

Real power comes from ideas



We've got **what it takes**

Think, plan and act ahead. Sustainability means doing business with a permanent eye to the future. That is particularly important in an area as dependent on natural resources as the energy sector. Global energy demands continue to rise. Energy suppliers need to meet them reliably and economically, while also protecting the environment. We are here to help with all-in solutions for efficient fossil-fuelled thermal power plants.

Operators use our pumps, valves, actuators and automation products across all primary and secondary processes in more than 1,000 power stations. KSB products help you manage boiler feed water, condensate and cooling water systems. Around the world, more than 170,000 of our pumps and some three million valves are already in action helping to generate energy.

KSB has been serving customers with innovative solutions for more than 140 years. Our know-how and experience across a wide spectrum of pump and valve technology make us the ideal partner for the consultants, plant engineering contractors and operators of high-performance power stations. Our ability to identify synergies and implement them in economical, all-in solutions has made us one of the leading specialists worldwide; one that knows all the ins and outs of the business. Quality is part of the company's philosophy. We develop materials, run our own international manufacturing network, and put our products through their paces on KSB test facilities. And every one of our 16,000 employees worldwide is committed to customer service. All our energy means more energy for all.





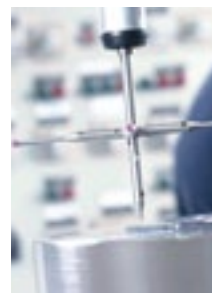
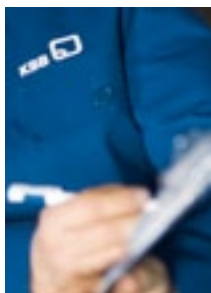
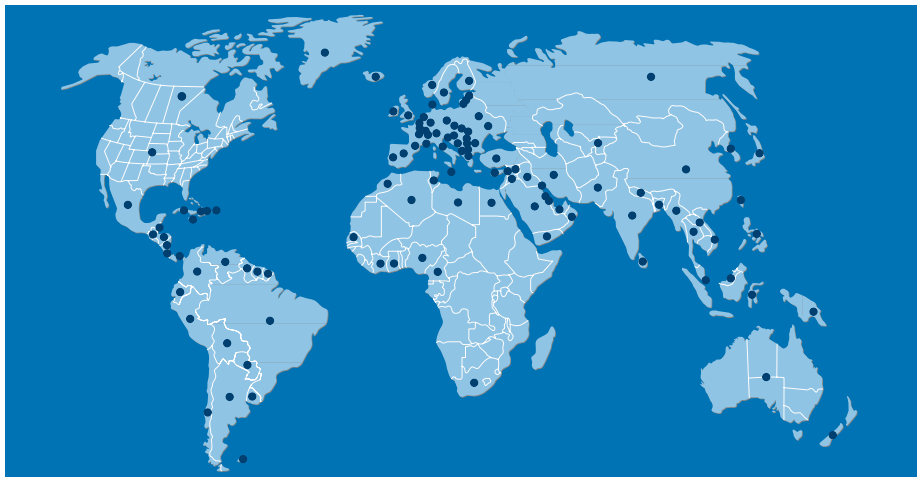
Performance from the start

To focus on detail, one has to see the bigger picture. So KSB provides solutions, not isolated products: solutions that we personally take from idea to implementation.

We listen to exactly what our customers want – the operators of large thermal power stations, for example. Then our engineers design the best pumps, valves, actuators and systems to ensure the facilities' reliability, day in, day out. Made from materials we have developed ourselves, ideally suited to the media to be handled.

For us, comprehensive consultation is crucial, particularly when the challenges are as complex as those in the energy sector. Customer dialogue enables us to match products' technical parameters exactly to the application in hand. We supply all the engineering to your specifications for every unit and system. We partner with you through the project phase to commissioning. And we are still on hand when everything is up and running. With more than 2,600 specialists in 160 service centres around the world, there is always one near you.

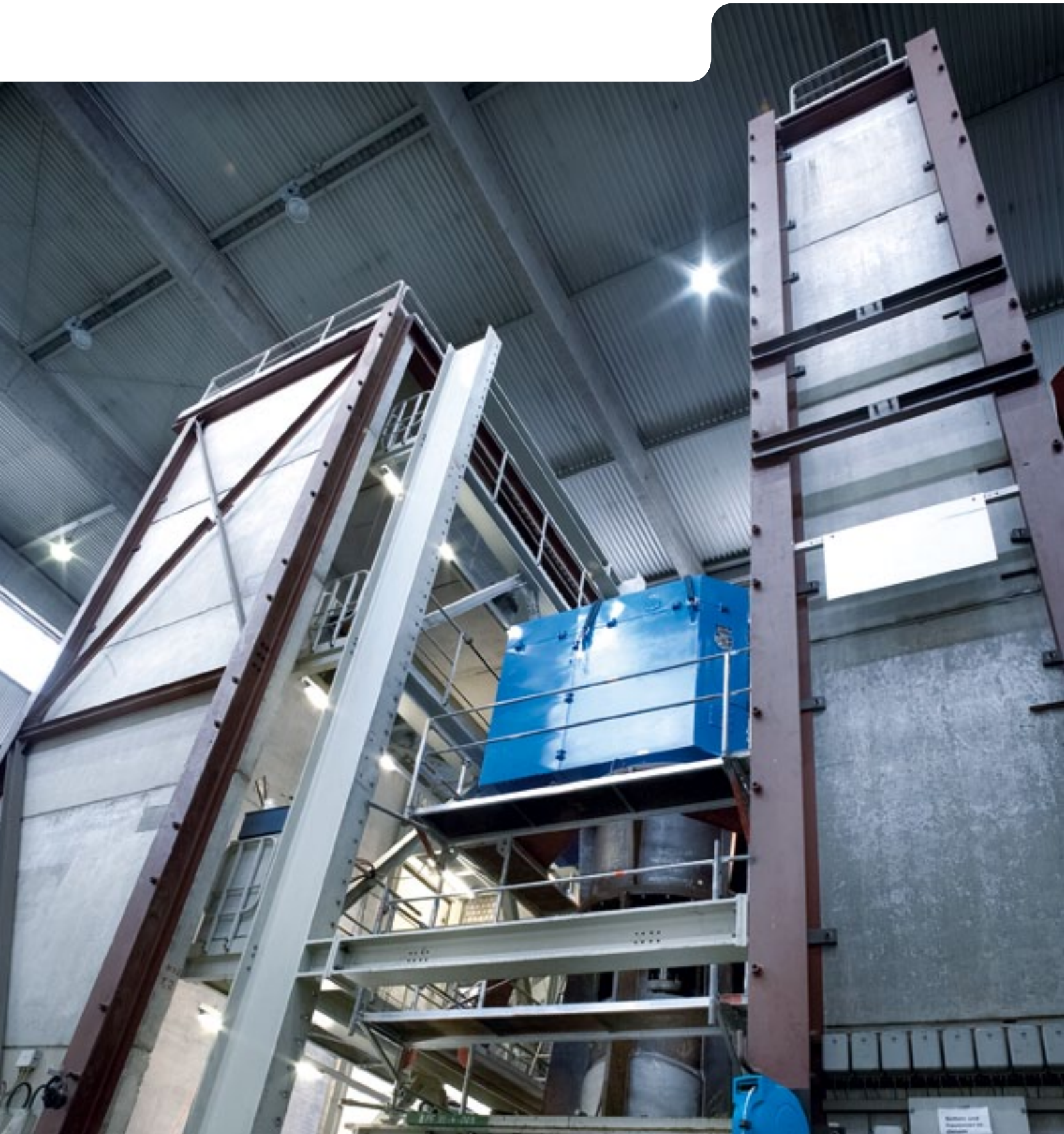
KSB provides it all: research, development, consulting, project implementation and service, plus our experience and innovation, and the ability to understand systems while studying every detail. We provide performance from the start. It is the yardstick we set for ourselves, and the promise we give our customers.





For the energy of the **future**

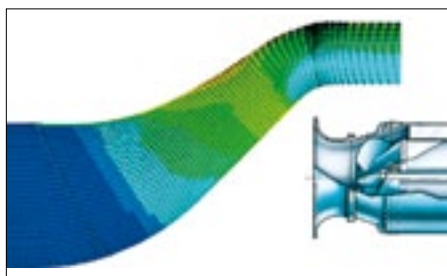
Today's power stations generate energy tomorrow's way.
Thanks to KSB technology.



