

More space for solutions.



KSB, Inc.
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Real power comes from ideas.





Making it work best for you.

You want optimum performance from your power station 24 hours a day. Which is why we are on call around the clock from the project phase through order processing, and on to continuous after-sales service. More than 1,500 KSB specialists from a service network that spans the world, one of our 100 plus service centers 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 in parallel 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 further. Our business processes are founded on recognized 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.



We've got watt it takes.



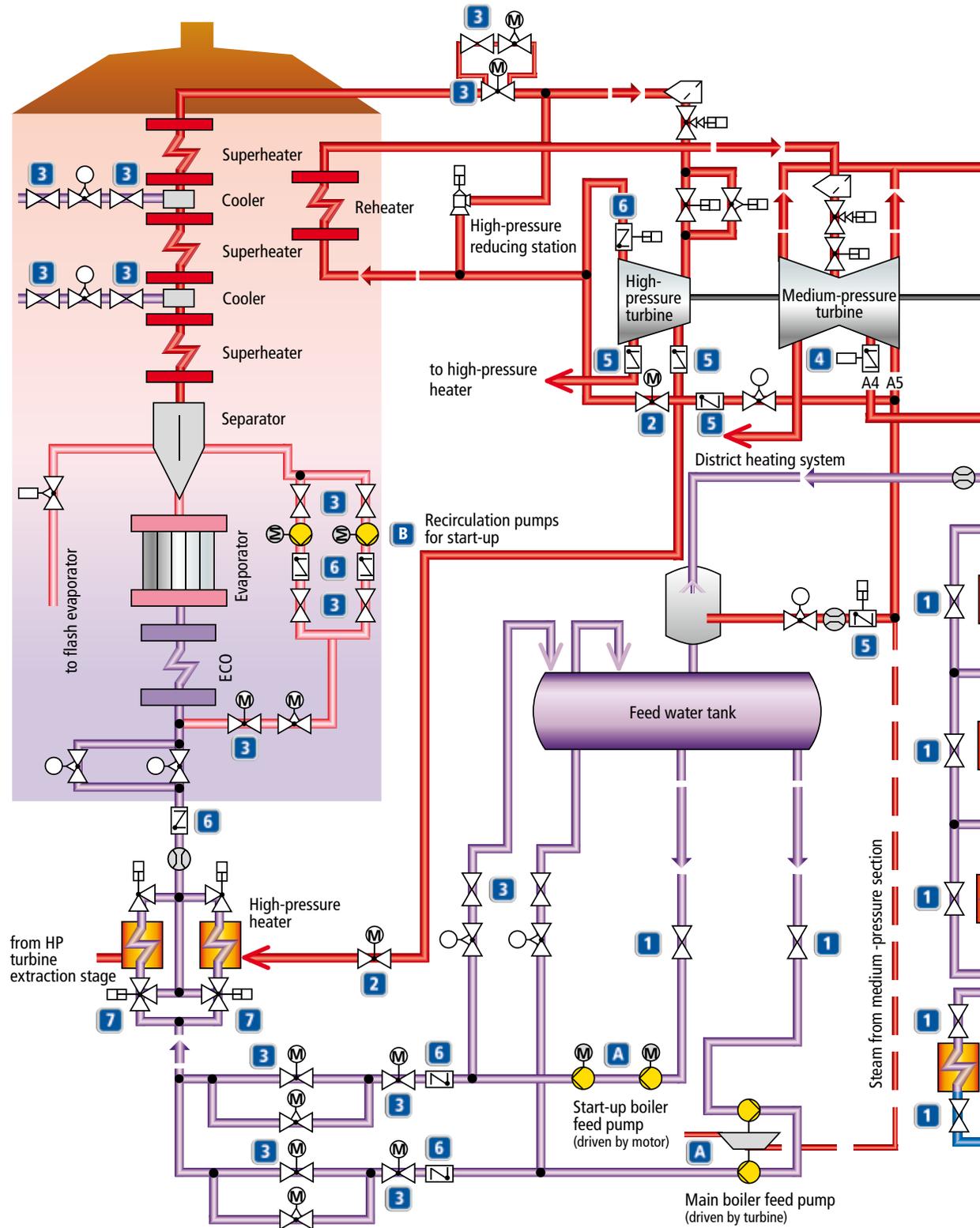
Think, plan, and act ahead.

