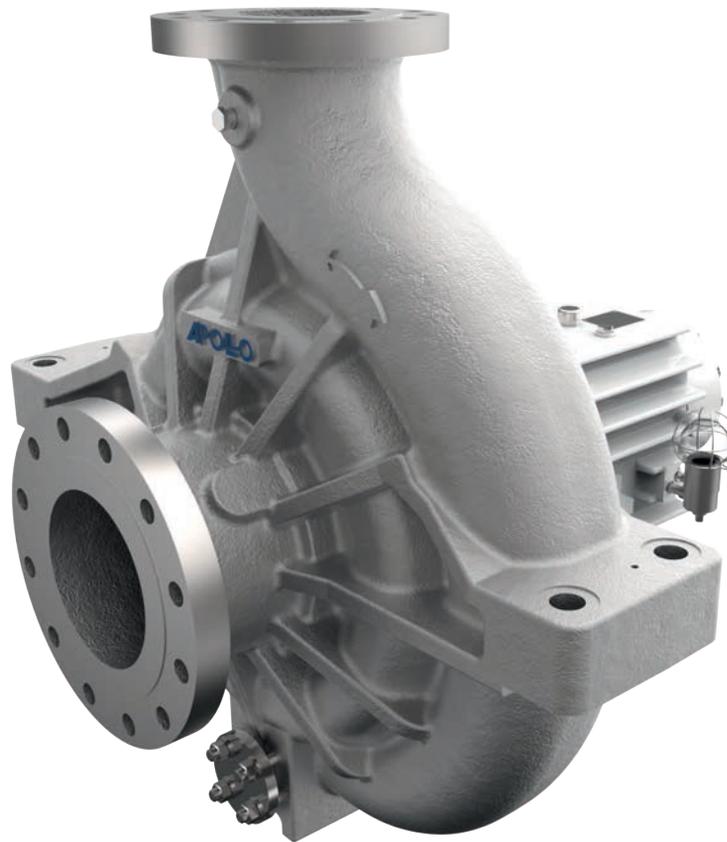


# SINGLE STAGE, RADIALY SPLIT PROCESS PUMPS

HEAVY-DUTY DESIGN  
API 610 / TYPE OH2

**KRH  
KRHA**



- „back pull-out“ version for maximum ease of maintenance
- modular system for the entire type series
- versatile shaft sealing options
- low NPSH values
- high reliability and low operating costs

# Range of Application

Based on solid design, heavy-duty bearing housing, low NPSH values and the suitability for high pressure and high temperature this pump series has various applications::

- refineries / petrochemical plants
- offshore engineering
- gas processing plants
- chemical plants / process engineering
- hot water applications
- power plants
- seawater desalination plants

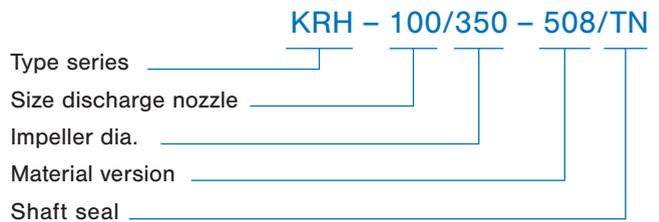
## Design

- Horizontal, single stage, radially split, heavy-duty process pump
- Axial suction nozzle, radial discharge nozzle
- Centerline casing support for max. reliability at high temperatures and high nozzle loads
- Casing > size 80 is designed as a double volute
- Replaceable wear rings and guide rings provide easy maintainability and cost reduction
- Solid shaft design
- Short downtime during maintenance, since pump casing can remain in the pipeline during disassembly
- Flanges according to ASME or DIN EN
- Heavy-duty design of bearing housings in „back pull out“ version in connection with a demountable coupling allows easy maintenance.
- The base frame of the unit is designed as a solid, steel-welded part according to API standard

## Shaft seal

Separate seal chamber suitable for a variety of mechanical seals – from single and double mechanical seals up to cartridge mechanical seals and gland packing – all variants are available. Pumps of this version have a standard design with cartridge mechanical seal. Assembly space according to API 610/682.