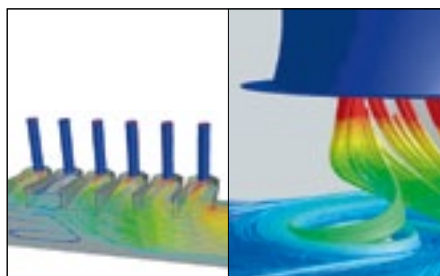
Designing power stations for tomorrow's world puts high demands on the equipment. High-performance drive solutions need ever-increasing efficiency, remarkable operating reliability and low life cycle costs. Our pumps and valves evolve with our customers' demands and requests. Over the past 50 years, the input power of our centrifugal pumps has risen to 40,000 kW, the discharge pressure to 400 bar and the stage pressure to 100 bar.

We invest more than € 45 million every year in research and development, in the latest simulation programs, company test beds and related facilities. Sophisticated power station equipment needs to meet the highest safety standards. Our development engineers work closely with customers throughout the development phase. Together they integrate stability and seismic calculations as well as sound and frequency analyses into the plans. And before a product leaves a KSB site, we test it under realistic conditions on a test facility for cooling water pumps, for example, that can simulate all the operating points specified.

Calculated 3D flow pattern for an impeller. KSB developers analyse these models for maximum hydraulic efficiency



Analysing the approach flow conditions for intake chambers with strong cross flow enables engineers to include the ideal internals. So the pumps keep running, smoothly and reliably



Test facility for cooling water pumps



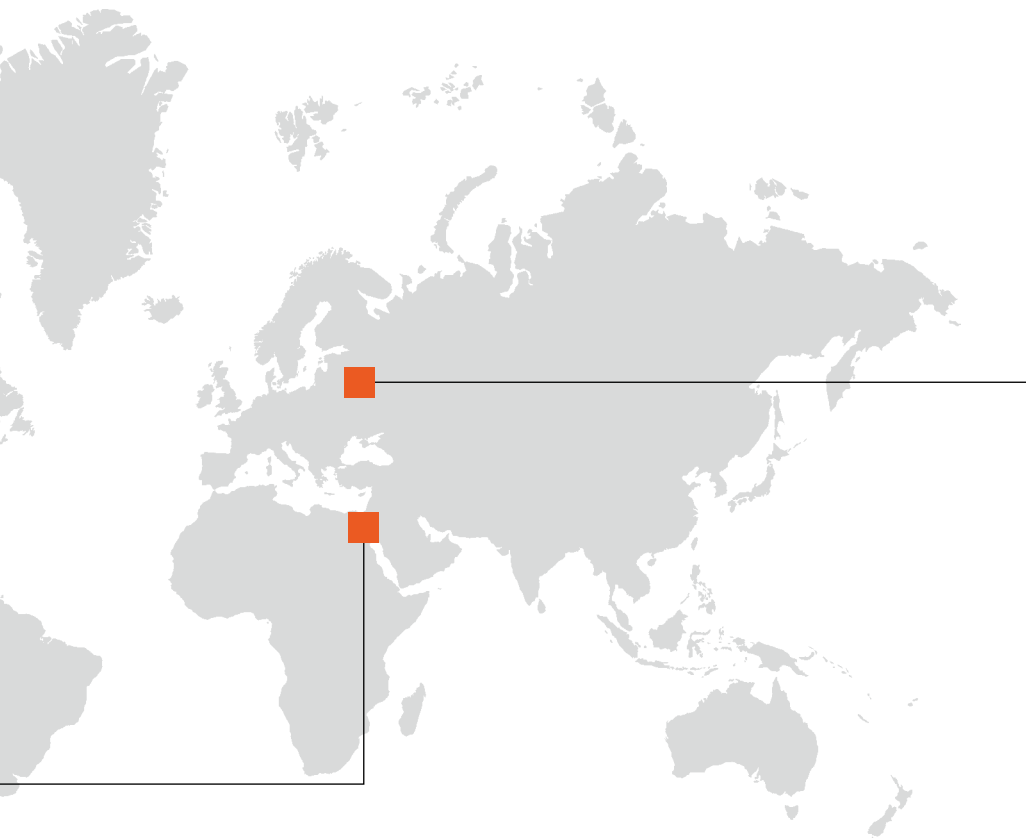
Impressing engineers **internationally**

Our pumps and valves keep power stations running on every continent. Customers choose KSB for many reasons. For example, we meet the highest safety requirements, enable economical operations, and provide comprehensive, on-site service.

Gulf of Suez and East Port Said / Egypt, gas-fired power stations

Gulf of Suez and East Port Said are two very similar Egyptian power stations that came on line in 2003. Our pumps and valves keep all their key processes moving. We supplied CHTC boiler feed pumps, SEZA cooling water pumps, WKTA condensate pumps and more than 500 butterfly valves. Professional planning and implementation, precisely on schedule, ensured an ideal cost-benefit ratio. We kept a close eye on every step in installation of the complete feed water circuit. That included aligning the units with ultra-modern laser technology, checking the measuring equipment and staging all the test runs. We also supervised the commissioning, and our engineers carefully trained the teams from both power stations on-site.





Kostromskaya Gres, Kostroma / Russia, gas-fired power station

Kostromskaya Gres houses the world's largest gas-fired power station unit, with an output of 1,200 MW. KSB pumps ensure that both it and the other eight 300 MW units keep running smoothly. In 2002, we replaced older Russian models in the 1,200 MW unit with three cartridges from CHTD boiler feed pumps. As well as the very high pressures involved, we also faced the challenge of fitting all the cartridges precisely to the Russian

casings. Thanks to KSB, the pumps are now highly efficient, need fewer inspections and are enjoying a new lease of life. That performance, plus our specialists' skills and knowhow, left a strong impression on Kostromskaya Gres management. At the end of 2005, KSB received a follow-up order for ten boiler feed pump cartridges for the 300 MW units.

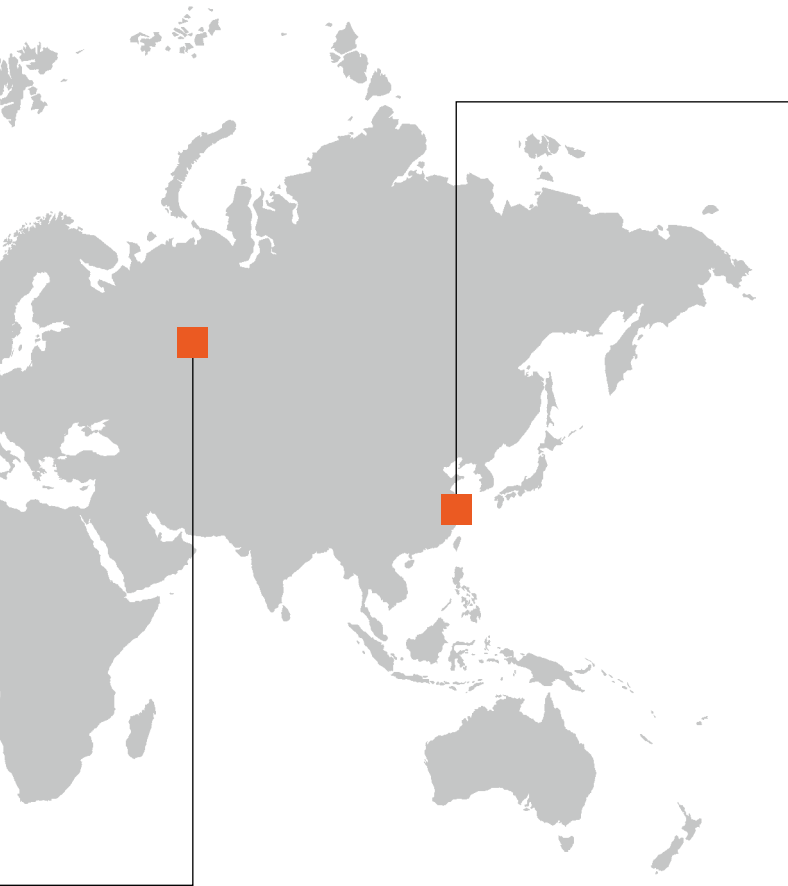


Permskaya Gres / Russia, gas-fired power station

Permskaya Gres started generating in 1986. Its three 800 MW units made it one of Europe's largest power stations, and the principal supplier for the whole Urals region. By the late 1990's, however, leakages, heavy vibrations and sealing liquid losses of the shaft seals were significantly reducing output. To guarantee electricity supply, the original Soviet boiler feed and booster pumps needed a complete refit.

