

# RN, RNSi

Horizontal metal pump





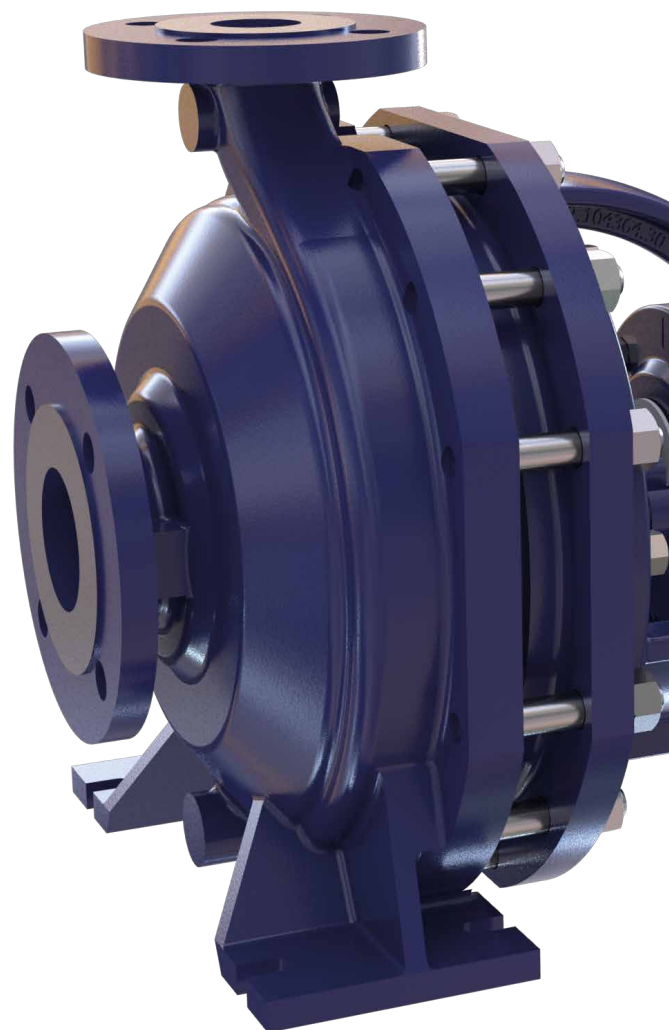
# The RN

## Standard chemical pump

The standardised chemical pumps RN and RNSi (ferro-silicon cast iron) are used for pumping all kinds of liquids in the wide field of chemical processing, basic chemicals and environmental technology.

### Design features

- Design: horizontal, single-stage
- Construction:
  - back pull out design according to ISO 2858
- Casing design: single or double volute casing
- Bearing lubrication: grease or oil lubrication
- Installation versions:
  - Base frame welded or base plate cast
- Ambient temperature:  $-20^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$
- Solid content limit value:
  - approx. 5 % (more with the open impeller)





## Technical data

	RN	RNSi
Size DN	25 to 400	32 bis 250
$Q_{\max}$ m <sup>3</sup> /h (gpm)	2700 (11888)	1500
$H_{\max}$ m (ft)	150 (492)	100
Temperature °C (°F)	-40 to +300 (-40 to +572)	
Standards	EN 22858, ISO 2858, ISO 5199	
Closed impeller	Standard	Standard
Open impeller	Option	-
Heatable	Option	Option
Back pull out design	Standard	Standard
Seal	Mechanical seal, Hydrodynamic seal	

## Options

- Inducer
- 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
- Centre line mounting for hot media
- Mechanical seal supply systems
- Storage and priming tank
- Pump accessories

## Applications

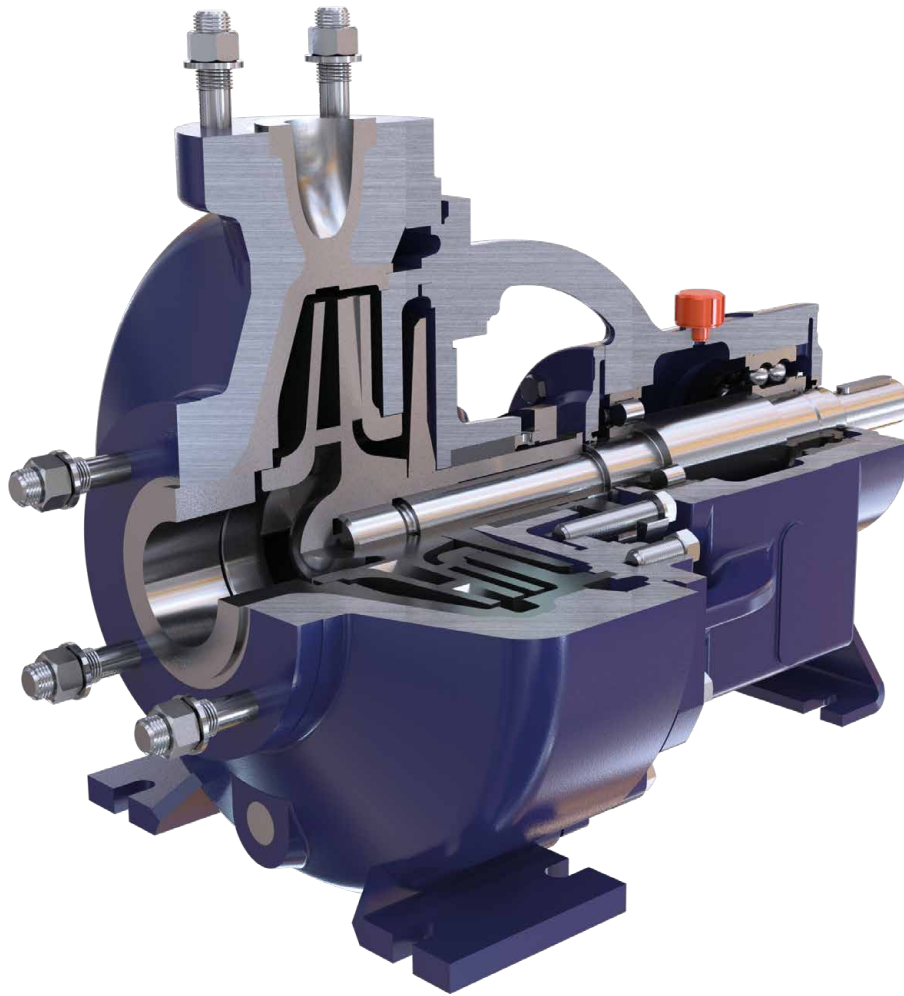
Due to the large selection of materials, almost universal application in trade, chemistry and industry

- Ammonium sulphate
- Chemical industry
- Chloralkali electrolysis
- Caustic soda (caustic, hot)
- Nitrogen fertilizer
- NPK/fertiliser production
- Pigments (TiO<sub>2</sub>)
- Sulphuric acid





# Main features



1

Many hydraulic sizes (also above and below ISO 2858) allow a size selection with high efficiency and low drive power.