## Designation



## Operating data

	KRH	KRHA
Nozzle size (mm)	from 25 to 200	from 100 to 300
Capacity	up to 1000 m <sup>3</sup> /h	up to 5000 m <sup>3</sup> /h
Head	up to 320 m	up to 200 m
Design pressure	up to 55/90 bar	up to 55 bar
Speed	up to 3600 rpm	up to 1800 rpm
Temperature limits	up to 450 °C	up to 450 °C

## Materials

	S-1	S-5	S-6	C-6	A-8	D-1	D-2
Volute Casing	Carbon steel	Carbon steel	Carbon steel	12 % Chromium steel	316AUS	Duplex	Super duplex
Casing cover	Cast iron	Carbon steel	12 % Chromium steel	12 % Chromium steel	316AUS	Duplex	Super duplex
Shaft	12 % Chromium steel	Duplex	Duplex	Super duplex			
Bearing housing	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel
Impeller	Cast iron	12 % Chromium steel	12 % Chromium steel	12 % Chromium steel	316AUS	Duplex	Super duplex

Materials according to API, NORSOK, NACE and special alloys are available.



### Discharge casing

- large corrosion allowance on all pressure casings
- double volute starting from size 80
- design for high suction pressure available

### Wear rings

- replaceable wear rings
- different material options and coatings available
- PEEK version with reduced clearance

### Flanges

- ASME or DIN EN
- class 600 standard for KRH
- class 300 standard for KRHA
- Flanges are completely machined

### Impeller

- dynamically balanced impellers
- low NPSH values

### Casing drainage

- flanged drains as standard
- screwed drains are possible

### Casing / casing cover

- with metal to metal fit
- variety of seal options available, to be selected by application
- fully chambered metal-graphite seal as standard

### Bearing housing

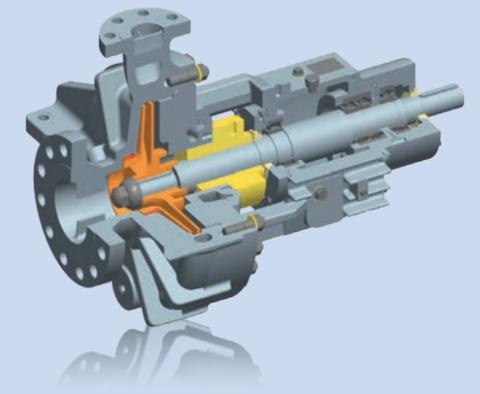
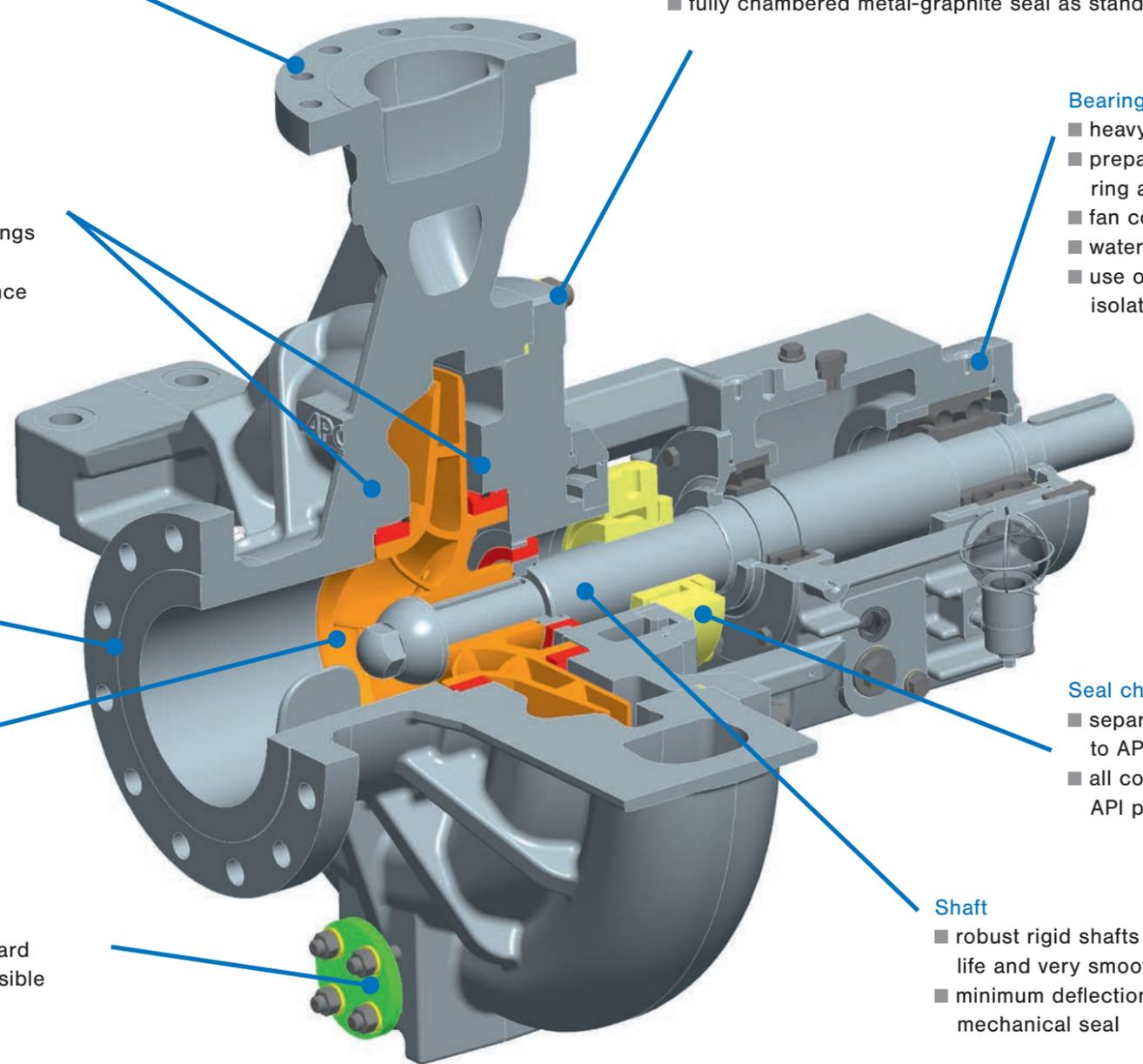
- heavy-duty, oil-lubricated bearings
- prepared for all necessary measuring and monitoring equipment
- fan cooling as an option
- water cooling as an option
- use of high-quality bearing isolators

