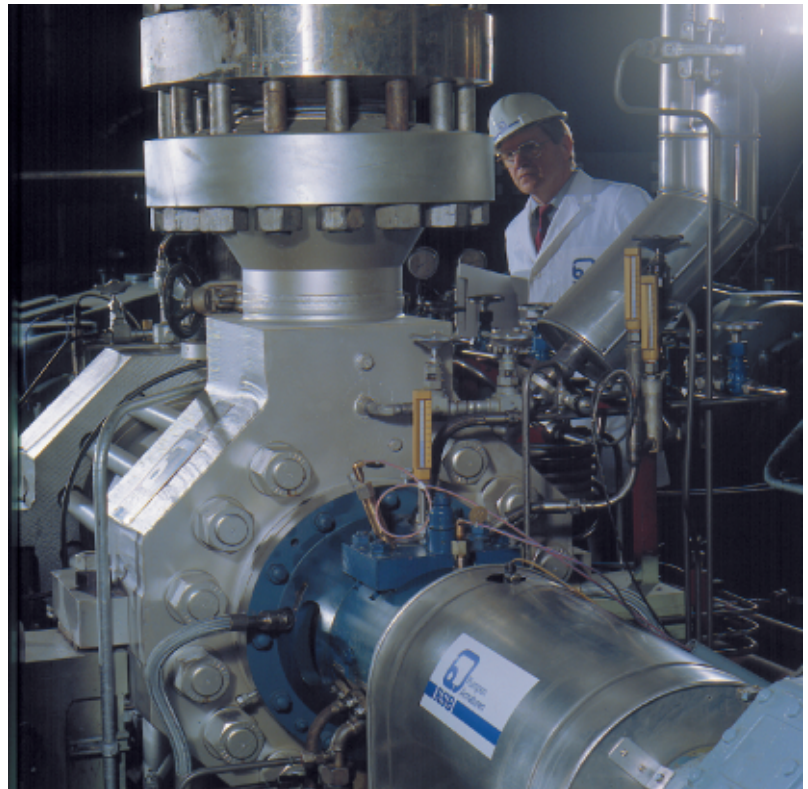


Centrifugal High-Pressure Multistage Pumps - **HG-CHT**



The right pump for the right job

Discharge Pressure up to 420 bar, Temperature up to 200°C high-pressure centrifugal pumps by KSB can handle not only high pressures but high temperatures, too. Pumps represent vital links in many a process and many a system. But no two service situations are exactly the same. Each user sets his own priorities and therefore needs high own individual kind of pump.



Progressive building blocks guarantee quality and longevity

The right impeller / diffuser variant for each job

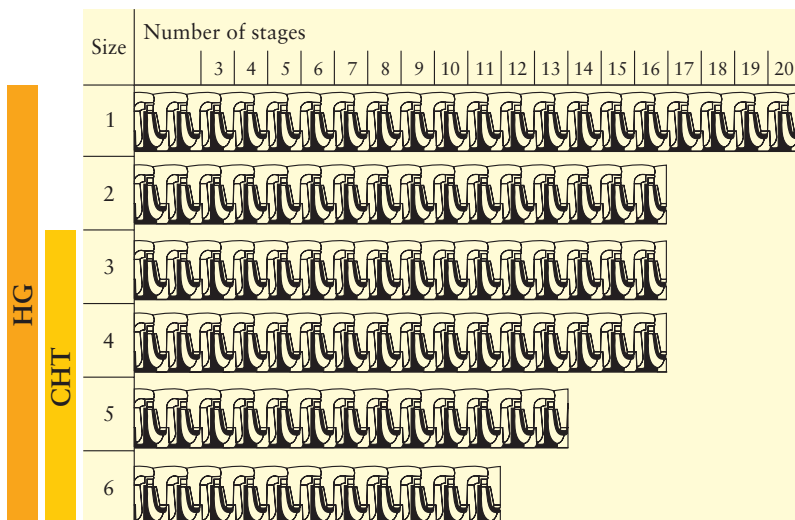
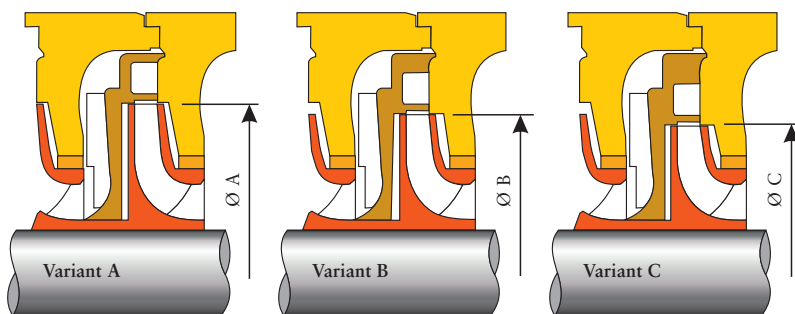
In the interest of optimal efficiency, and with several hundred combinations to choose from, we calculate the ideal impeller/diffuser variant for your particular case.

An efficiently designed hydraulic system precisely accommodates the specified capacity and discharge head values.