2

The wide material range of this series offers the optimum material for every application.

3

Robust stationary standard mechanical seal Allpac S with FKM coated single spring. The very simply constructed Allpac S has proven itself in many critical applications for decades. The installation spaces according to EN 12756 also allow the flexible use of special seals from all manufacturers. The hydrodynamic shaft seal complements the mechanical seal variants for special applications where mechanical seals cannot be used economically.

4

The SIGUSS version RNSi for hot, abrasive, sulphuric acid media ensures increased safety in the plant in the armoured housing.

5

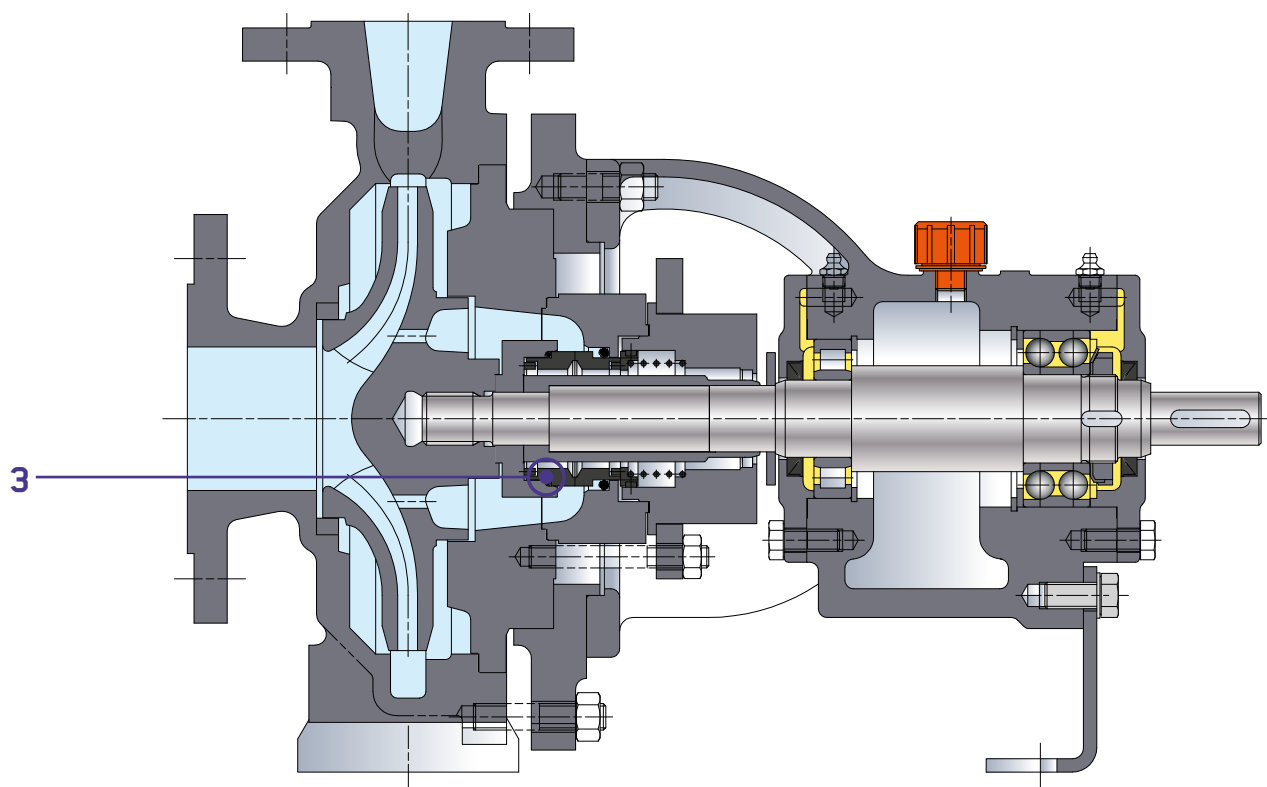
By using the double jacket, the whole hydraulic pump section can be optimally heated by steam, heat transfer oil or electric resistance heating.