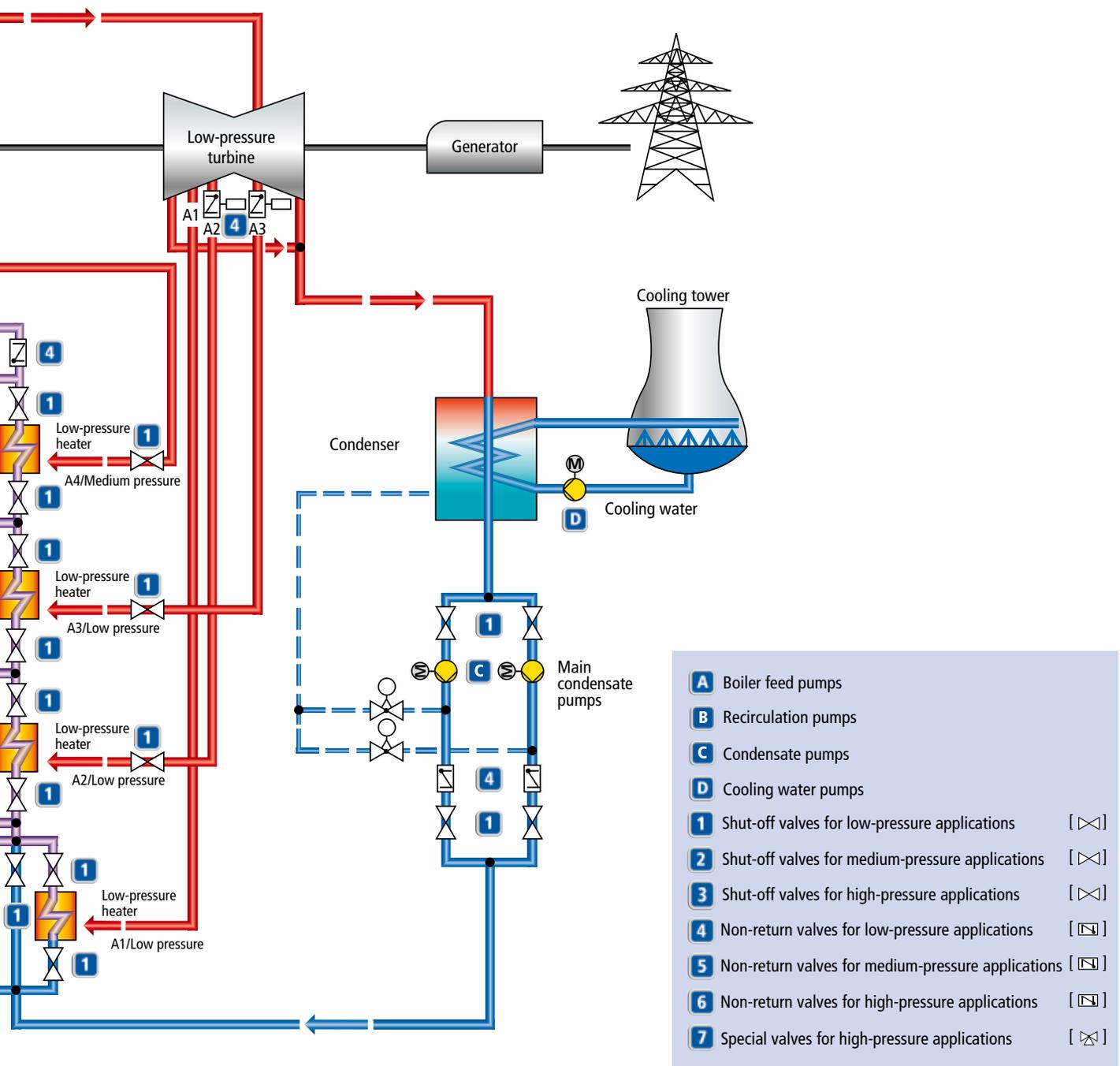
Sustainability means doing business with a permanent eye to the future. That is particularly important in an area as dependent on natural resources as the energy sector. Global energy demands continue to rise. Energy suppliers need to meet them reliably and economically, while also protecting the environment.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

KSB has been serving customers with innovative solutions for more than 130 years. Our know-how and experience across a wide spectrum of pump and valve technology makes us the ideal partner for the operators, consultants, and plant engineering contractors of high-performance power stations. One of our core skills is identifying synergies and implementing them in economic all-in-one solutions. That has made us one of the leading specialists worldwide. KSB knows all the ins and outs, and sees quality as part of its company philosophy. We develop materials, run our international manufacturing network, and put our products through the paces on KSB test facilities. An every one of our 14,000 employees worldwide is committed to customer service. All our energy means more energy for all.