Six impeller/diffuser combinations per pump size

Here, flexibility is achieved with six different impeller diffuser combinations per pump size. The hydraulic duty points are so finely distributed, and the impeller profiles have such special cut-down characteristics, that optimum efficiency is guaranteed. The modular design enables optimization of pumps with regard to:

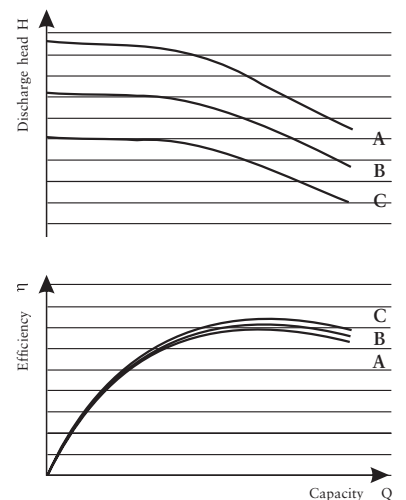
- power consumption (efficiency)
- initial cost (number of stages)
- NPSH-value



Six pump sizes with up to 20 stages

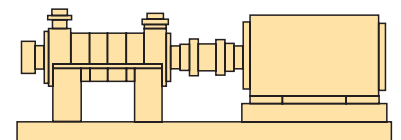
The user's ideal pump can be selected from more than 700 different hydraulic combinations.

Comparative Q/H diagram for three Hydraulic system variants



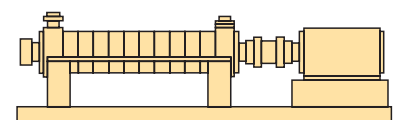
Pump optimization according to :

Pump A



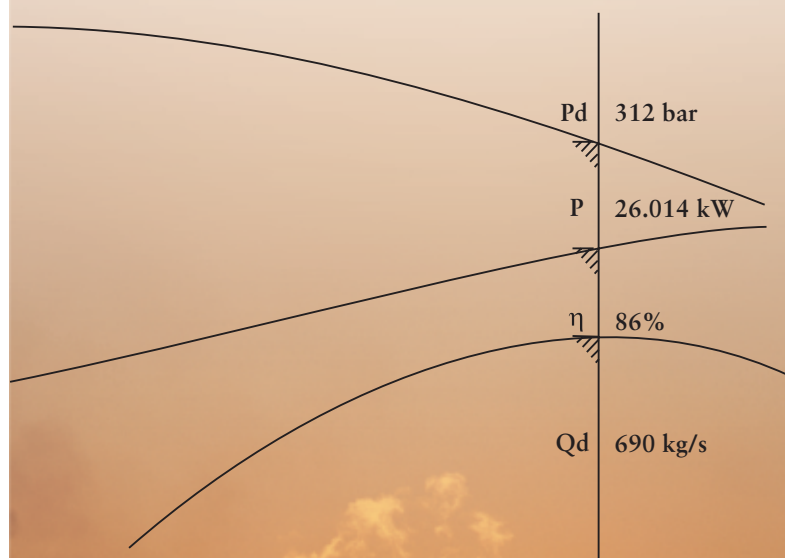
Investment cost (fewer stages)

Pump C



Efficiency (lower power input)