6

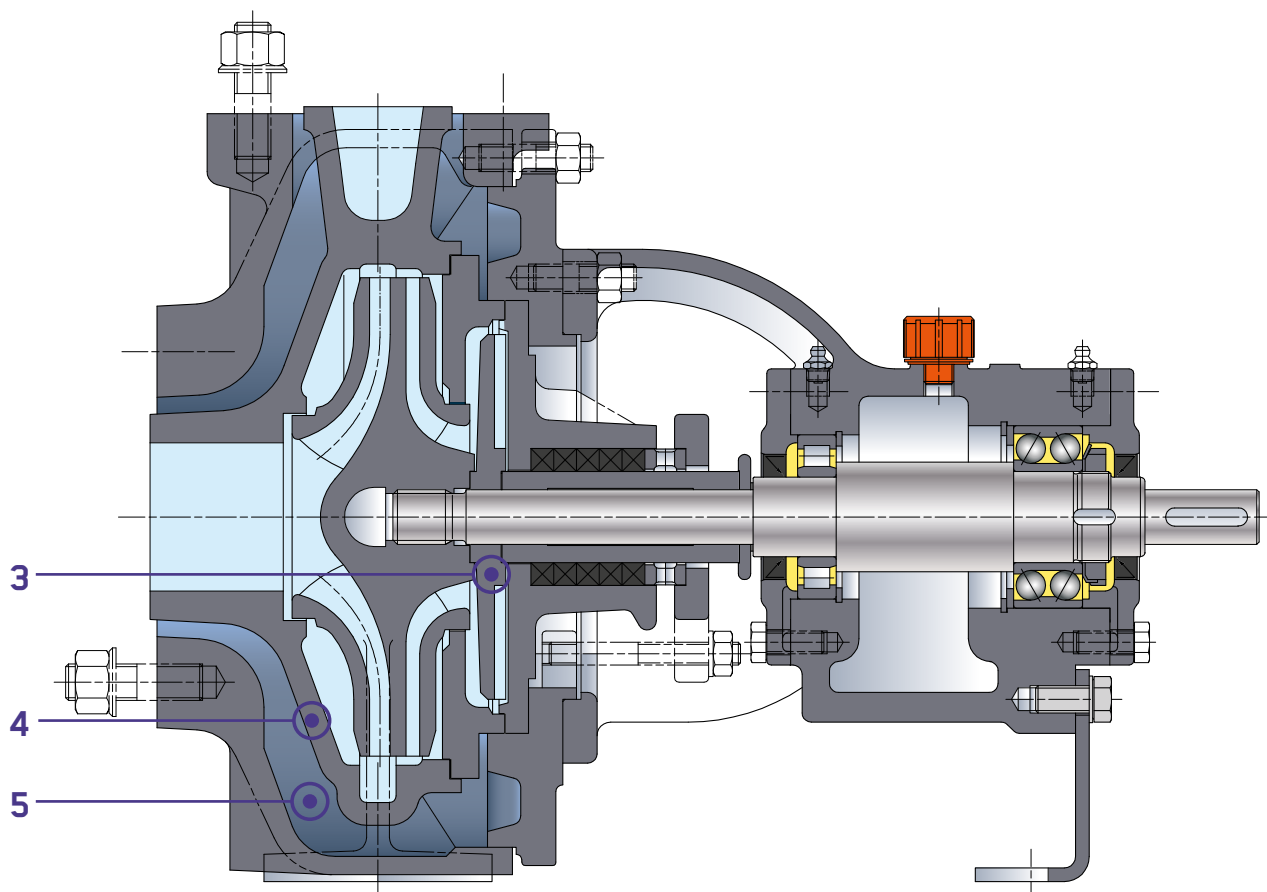
The bearing bracket can be equipped with the patented i-Alert® sensor. The i-Alert® sensor enables continuous recording of pump vibrations in three dimensions, as well as the bearing temperature at the bearing bracket. The data can be read out contact-free via Bluetooth.

The drawings essentially correspond to the execution. We reserve the right to make design changes.

## Unarmoured design with standard mechanical seal type AllpacS (RN CS)



## Armoured design with hydrodynamic shaft seal (RNSi B)



# Metal materials

The range of metallic materials includes a wide range 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.

## High-alloy cast steel

### 1.4136S / RHRS

Corrosion and erosion resistant high alloy ferritic cast steel. Typical applications are highly concentrated sulphuric acid up to 225 °C (437 °F), oleum, fertiliser production, crude phosphoric acid containing solids.

### 1.4306S

High-quality, molybdenum-free material suitable for applications such as pumping of ammonium nitrate melt, hot nitric acid at medium concentrations and also the vaporization 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 %  $\text{HNO}_3$ .

### 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 (194 °F), 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 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 (212 °F), hot sea water, many solutions containing chloride, FGD suspensions and sulphuric acid at all concentrations at low temperatures.

### 1.4529S

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 vaporisation and crystallisation processes and also for hot sea water.

### 1.4652S

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

### 2.4170

Nickel is mainly used for alkali evaporation, pumping molten alkalis and other highly refined alkalis that are not contaminated with iron ions.

### 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 (392 °F), 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.

## Pure metals

### 3.7031

Titanium is especially resistant to heavily oxidising and chloride containing media. The material is preferred for use in chloralkali-electrolysis, bleaching solutions containing chlorine and in the manufacture of acetic acid.

### 3.7032

Titanium alloyed with palladium. This improves the corrosion resistance in reducing media, e.g. in solutions of iron chloride or aluminium chloride containing hydrochloric acid.

## Nickel based materials

### 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.

## Silicon iron alloys

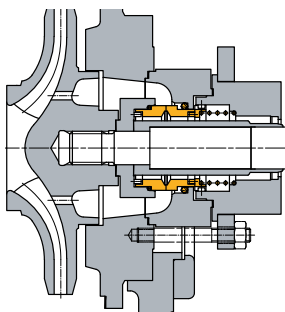
### SIGUSS

Highly corrosion resistant chromium alloy silicon cast iron with a good resistance to wear and increased chemical resistance. This material is chemically resistant to  $H_2SO_4$  at all concentrations up to boiling point, therefore for all sulphuric acid applications including the evaporation of waste sulphuric acid, SIGUSS is virtually indispensable.



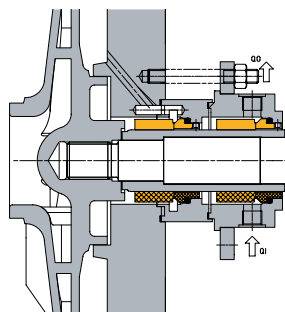
# Sealings

Depending on the application, a selection can be made between hydrodynamic seal or mechanical seal variants.



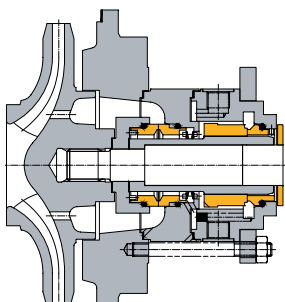
## Design CS

Internal, balanced mechanical shaft seal type Allpac S by Rheinhütte with stationary spring-loaded face and rotating face



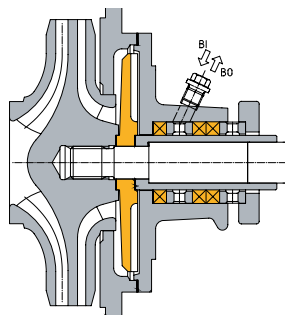
## Design CT

Two internal mechanical seals, which are arranged in tandem configuration.



