

# CHTR – Centrifugal, High-pressure, Multistage Barrel Pump to API 610, 10<sup>th</sup> Edition.



## CHTR – 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 cope with gaseous fluids? Are your system components and pumps subject to on-going tough conditions? KSB can handle the pressure. Our team works hand in hand with engineers from the oil and gas industries to provide the most appropriate and efficient solution for your processes.

## CHTR – Optimum efficiency in all processes.

Single and double-entry CHTR multistage barrel pumps are available in 5 sizes – with up to 16 stages for over 30 hydraulic configurations. This modular design combined with the standard option of turning down impellers 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 processes:

- Small capacities at high pressure
- Large capacities at medium pressure
- Operation around the clock
- Periodic operation at short intervals





### **CHTR – 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:

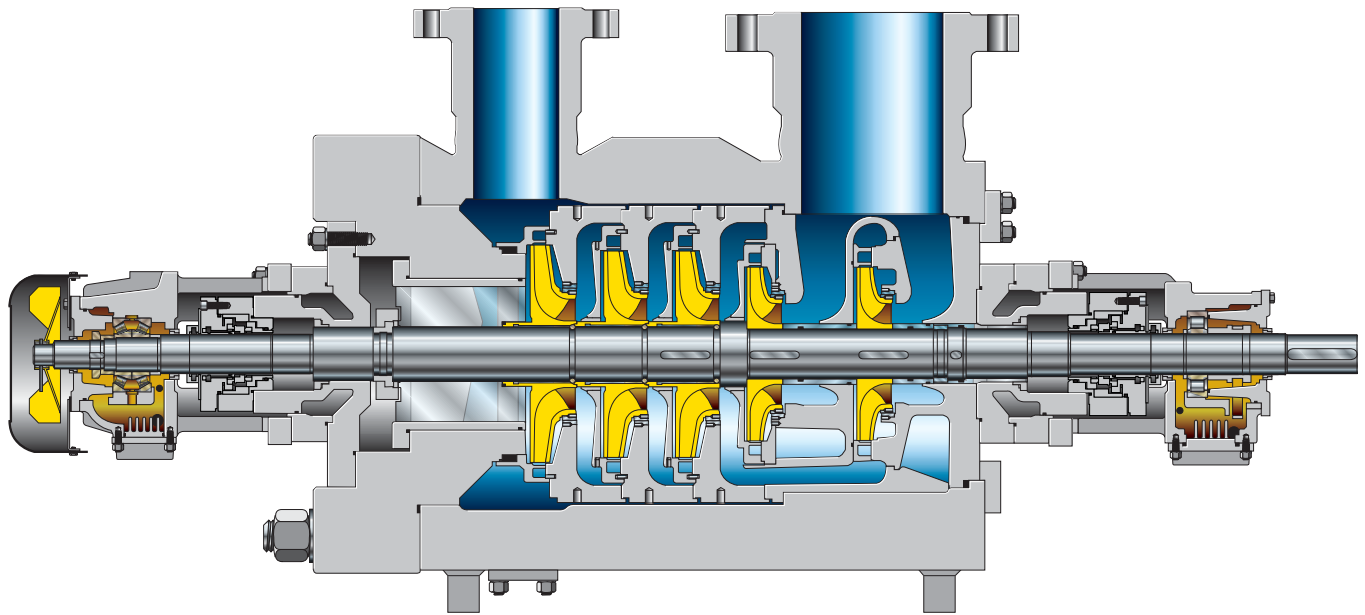
- Extremely durable rigid pump shafts
- Long interstage bushes and wear rings
- KSB expertise in selecting robust materials

### **KSB Total Pump Management.**

In order to offer our customers the best possible system optimisation, KSB subscribes to the philosophy of Total Pump Management:

- 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
- Minimisation of NPSH values through choice of single or double-entry suction stage impellers





## 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 610-10 Table 2.2
- Impellers secured individually and locked in direction of normal axial thrust, design to API 610
- Discharge pressure rating criteria to API 610-10 Clause 2.2.4, 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