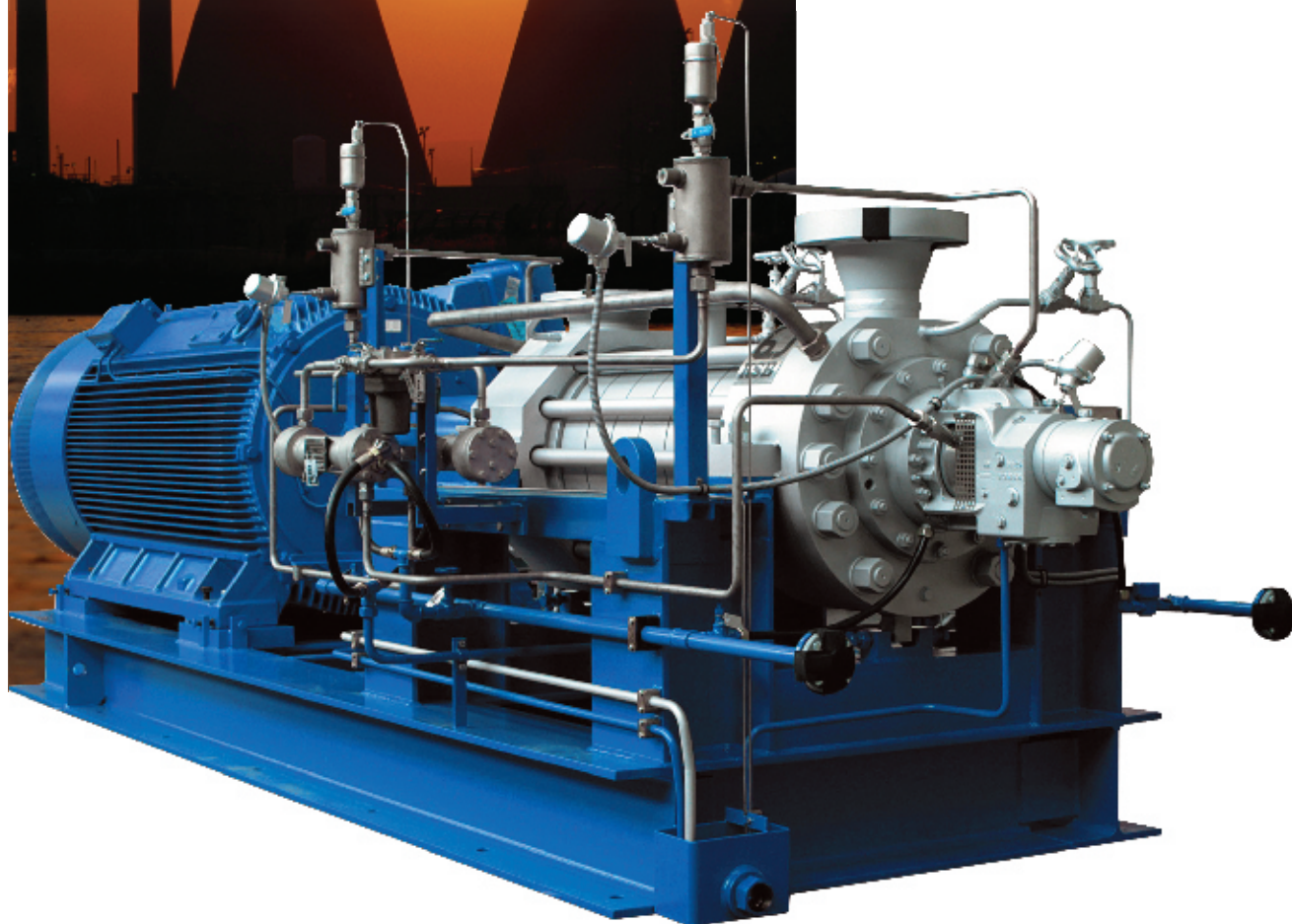
Optimized efficiency



Efficiency always at its optimum

Due to a dense coverage of the flow vs. head chart with peak efficiency impeller / diffuser geometries, boiler feed pumps by KSB always provide highest efficiencies for any service requirement.

Acceptance testing has shown that KSB-built barrel-type pumps operate at efficiency as high as 86%.



HG - Technical Data

Design

Horizontal, radially split, multistage barrel type ring section pump with radial single entry impellers.

Applications

- For feed water transport in power plants
- Boiler feed applications and condensate transport in industrial applications.
- Pressurised water generation for presses, descaling equipments etc.

Operating data

Pump sizes

Capacity

Head (at $Q = 0$ $X = 1000 \text{ kg/m}^3$)

Temperature of medium pumped

Pump suction pressure

Pump discharge pressure

Speed

Q	2 to 5 up to $1400 \text{ m}^3/\text{hr.}$ (400 l/s)
H	up to 4200 m
T	up to 200°C
Ps	up to 30 bar
Pd	up to 420 bar
	up to 7000 rpm

Materials

Suction casing

Stage casing

Discharge casing

Impellers, diffusers

Casing wear rings

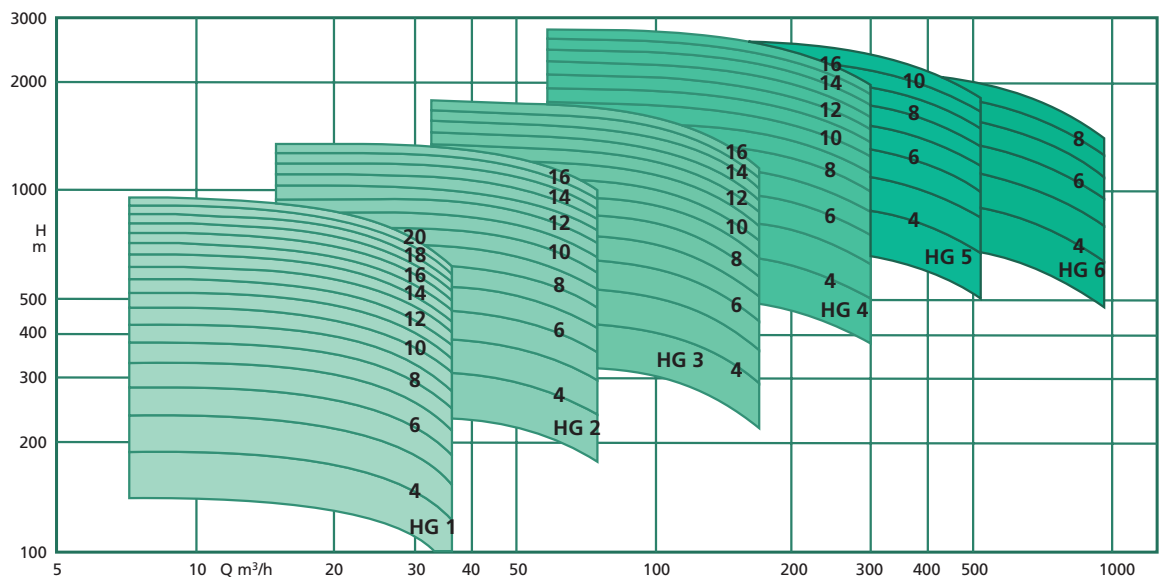
Shaft sleeves

Shaft

C-steel, clad C-steel, Cr-steel
cast-steel
cast-steel, C-steel, Cr-steel
C-steel, Cr-steel, clad C-steel
cast iron, cast-Cr-steel
cast iron, Cr-steel
cast iron, Cr-steel
C-steel, Cr-steel