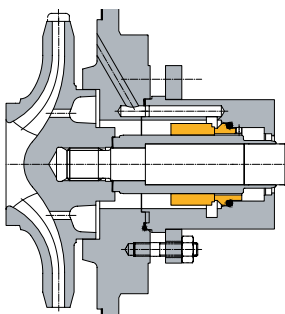
## Design CST

Double mechanical seal with stationary seal ring and downstream standardised mechanical seal with feed thread



## Design B

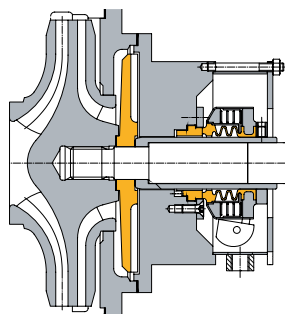
Hydrodynamic shaft seal. If necessary, there is the possibility of a barrier or a flushing medium.  
(See picture on page 9)



## Design CN1

Single acting standardized mechanical seal

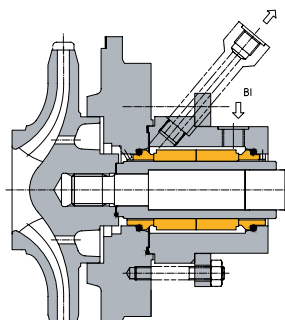
- internal or external circulation
- Quench connection easily retrofittable as an option



## Design DCA

Hydrodynamic seal and additional standstill sealing controlled by centrifugal force

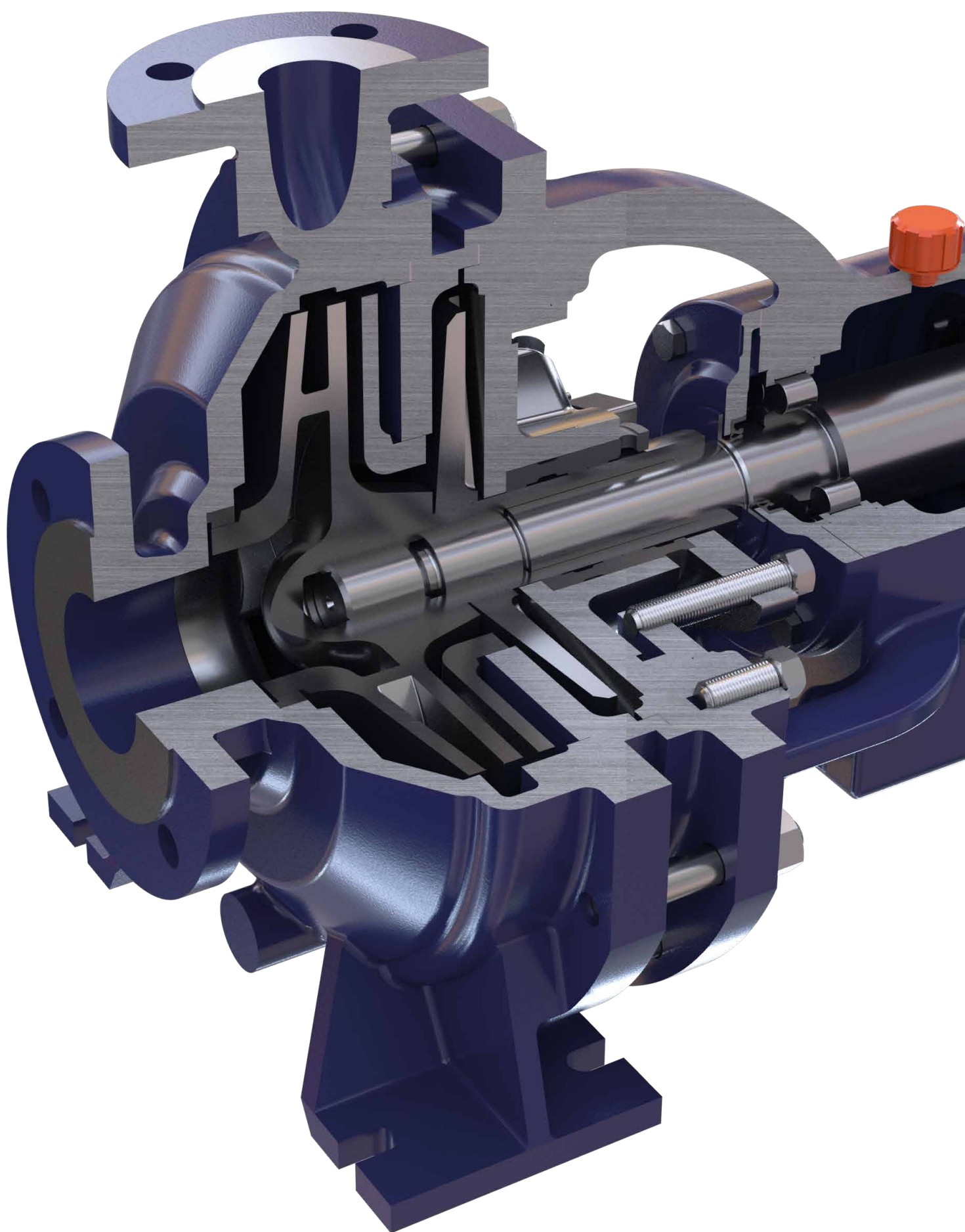
- Liquid repellent PTFE bellows with generous cavities



