

RCE

Horizontal metal pump





The RCE

Optimal for solids

The particularly robust, horizontal RCE series with a single-stage volute casing has proven its worth as a chemical pump for many decades now. As a product-based special version, the RCE is also clearly the first choice for use in the chemical industry, the primary industry – here in particular in the manufacturing of fertilisers – environmental technology and many other areas of industry.

The RCE pumps organic and inorganic as well as aggressive fluids with high solids fractions during normal and heavy-duty operation and is particularly suitable for hot media up to 450 degrees.

Design features

- Design: horizontal, single-stage
- Casing design: single or double volute casing
- Impeller: closed or open
- Bearing lubrication: grease or oil lubrication
- Installation versions:
 - base plate, base frame or stilt mounting
- Ambient temperature: -20 °C to +60 °C
- Solid content limit value: ca. 30 %





Technical data

RCE	
Size DN	32 to 300
Q_{\max} (m ³ /h)	1200
H_{\max} (m)	180
Temperature (°C)	-30 to +450
Standards	ISO 5199
Closed impeller	Standard
Open impeller	Standard
Heatable	Option
Seal	Stuffing box packing, mechanical seal, Hydrodynamic sealing



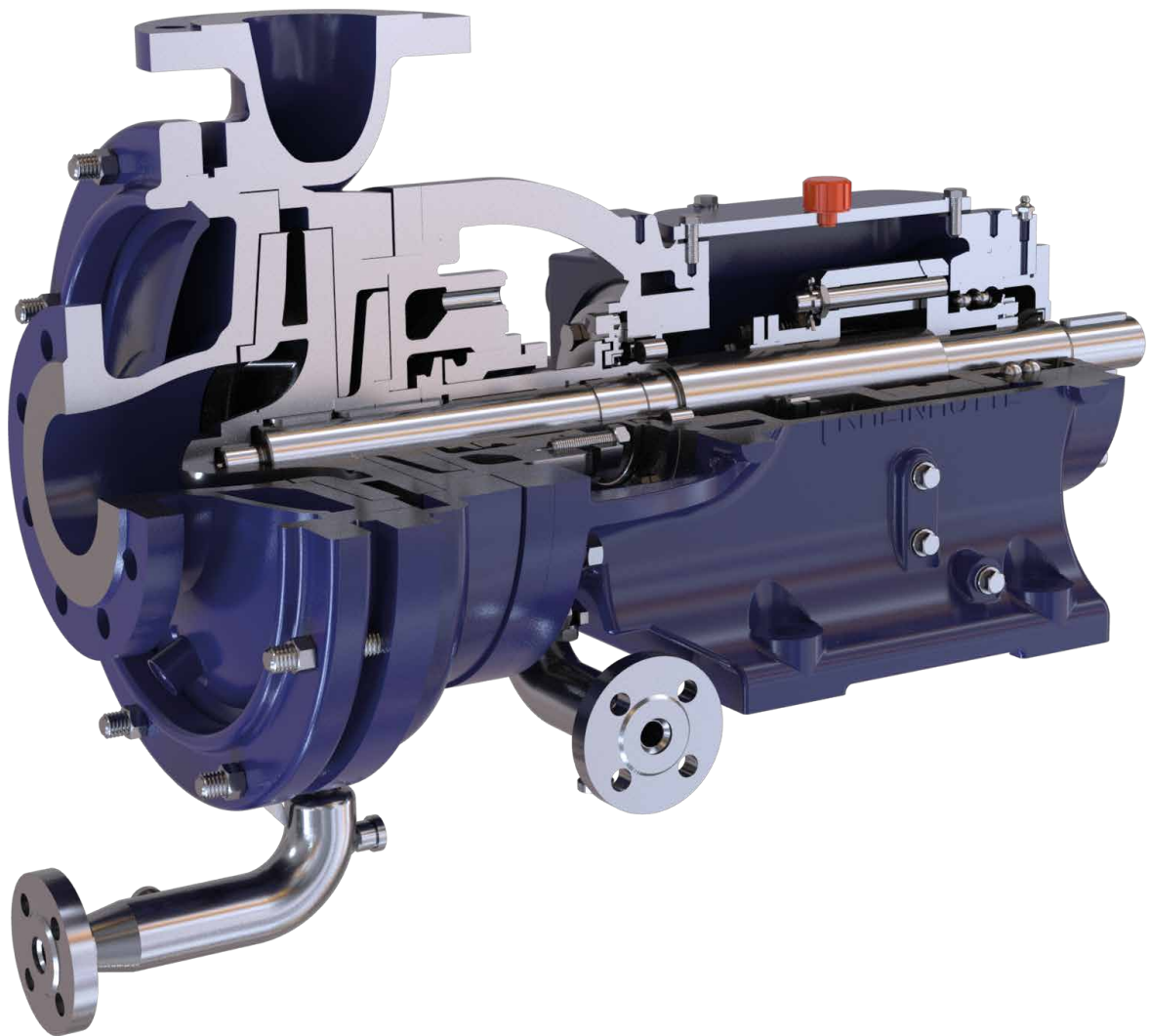
Options

- Inducer
- Heated version
- Drain of volute casing
- Flushing in different versions
- Temperature and vibration monitoring
- Equipment health monitoring with i-Alert®3
- Flange processing in line with international standards
- Thermosyphon system
- Quench system
- Storage and priming tank
- Pump accessories

Fields of application

- Ammonium nitrate
- Fertilizer production
- Molten sulphur
- Phosphoric acid
- Slurry
- Sulphuric acid

Main features



1 Optimum flow rates and flow guidance arrangements are specially designed for pumping aggressive and abrasive liquids. This allows a longer life with the best level of efficiency.