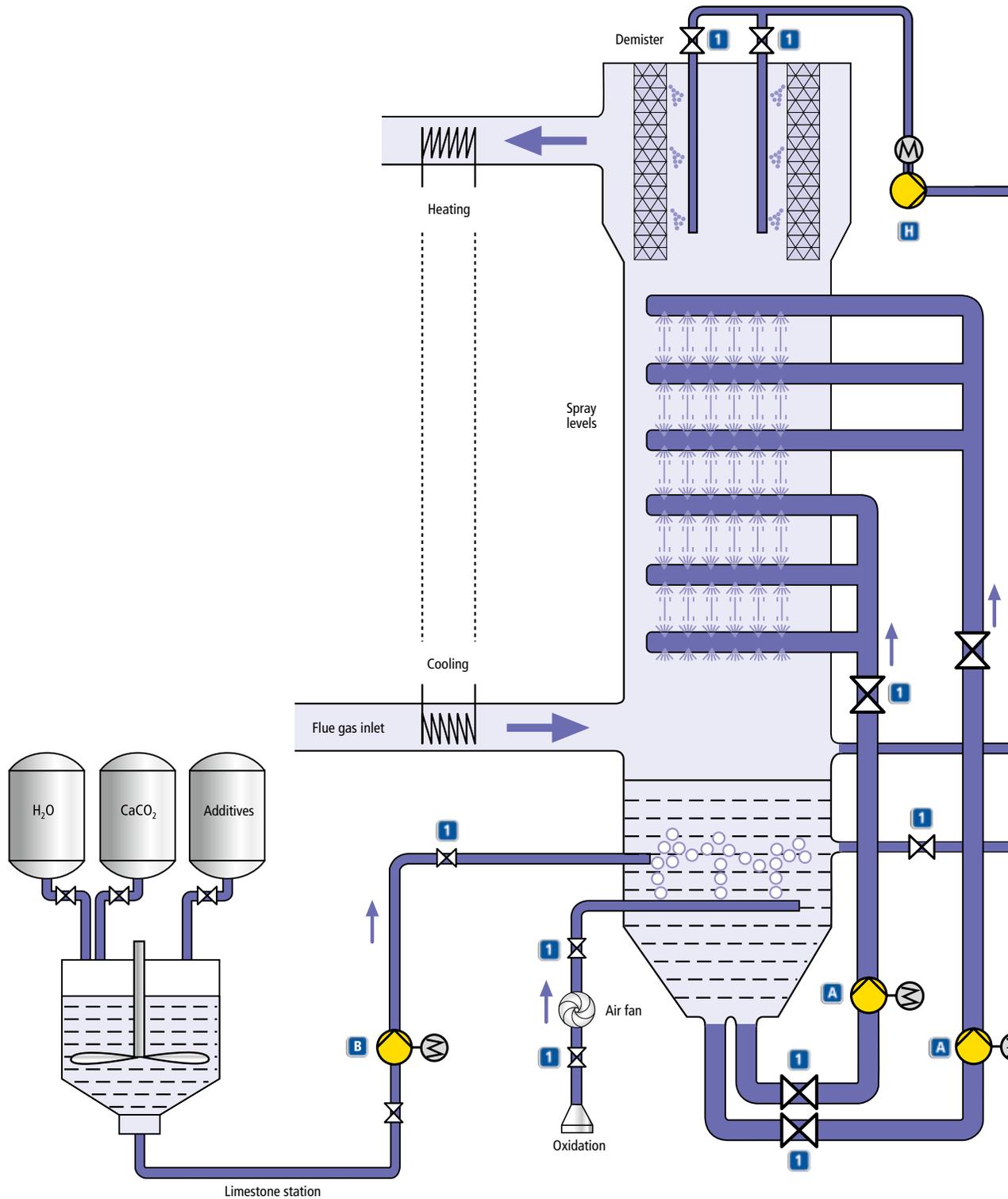
In where the action is.

