CHTR – Centrifugal, High-pressure, Barrel Pump to API 610 Type BB5
Applications

Water injection  Refineries  Petrochemical industries

Steam generators  Seawater

Reliable delivery at high pressure.

Day in and day out, KSB pumps prove their worth again and again, delivering a consistently high level of quality and reliability. Are your pumps exposed to extreme temperatures and need to handle critical fluids? Do you require solutions to ensure a reliable performance under tough conditions? KSB can handle the pressure. Our team works hand in hand with engineers of the oil and gas industries to provide the most appropriate and efficient solution for your processes.

Optimum efficiency in all processes.
CHTR multistage barrel pumps are available in 5 sizes – with up to 16 stages and more than 30 hydraulic configurations. The modular design according to API 610 in its current condition guarantees the optimum and most efficient solution at all times. CHTR pumps can therefore be matched to the specific needs and requirements of a wide range of applications:

- Small capacities at high pressure
  (Low Flow High Head application)
- Large capacities at medium and high pressure
- Operation around the clock
- Periodic operation at short intervals

Smooth operator in extreme situations.
Reliable KSB quality guarantees that processes in the oil and gas industries keep working at their best. The all-rounder CHTR offers several features to ensure everything runs smoothly – even under the most severe conditions. For example:

- Extremely durable rigid pump shafts
- Long interstage bushes and wear rings
- KSB expertise in selecting robust materials
This comprehensive service concept from KSB offers customers the chance to put together a service and spare parts package tailored to their specific requirements. Spare parts stocks, for example, can be structured far more efficiently thanks to our inventory management under a KSB service contract, significantly reducing costs.

- Ongoing support from pre-sales to after-sales
- Configuration of processes for maximum efficiency and minimum maintenance
- Reduction of stages to keep investment costs low
- NPSH values on lowest level through choice of single or double-entry suction stage impellers

Total Pump Management from KSB: individual concepts for highly efficient systems
CHTR – safe, service-friendly, system-compatible.

High reliability
- Strong antifriction or segmental thrust bearings hold the pump rotor in axial position and absorb residual axial thrust
- Optimised balance drum minimises axial thrust load on bearing and enables a longer service life
- Seal cavity dimensions to API 610
- Impellers secured individually and locked in direction of normal axial thrust, design to API 610
- Discharge pressure rating criteria for suction regions to API 610 on request

Long service life
- Plain bearing design reduces vibrations and wear
- Bearing check or replacement without dismantling the drive
- Pressure enclosure components designed to guidelines of ASME Sec. VIII Div. 1
- Flange ratings selected to match discharge pressure

High flexibility and adaptability
- Flange design meets loading requirements to API 610 – higher values on request

Reduced operating costs
- Top efficiency thanks to over 30 possible hydraulic configurations, by combining two special impeller with six diffuser configurations
- Improved efficiency through CFD optimized hydraulically contour on impellers and diffusers

Ease of maintenance
- Mechanical seals (cartridge design) can be easily dismantled and replaced without opening the pump
- Bearings can be monitored without opening the pump
### Bearing configurations

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Antifriction bearings** | - Oil ring lubrication  
- Water-cooled bearing housing  
- Provision for purge mist lubrication on request |
| **Bearing cooling (on request)** | - fan cooling  
- water cooled bearing |
| **Heavy-duty thrust bearing design** | - With forced-feed lubrication for higher loads/speed  
- Special design to provide self-alignment feature for axial thrust bearing |
Technical data and tables

Characteristic curves

Technical data

Flow rate $Q$ up to 1,450 m³/h (400 l/s)
Head $H^*$ up to 4,000 m
Temperature $T$ -60 °C to 450 °C
Pump discharge pressure $p_d$ up to 400 bar
Speed up to 7,000 rpm
Size DN 50 to DN 250

* $Q = 0$ and $\rho = 1$ kg/dm³

Materials

<table>
<thead>
<tr>
<th>API 610 Major components**</th>
<th>S-5</th>
<th>S-6</th>
<th>C-6</th>
<th>A-8#</th>
<th>D-1#</th>
<th>D-2#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrel / Stage casing</td>
<td>C Steel</td>
<td>C Steel</td>
<td>Cr Ni Steel</td>
<td>AUS SS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Impellers / Diffusers</td>
<td>C Steel</td>
<td>Cr Steel</td>
<td>Cr Ni Steel</td>
<td>AUS SS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Impeller and stage casing wear rings / bushes</td>
<td>Cr Steel</td>
<td>Cr Steel</td>
<td>Cr Ni Steel</td>
<td>AUS SS*</td>
<td>Duplex*</td>
<td>Super Duplex*</td>
</tr>
<tr>
<td>Shaft</td>
<td>Cr Steel / CrNi Steel</td>
<td>Cr Steel / CrNi Steel</td>
<td>Cr Steel / CrNi Steel</td>
<td>AUS SS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Shaft sleeves (mech. seal)</td>
<td>AUS SS*</td>
<td>AUS SS*</td>
<td>AUS SS*</td>
<td>AUS SS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Cover / Casing Insert</td>
<td>C Steel</td>
<td>C Steel</td>
<td>CrNi Steel</td>
<td>AUS SS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
<tr>
<td>Shaft Seal Housing</td>
<td>C Steel</td>
<td>C Steel</td>
<td>CrNi Steel</td>
<td>AUS SS</td>
<td>Duplex</td>
<td>Super Duplex</td>
</tr>
</tbody>
</table>

# On special request
* Hard-faced
** further materials on customer request

* C steel Carbon steel
  Cr steel Chromium steel
  CrNi steel Chromium Nickel steel
  AUS SS Austenitic stainless steel
  Duplex Duplex stainless steel
Easy to service

Quick pull-out of the complete cartridge unit is possible, only one bolded joint must be undone. The complete cartridge can be removed easily by means of a special device. The CHTR pump casing remains in the piping system. Therefore, suction and discharge flanges do not need to be disconnected. Wear condition of interior of the pump can be determined easily.

The cartridge design of CHTR barrel pumps allows dismantling and replacement of the inner assembly within only a few hours.