## Design CN2

Double acting standardized mechanical seal in „back to back“ arrangement





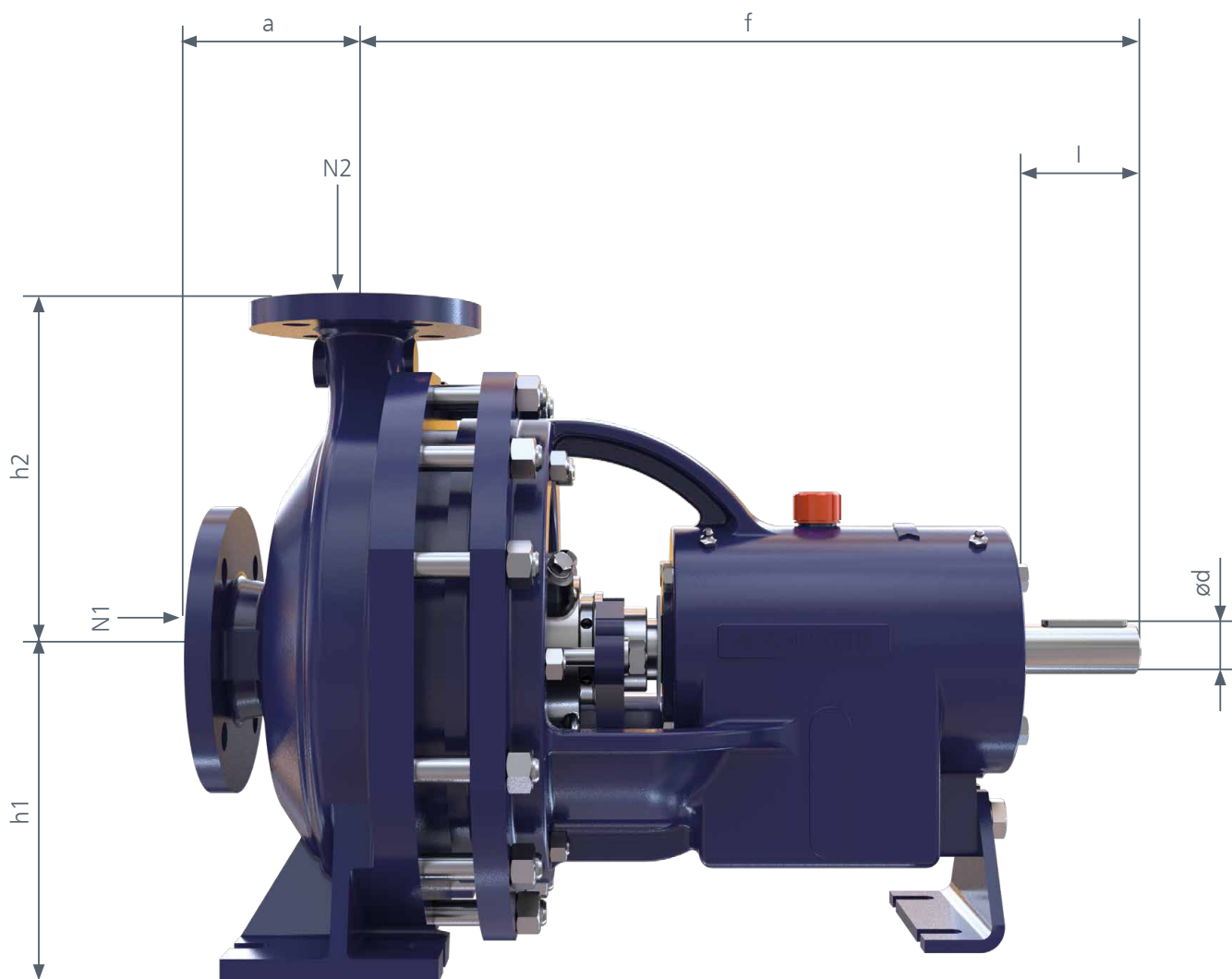
# Pumps & installation dimensions

Size	BB	Pump dimensions				Shaft end		Flange dimensions	
		a	f	h <sub>1</sub>	h <sub>2</sub>	ød	l	N1	N2
25-160	1	80	385	132	160	24	50	40	25
25-200	1	80	385	160	180	24	50	40	25
32-125	1	80	385	112	140	24	50	50	32
32-160	1	80	385	132	160	24	50	50	32
32-200	1	80	385	160	180	24	50	50	32
40-125	1	80	385	112	140	24	50	65	40
40-160	1	80	385	132	160	24	50	65	40
40-200	1	100	385	160	180	24	50	65	40
50-125	1	100	385	132	160	24	50	80	50
50-160	1	100	385	160	180	24	50	80	50
50-200	1	100	385	160	200	24	50	80	50
65-125	1	100	385	160	180	24	50	100	65
25-250	2	100	455	180	225	32	80	40	25
32-250	2	100	500	180	225	32	80	50	32
40-250	2	100	500	180	225	32	80	65	40
40-315	2	125	500	200	250	32	80	65	40
50-250	2	125	500	180	225	32	80	80	50
50-315	2	125	500	225	280	32	80	80	50
65-160	2	100	500	160	200	32	80	100	65
65-200	2	100	500	180	225	32	80	100	65
65-250	2	125	500	200	250	32	80	100	65
80-160	2	125	500	180	225	32	80	125	80
80-200	2	125	500	180	250	32	80	125	80
80-250	2	125	500	225	280	32	80	125	80
100-200	2	125	500	200	280	32	80	125	100
65-315	3	125	530	225	280	42	110	100	65
80-315	3	125	530	250	315	42	110	125	80
80-400	3	125	530	280	355	42	110	125	80
100-250	3	140	530	225	280	42	110	125	100
100-315	3	140	530	250	315	42	110	125	100
100-400	3	140	530	280	355	42	110	125	100
125-250	3	140	530	250	355	42	110	150	125
125-315	3	140	530	280	355	42	110	150	125
125-400	3	140	530	315	400	42	110	150	125
150-250	3	160	530	280	375	42	110	200	150
150-315	4	160	670	280	400	48	110	200	150
150-400	4	160	670	315	450	48	110	200	150
150-500	4	180	670	375	500	48	110	200	150
200-250	4	180	670	355	425	48	110	200	200
200-315	4	180	670	355	450	48	110	250	200
200-400	4	180	670	355	500	48	110	250	200
250-315	4	250	670	400	560	48	110	300	250
200-500	6	200	900	425	560	75	150	250	200
250-400	6	250	900	425	600	75	150	300	250
300-400	6	300	900	500	670	75	150	350	300
400-500	7	340	1160	550	800	100	160	400	400

BB = Bearing bracket N2 = Pressure flange

All dimensions are shown in millimetres.

