

# VERTICAL, SINGLE-STAGE, RADIALLY SPLIT PROCESS PUMP OF INLINE VERSION

API 610 / TYPE OH3

**KRI  
KRIL**



- Process design for highest reliability
- Minimum space required due to vertical installation
- „Pull out“ version for maximum serviceability
- Various types of shaft seals
- KRIL available as „low flow“ version

# Range of Application

Due to heavy-duty design, minimum required space, lowest possible NPSH values and highest energy efficiency the pumps of this range are suitable for a variety of applications:

- Offshore / FPSO
- Oil and Gas Industry
- Power Plants
- Refineries
- Chemical Industry
- Water and Waste water disposal

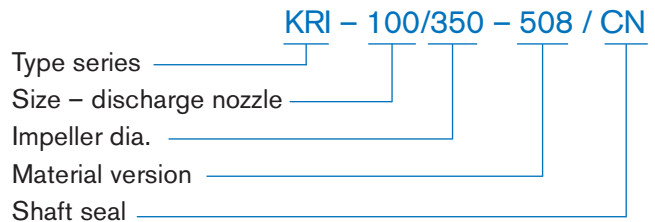
## Design

- Vertical, single-stage, radially split, heavy-duty process pump of inline version
- Minimum installation space and low transport weight
- Application of approved hydraulics of KRH and KRHL type series (OH2)
- KRIL as „low flow“ version
- Grease lubrication up to 160 °C as standard, circulating-oil lubrication as option
- Starting with rated width DN 80 the discharge casing is designed as double volute
- Replaceable wear and split rings ensure maximum maintainability
- Process safe sealing on most various application conditions
- High nozzle-load compensation due to casing supports close to flange
- 2x API of nozzle load as standard

## Shaft seal

Separate seal chamber, suitable for a variety of seals from single and double mechanical seals up to stuffing box seals – all variants are possible. Pumps of this design are generally equipped with cartridge mechanical seals. Seal chamber according to API 610 /ISO13709/ API 682.

## Designation



## Operating data

Rated width	DN 25 up to DN 200
Capacity	up to 600 m <sup>3</sup> /h
Head	up to 320 m
Design pressure	up to 55 bar
Speed	up to 3600 rpm
Temperature limits	up to 385 °C

## Materials

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

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





### Shaft

- rigid heavy-duty shaft for long life and smooth running
- minimum deformation in the range of mechanical seal
- shaft dimensions like with OH2 Types: KRH, KRHL

### Bearing cooling

- bearing housing with optimized fins for maximum heat dissipation
- fan cooling as standard, water cooling as an option

### Heavy-duty bearing housing

- separate solid bearing housing
- grease lubrication as standard, bearing housing for oil lubrication as an option
- connections for various instruments available

### Mechanical seal

- separate seal chamber according to API 610 / API 682
- all API piping schemes are possible
- full replaceability among the type series KRH, KRHL, KRI, KRIL

### Discharge casing

- considerable corrosion allowance on pressurized components
- double volute starting with rated width 80

