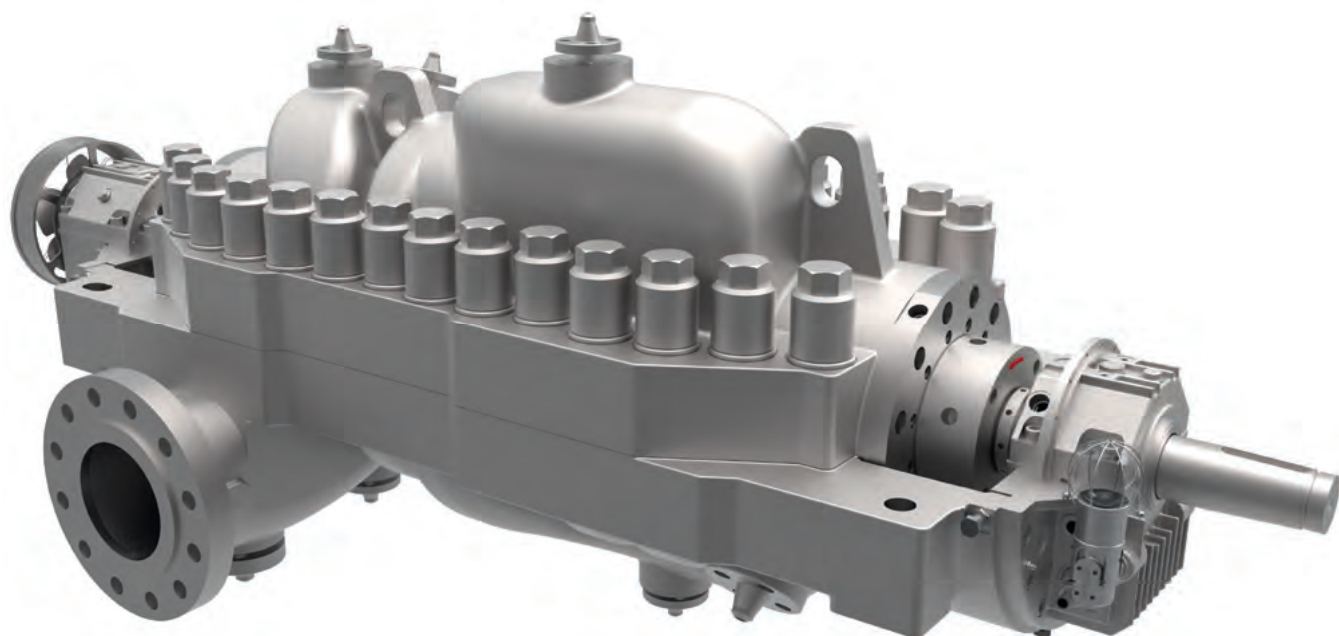


AXIALLY SPLIT, MULTISTAGE HIGH-PRESSURE PUMP

API 610 / TYPE BB3

AMG



- Easy maintenance without disconnecting the piping due to axial split casing
- Back-to-back rotor design to minimise axial thrust
- Optimum rotor dynamics for safe operation, also at high speeds
- Best NPSH values by optimally designed suction impellers
- Highest efficiency for energy saving operation

Range of Applications

Based on the excellent hydraulic characteristics, the perfectly optimized performance range and modern structural design, the pumps are suitable for applications such as:

- applications in the oil and gas industry
- offshore applications
- water injection onshore and offshore
- applications in refineries
- booster applications in all industrial branches
- boiler feed water applications

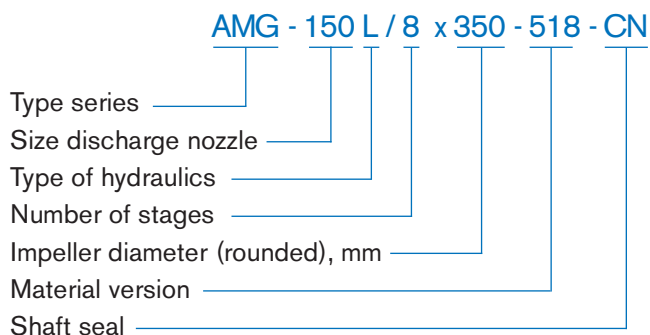
Design

- Horizontal, axially split between bearing pump
- Bearing types: antifriction bearings with ring oil lubrication
Mixed bearings: radial slide bearings, axial antifriction bearings with ring oil lubrication
Radial and axial slide bearings with pressure oil lubrication
- Due to the axial split casing design, very short downtimes during maintenance and inspection work. Lower casing part remains in the pipeline. Dismantling of the coupling is not necessary.
- 1st stage with NPSH impeller as standard. Double suction impeller for even lower NPSH values optional
- Flanges according to ASME or DIN EN in different pressure ratings and flange facings
- Single impeller support and shrink fit impellers in reference to the application
- Double volute construction for minimum radial thrust, back-to-back impeller design for axial thrust compensation for optimised bearing and sealing life
- Casing with near centeline support
- High speed options available

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 have a standard design with cartridge mechanical seal. Assembly space according to API 610/682.