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 because KSB pumps play a major role, and cut operators' energy bills significantly.

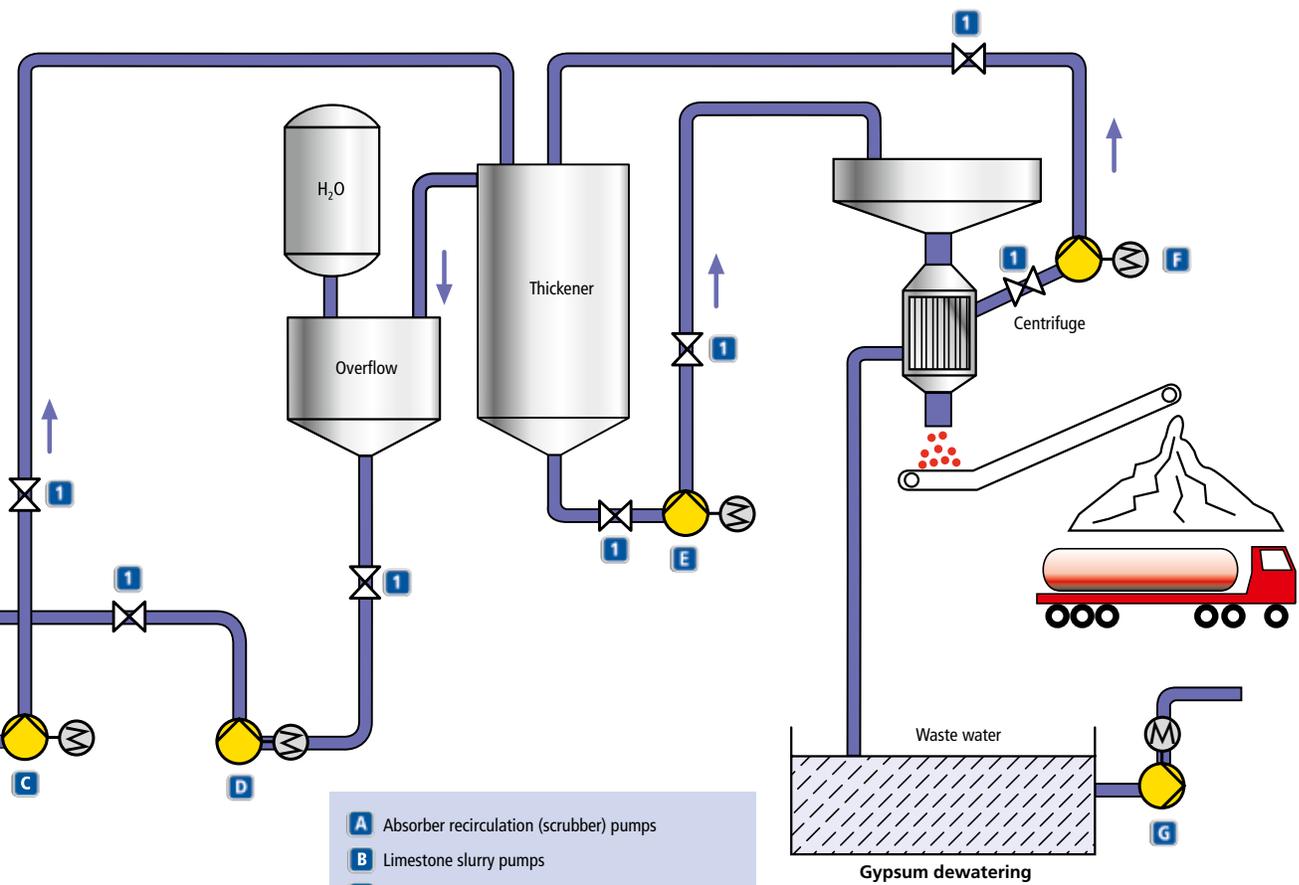
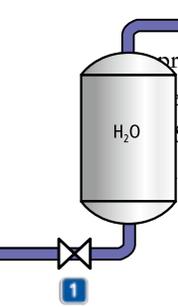




Today's desulphurization technology removes more than 95% of pollutants from the flue gas before release into the atmosphere. Our pumps are in demand across the full range of primary and secondary desulphurization processes. To ensure maximum operating reliability, we manufacture them from specially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