### Flanges

- ASME or DIN EN
- Class 600 standard

### Inline Design

- minim installation surface saves place
- nozzle loads 2x API

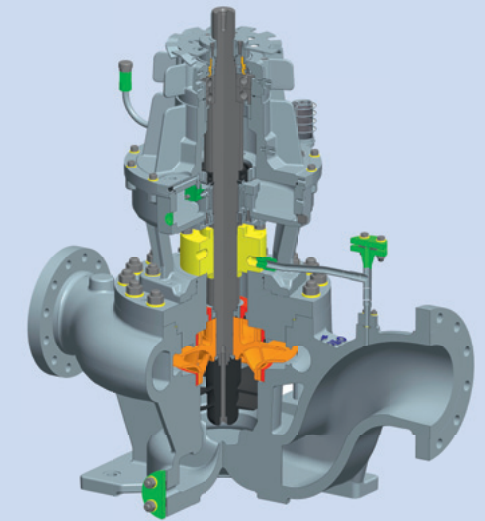
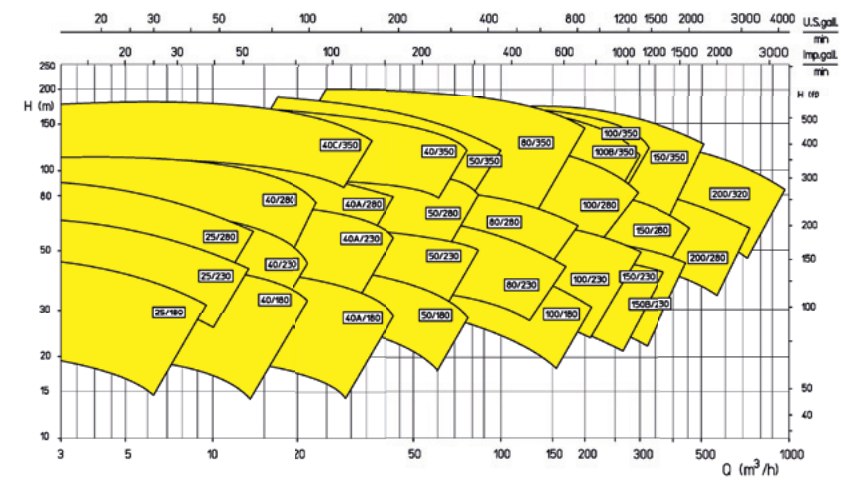
### Venting Drainage

- via integral flanges
- welding on casing not required

### Wear and split rings

- replaceable wear and split rings
- different material Venting Drainage options and coatings available

## Performance range



■ KRI Version with Inducer

### Bearing seals

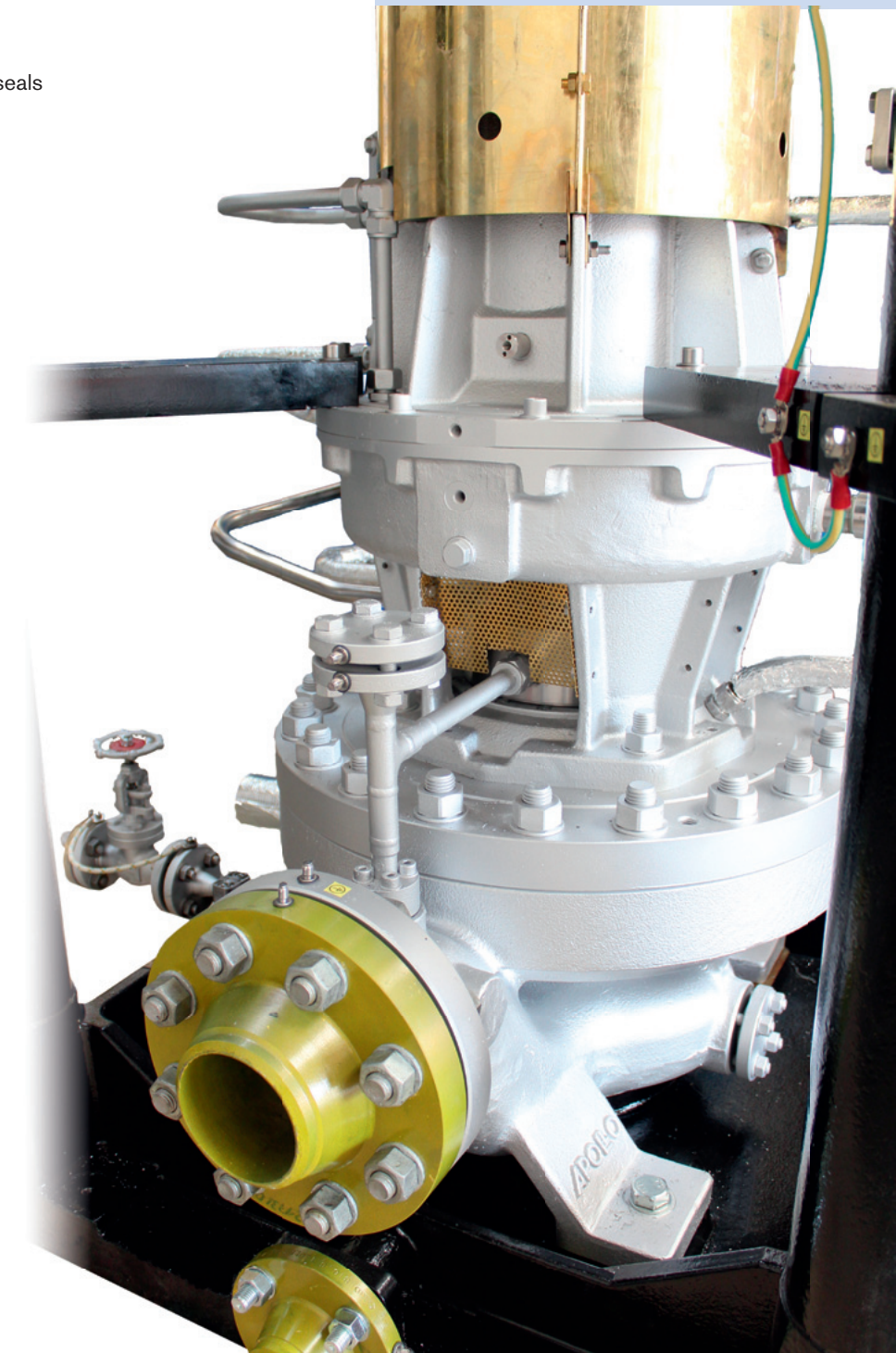
- application of high-grade bearing seals of Manufacturers like Inproseal, Garlock or ProTech