Designation



Operating data

Nozzle size (mm)	from 80 to 500
Capacity	up to 3200 m ³ /h
Head	up to 2200 m
Pressure design	up to 265 bar
Operating temperature	-50 °C to +200 °C

Materials

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

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



Bearing housing

- prepared for all required connections for measuring and monitoring equipment
- application of high-grade metallic bearing isolators
- cooling fan or water cooling

Suction impeller

- 1st stage with double suction NPSH impeller as standard
- very low NPSH values possible

Rotor / Impellers

- shrink fit impellers available
- single impeller support
- dynamically balanced

Double volute design

- minimum radial thrust for long bearing and seal life

Wear rings

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

Shaft

- rotor-dynamically optimized solid shafts
- cylindrical or conical shaft end

Bearing

- antifriction bearings radial, axial
- mixed bearings
- sliding bearings
- ring oil lubrication or forced lubrication
- bearing selection, in dependence on customer specification, speed, performance and API requirements

Flanges

- ASME or DIN EN
- class 900 Standard
- different flange facings available

Central bearing

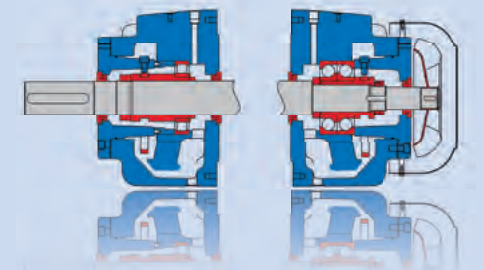
- liquid lubricated, central plain bearing
- best rotor dynamics even at high speeds and large number of stages

back-to-back impeller

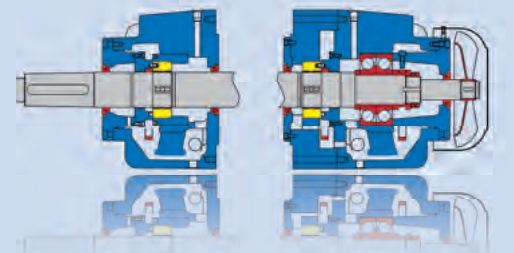
- compensation of axial thrust close to balanced even with worn gaps
- for long bearing and seal life

Seal chamber

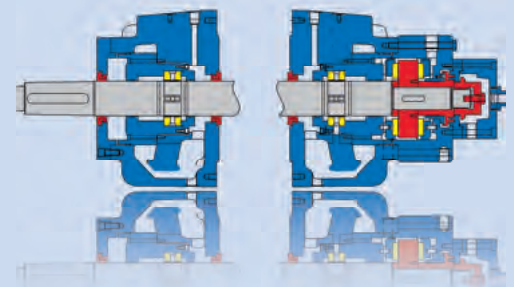
- separate seal chamber according to API 610 / 682
- all the usual variations of sealing and API piping schemes are possible
- equipped with a cartridge mechanical seal as standard