## RN: Design without armour



# Pumps & installation dimensions

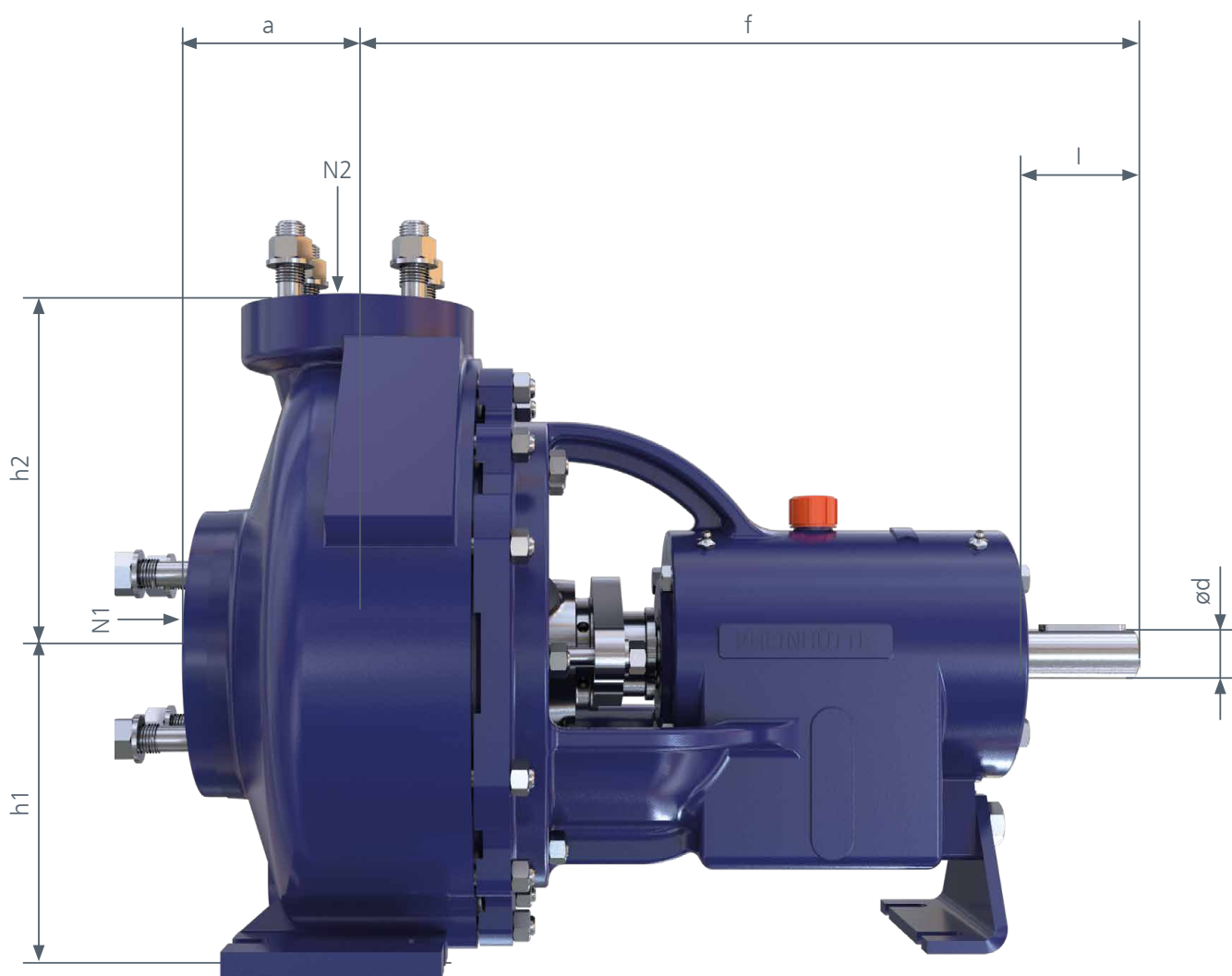
Size	BB	Pump dimensions				Shaft end		Flange dimensions	
		a	f	h <sub>1</sub>	h <sub>2</sub>	ød	l	N1	N2
32-160	1	80	385	132	160	24	50	50	32
32-200	1	80	385	160	180	24	50	50	32
40-200	1	100	385	160	180	24	50	65	40
40-250	2	100	500	180	225	32	80	65	40
40-315	2	125	500	200	250	32	80	65	40
50-250	2	125	500	180	225	32	80	80	50
50-315	2	125	500	225	280	32	80	80	50
65-200	2	100	500	180	225	32	80	100	65
65-250	2	125	500	200	250	32	80	100	65
80-200	2	125	500	180	250	32	80	125	80
80-250	2	125	500	225	280	32	80	125	80
100-200	2	125	500	200	280	32	80	125	100
80-315	3	125	530	250	315	42	110	125	80
125-250	3	140	530	250	355	42	110	150	125
125-315	3	140	530	280	355	42	110	150	125
150-315	4	160	670	280	400	48	110	200	150
200-250	4	180	670	355	425	48	110	200	200
200-315	4	180	670	355	450	48	110	250	200
200-400	4	180	670	355	500	48	110	250	200
250-315	4	250	670	400	560	48	110	300	250

All dimensions are shown in millimetres.