In 1999, KSB supplied six state-of-the-art cartridges for boiler feed pumps, two spare cartridges and six booster pumps. Our service specialists supervised installation and commissioning. The equipment enabled the systems to operate smoothly and reliably. This has made a decisive improvement to power station availability and efficiency and, hence, economic efficiency.





Wai Gao Qiao, Shanghai/China, coal-fired power station

Visit the Pudong District of Shanghai, and you will see one of China's largest coal-fired power stations. Wai Gao Qiao marks a milestone in Chinese power station construction. Commissioned in 2003 and 2004, the two 900 MW units have run without a hitch from the word 'go'. And they have set new yardsticks for efficiency, reliability and economical operation. Overall system efficiency is more than 42 %.

Our SEZA cooling water pumps, CHTC motor-driven start-up boiler feed pumps and CHTD turbine-driven boiler feed pumps ensure efficient power generation. We also supplied the entire valve package for the feed water system. KSB also met a special requirement: the large-sized valves have to withstand pressures of 601 bar and temperatures of up to 207 °C. Our service engineers quarterly inspect all the products fitted.



Generating gains for **Germany**

Heyden / Germany, coal-fired power station

Heyden coal-fired power station went into operation in 1986 at 760 MW. Today it generates 865 MW. To achieve the new operating parameters, the operators increased the speed of the boiler feed pump. That required retrofitting the pump, including a change in design. Successful modifications reduced the vibrations, improved availability and markedly increased reliability. Innovative KSB technology thus helped reduce Heyden's operating costs by a significant margin.





BoA Niederaussem / Germany, lignite-fired power station

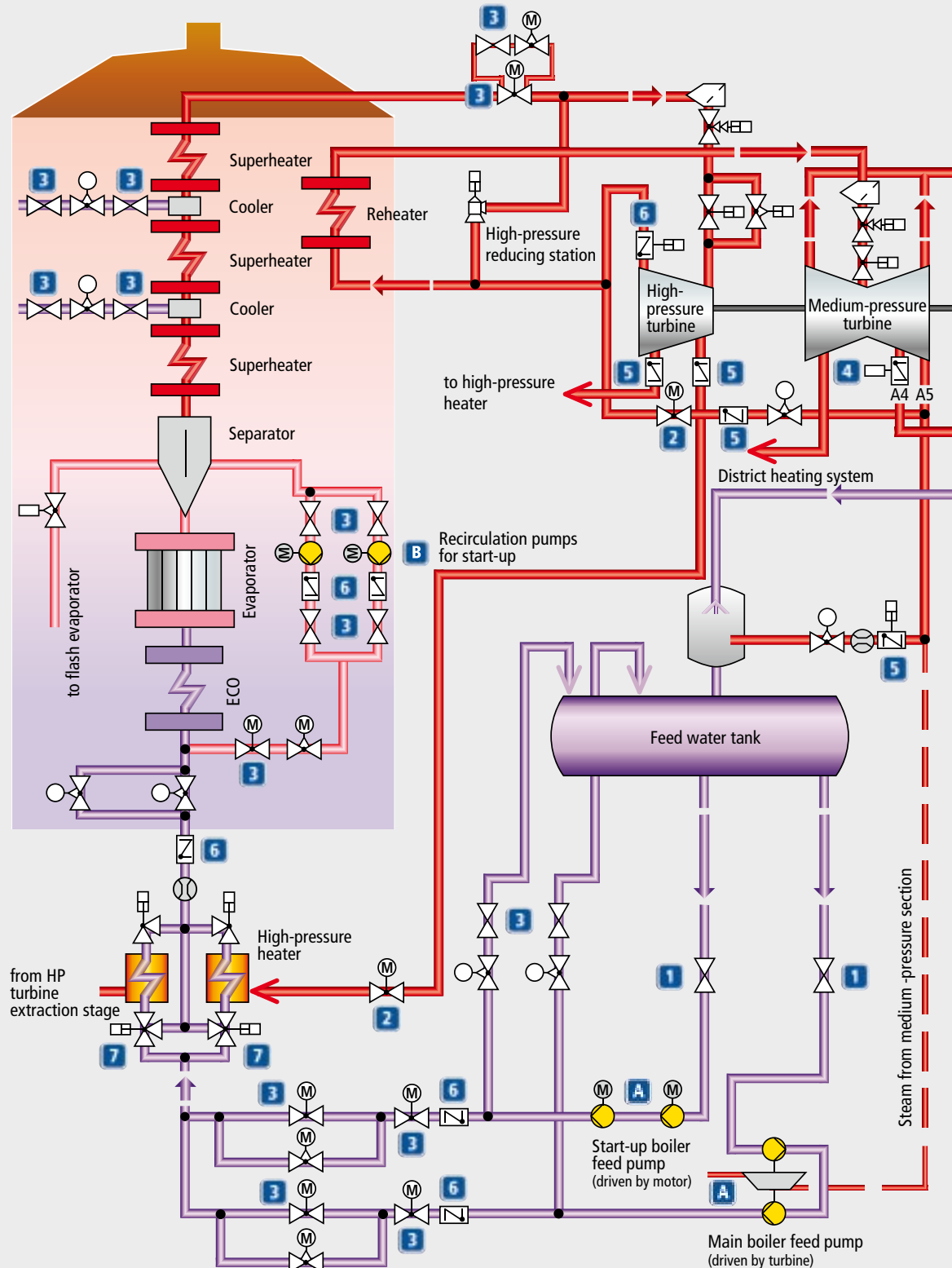
The largest CHTA boiler feed pump ever built by KSB has been in action at the Niederaussem lignite-fired power station since 2002. The full-load pump set is designed for 30 years' operation with above-average efficiency and maximum availability. Optimised plant engineering ensures a high economic efficiency and a considerable reduction in life cycle costs (LCC). As well as the high-performance 40 MW CHTA and its booster pump, Niederaussem uses an LUV boiler recirculation pump and more than 50 other KSB Amarex, CPK, Eta and Multitec pumps.

The power station also employs numerous NORI, ZTS and ZXSSVA high-pressure valves and the SISTO low-pressure diaphragm valves. The commissioning team tracked operating data through the entire commissioning phase. This ensured a faultless start to the feed pump unit's service life. Our experienced plant service specialists planned every step of the installation and kept the project on schedule. That kept costs low and safety high throughout construction and commissioning.