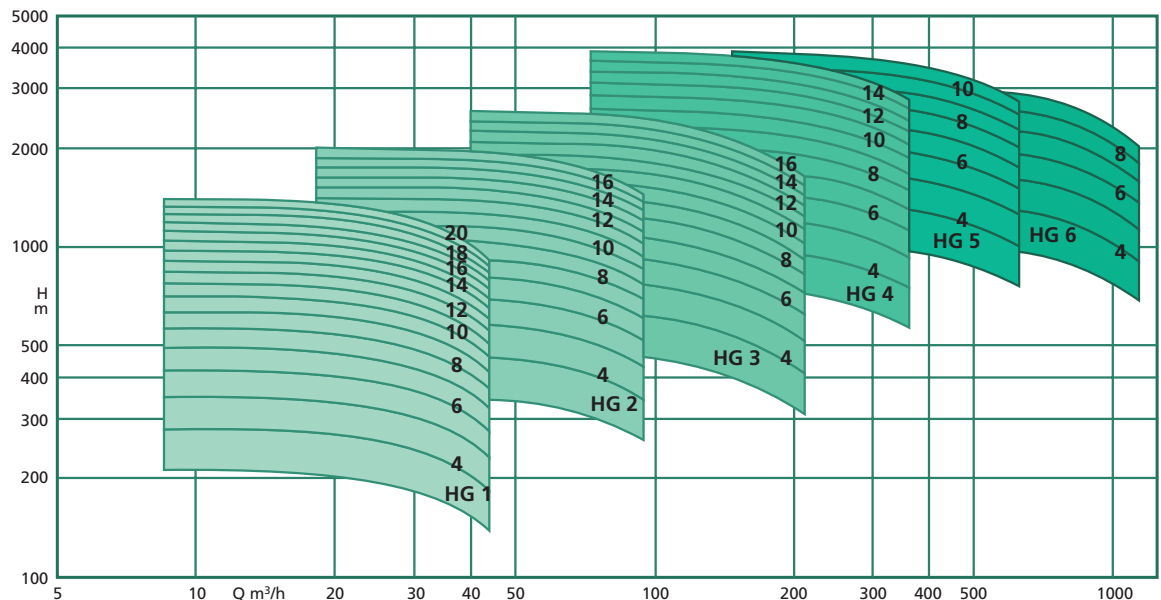
50 Hz

(2900 rpm)