### Jacket cooling

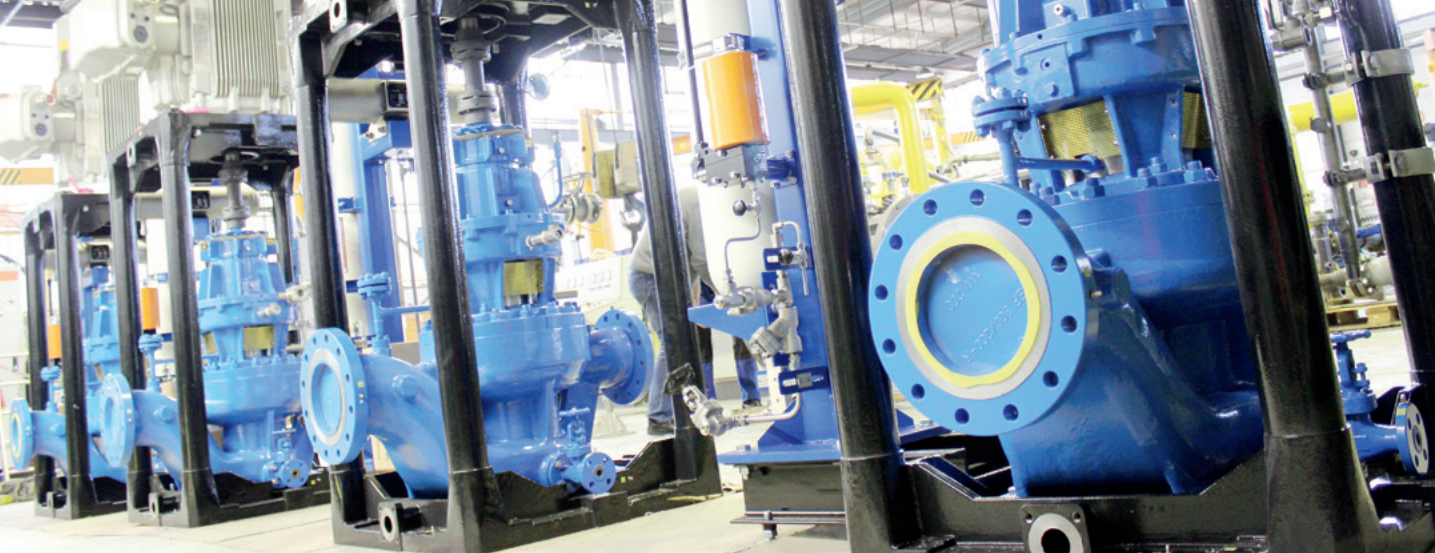
- efficient jacket cooling is available as an option

### Hydraulics

- application of approved KRH and KRHL hydraulics
- optimized suction chambers for low NPSH values
- a variety of hydraulic versions per casing for optimum adaptation to operating conditions