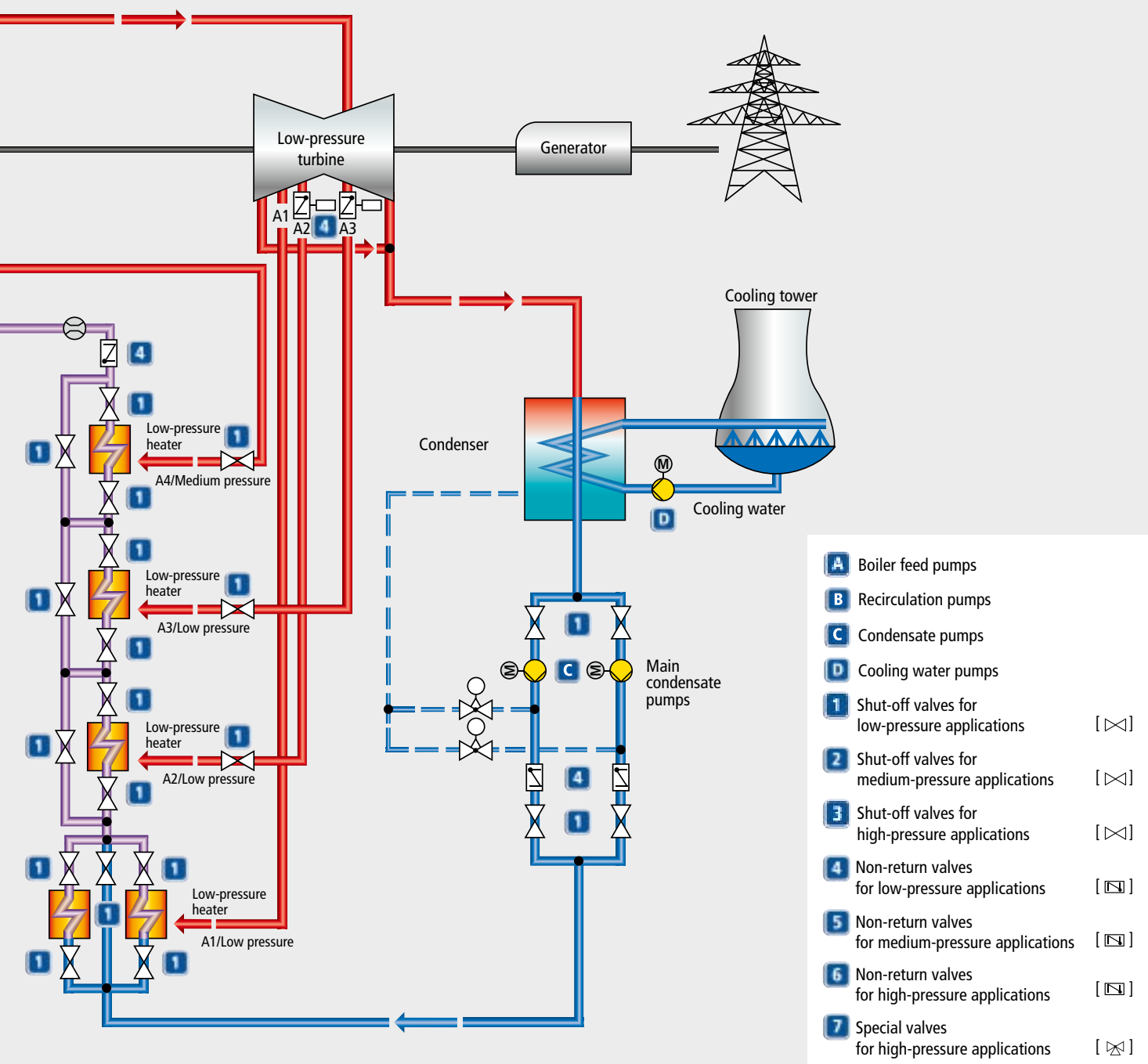
Where the **action** is

Our pumps and valves feature in all the primary and secondary processes of thermal power stations – like the handling and circulation of boiler feed water, condensate and cooling water. They ensure reliability, safety and absolute precision, coupled with



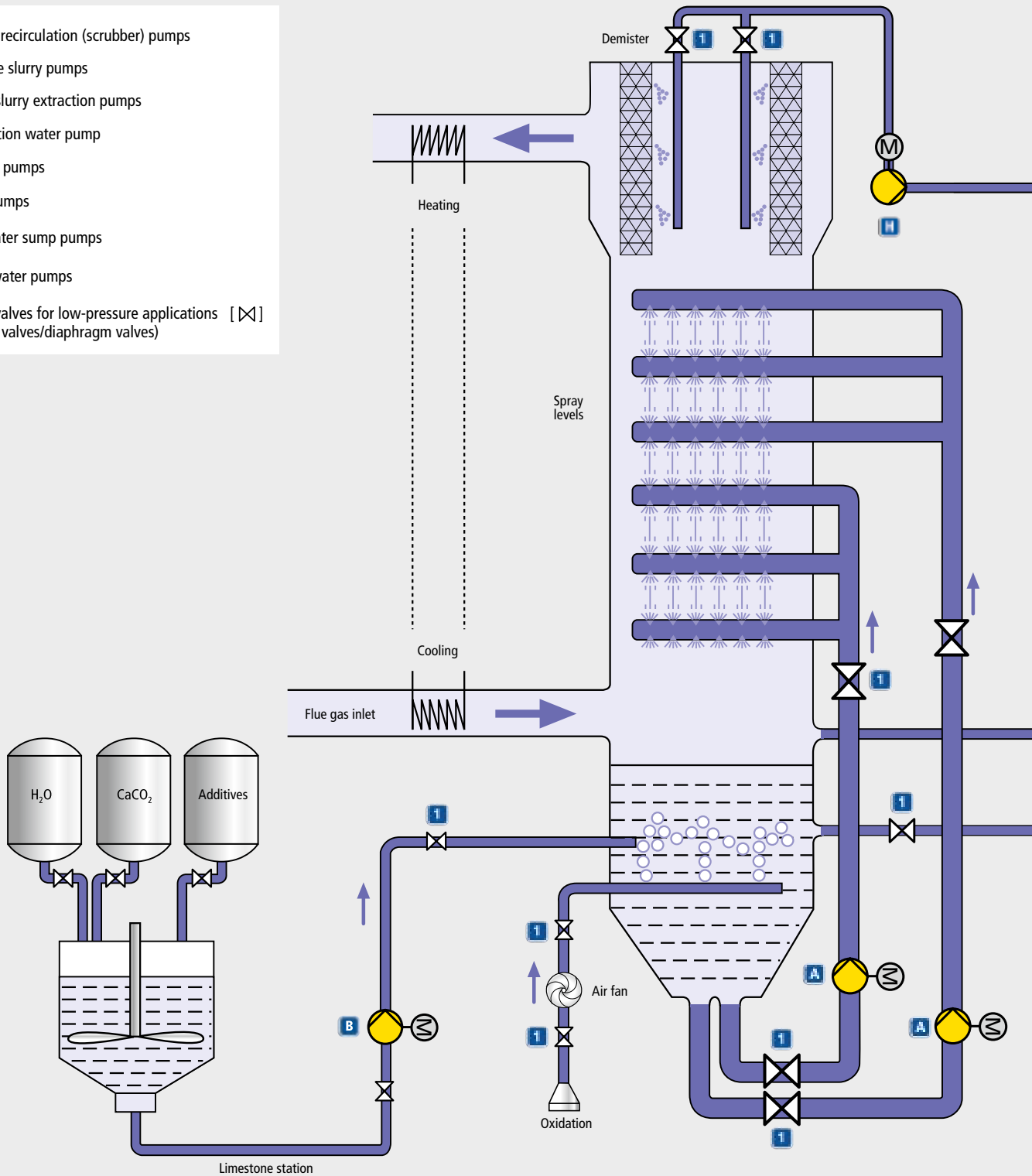
unbeatable economic efficiency. Modern steam power stations are highly efficient. KSB pumps play a major role and cut operators' energy bills significantly.