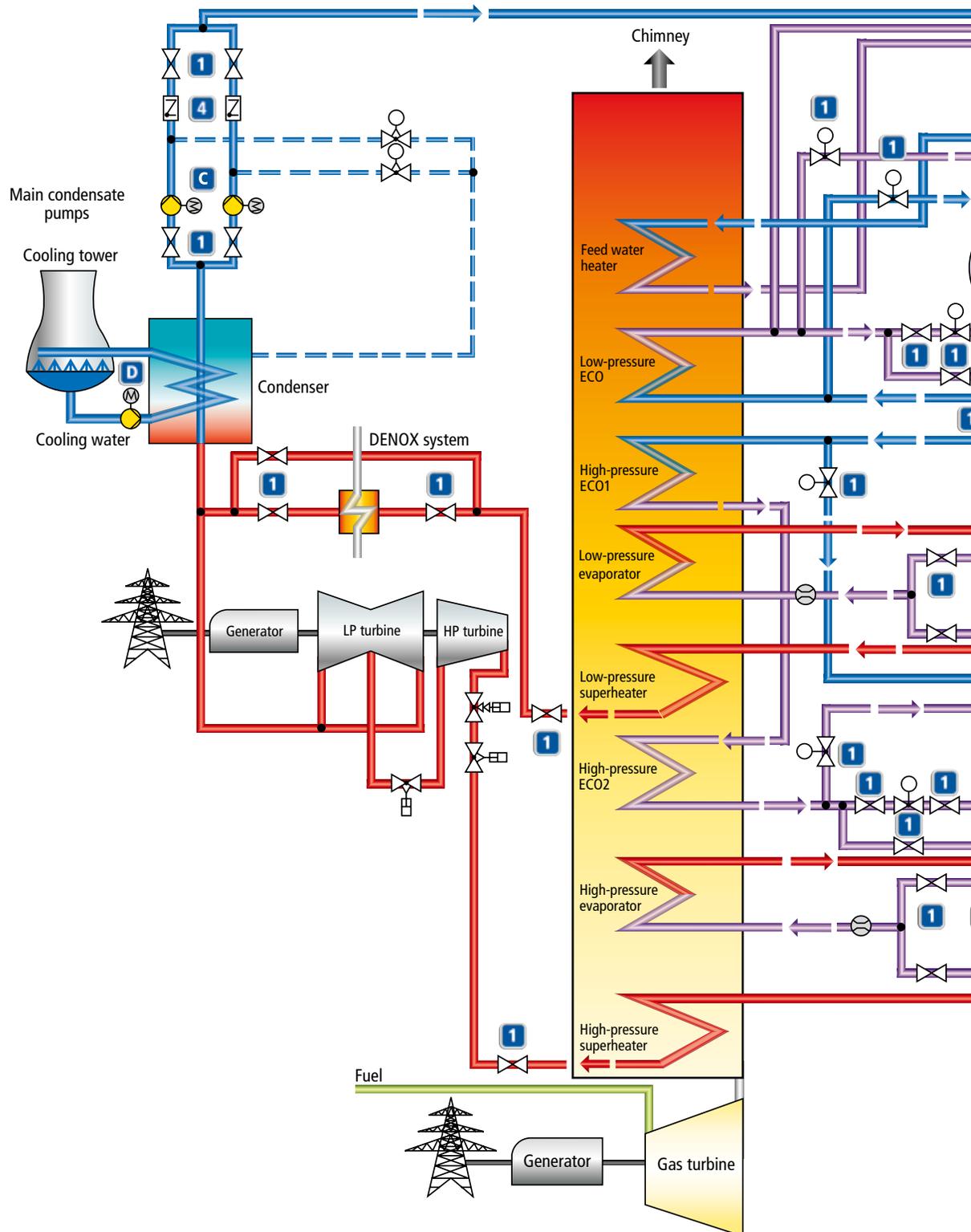


designed to make pump planning easy by providing products for every step of the process – solutions that have proven themselves over time. From the start of the mine right to the end product, SB powers the future of high quality, safe mining.

