN 22858
Closed impeller	✓
Heatable	✓
Back pull out design	✓
Material	Stainless steel (1.4408)
Seal	Magnetic coupling

Magnetic Coupling

The magnetic coupling is based on a completely different sealing principle. Here the drive for the hydraulic part of the pump takes place through the pairing of permanent magnets whose external unit transmits the torque generated by the motor to an internal unit, which in turn transfers this to the impeller.



The external or atmosphere side magnet system is separated from the internal product side magnetic system by a spacer can made of non-magnetic material. The torque needed to drive the impeller is transmitted exclusively by magnetic forces which act through the spacer can. The pump it is thus hermetically sealed.

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