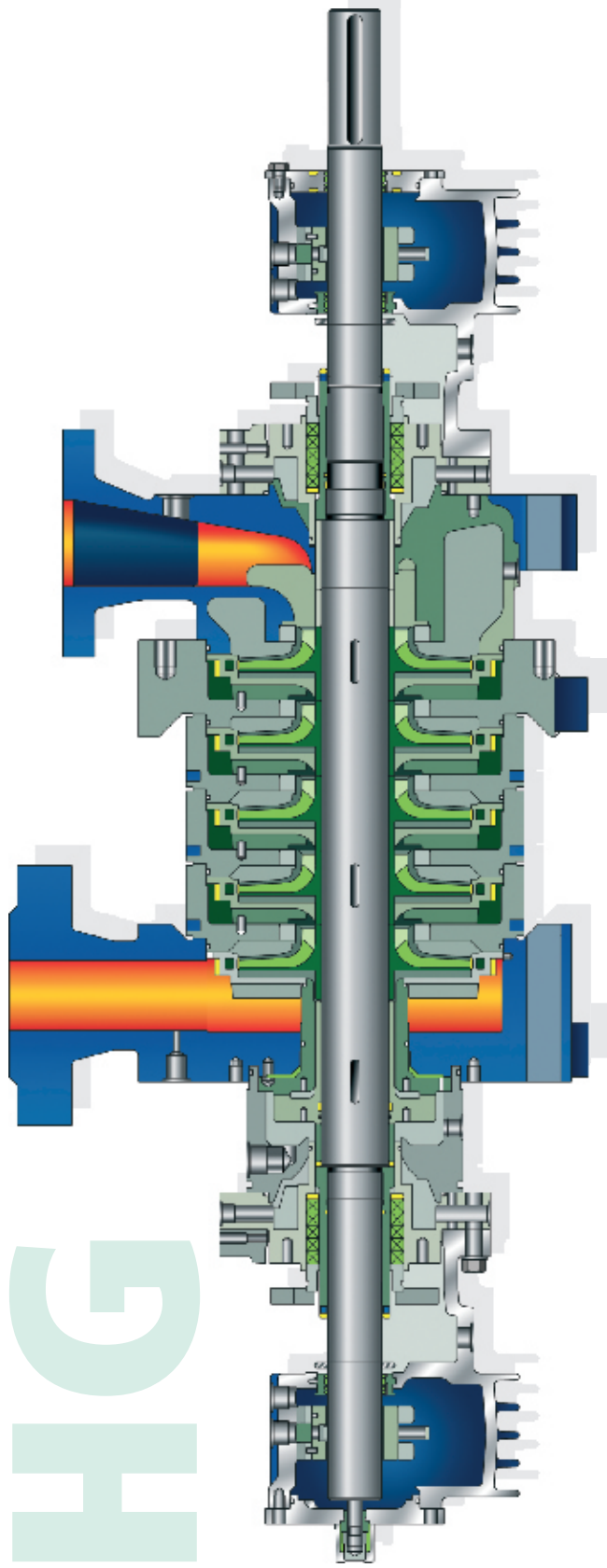


60 Hz

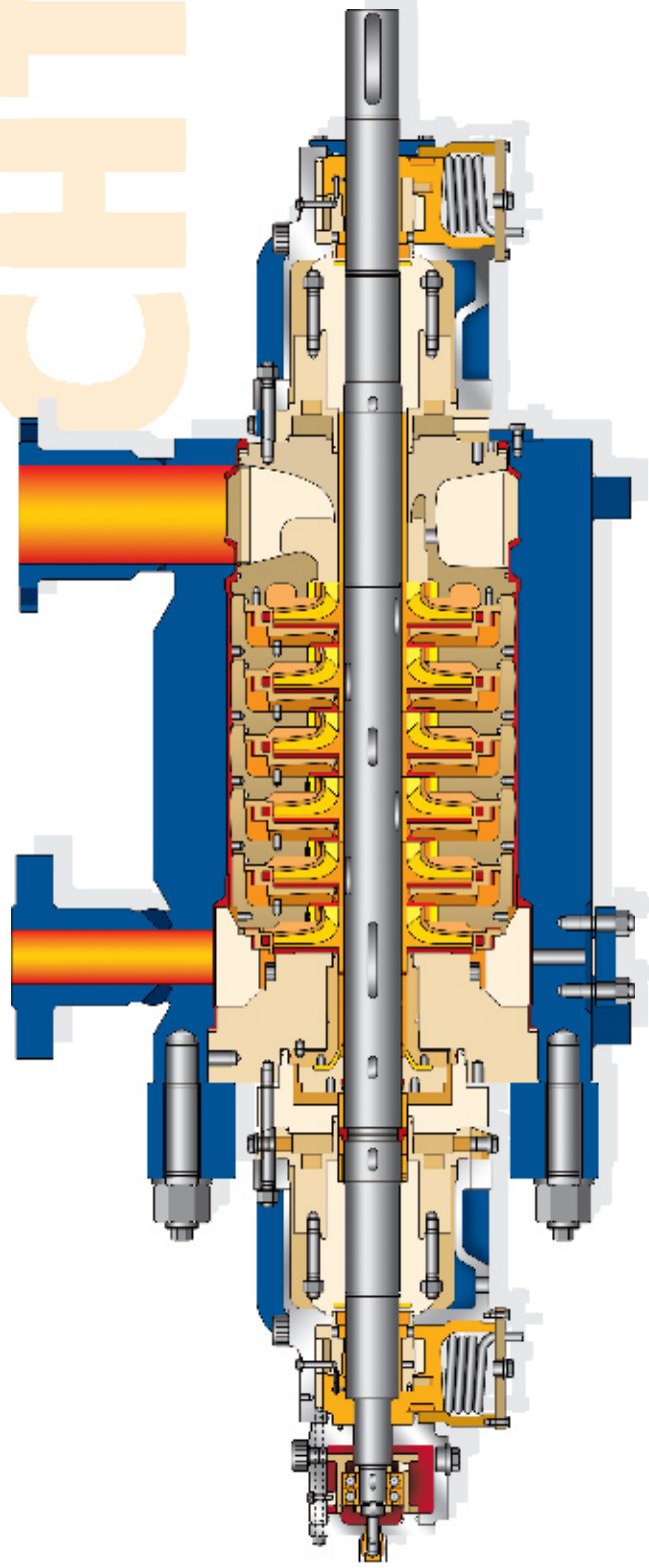
(3550 rpm)



FIG



CHT



CHT - Technical Data

Design

Horizontal, radially split, multistage barrel type ring section pump with radial single entry impellers.

Applications

- For feed water transport in power plants
- Boiler feed applications and condensate transport in industrial applications.
- Pressurised water generation for presses, descaling equipments etc.

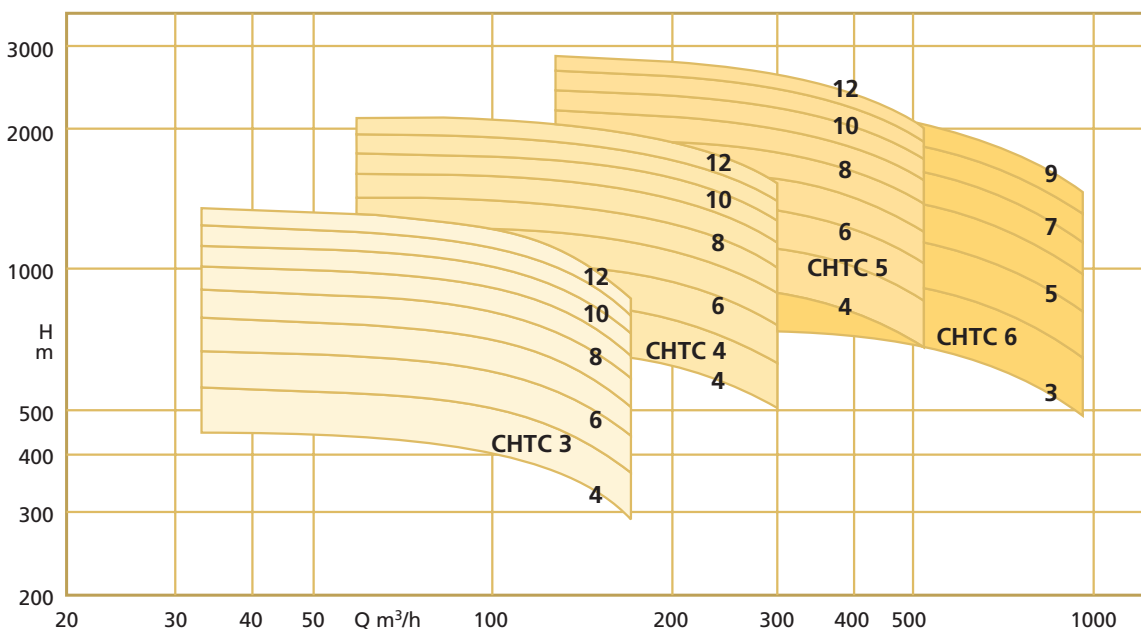
Operating data

Pump sizes	3 to 5
Capacity	Q up to 860 m ³ /hr. (238 l/s)
Head (at Q = 0 X = 1000 kg/m ³)	H up to 4000 m
Temperature of medium pumped	T up to 200°C
Pump suction pressure	Ps up to 30 bar
Pump discharge pressure	Pd up to 400 bar
Speed	up to 6760 rpm