■ Antifriction bearings with oil-ring lubrication

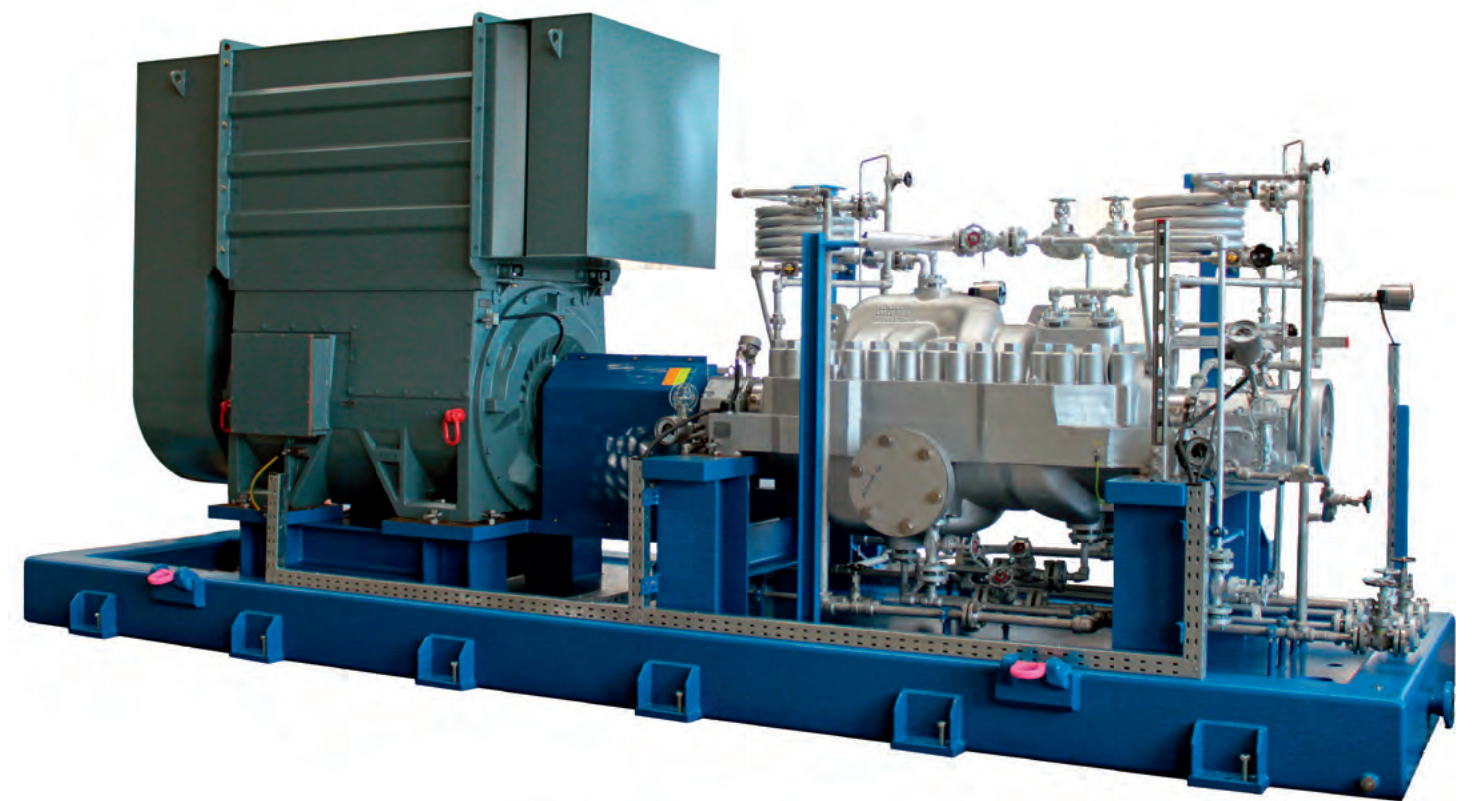
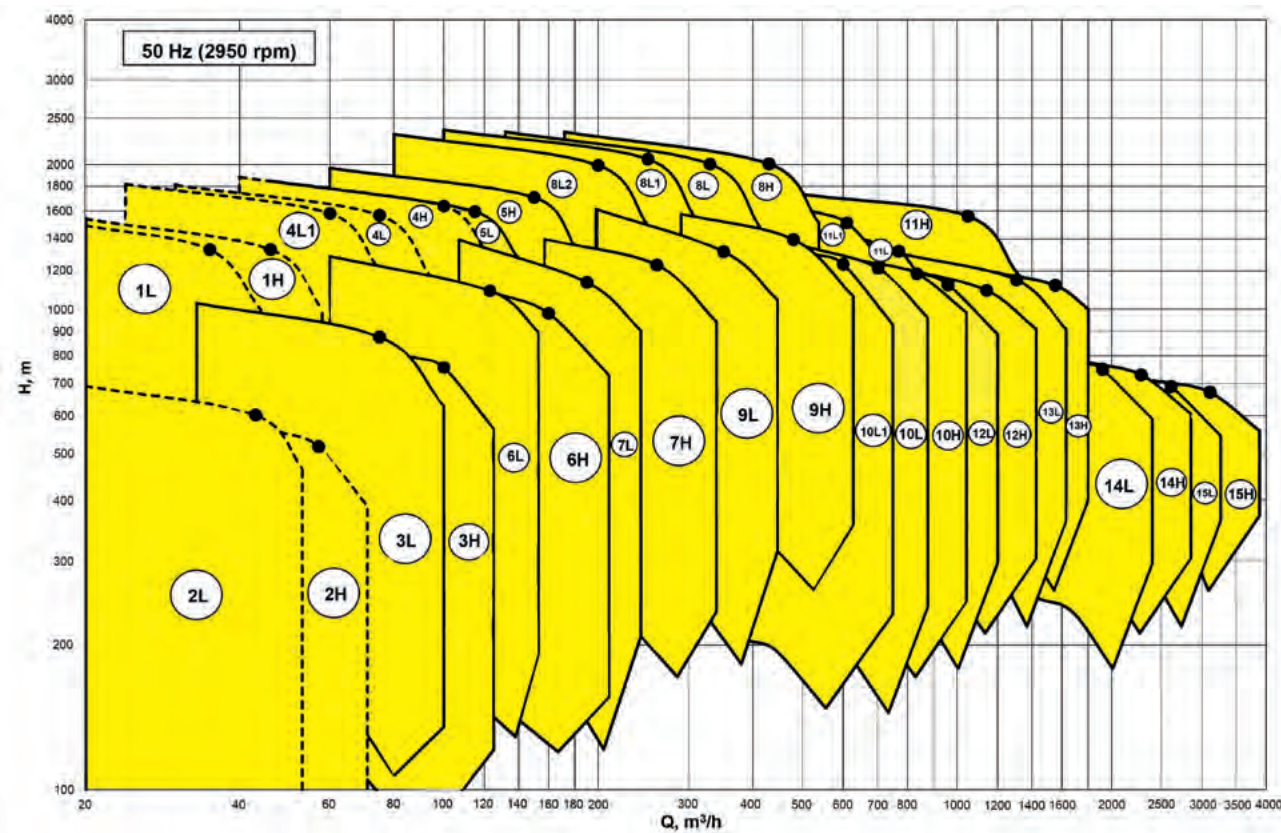