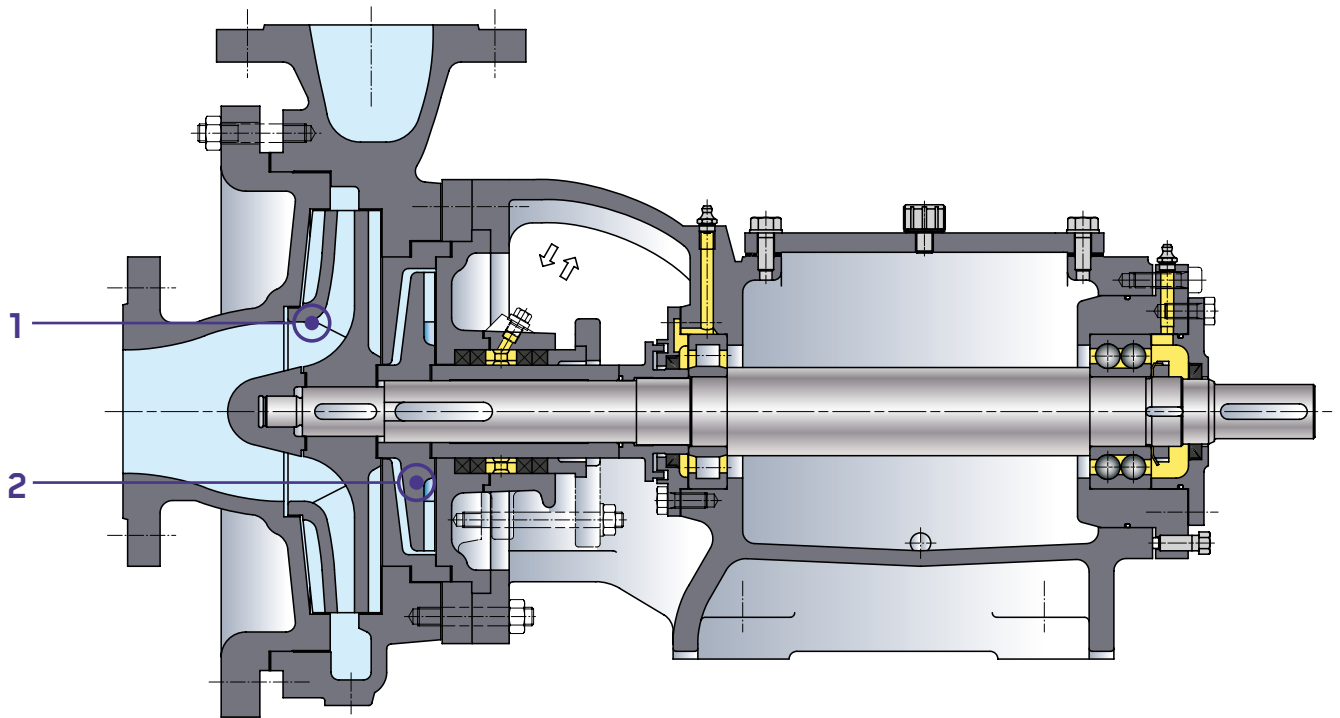
2 In addition to all customary mechanical sealing concepts, the use of hydrodynamic shaft sealing concepts also allows the pump to be used in demanding areas, like corrosive fluids and/or fluids containing solids. For particularly abrasive and aggressive fluids, both sealing variants can be combined.

3 Complete pump units with all of the necessary supply components are tailored to specific customer requirements. The comprehensive heating chamber system (RCE DWH) also surrounds the sealing area.