Steam power station circuit

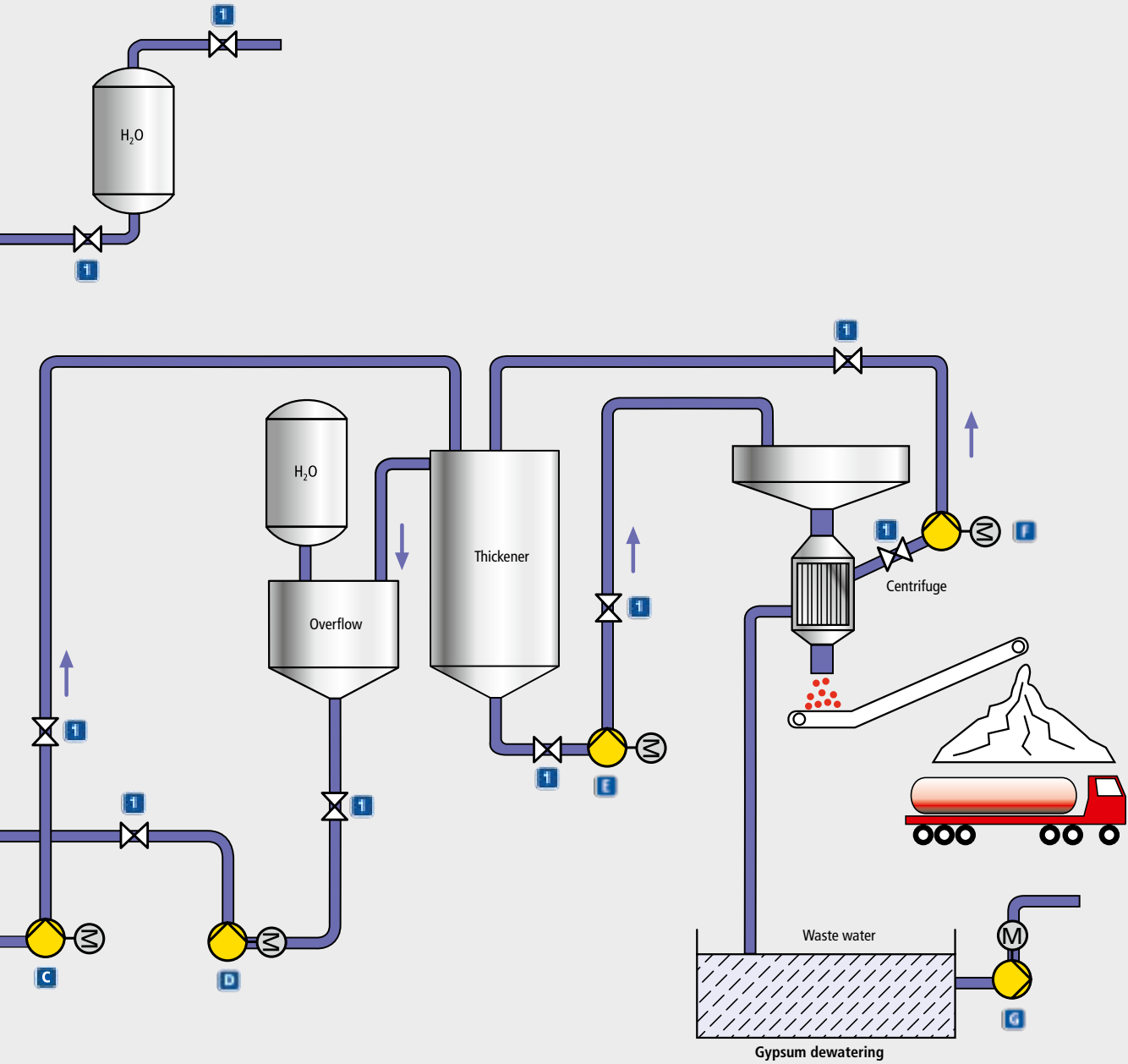


Today's desulphurisation technology removes more than 95% of pollutants from flue gas before their release into the atmosphere. Our pumps are in demand across the full range of primary and secondary desulphurisation processes. To ensure maximum operating reliability, we manufacture them from specially developed anticorrosive and wearresistant materials.

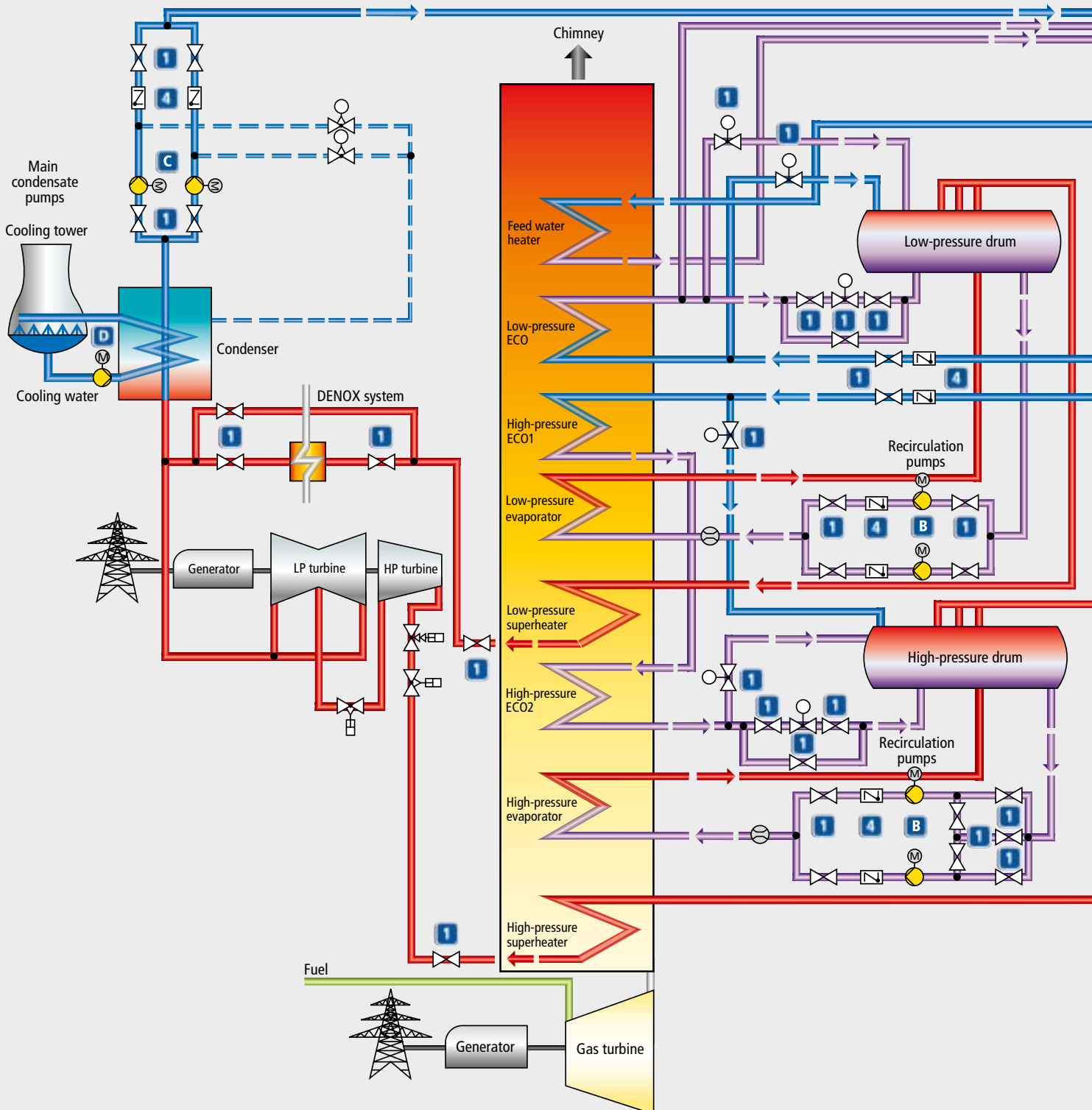
- A** Absorber recirculation (scrubber) pumps
- B** Limestone slurry pumps
- C** Gypsum slurry extraction pumps
- D** Recirculation water pump
- E** Thickener pumps
- F** Filtrate pumps
- G** Waste water sump pumps
- H** Process water pumps
- I** Shut-off valves for low-pressure applications [X] (butterfly valves/diaphragm valves)