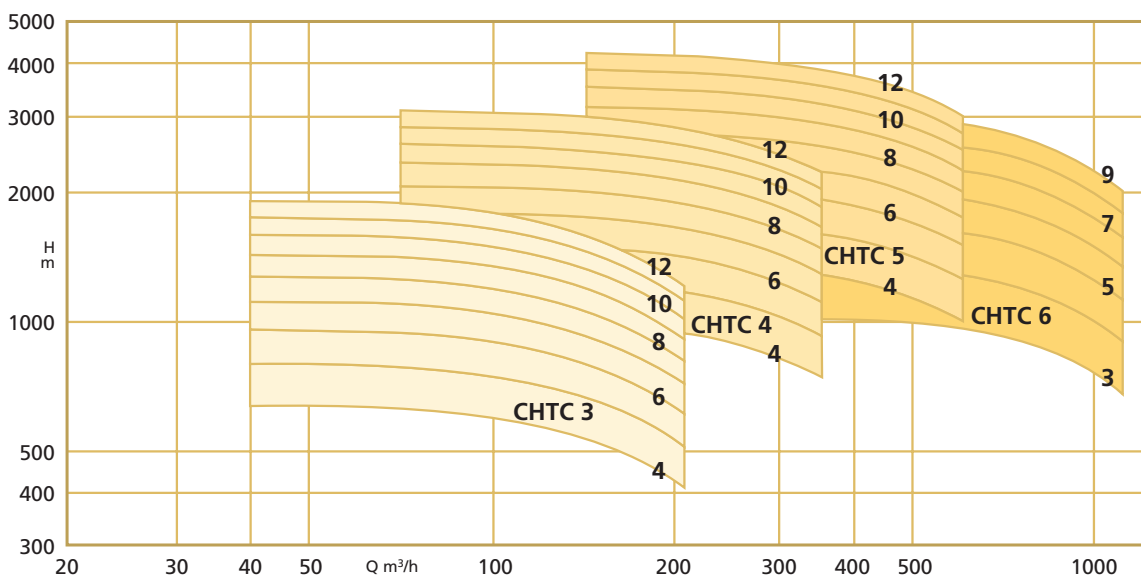
Materials

Barrel casing	C-steel, clad C-steel
Stage casing	Cr-steel
Impeller diffuser	Cr-steel
Casing wear ring, impeller wear ring	Cr-steel
Shaft sleeves	Cr-steel, Cr-Ni-steel
Shaft	Cr-steel

50 Hz
(2900 rpm)

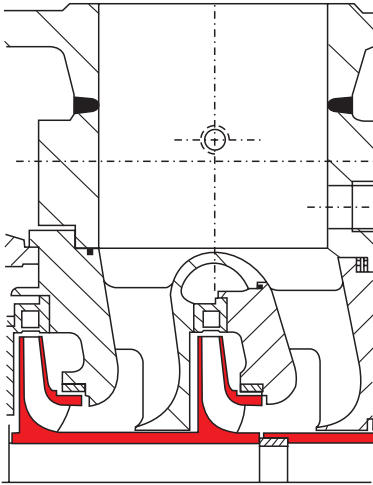


60 Hz
(3550 rpm)



A multitude of special-purpose assemblies for a wide range of applications

Adaptable to the NPSH situation



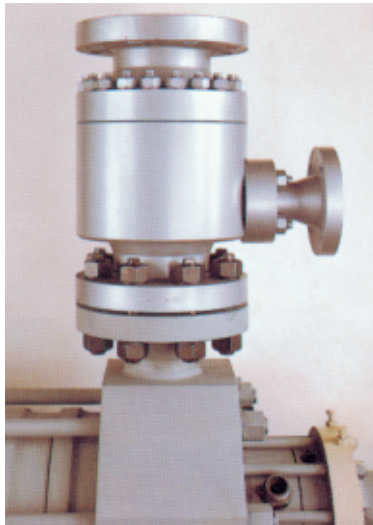
All across the delivery-data range (selection chart) additional outlays for ensuring adequate suction head are seen to be unnecessary. In many cases, a booster pump can be dispensed with merely by opting for a suction impeller or a double-flow in-take. Even for the latter, standard impellers are used.

Part flow at client's discretion



Providing an extraction point for, say, main steam cooling is no problem. In fact, the user can nozzles.

Saving through careful sizing of minimum flow systems

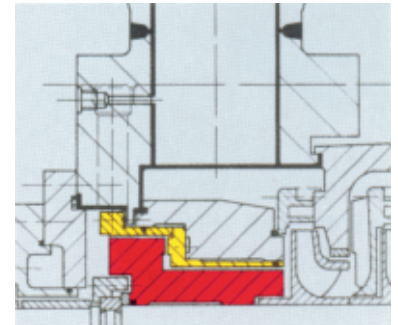


Each basic model is available with two or three alternative discharge nozzle dimensions. The minimum flow valve is designed to optimally match the pump output.

Superior rotor stability

Optimal rotor stability was achieved by enlarging the shaft diameter. Longer supporting surfaces around the throttle gap yield clearance gap widths that contribute to permanently high efficiency. The long throttle gaps act like bearings, thus exerting a positive influence on stability. For pumps with numerous stages, the casing is modified to match the rotor's deflection line.

Hydraulic balancing precludes axial-thrust problems



Hydraulic balancing devices compensate for axial thrust. Depending on the pump design and the user's individual requirements, balancing is attended to by a disk, piston or double piston.

Smooth running thanks to long throttle gaps

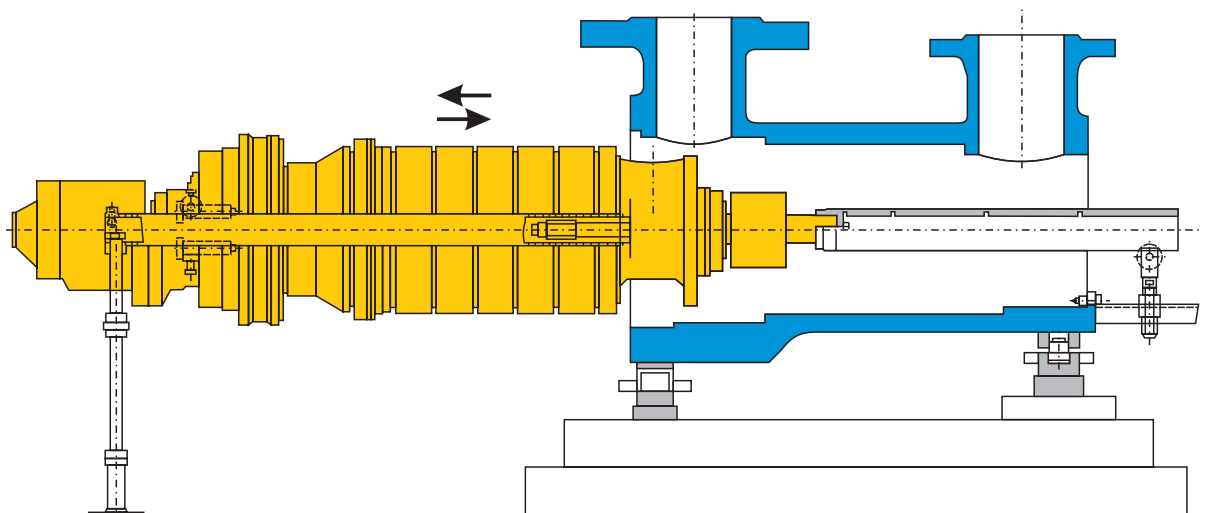
Radial forces are minimized from the very start by subjecting the rotor to dynamic balancing at operating speed. The long axial-flow throttle gaps provide added damping for any residual radial forces.