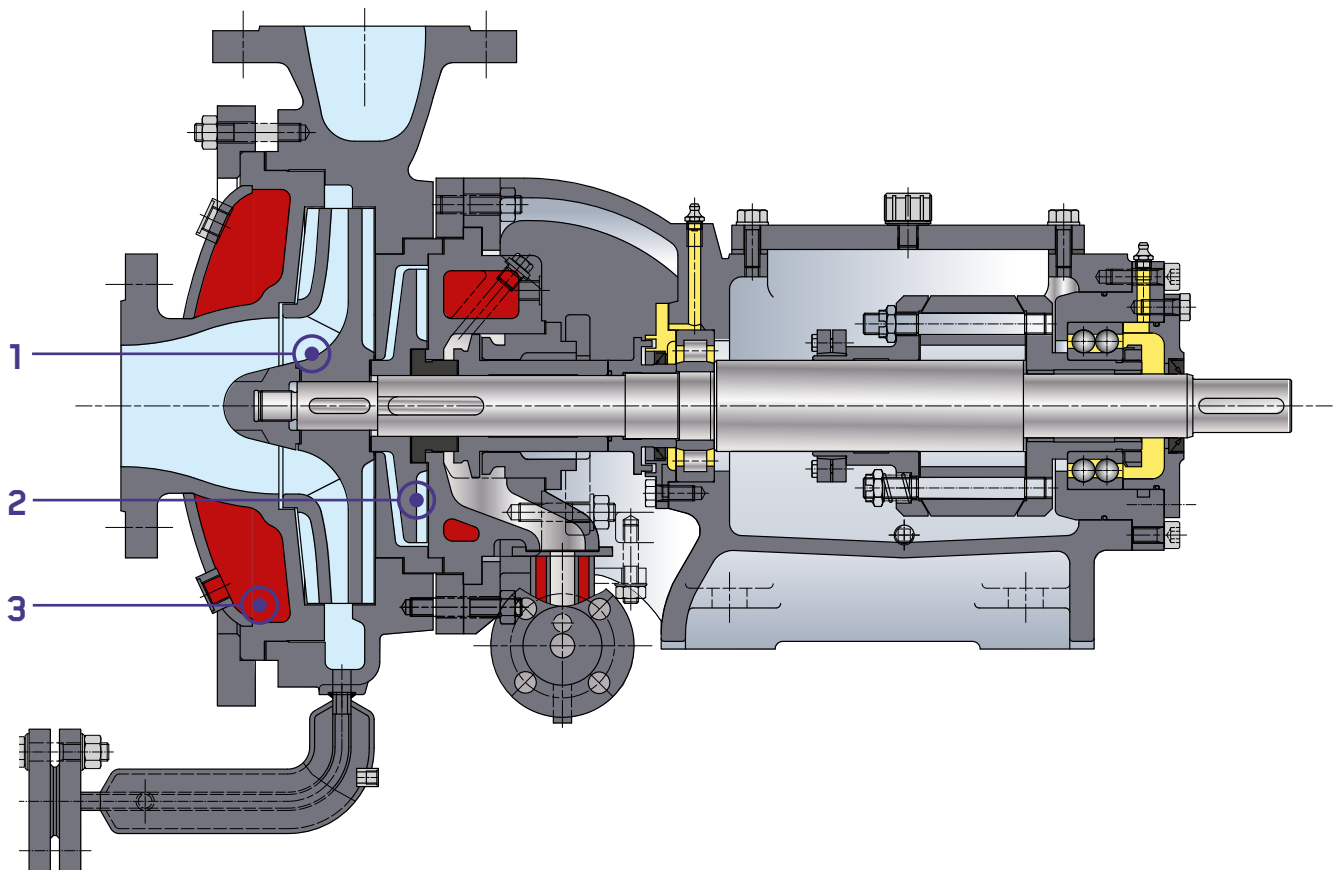
Areas of application in which the medium needs to be kept at a constant temperature do not present any problem for the RCE. The use of heating chamber systems means that the RCE is also ideally suited to difficult situations, e.g. the pumping of liquid sulphur.

The sectional drawings essentially correspond to the design. Subject to design changes.

RCE B: Design with hydrodynamic shaft sealing and stuffing box packing



RCE DWH: Heated design with hydrodynamic shaft sealing and ring valve



Metal materials

The range of metallic materials encompasses a wide variety of very different types of material which are distinguished mainly by their alloy composition, their structure and their manufacturing process. This gives each material its characteristic properties and allows an optimal material to be selected to suit the application.

1.0619

High temperature ferritic cast steel, can be used up to 450 °C. For use with low or non-corrosive media, such as molten sulphur.

V5700

Particularly wear resistant high alloy cast iron. This material is used for suspensions with an abrasive effect such as gypsum, carbonates, carbides, sand, ore or metal oxides.

1.4136 S

Corrosion and erosion resistant high alloy ferritic cast steel. Typical applications are highly concentrated sulphuric acid up to 180 °C, oleum, fertiliser production, crude phosphoric acid containing solids.

1.4306 S

A specially developed material for the pumping of ammonium nitrate melt, hot nitric acid at medium concentrations and also the vapourisation of waste nitric acid.

1.4361

Low carbon silicon alloy material for pumping strongly oxidising media. Particularly suitable for hot highly concentrated nitric acid, e.g. 98 % HNO₃.

1.4408

Fully austenitic chromium nickel molybdenum steels with a good general resistance to corrosion. These materials are suitable for pumping almost all organic liquids, 50% caustic soda up to 90 °C, KTL paint, pure phosphoric acid, dry chlorine, liquid sulphur, PTA and many other media.

1.4463

Semi-austenitic, easily welded material with an increased strength and a good general resistance to corrosion. Due to its good welding properties and wear resistance it is frequently used for jacketed pumps for handling melts containing solids, such as pitch and tar.

1.4517

Duplex (Semi-austenitic), molybdenum and copper alloyed material with a high resistance to pitting and stress corrosion. This material is one of the super duplex steels. It can be used with crude phosphoric acid, containing solids at up to 100 °C, hot sea water, many solutions containing chloride, FGD suspensions and sulphuric acid at all concentrations at low temperatures.

1.4529 S

A high grade special material having a high resistance to acidic media containing solids and rich in chlorides. Used in absorber and quencher fluids of the FGD, for acidic and chloride containing gypsum slurries, in the manufacture of phosphoric acid, in vapourisation and crystallisation processes and also for hot sea water.

1.4652 S

Higher austenitic cast material with very high corrosion resistance. Especially in very corrosive phosphoric acid with solids this material is perfectly suitable.