BB = Bearing bracket N2 = Pressure flange

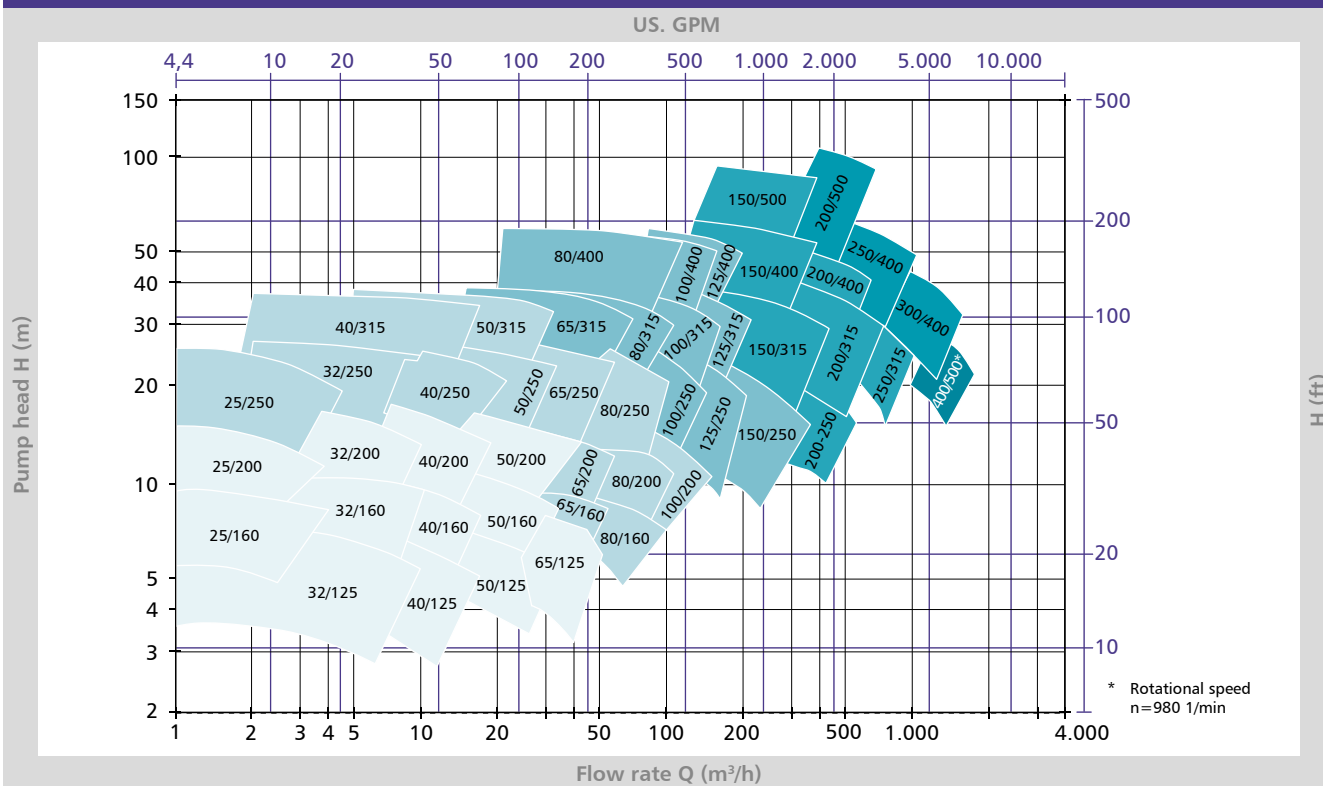


## RNSi: Design with armour

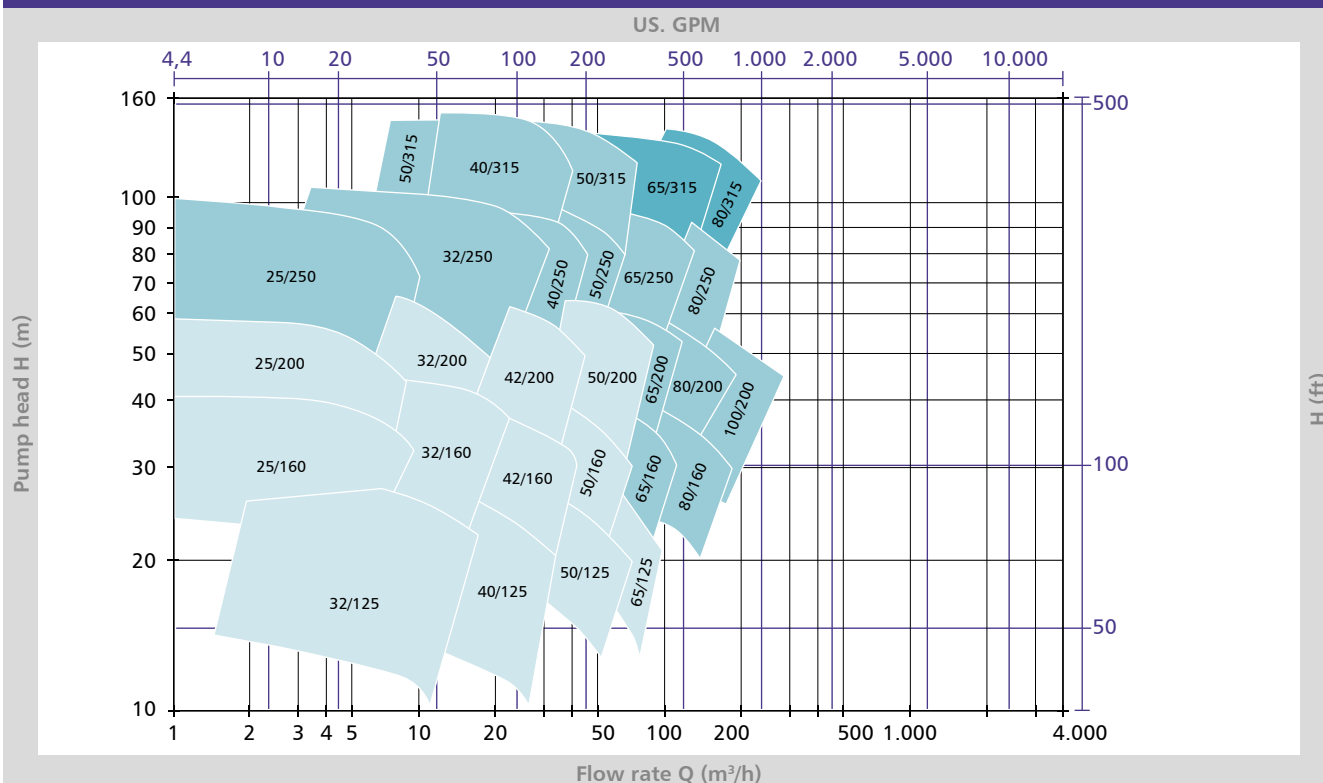


# Capacity ranges

RN/RNSi: 50 Hz n = 1450 /min

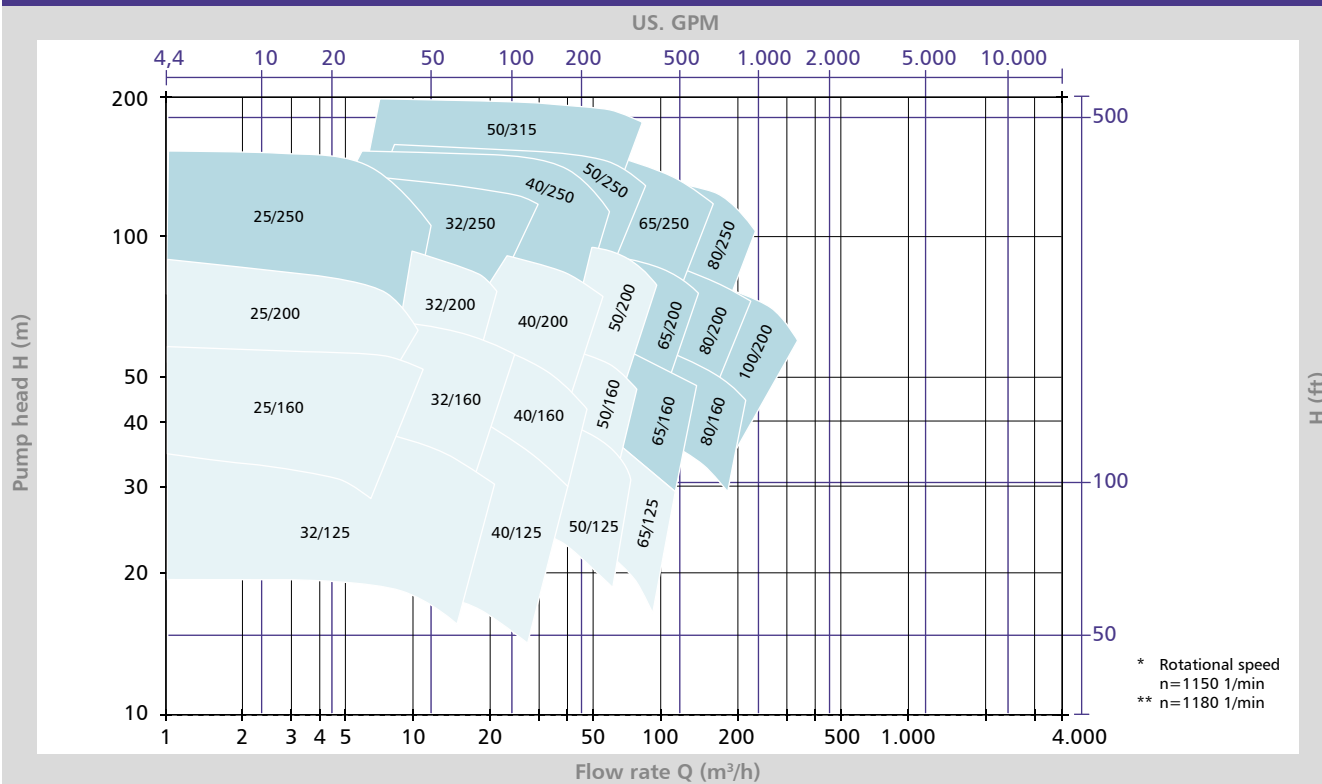