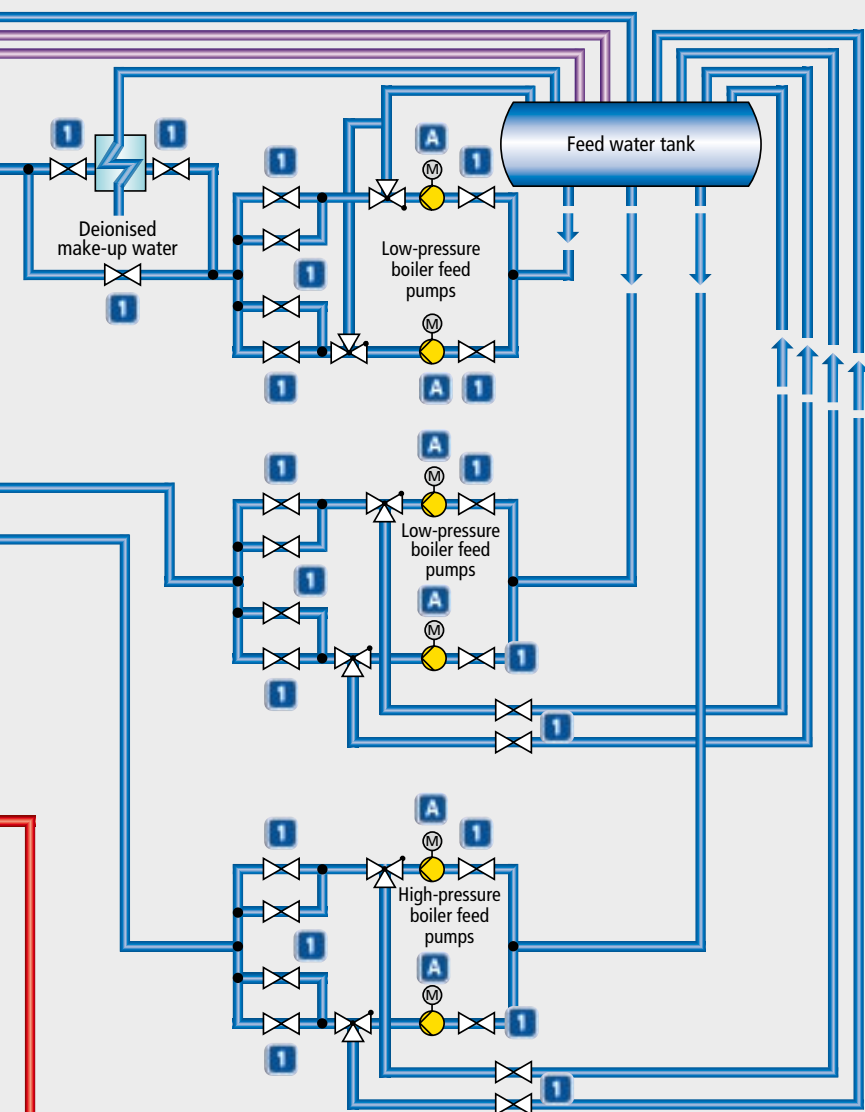
Flue gas desulphurisation circuit



Combined cycle power stations are quick to build, extremely efficient and release only limited amounts of CO₂. Our pumps and valves ensure smooth and highly economical operation.



Combined cycle power station circuit



- A Boiler feed pumps
- B Recirculation pumps
- C Condensate pumps
- D Cooling water pumps
- 1 Shut-off valves for low-pressure applications []
- 4 Non-return valves for low-pressure applications []



The choice is all yours

New construction or modernisation. All-in solution or individual service. Pumps, valves or systems. We gear our extraordinarily flexible product range to the special demands of high-performance power stations.



	Pumps for steam power stations	Pumps for combined cycle power stations
Boiler feed pumps	Barrel-type pumps	CHTC/CHTD
	Ring-section pumps	HGC/HGD
	Booster pumps	YNK
Boiler recirculation pump	LUV	LUV
Condensate pumps	WKTA/WKTB	WKTA/WKTB
Cooling water pumps	SEZ/SEZT/PHZ/PN SNW/PNW	SEZ/PHZ/PNZ SNW/PNW RDLO
Auxiliary pumps	Omega Amarex KRT KWP HPK HPH RPH MegaCPK SPY Multitec	Omega Amarex KRT KWP HPK HPH RPH MegaCPK SPY Multitec
Pumps for flue gas desulphurisation	KWPK FGD LCC	

Pumps for efficient operation

CHTC/CHTD Boiler feed pump



DN	100–500
Q [m ³ /h]	max. 3,700
H [m]	max. 5,300
p [bar]	max. 560
T [°C]	max. +210
n [min ⁻¹]	max. 6,750

Data for 50 Hz operation,
higher values available upon request.

Design: Horizontal, high-pressure barrel-type pump with radial impellers, single- and double-entry, multistage, with flanges / weld end nozzles to DIN and ANSI.

Applications: Handling of feed water and condensate in power stations and industrial facilities, generation of pressurised water for bark peeling machines and descaling equipment.

also available in 60 Hz

HGC®/HGD Boiler feed pump



DN	40–400
Q [m ³ /h]	max. 2,300
H [m]	max. 5,300
p [bar]	max. 560
T [°C]	max. +210
n [min ⁻¹]	max. 7,000

Data for 50 Hz operation,
higher values available upon request.

Design: Horizontal, radially split, multistage ring-section pump with radial impellers, single- or double-entry.

Applications: Handling of feed water and condensate in power stations and industrial facilities, generation of pressurised water for bark peeling machines, descaling equipment, snow guns, etc.

also available in 60 Hz

HGM® Boiler feed pump



DN	25–100
Q [m ³ /h]	max. 274
H [m]	max. 1,400
p [bar]	max. 140
T [°C]	max. +160
n [min ⁻¹]	max. 3,600

Data for 50 Hz operation,
higher values available upon request.

Design: Horizontal, radially split, product-lubricated, multistage ring-section pump with radial impellers, axial and radial single-entry inlet.

Applications: Handling of feed water in power stations, boiler feed water and condensate in industrial facilities.

also available in 60 Hz

YNK Boiler feed booster pump



DN	125–600
Q [m ³ /h]	max. 3,700
H [m]	max. 280
p [bar]	max. 40
T [°C]	max. +210
n [min ⁻¹]	max. 1,800

Data for 50 Hz operation,
higher values available upon request.

Design: Horizontal, radially split, single-stage, double-entry boiler feed booster pump (booster system) with single or double cast steel volute casing.

Applications: Handling of feed water in power stations and industrial facilities.

also available in 60 Hz

LUV® Boiler recirculation pump



DN	100–550
Q [m³/h]	max. 7,000
H [m]	max. 300
p [bar]	max. 350
T [°C]	max. +380
n [min⁻¹]	max. 3,600

Higher values available upon request.

Design: Vertical spherical casing pump, radial impellers, single-entry, single- to three-stage. Suitable for very high inlet pressures and temperatures. Integrated wet winding motor to VDE. Product-lubricated bearings, no need for oil supply systems. Design to TRD or ASME.

Applications: Hot water recirculation in forced-circulation, forced-flow and combined-circulation boilers for very high pressures and in solar power towers.

available in 50 Hz and 60 Hz

WKTA / WKTB Condensate pump



DN	150–300
Q [m³/h]	max. 3,100
H [m]	max. 370
p [bar]	max. 40
T [°C]	max. +100
n [min⁻¹]	max. 1,800

Data for 60 Hz operation,
higher values available upon request.

Design: Vertical can-type ring-section pump. Radial and mixed flow impellers, multistage. Single-entry and double-entry suction impellers. Flanges to DIN or ANSI. Also available in re-entry design.

Applications: For handling condensate in power stations and industrial systems.

available in 60 Hz

SEZ® / SEZT / PHZ / PNZ Cooling water pump



Q [m³/h]	max. 80,000
H [m]	max. 120
p [bar]	max. 16
T [°C]	max. +40
n [min⁻¹]	max. 980

Data for 50 Hz operation,
higher values available upon request.

Design: Vertical tubular casing pump with open mixed flow impeller (SEZ), mixed flow propeller (PHZ) or axial propeller (PNZ). Pump inlet with bellmouth or suction elbow, pull-out design available, discharge nozzle arranged above or below floor, flanges to DIN or ANSI standards available. With maintenance-free Residur shaft bearings.

Applications: Handling of raw, pure, service and cooling water in industry, water supply systems, in power stations and seawater desalination plants.

available in 50 Hz and 60 Hz

SNW / PNW Cooling water pump



DN	350–800
Q [m³/h]	max. 9,000
H [m]	max. 50
p [bar]	max. 10
T [°C]	max. +60
n [min⁻¹]	max. 1,500

Data for 50 Hz operation,
higher values available upon request.

Design: Vertical tubular casing pump with mixed flow impeller (SNW) or axial propeller (PNW), single-stage, with maintenance-free Residur shaft bearings, discharge nozzle arranged above or below floor.

Applications: Irrigation and drainage systems, stormwater pumping stations, handling of raw and pure water, water supply systems, handling of cooling water.

available in 50 Hz and 60 Hz

RDLO Cooling water pump



DN	350–700
Q [m³/h]	max. 10,000
H [m]	max. 240
p [bar]	max. 25
T [°C]	max. +80
n [min⁻¹]	max. 1,500

Data for 50 Hz operation,
higher values available upon request.

Design: Single-stage, axially split volute casing pump for horizontal or vertical installation with double-entry radial impeller, mating flanges to DIN EN or ASME.

Applications: For handling water with a low solids content, e.g. in water-works, irrigation and drainage pumping stations, desalination systems for water extraction, power plants, fire-fighting systems, shipbuilding, district heating / cooling.

Hyamaster

also available in 60 Hz, also suitable for 60 Hz operation

Omega® Auxiliary pump



DN	80–350
Q [m³/h]	max. 2,880
H [m]	max. 210
p [bar]	max. 25
T [°C]	max. +80
n [min⁻¹]	max. 2,900

Data for 50 Hz operation,
higher values available upon request.