Outstanding sealing

R 3020

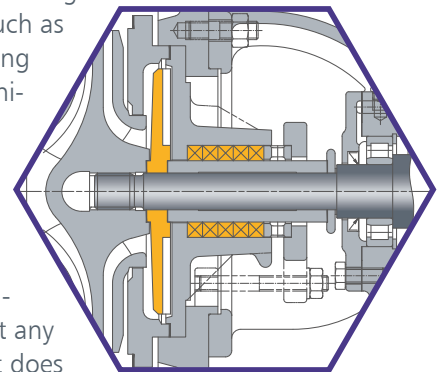
Fully austenitic special stainless steel with a high molybdenum and copper content. High resistance to pitting, stress corrosion and intercrystalline corrosion. Suitable for 70% caustic soda up to 200 °C, sulphuric acid at all concentrations at low and medium temperatures, sulphuric acid pickling solutions, in certain areas of the manufacture of phosphoric acid, for pumping solutions with a high chloride content and in spin baths.

2.4686

Highly resistant nickel-base alloys for special applications such as liquids containing high chloride, hydrochloric acid, FGD liquids, very heavily contaminated phosphoric acid, hypochlorites and solutions with oxidising chlorides.

The hydrodynamic shaft sealing variants of the RCE represent a unique and reliable sealing option. Their area of use extends across special applications in which standard sealing

arrangements such as mechanical sealing systems (mechanical seals) can no longer operate reliably. This special sealing variant operates without any contact and without any wearing parts. It does not require any maintenance and is therefore particularly suitable for continuous operation. Conditions of use with crystallisation or temperature problems therefore do not present any hurdle for the RCE.



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Impeller back vanes and the additional auxiliary impeller connected downstream hydrodynamically relieve any pump and feed pressure on the shaft passage in full. The medium is kept away from the shaft gland and the pump is thus leak-free during operation. A liquid ring is produced in the area of the auxiliary impeller which separates the inner area of the pump from the atmosphere without any leaks. The hydrodynamic shaft sealing arrangement thus only functions fully when the pump is operating.

During stationary periods various configurable stationary seals insulate the shaft passage off from the atmosphere. Different versions can be selected for this purpose: The simple stuffing box packing, the pneumatic system or a ring valve which is mechanically controlled by means of a regulator.

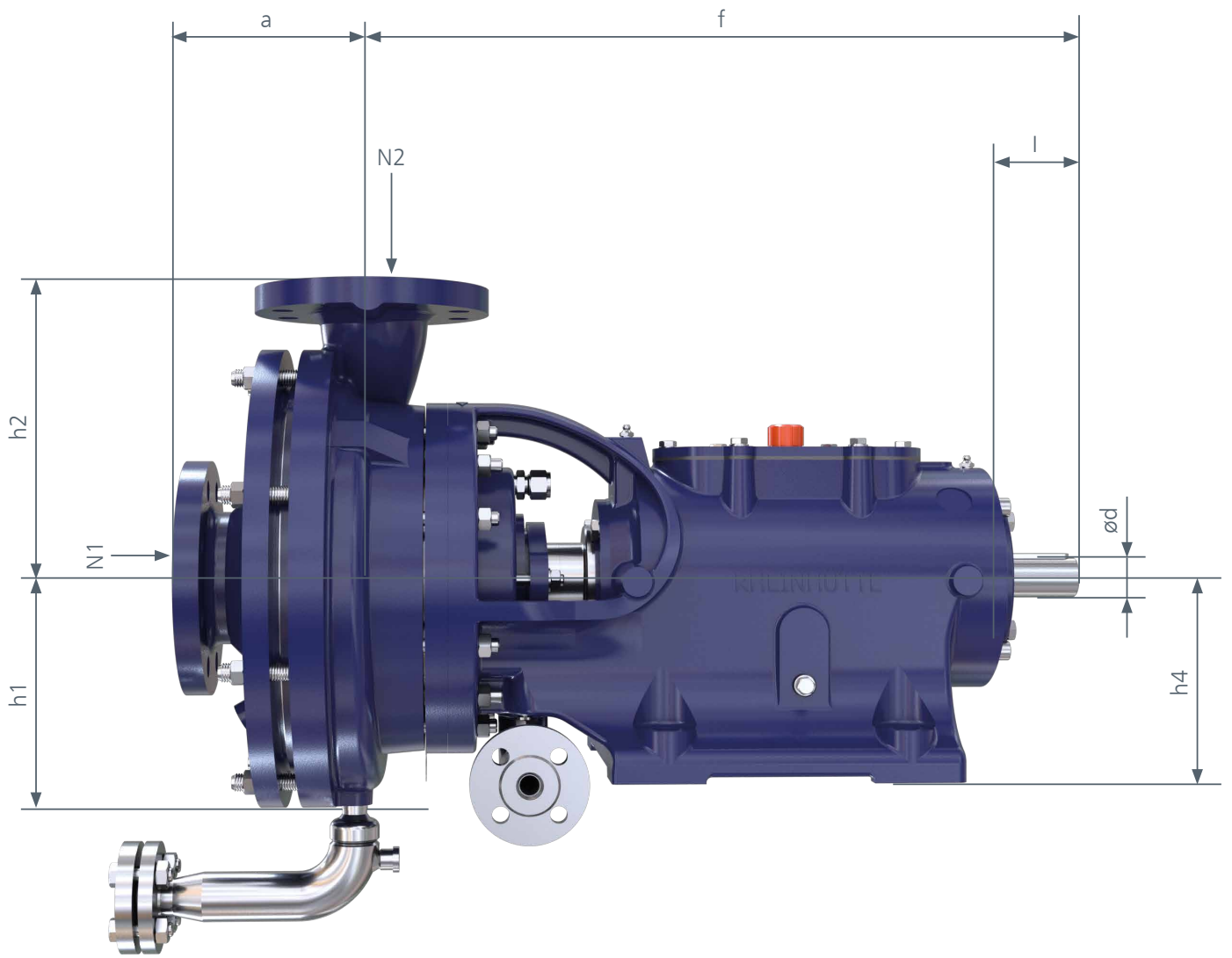
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Pumps & installation dimensions