### Seal chamber

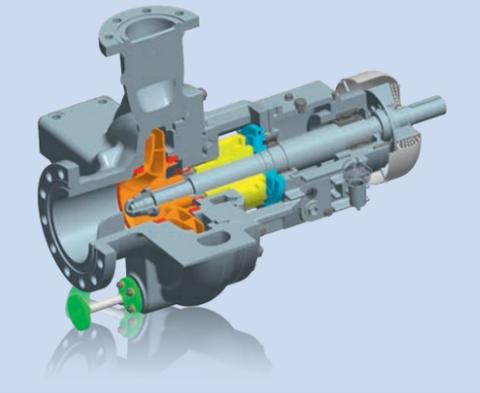
- separate seal chamber according to API 610/682
- all common seal variants and API piping plans possible

### Shaft

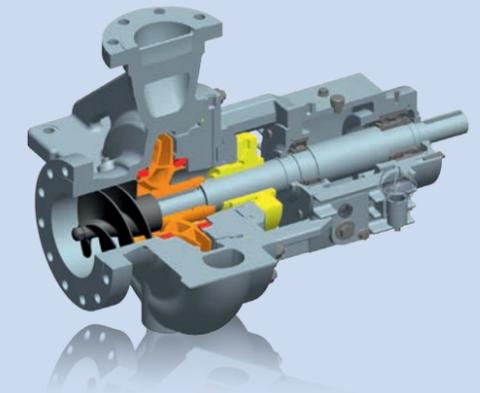
- robust rigid shafts for long life and very smooth running
- minimum deflection in the area of mechanical seal