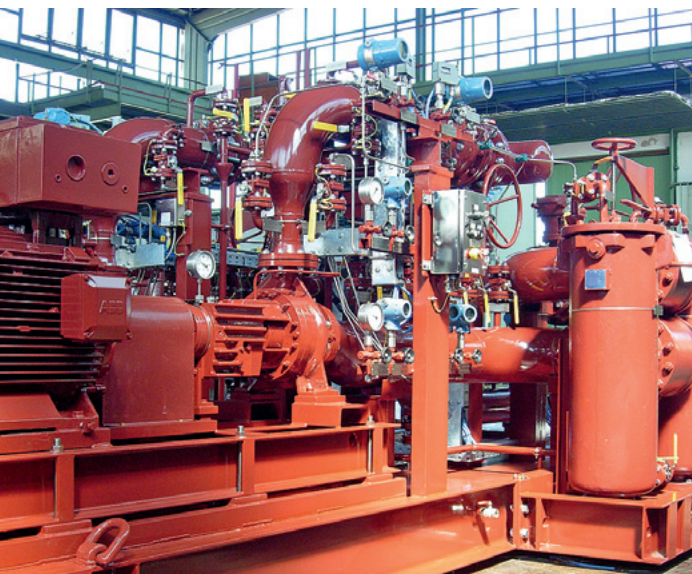






Since more than 100 years APOLLO in Goessnitz has been developing and producing pumps for different applications with most different operating principles.

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-skilled 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.

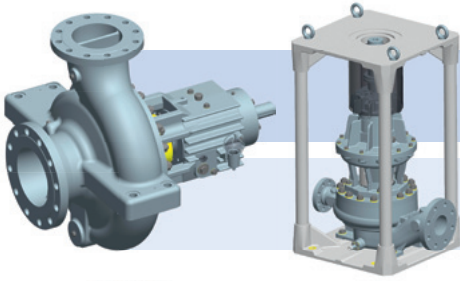
The Quality Assurance in all areas of the company, including suppliers and cooperation partners, is the top priority and is consistently implemented. The most up-to-date test fields provide realistic test conditions.

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.



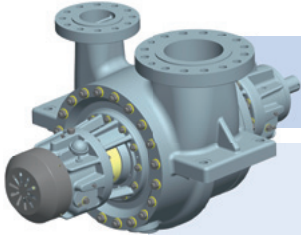


# PROCESS PUMPS | API 610



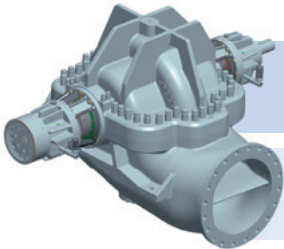
Single stage pumps: **OH1, OH2, OH3**

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



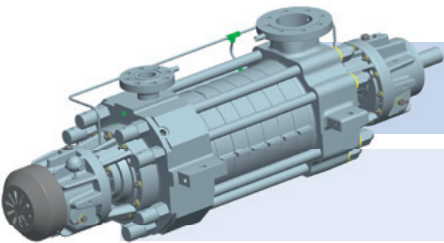
Single and two-stage between bearings pumps: **BB2**

■ ZPR ■ ZPRA ■ KGR / KGRD



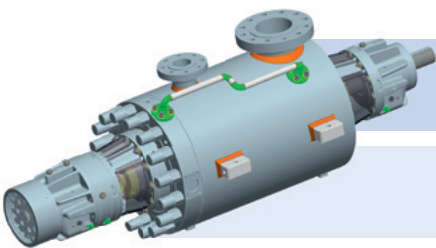
Axial split between bearings pumps: **BB1, BB3**

■ ZMK ■ ZMKV ■ AMG



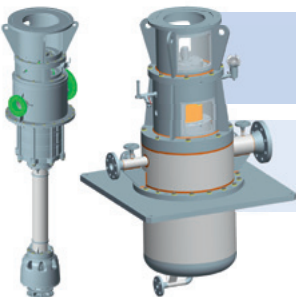
Multistage high-pressure pumps, ring sections type: **BB4**

■ 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

**APOLO**

— PUMPS —

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