■ Mixed bearings: radial sliding bearings, axial antifriction bearings with oil-ring lubrication



■ Sliding bearings axial, radial with forced oil lubrication

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-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.

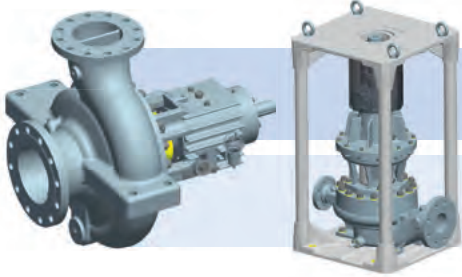
Our production methods and systems meet the highest level of quality and allow the implementation of orders according to different standards and regulations.

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



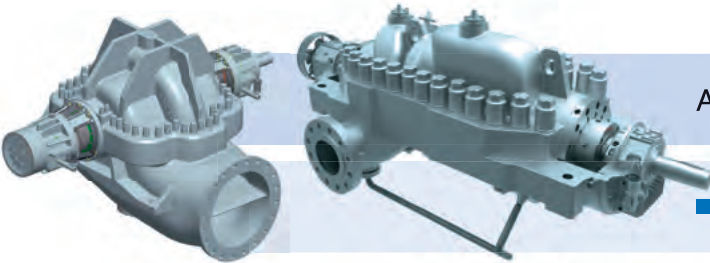
Single stage pumps: **OH1, OH2, OH3**

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



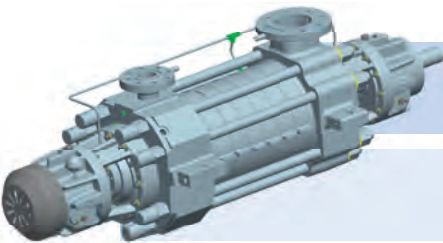
Single and two-stage between bearings pumps: **BB2**

■ ZPR ■ ZPRA ■ KGR / KGRD



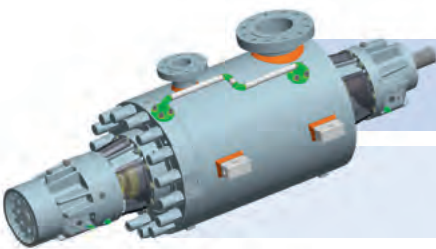
Axial split between bearings pumps: **BB1, BB3**

■ ZMK ■ ZMKV ■ AMG



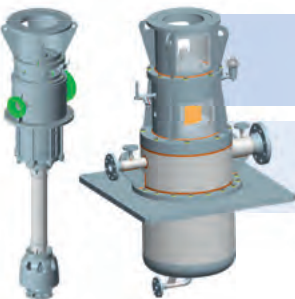
Multistage high-pressure pumps, ring sections type: **BB4**

■ 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 ■ GDTV ■ GDV

APOLO

– PUMPS –



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