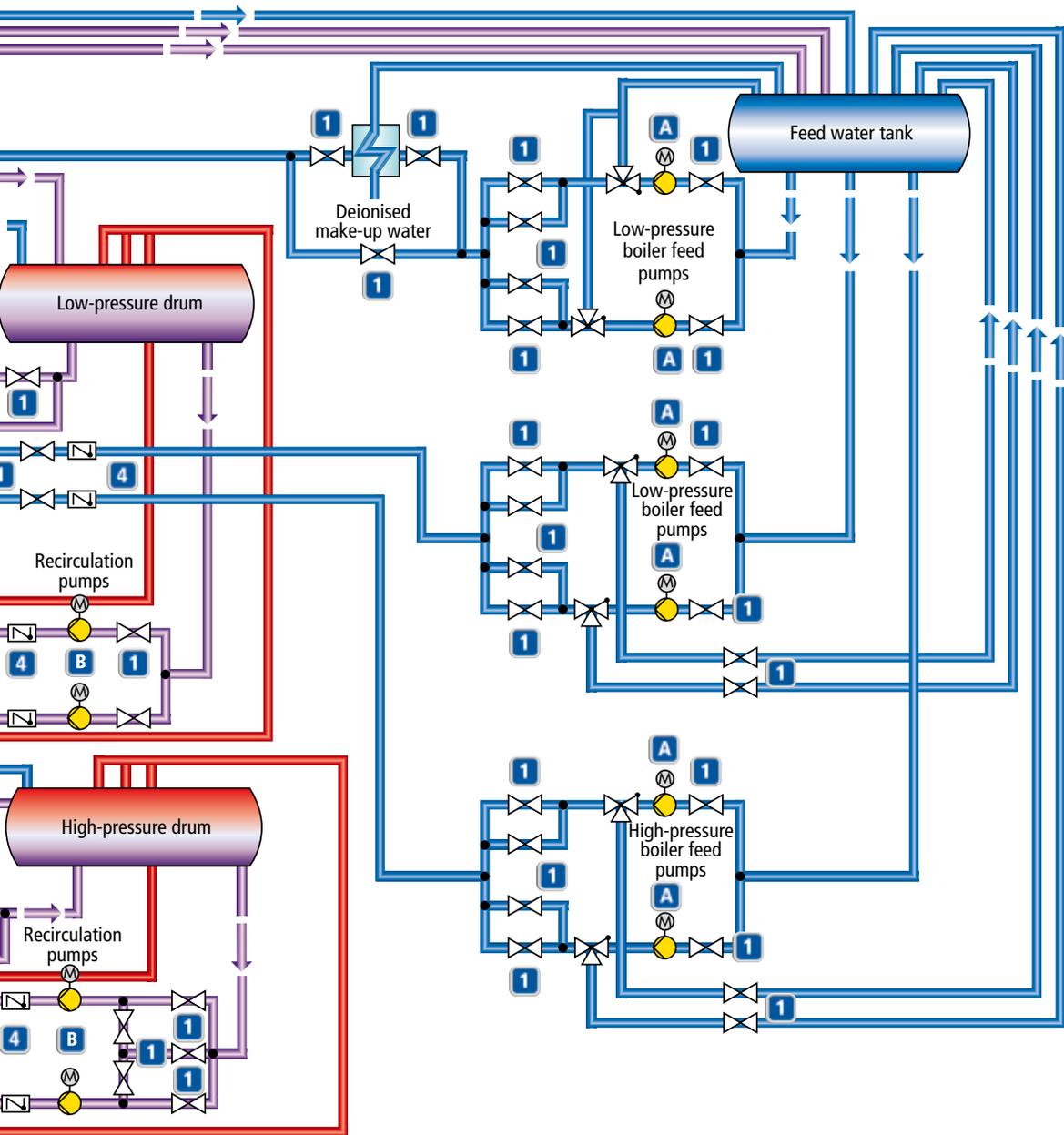


- A** Absorber recirculation (scrubber) pumps
- B** Limestone slurry pumps
- C** Gypsum slurry extraction pumps
- D** Recirculation water pump
- E** Thickener pumps
- F** Filtrate pumps
- G** Waste water sump pumps
- H** Process water pumps
- 1** Shut-off valves for low-pressure applications [X] (butterfly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

Combined cycle power stations are quick to build, extremely efficient, and release only limited amounts of CO_2 . Our pumps and valves ensure smooth and highly economical operation.