■ Version for high suction pressure

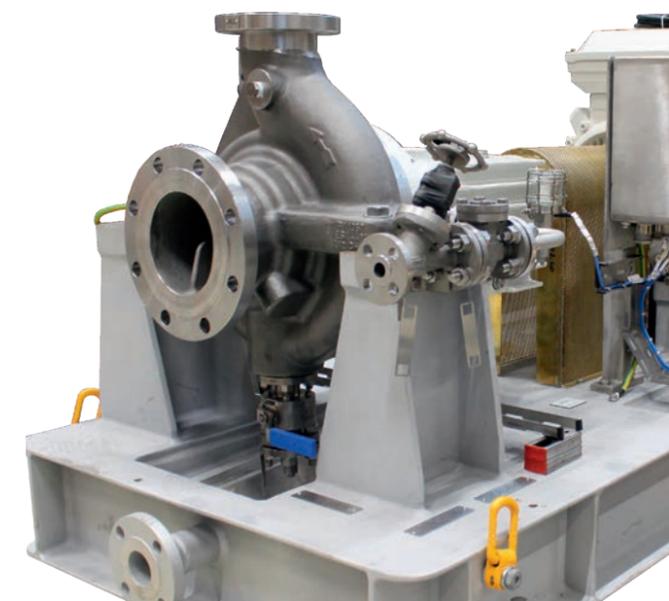
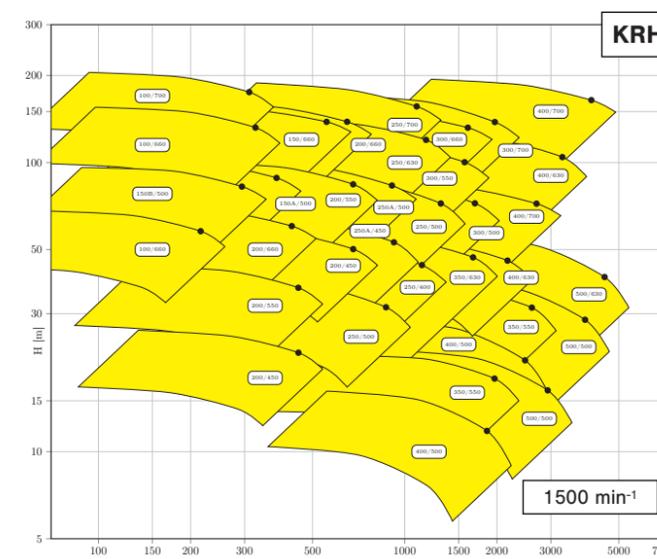
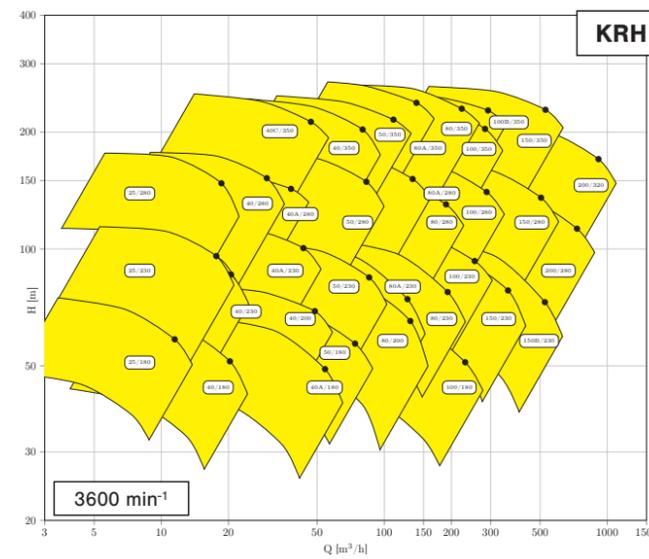
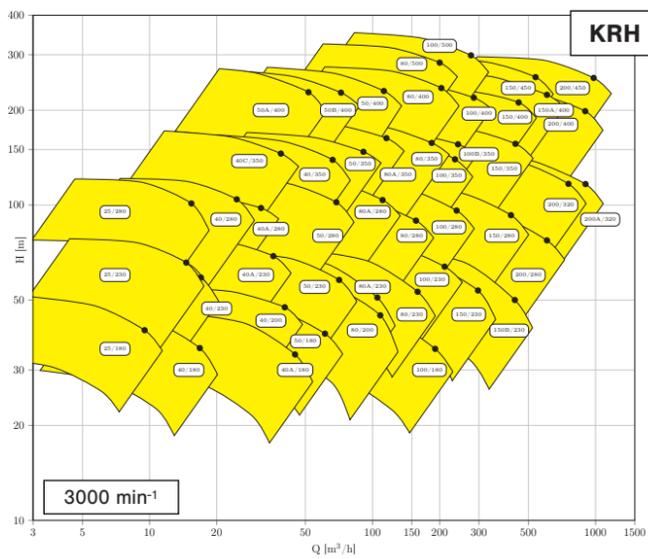


■ High-temperature design



■ Version with Inducer

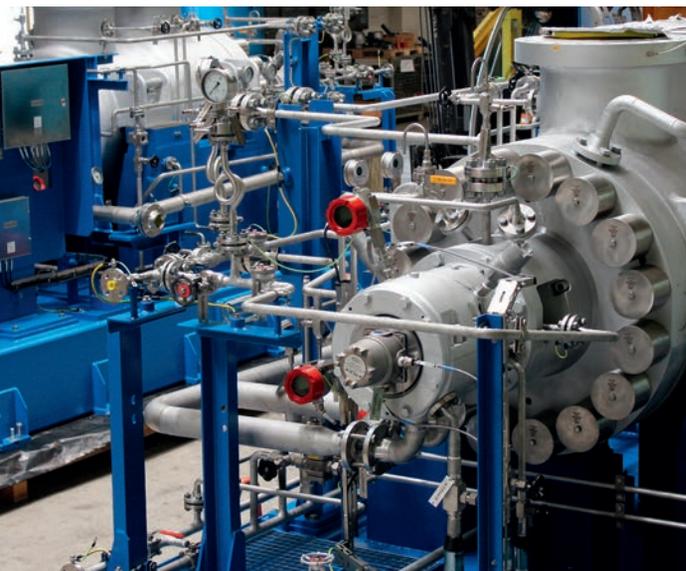
## Performance range





Since more than 100 years APOLLO in Goessnitz has been developing and producing pumps for different applications with most different operating principles.