Design: Single-stage, axially split volute casing pump for horizontal or vertical installation, with double-entry radial impeller, mating flanges to DIN EN or ASME.

Applications: For handling water with a low solids content, e.g. in water-works, irrigation and drainage pumping stations, desalination systems for water extraction, power plants, fire-fighting systems, shipbuilding, district heating / cooling.

Hyamaster • PumpMeter

also available in 60 Hz, also suitable for 60 Hz operation

Amarex® KRT® Auxiliary pump



DN	40–700
Q [m³/h]	max. 10,080
H [m]	max. 120
T [°C]	max. +60
n [min⁻¹]	max. 2,900

Data for 50 Hz operation.

Design: Vertical, single-stage, submersible motor pump in close-coupled design, various impeller types, for wet or dry installation, stationary and transportable version. ATEX-compliant version available.

Applications: Handling of all types of abrasive or aggressive waste water in water and waste water engineering as well as industry, especially untreated sewage containing long fibres and solid substances, fluids containing gas / air, as well as raw, activated and digested sludge; sea water desalination.

PumpDrive • Hyamaster • Amacontrol • Switchgears • LevelControl

also available in 60 Hz

KWP® / KWP®-Bloc Auxiliary pump



DN	40–900 (1,000)
Q [m³/h]	max. 15,000 (18,000)
H [m]	max. 100
p [bar]	max. 10
T [°C]	–40 to +120 (max. +280)
n [min⁻¹]	max. 2,900

Data for 50 Hz operation.

Design: Horizontal, radially split volute casing pump in back pull-out or close-coupled design, single-stage, single-entry, available with various impeller types: non-clogging impeller, open multi-vane impeller, free-flow impeller. ATEX-compliant version available.

Applications: Handling of pre-treated sewage, waste water, all types of slurries without stringy substances and pulps up to 5 % bone dry.

Hyamaster

also available in 60 Hz

HPK[®]-L Auxiliary pump



DN	25–250
Q [m ³ /h]	max. 1,330
H [m]	max. 155
p [bar]	max. 40
T [°C]	max. +240 / +400

Data for 50 Hz operation.

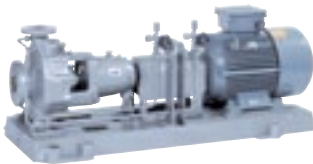
Design: Horizontal, radially split volute casing pump in back pull-out design to EN 22 858 / ISO 2858 / ISO 5199, single-stage, single-entry, with radial impeller. Equipped with heat barrier, seal chamber air-cooled by integrated fan impeller, no external cooling. ATEX-compliant version available.

Applications: Handling of hot water and thermal oil in piping or tank systems, particularly in medium-sized and large hot water heating systems, forced circulation boilers, district heating systems, etc.

PumpDrive • Hyamaster

also available in 60 Hz

HPK[®] Auxiliary pump



DN	150–400
Q [m ³ /h]	max. 4,150
H [m]	max. 185
p [bar]	max. 40
T [°C]	max. +400

Data for 50 Hz operation.

Design: Horizontal, radially split volute casing pump in back pull-out design to EN 22 858 / ISO 2858 / ISO 5199, single-stage, single-entry, with radial impeller. TÜV certification to TRD on option. ATEX-compliant version available.

Applications: Handling of hot water and thermal oil in piping or tank systems, particularly in medium-sized and large hot water heating systems, forced circulation boilers, district heating systems, etc.

PumpDrive • Hyamaster

also available in 60 Hz

HPH[®] Auxiliary pump



DN	40–350
Q [m ³ /h]	max. 2,350
H [m]	max. 225
p [bar]	max. 110
T [°C]	max. +320

Data for 50 Hz operation.

Design: Horizontal, radially split volute casing pump in back pull-out design, single-stage, single-entry, with centreline pump feet and radial impeller. TÜV certification to TRD on option. ATEX-compliant version available.

Applications: Handling of hot water in high-pressure hot water generation plants and for use as boiler feed and recirculation pump.

Hyamaster

also available in 60 Hz

MegaCPK Auxiliary pump



DN	25–250
Q [m ³ /h]	max. 1,160
H [m]	max. 162
p [bar]	max. 25
T [°C]	max. +400

Data for 50 Hz operation.

Design: Horizontal, radially split volute casing pump in back pull-out design to EN 22 858 / ISO 2858 / ISO 5199, single-stage, single-entry, with radial impeller. Also available as variant with 'wet' shaft. ATEX-compliant version available.

Applications: Handling of aggressive liquids in the chemical and petrochemical industries as well as in refinery.

PumpMeter • PumpDrive

also available in 60 Hz

SPY® Auxiliary pump



DN	350–1,200
Q [m³/h]	max. 21,600
H [m]	max. 50
p [bar]	max. 10
T [°C]	max. +105
n [min⁻¹]	max. 1,480

Data for 50 Hz operation,
higher values available upon request.

Design: Long-coupled, single-stage volute casing pump in back pull-out design.

Applications: Drainage, irrigation and water supply systems, handling of condensate, cooling water, service water, etc.

also available in 60 Hz

RPH® Auxiliary pump



DN	25–400
Q [m³/h]	max. 4,150
H [m]	max. 270
p [bar]	max. 51
T [°C]	max. +450

Data for 50 Hz operation.

Design: Horizontal, radially split volute casing pump in back pull-out design to API 610, ISO 13709 (heavy-duty), with radial impeller, single-stage, single-entry, centreline pump feet; with inducer, if required. ATEX-compliant version available.

Applications: Refineries, petrochemical and chemical industry, power stations.

also available in 60 Hz

Hyamaster

Multitec® Auxiliary pump



DN	32–150
Q [m³/h]	max. 850
H [m]	max. 630 (1,000)
p [bar]	max. 63 (100)
T [°C]	–10 to +200
n [min⁻¹]	max. 4,000

Data for 50 Hz operation,
data for 60 Hz operation.

Design: Multistage, horizontal or vertical centrifugal pump in ring-section design, long-coupled and close-coupled variant, with axial or radial suction nozzle, cast radial impellers. ATEX-compliant version available.

Applications: Water and drinking water supply systems, general industry, pressure boosting systems, irrigation systems, in power stations, heating, filter, fire-fighting, reverse osmosis and washing plants, snow guns, etc.

available in 50 Hz and 60 Hz

PumpMeter • Hyamaster • PumpDrive

KWPK DN 400-1000 Pump for flue gas desulphurisation



DN	400–900
Q [m³/h]	max. 15,000
T [°C]	max. +80

Design: Horizontal, radially split volute casing pump in back pull-out design with high-grade CeramikoPolySiC lining.

Applications: As absorber recirculation (scrubber) pump.

KWPK DN 40-350 Pump for flue gas desulphurisation



DN	max. 3,000
Q [m ³ /h]	max. 60
T [°C]	max. +120

Design: Horizontal, radially split volute casing pump in back pull-out design.

Applications: In secondary circuits as limestone slurry pump, gypsum slurry extraction pump, recirculation water pump and thickener pump.

FGD Pump for flue gas desulphurisation



Q [m ³ /h]	max. 22,700
H [m]	max. 45
p [bar]	max. 17
T [°C]	max. +120

Design: High-flow/low-head hard metal pumps with a single-wall shell design. High-efficiency impeller. Suction-side liner is equipped with integrated mounting plates.

Applications: Absorber recirculation and ancillary process pumps.

LCC-M Pump for flue gas desulphurisation



Q [m ³ /h]	max. 3,865
H [m]	max. 90
p [bar]	max. 16
T [°C]	max. +120

Design: The hydraulic wet end consists of three components: a shell or casing, an impeller and a suction plate/liner to permit easy removal for maintenance and inspections.

Applications: Reliable pumps for high discharge head, mildly corrosive slurries and a wide range of particle sizes. Used in mineral processing, mine dewatering, ash and tailings.

Valves for reliable flow shut-off

Valves face special challenges in power stations. They have to sustain high pressures and temperatures and control the flow of a wide range of liquids and gases. Whether in condensate, feed water or steam processes, meeting the prescribed parameters is essential.