Custom connections

At the client's request, flanges are provided according to ANSI, DIN or BS. Last but not least, there are numerous possible nozzle orientations.

Stable impeller seat

Thanks to their extra-long hubs, impellers stay firmly seated despite changes in operating temperature.

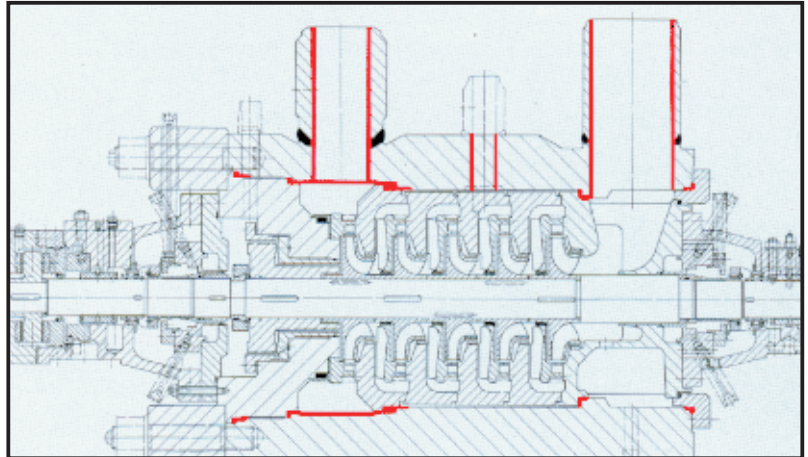


Made to meet all plant-specific requirements

Cladding prevents mechanical wear

In large feed pumps, high fluid velocities may promote corrosion and erosion particularly bleed stages and discharge nozzles. The pump casing, made of tough forged carbon steel, is provided with a cladding at there vulnerable points. In our highly qualified welding shop, automatic welding machines apply high-alloy corrosion resistant material.

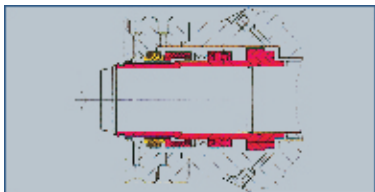
KSB units of this type have already logged more than 100,000 trouble-free operating hours.



Long-lasting reliability

Reliable seals make for long service lives

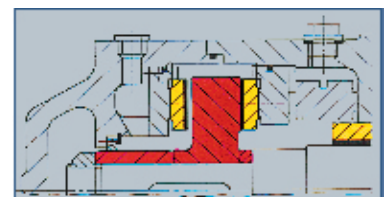
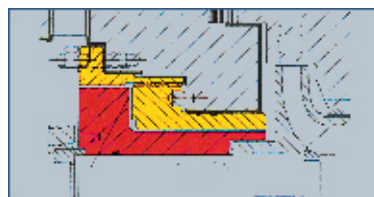
KSB has lots of experience in the industrial use of seals. That experience proved very valuable in designing the HG pump series. Depending on the case requirements, soft-packed stuffing boxes, single-acting or double-acting mechanical seals are used. KSB employs only wear-resistant seal ring materials in combination with cooling, sealing and flushing systems - appropriate to the operating conditions - to ensure maximum longevity.



No longer worry about axial thrust

The in-line configuration of pump stages produces an axial thrust acting on the pump rotor. The thrust, which varies with the pressure developed by the pump, is largely compensated by the highly effective stepped piston balancing device. A forced oil lubricated segmental thrust bearing absorbs the residual axial thrust during normal operating conditions and in particular during off-design conditions thus guaranteeing proper axial rotor positioning.

Forced-oil lubricated plain bearings and segmental thrust bearings provide the necessary rotor support and damping under all operating conditions. Equal load distribution on the thrust bearing is assured by equalizing ring compensating for misalignment tolerances between the rotor and stator.



Durable materials

KSB has available a board spectrum of materials satisfying national and international standards. In addition KSB material laboratories turn our ever-better materials for pump applications. Even for the most stringent requirements, an array of materials can provide solutions to meet most demanding requirements.

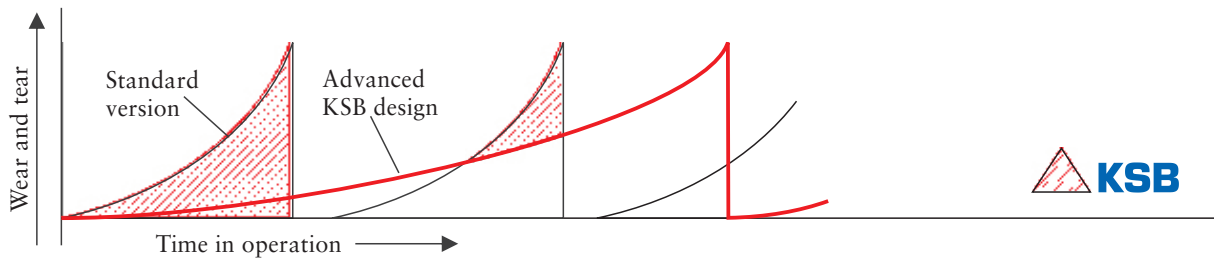
Built for maximum service life and minimum inspection effort

Robust design, well-conceived details, easy replacement of expendables, and generous wear allowances : all that and more comes naturally to KSB-built pumps. They are known for an extra measure of reliability and optimal emergency running characteristics.