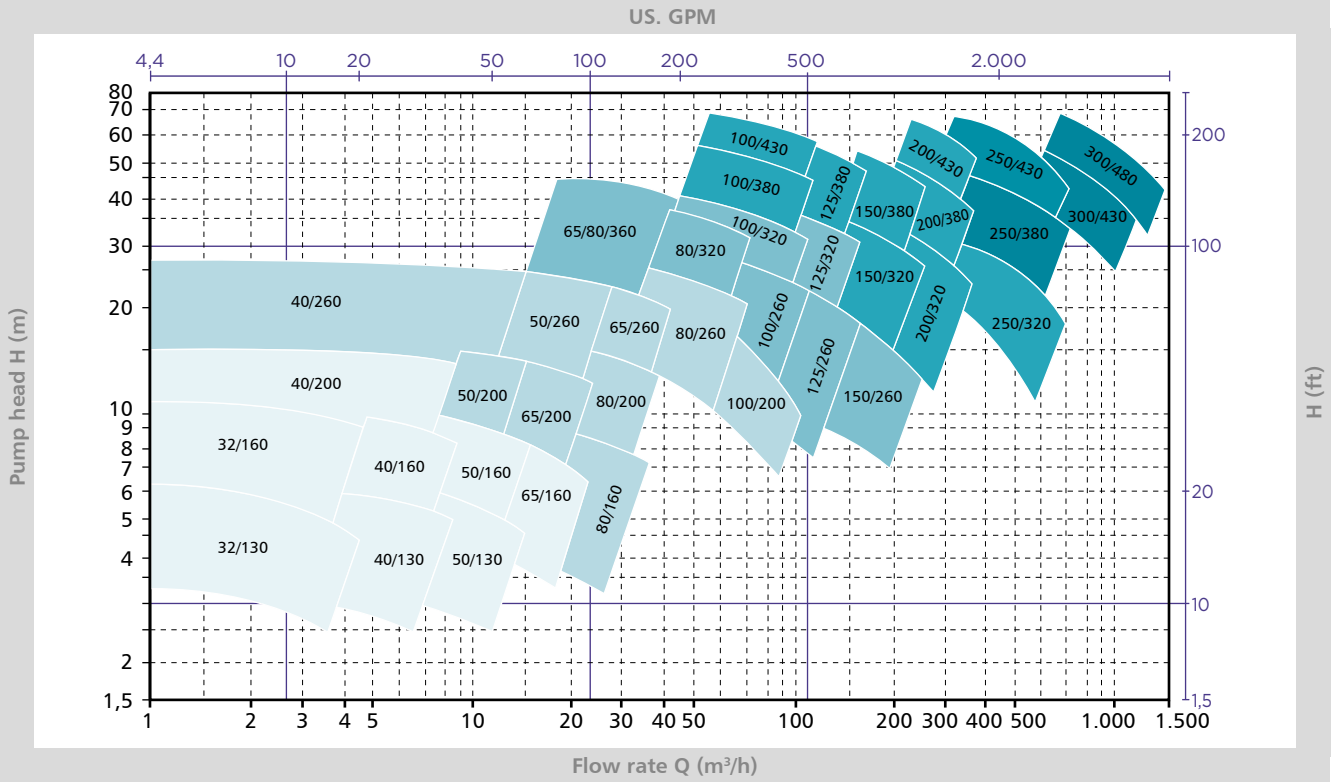
Size	BB	Without volute foot support	Pump dimensions					Shaft end		Flange dimensions	
			a	f	h ₁	h ₂	h ₄	ød	l	N1	N2
32/130	1	X	105	505		165	125	25	45	32	32
32/160	1	X	105	505		175	125	25	45	32	32
40/130	1	X	105	505		165	125	25	45	40	40
40/160	1	X	105	505		175	125	25	45	40	40
40/200	1	X	130	505		200	125	25	45	40	40
50/130	1	X	120	510		175	125	25	45	50	50
50/160	1	X	120	510		185	125	25	45	50	50
65/160	1	X	130	510		200	125	25	45	65	65
40/260	2	X	150	610		225	160	35	65	40	40
50/200	2	X	150	610		200	160	35	65	50	50
50/260	2	X	150	610		225	160	35	65	50	50
65/200	2	X	160	610		225	160	35	65	65	65
65/260	2	X	160	610		225	160	35	65	65	65
80/160	2	X	160	610		200	160	35	65	80	80
80/200	2	X	160	610		225	160	35	65	80	80
80/260	2	X	160	610		250	160	35	65	80	80
100/200	2	X	160	610		250	160	35	65	100	100
65/80/360	3	X	170	820		295	205	45	65	65	80
80/320	3	X	200	800		275	205	45	65	80	80
100/260	3	X	200	800		275	205	45	65	100	100
100/320	3		200	800	275	300	205	45	65	100	100
125/260	3	X	200	800		300	205	45	65	125	125
125/320	3		200	800	300	325	205	45	65	125	125
150/260	3		210	820	275	325	205	45	65	150	150
100/380	4		200	1000	300	325	225	60	95	100	100
100/430	4		200	1000	325	350	225	60	95	100	100
125/380	4		200	1000	300	350	225	60	95	125	125
150/320	4		200	1000	300	350	225	60	95	150	150
150/380	4		210	990	300	375	225	60	95	150	150
200/320	4		220	1000	300	400	225	60	95	200	200
200/380	4		240	980	325	450	225	60	95	200	200
200/430	4		240	980	350	500	225	60	95	200	200
250/320	4		250	980	350	450	225	60	95	250	250
250/380	6		250	980	350	525	225	65	130	250	250
250/430	6		250	980	350	550	225	65	130	250	250
300/430	6		250	970	450	550	225	65	130	300	300