ALWAYS FOCUS ON THE CUSTOMER'S JOB

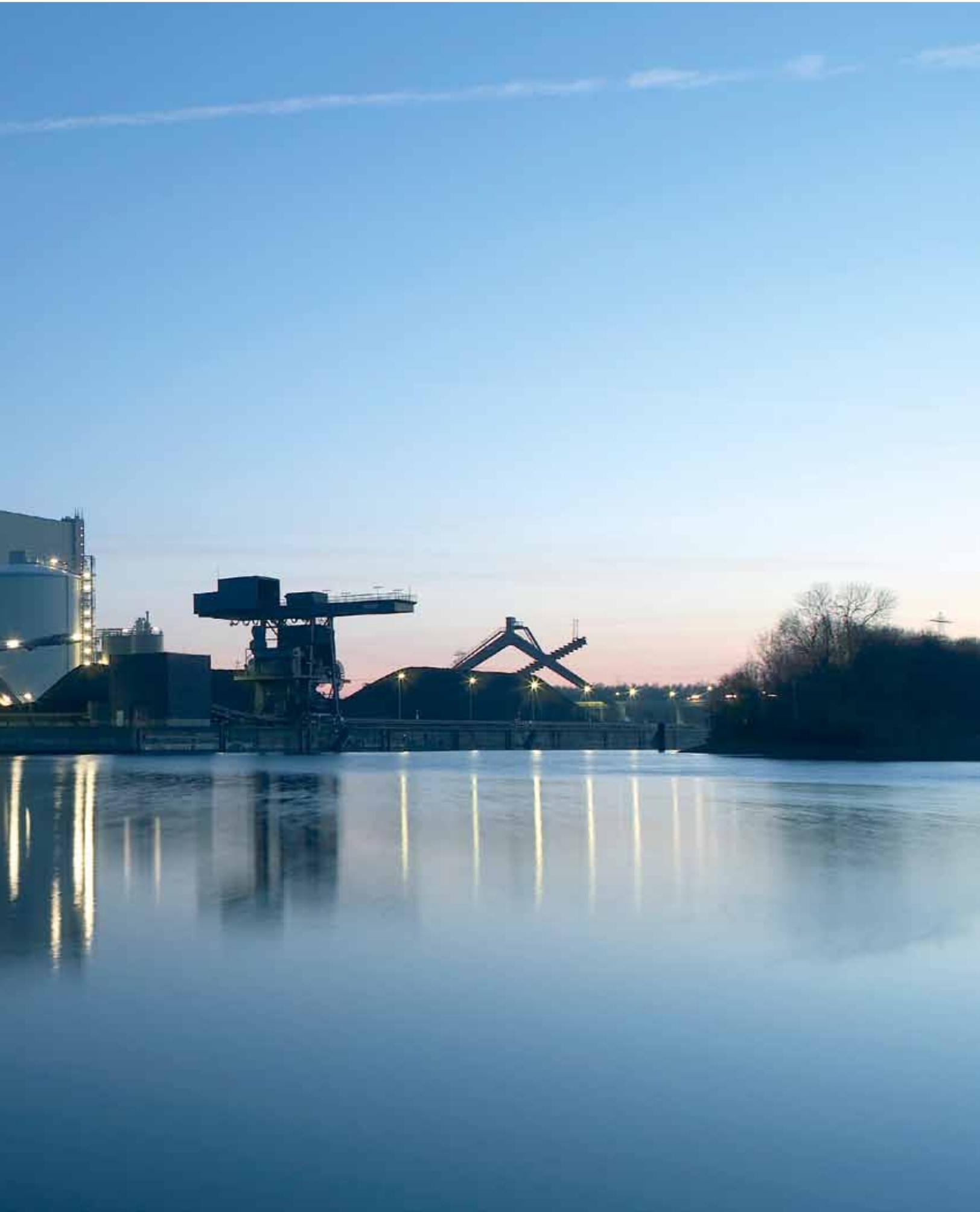


- A** Boiler feed pumps
- B** Recirculation pumps
- C** Condensate pumps
- D** Cooling water pumps
- 1** Shut-off valves for low-pressure applications [√]
- 4** Non-return valves for low-pressure applications [√]



The choice is all yours.

New construction or modernization; all-in-one solution or individual service; pumps, valves, or systems. We gear our extraordinarily flexible products to the special demands of high performance power stations.