Short downtime for overhaul and inspection

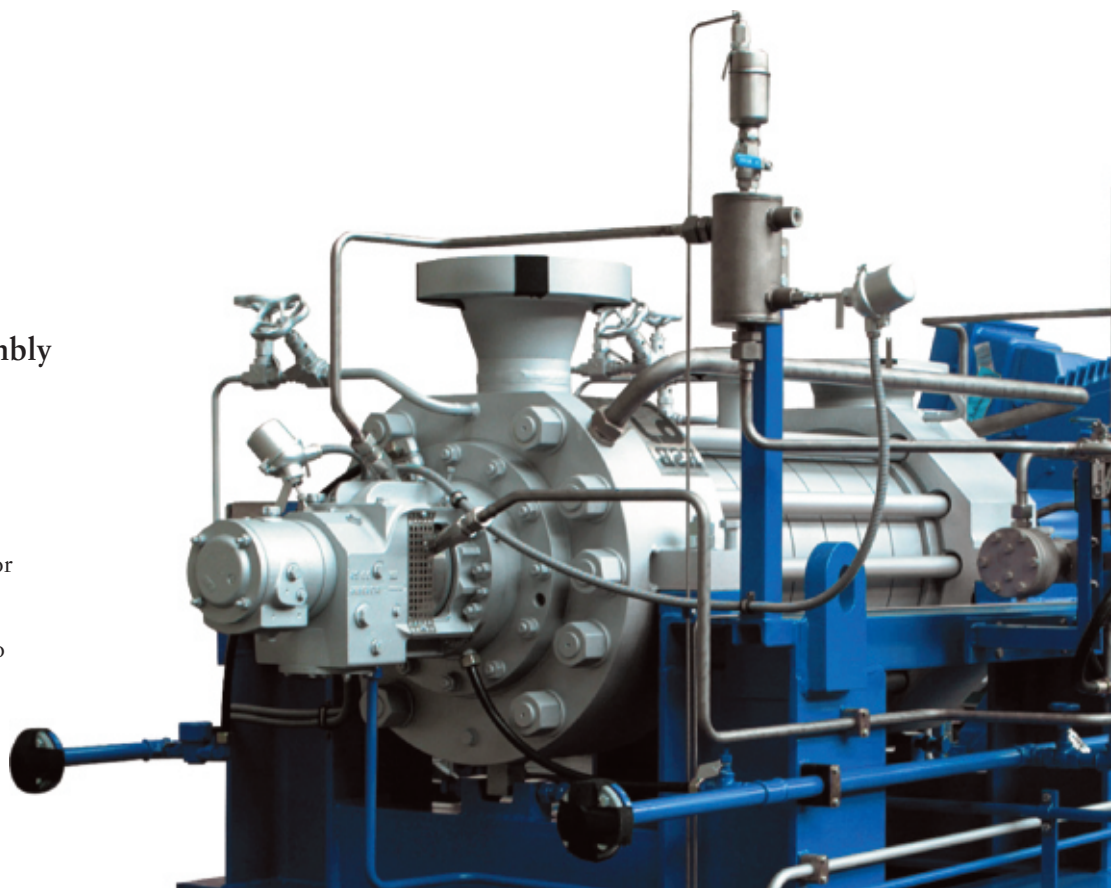
Downtime is expensive. Consequently, the bearings and seals of KSB pumps can be replaced

- and the balancing device inspected
 - without having to dismantle the entire pump. the inspection intervals can be accommodated to the plant's inspection schedule with no problem.
- Considering how many variants there are to choose from, it is astounding how few spare parts are needed ; a very special advantage for the user spare-parts organization.



Easy servicing fast assembly

A principal feature of KSB's second generation barrel-type pump is their quick-assembly, design, allowing replacement of seals, bearings and balancing device without having to disassemble the pump casing. For major inspections the complete cartridge, including bearing and seals, can be replaced in just two shifts without need for disturbing the casing and feed-water piping nor disturb motor alignment.



KSB Pumps and Valves - We are where you are

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Power Projects Division
D-II Block, MIDC Chinchwad,
Pune - 411 019.
Tel.: 020-2740 9100 Fax : 020-2747 0890

Coimbatore :
Valves Division
151, Mettupalayam Road,
NSN Palayam Post,
Coimbatore - 641 031.
Tel.: 0422-246 8222, 246 8547-9
Fax : 0422-246 8232

Sinnar :
Water Pumps Division
Plot No. E-3 & E-4, MIDC Sinnar,
Nashik - 422 103.
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Fax : 02551-230254

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Foundry Division
Vambori, Ahmednagar - 413 704.
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Branch Offices :

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Bareilly - 243 122.
Tel.: 0581-230 4540 Fax : 0581-230 0748

Baroda :
4-B, Ramkrishna Chamber,
Productivity Road, Baroda - 390 005.
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Bhubaneswar - 751 013, Orissa.
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10, Rajbhawan Road, Civil Lines,
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UG-4, Gangotri House, 'Q' Road,
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Fax : 0657-231 7128

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309, Chintels House, 16, Station Road,
Lucknow - 226 001.
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126, Maker Chambers III, Nariman Point,
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