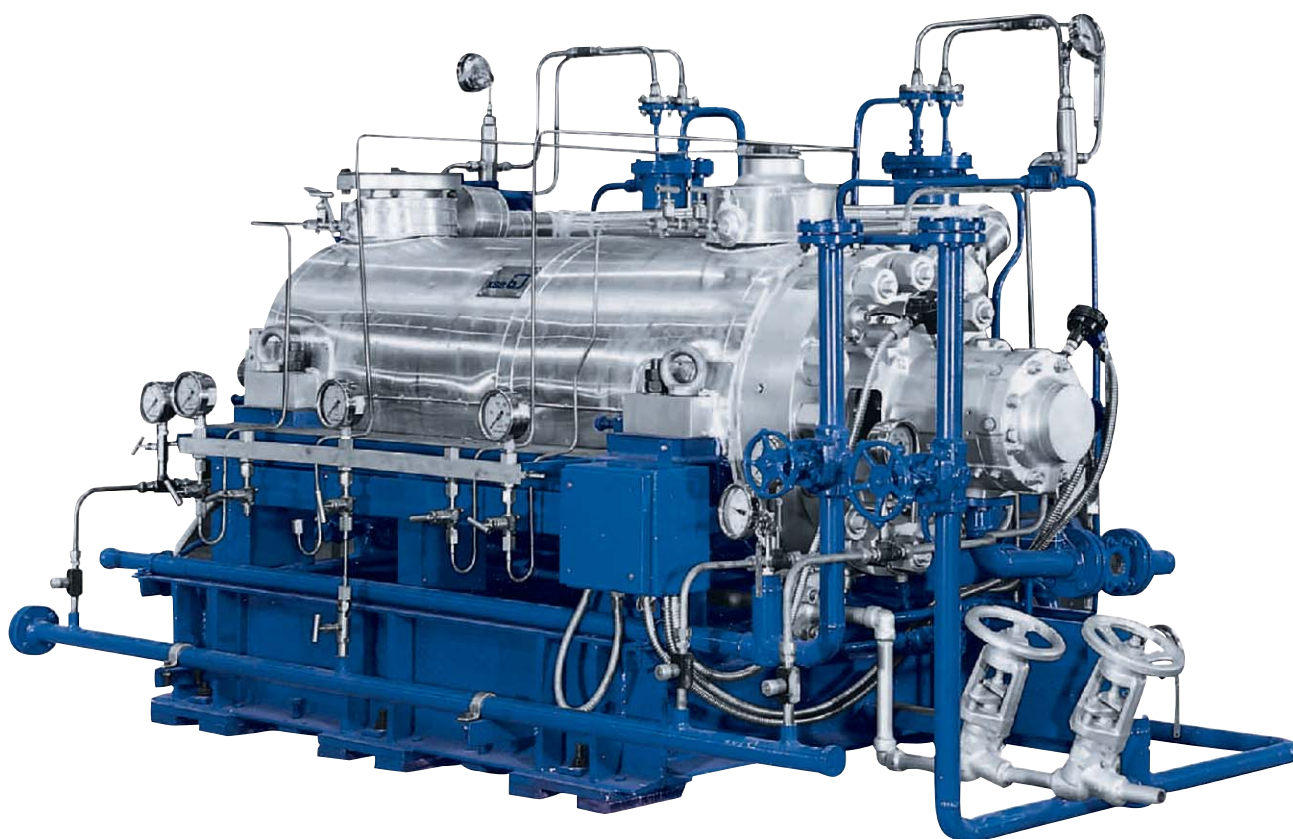
- High adaptability to processes thanks to modular design principle (5 sizes with up to 16 stages)
- Flange design meets loading requirements to API 610

### Reduced operating costs

- Top efficiency thanks to over 30 possible hydraulic configurations, by combining two special impeller with six diffuser configurations
- Improved efficiency through option of turning down the impeller

### 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
- No need to disconnect suction and discharge flanges for maintenance



## Further features

### Antifriction bearings

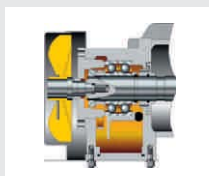
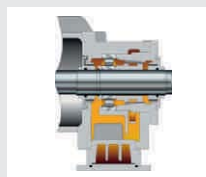
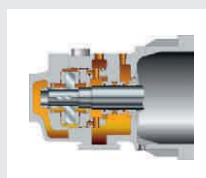
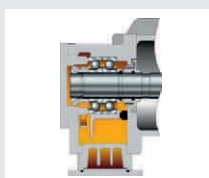
- Oil ring lubrication
- Water-cooled bearing housing
- Provision for purge mist lubrication on request

### Seal casing design

- With or without cooling, as required

### Fan cooling

- On request



### Heavy-duty thrust bearing design

- With forced-feed lubrication for higher loads/speed
- Special design to provide self-alignment feature for axial thrust bearing

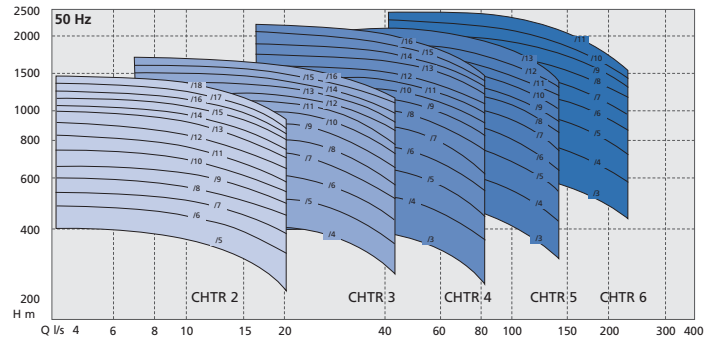
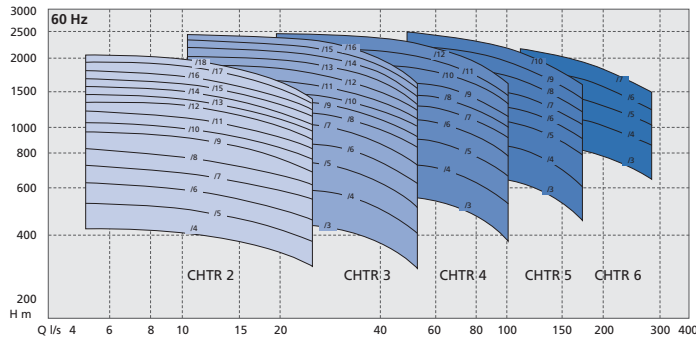
### Drive and bearings