RN/RNSi: 50 Hz n = 2900 /min

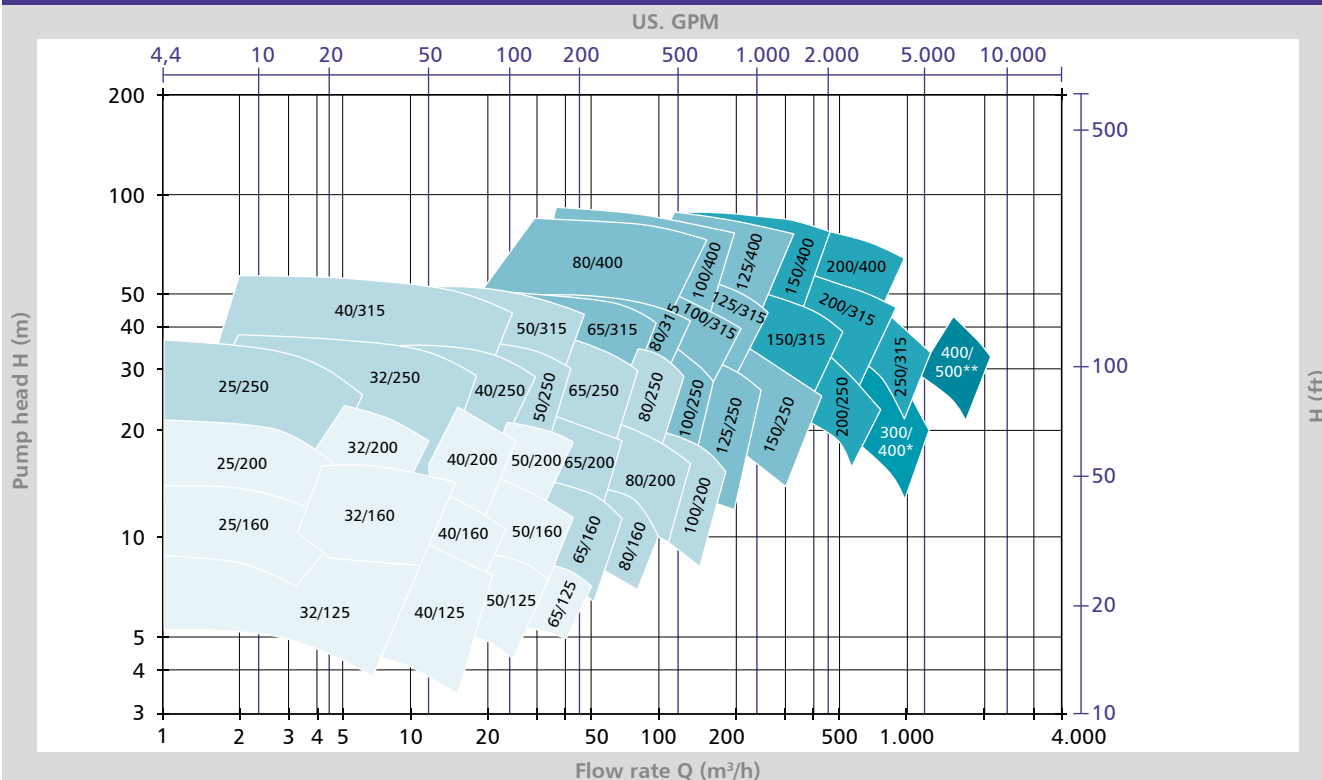


Bearing bracket 1 2 3 4 6

RN/RNSi: 60 Hz n = 1750 /min



RN/RNSi: 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.de](mailto:info@rheinhuette.de)  
[www.rheinhuette.de](http://www.rheinhuette.de)