BB = Bearing bracket N2 = Pressure flange

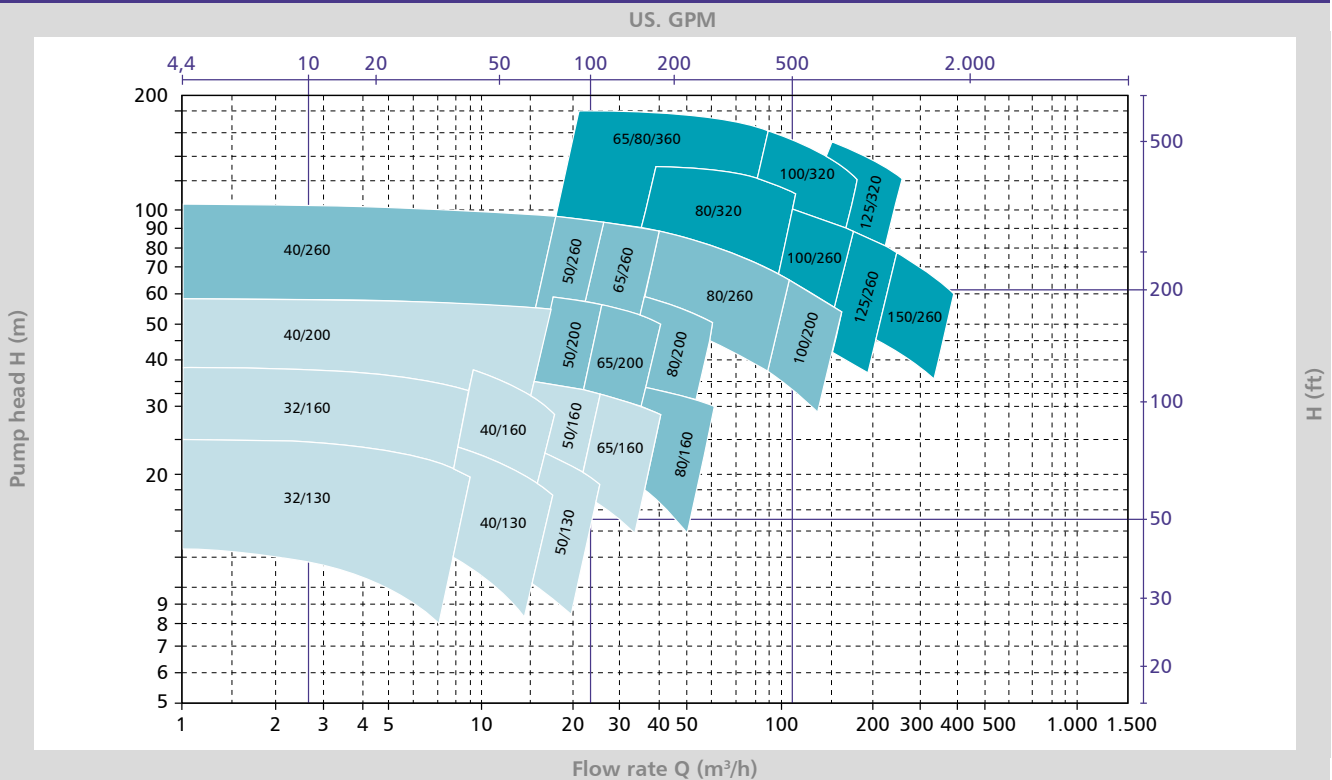


Capacity ranges

RCE: 50 Hz n = 1450 /min

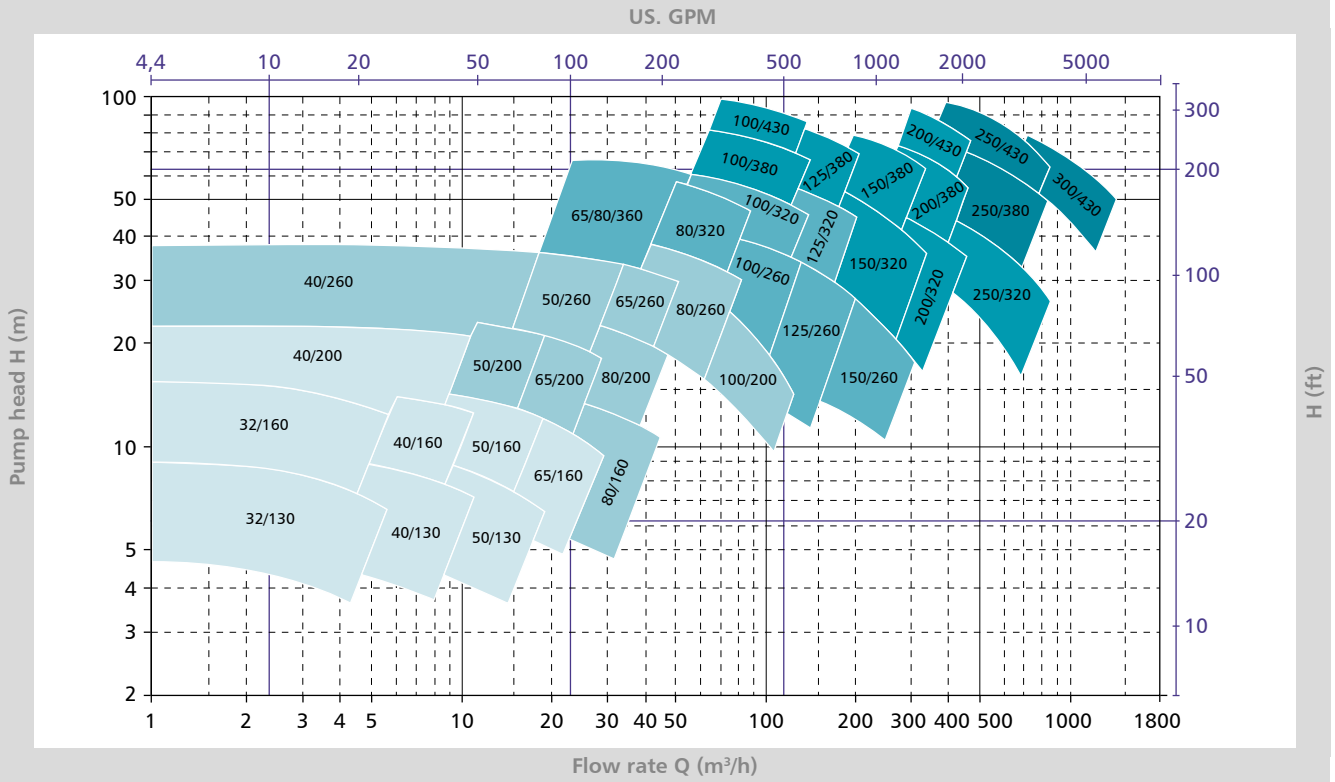