In continuation of this history Apollo has developed to a Manufacturer of high quality heavy-duty Process Pumps – especially according to API 610 Standard.



20 years ago, the business Division „System Engineering & System Technology“ was founded. With this division we can offer our Customers complete solutions from a single source. Apollo has high-killed Personnel for Pumps and Pumping Systems up to Specialists for Electrical and Control Engineering. By taking advantage of these synergies, of short lines of communication, of optimized process

chains and of high Flexibility of our company, we provide our Customers with best support in solving their problems and tasks worldwide.

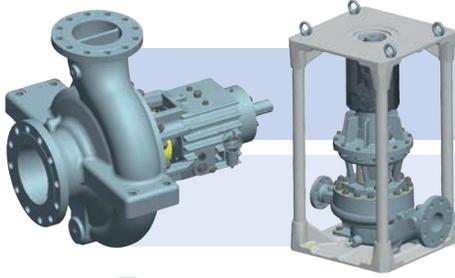
Our production methods and systems meet the highest level of quality and allow the implementation of orders according to different standards and regulations.

The Quality Assurance in all areas of the company, including suppliers and cooperation partners, is the top priority and is consistently implemented. The most up-to-date test fields provide realistic test conditions.

Today we develop and manufacture with the most modern methods – from the hydraulic design over to 3D CAD design and engineering, FEM calculation to the casting patterns and parts manufacture via CAD -CAM Interfaces.



# PROCESS PUMPS | API 610



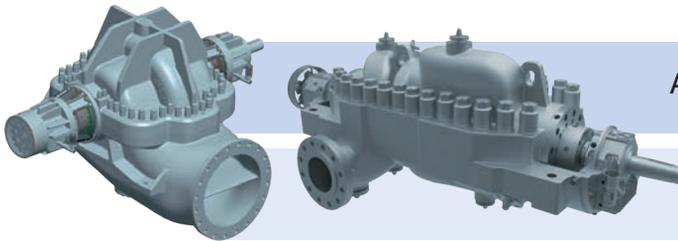
Single stage pumps: **OH1, OH2, OH3**

■ KRH ■ KRHA ■ KRHL / KRPO ■ KRP / KRPH ■ KRI / KRIL



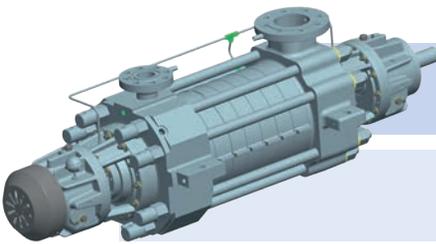
Single and two-stage between bearings pumps: **BB2**

■ ZPR ■ ZPRA ■ KGR / KGRD



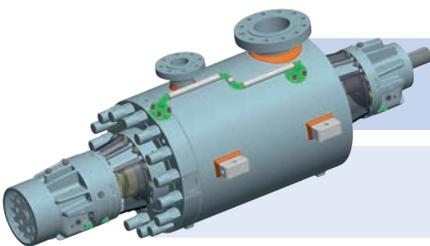
Axial split between bearings pumps: **BB1, BB3**

■ ZMK ■ ZMKV ■ AMG



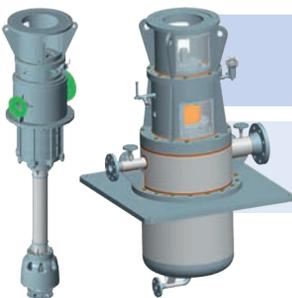
Multistage high-pressure pumps, ring sections type: **BB4**

■ HP ■ GP „back-to-back“ ■ GMHD



Multistage high-pressure barrel pumps: **BB5**

■ TL ■ TG „back-to-back“ ■ TGDX



Single and multistage, vertical pumps: **VS1, VS4, VS6**

■ HPTV ■ HPV ■ HPVX ■ GSTV