- Can be dismantled without disturbing motor/pump piping connections



# Technical data and tables

## Characteristic curves



### Technical data

Flow rate Q	Up to 1,450 m <sup>3</sup> /h (400 l/s)
Head H*	Up to 4,000 m
Temperature t	- 60 °C to 450 °C
Pump discharge pressure p <sub>d</sub>	Up to 400 bar
Speed	Up to 7,000 rpm
Sizes	DN 50 to DN 250
*Q = 0 and ρ = 1 kg/dm <sup>3</sup>	

### Materials

API 610/10 class major components	S - 5	S - 6	C - 6	A - 8 #	D - 1
Barrel/stage casings	C steel		CrNi steel	AUS SS	Duplex
Impellers/diffusers	Cr steel			AUS SS	Duplex
Impeller and stage casing wear rings/bushes	Cr steel			AUS SS*	Duplex*
Shaft	Cr steel/Cr Ni steel			AUS SS*	Duplex*
Shaft sleeve (mech. seal)	AUS SS*				Duplex*

\* Hard-faced  
# On special request

C steel      Carbon steel  
Cr steel      Chromium steel  
CrNi steel    Chromium Nickel steel  
AUS SS      Austenitic stainless steel  
Duplex      Duplex stainless steel

## Applications

### Water injection



### Refineries



### Petrochemical industries



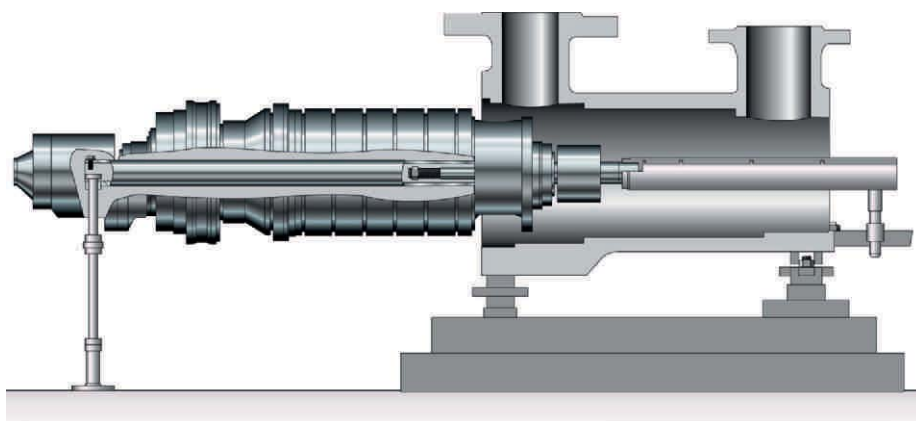
## Spectrum

<b>Design</b>	Horizontal, radially split, multistage barrel-type pump, "quick pull-out" cartridge design								
<b>Drive</b>	Electric motor, steam turbine, combustion engine, gas turbine								
<b>Rotation</b>	Clockwise viewed from drive end (suction side drive)								
<b>Nozzles</b>	Flanges to ASME, radial, pointing vertically upwards, to DIN/BS on request								
<b>Mounting</b>	Shaft centreline								
<b>Casing sealing</b>	Confined spiral-wound stainless steel gaskets								
<b>Impellers</b>	Radial flow, single entry, integrally cast								
<b>Pump size</b>	2		3		4		5		
<b>Pump discharge pressure <math>p_d</math></b>	100	250	100	250	100	250	100	250	
<b>Suction-stage impellers</b>	Single entry	▪	▪	▪	▪	▪	▪	▪*	▪
	Double entry					▪	▪	▪*	▪
<b>Axial thrust balancing</b>	Hydraulically by single balance drum	▪	X	▪	X	▪	X	▪	X
	Stepped balance drum	X	▪	X	▪	X	▪	X	▪
<b>Bearings, lubrication</b>									
<b>Radial bearings</b>	Antifriction bearings, splash-lubricated	▪	X	▪	X	▪	X	▪	X
	Plain bearings, forced-feed oil-lubricated	X	▪	X	▪	X	▪	▪	▪
<b>Thrust bearing</b>	Antifriction bearings, splash-lubricated	▪		▪		▪		▪	
	Segmental thrust bearing, Forced-feed oil-lubricated	X	▪	X	▪	X	▪	▪	▪
<b>Shaft seal</b>	Mechanical seal to API 682								
<b>Mechanical seal</b>	Mechanical seal (Cartridge design)								

x Not applicable    ▪ Applicable    \* On request

Quick pull-out of the complete cartridge unit is possible, only one screw joint must be undone. The complete cartridge can then 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.

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



### Steam generators



### Seawater



Your local KSB representative:

Placeholder for local KSB representative information, indicated by four corner brackets.

More space for solutions.



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