KSB valves rise to every challenge. We solder all materials to DIN EN and ASME/ANSI. We make our own rubber and liners, produce diaphragms and run a company foundry – so top quality is guaranteed from the start. We use new high-temperature materials, and we team up for tests with universities and research institutes. All of which contributes to the continuous further development of our products. Innovation, the latest technology and our expertise enable us to meet all the demands of power station operators, consultants and plant engineering contractors. Every type of valve has its own advantages and limitations.

Some tasks call for globe valves, others for the gate variety. Sometimes a non-return valve is the right choice, sometimes a butterfly valve. Or diaphragm valves. Or ball valves. And if need be, we modify the standard product or manufacture special valves such as feed water bypass valves, start and stop control valves or line blind valves.



Shut-off valve





Shut-off valves

See circuits on pages 14 to 19

1 Low-pressure applications**4** PN 10–40

T up to 450 °C

[used in combined cycle power stations and steam power stations]



BOA H/HE



SICCA 150-300 GLC

STAAL 40
AKD/AKDSSICCA
150-300 GTC

NORI 40 ZXL/ZXS

NORI 40
ZXLF/ZXSF

SICCA 800 GLF



SICCA 800 GTF

2 Medium-pressure applications**5** PN 63–160

T up to 550 °C

[used in steam power stations]



NORI 160 ZXL/ZXS



SICCA 150-600 GLC

STAAL 100
AKD/AKDS

SICCA 600 GTC



SICCA 900-2500 GLC



SICCA 900 GTC



NORI 160 ZXLF/ZXSF



SICCA 800-2500 GLF



AKGS-A



SICCA 800 GTF

3 High-pressure applications**6** PN 250–600**7** T up to 650 °C

[used in steam power stations]



NORI 320 ZXSV



NORI 500 ZXSV



SICCA 900-2500 GLC



ZTS

SICCA
1500-2500 GTCNORI 320
ZXLF/ZXSFNORI 500
ZXLR/ZXSR





























SICCA 800-2500 GLF



SICCA 1500 GTF

Non-return valves

Special valves

Diaphragm valves	Butterfly valves			Feed water bypass valves	Start and stop control valves	Line blind valves
DIN	DIN / ANSI	DIN	ANSI	DIN	DIN	DIN
 <p>SISTO-10</p>  <p>SISTO-16</p>  <p>SISTO-KB</p>  <p>SISTO-20</p>	 <p>DANAIS</p>  <p>ISORIA</p>  <p>MAMMOUTH</p>	 <p>SISTO-RSK/RSKS</p>  <p>NORI 40 RXL/RXS</p>  <p>STAAL 40 AKK/AKKS</p>  <p>SERIE 2000</p>	 <p>SERIE 2000</p>  <p>SICCA 150-300 SCC</p>			
		 <p>NORI 160 RXL/RXS</p>  <p>STAAL 100 AKK/AKKS</p>  <p>AKR/AKRS</p>	 <p>SICCA 600 SCC</p>  <p>SICCA 900 SCC</p>  <p>SICCA 800 PCF</p>			
		 <p>NORI 320 RXL/RXS</p>  <p>NORI 500 RXLR/RXSR</p>  <p>RGS</p>  <p>ZRS</p>	 <p>SICCA 1500-2500 SCC</p>  <p>SICCA 1500-2500 PCF</p>	 <p>ZJSVM/RJSVM</p>	 <p>ZJSVA/ZXSVA</p>	 <p>VTS</p>

Getting the most out of energy

Measure us by the performance of your pump or valve – after we have brought it up-to-date technologically with the latest components and spare parts, regardless of who made it in the first place. The result will be longer service life, lower operating costs, extended maintenance intervals and reduced downtimes. KSB provides all-in solutions. So we can help you plan every stage of modernisation and recommissioning of your plant,

from inspection to production of the necessary new components, via fitting, test runs or the installation of new pumps or valves. Even minor retrofitting can make a major difference:

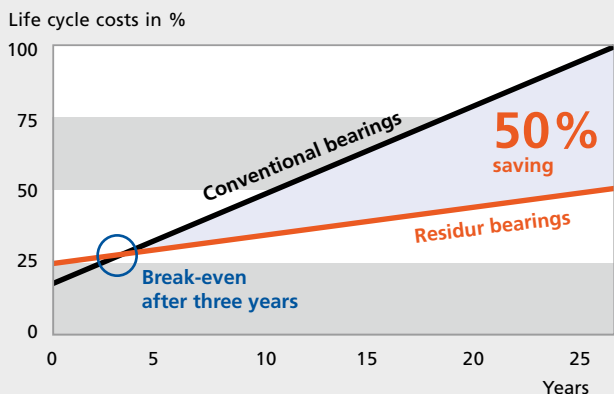
- Energy savings, efficiency improvements and emission reductions
- Monitoring, automatic early warning of faults
- Availability, extension of service lives
- Greater ease of servicing, no maintenance, reduction in auxiliary systems



Residur® reduces life cycle costs

Tubular casing pumps in power station cooling circuits operate round the clock under the toughest conditions. Radial bearings made of conventional materials need constant lubrication with fresh water or filtered operating medium. That costs time and money. Our specially developed Residur ceramic bearings are lubricated directly by the fluid pumped.

You can retrofit them to any tubular casing pump. Residur has been in use since the early 1980's. Over 25 years, these ceramic bearings save about 50% of the costs associated with conventional models. Investment costs are recouped in three years.

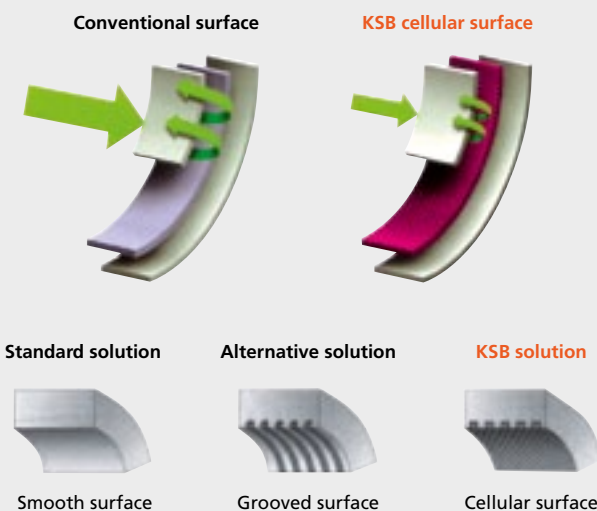


Cells turn a problem into an advantage

In centrifugal pumps, all cylindrical annular clearances are medium-swept. Conventional casing wear rings induce considerable efficiency losses caused by circumferential flow in the annular clearances. However, the clearances act as supplementary bearings and can, depending on their shape, significantly improve the dynamic behaviour of the rotor. KSB has developed cellular surface wear rings to benefit from this effect.



Thanks to their regular pattern of exactly calculated and spark-eroded recesses (cells) with an axis perpendicular to the direction of flow, axial and circumferential flows are extensively decelerated by swirling. This, in turn, leads to optimal stabilisation of the rotor and to much more extensive reduction of leakage losses – as compared to conventional surfaces. Efficiency increases considerably, energy costs fall noticeably, and operating reliability improves.



Making it work best for you

You want optimum performance from your power station 24 hours a day. This is why we are on call right around the clock, from the project phase through order processing, to continuous after-sales service. More than 1,500 KSB specialists form a service network that spans the world. One of our 100-plus service centres is sure to be near you.

For us, rapid, comprehensive service is an integral part of product quality. Frequent staff training keeps our standards high. And as a parallel program, we offer detailed, directly relevant courses for our power station customers.

At KSB, there are many sides to quality. But the goal is always the same: to meet our own particularly strict demands. We take legal regulations as a starting point and usually go much further. Our business processes are founded on recognised global quality guidelines, a modern integrated management system (quality management, environmental management, and occupational health and safety), and a quality policy based on the European Foundation for Quality Management (EFQM) business excellence model.





Our products and management systems are certified to:

- DGR, AD 2000, GOST
- DIN EN ISO 9001:2000
- ISO 14001:2004
- OHSAS 18001:1999



► Technology that **drives success**

Your Contact:

Pumps

Bernd Hoffmann

Tel.: +49 6233 86-1971

bernd.hoffmann@ksb.com

Valves

Rainer Dezelski

Tel.: +49 9241 71-1656

rainer.dezelski@ksb.com

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KSB Aktiengesellschaft
Johann-Klein-Straße 9
67227 Frankenthal (Germany)
www.ksb.com