RCE: 50 Hz n = 2900 /min

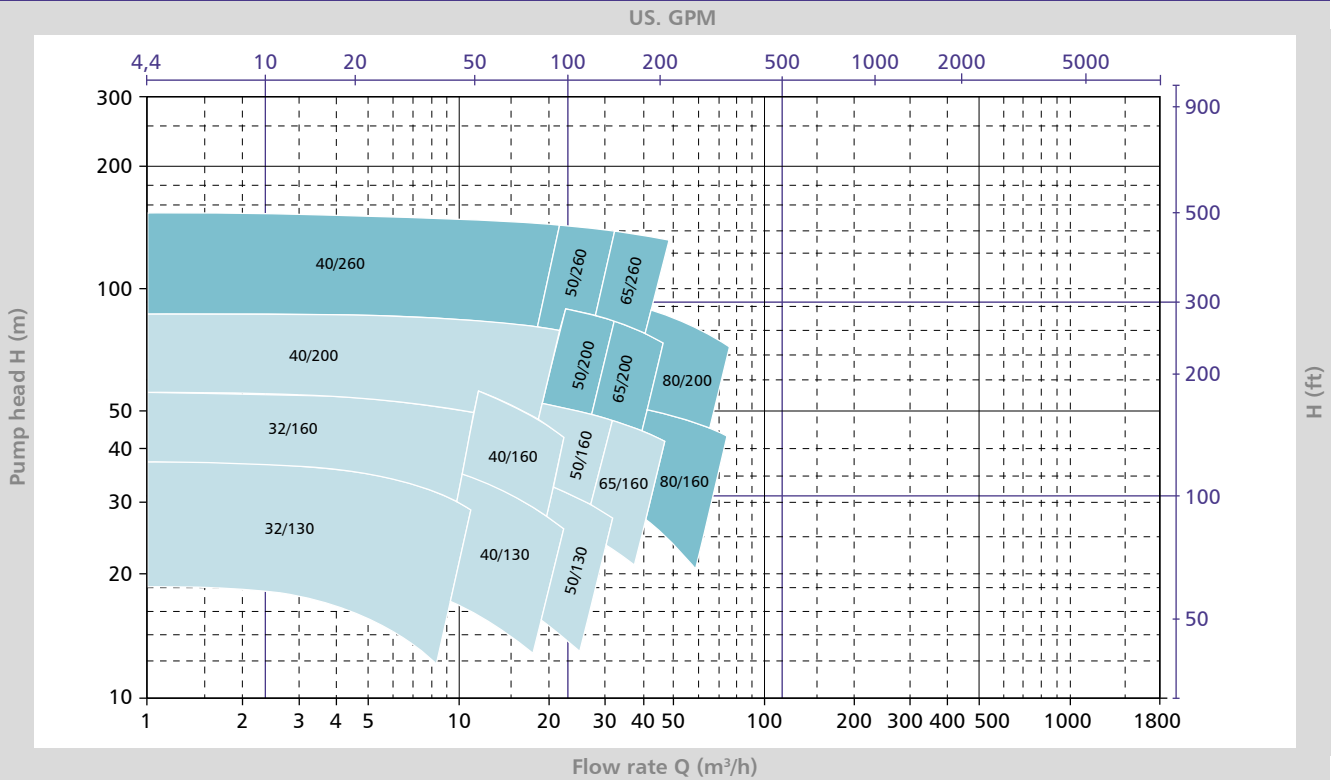


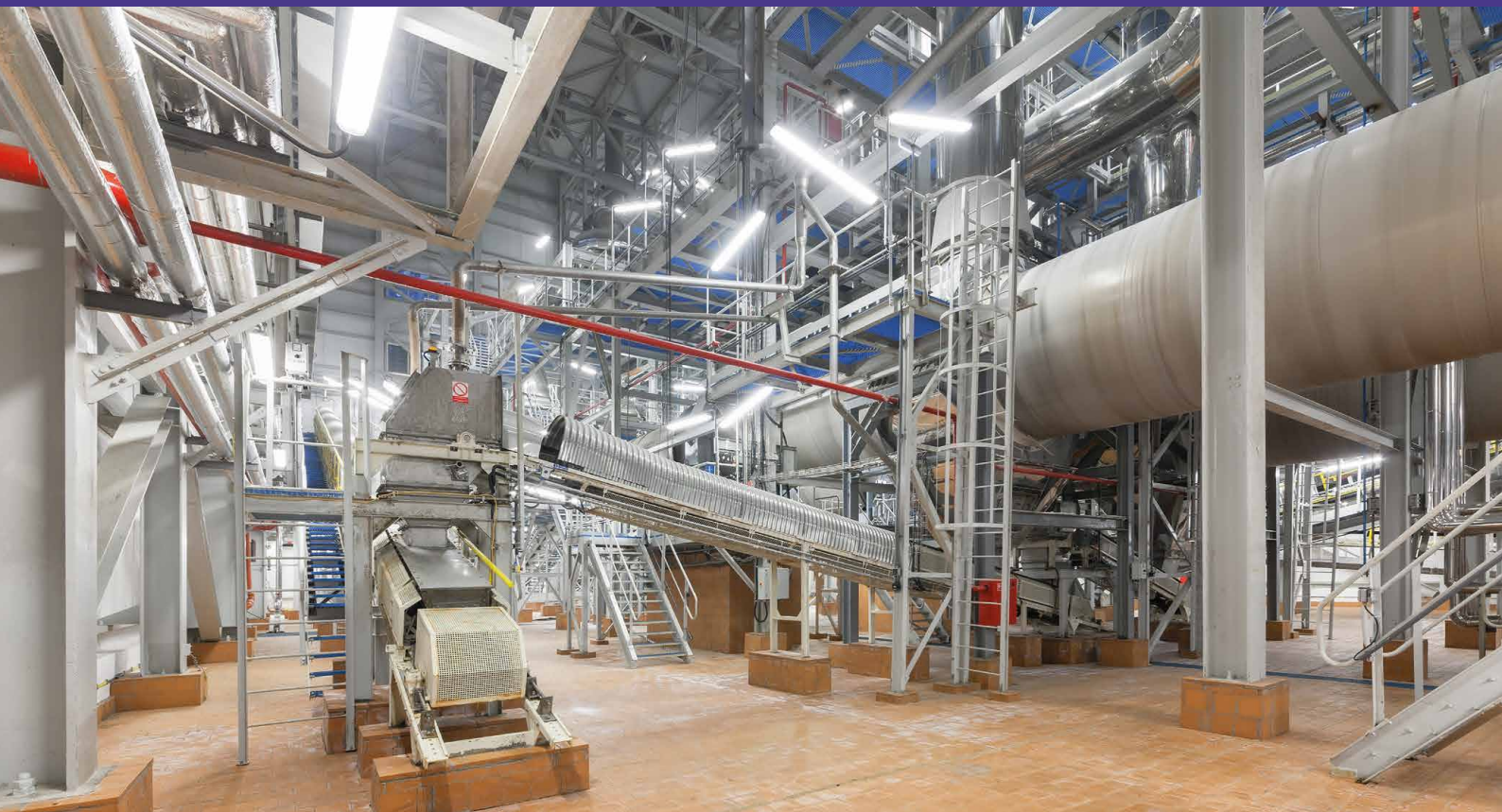
Bearing bracket 1 2 3 4 6

RCE: 60 Hz n = 1750 /min



RCE: 60 Hz n = 3500 /min





— An ITT Brand

ITT RHEINHÜTTE Pumpen GmbH
Rheingaustraße 96-98
D-65203 Wiesbaden
T +49 611 604-0
info@rheinhuette.com
www.rheinhuette.de