Boiler feed pumps

CHTC/CHTD Boiler feed pump



Design: Horizontal high pressure barrel-type pump with radial impellers, single-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 pressurized water for bark peeling machines and descaling equipment.

Technical data CHTC

Q gpm:	up to 5,635
H ft:	up to 13,780
p psi:	up to 6,092
T °F:	up to +390
rpm:	up to 6,750

Technical data CHTD

Q gpm:	up to 15,850
H ft:	up to 14,764
p psi:	up to 6,527
T °F:	up to +410
rpm:	up to 6,200

HGC/HGD Boiler feed pump



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 pressurized water for bark peeling machines, descaling equipment, snow guns, etc.

Technical Data HGC

Q gpm:	up to 6,384
H ft:	up to 13,780
p psi:	up to 6,092
T °F:	up to +390
rpm:	up to 7,000

Technical Data HGD

Q gpm:	up to 8,805
H ft:	up to 14,764
p psi:	up to 6,527
T °F:	up to +410
rpm:	up to 6,200

YNK/KRHA Boiler feed booster pump



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.

Technical Data

Q gpm:	up to 16,290
H ft:	up to 919
p psi:	up to 580
T °F:	up to +410
rpm:	up to 1,800

The backbone of every mining operation

HGM Boiler feed pump

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.

Technical Data

Q gpm:	up to 1,206
H ft:	up to 4,593
p psi:	up to 2,030
T °F:	up to +320
rpm:	up to 3,600



Boiler recirculation pump

LUV/LUVA Boiler recirculation pump

Design: Hermetically sealed vertical recirculation pump, radial or mixed flow impellers, single-entry, sing or double stage; suitable for very high system pressures and temperatures. Integrated wet rotor motor to VDE/IEEE specifications, pressure boundary designed in accordance with the common boiler codes.

Applications: Hot water recirculation in large steam generators of power stations and industrial facilities.

Technical Data

Q gpm:	up to 30,820
H ft:	up to 984
p psi:	up to 5,076
T °F:	up to +716
rpm:	up to 3,600



Condensate pumps

WKTA/WKTB Condensate pump



Design: Vertical, multistage, can type ring-section pump with radial and mixed flow impellers. Single-entry and double-entry suction impellers. Flanges to DIN or ANSI. The can is arranged below the installation floor. The pump is connected with the structure by means of a baseplate.

Applications: Handling of condensate in power stations and energy systems.

Technical Data

Q gpm:	up to 11,447
H ft:	up to 1,115
p psi:	up to 580
T °F:	up to +212
rpm:	up to 1,800

WKH Condensate pump



Design: Horizontal, multistage ring-section pump with single-entry, radial impellers. Axial thrust balancing by drum or disc. Oil-lubricated rolling element bearings (oil bath lubrication). Centerline pump feet.

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

Technical Data

Q gpm:	up to 7,045
H ft:	up to 1,476
p psi:	up to 928
T °F:	up to +356
rpm:	up to 1,800

Cooling water pumps

The backbone of every mining operation

SEZ/PHZ/PNZ Cooling water pump

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.

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

Technical Data SEZ

Q gpm:	up to 286,186
H ft:	up to 157
p psi:	up to 145
T °F:	up to +104
rpm:	up to 1,200

Technical Data PHZ/PNZ

Q gpm:	up to 286,186
H ft:	up to 49/82
p psi:	up to 145
T °F:	up to +104
rpm:	up to 1,200



SNW/PNW Cooling water pump

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.

Technical Data SNW

Q gpm:	up to 37,865
H ft:	up to 295
p psi:	up to 145
T °F:	up to +140
rpm:	up to 1,800

Technical Data PNW

Q gpm:	up to 39,625
H ft:	up to 33
p psi:	up to 145
T °F:	up to +140
rpm:	up to 1,800



RDLO Cooling water pump

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

Applications: Handling of raw, pure, service, and cooling water as well as seawater in power stations, water treatment plants, irrigation and drainage pumping stations, fire-fighting systems, ship building and the petrochemical industry, in refineries, pipelines and tank farms; handling of crude oil and refinery intermediates.

Technical Data

Q gpm:	up to 44,029
H ft:	up to 787
p psi:	up to 363
T °F:	up to +158
rpm:	up to 1,800



Auxiliary pumps

Omega Auxiliary pump



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

Applications: Handling of raw, pure, and service water as well as seawater in water treatment plants, irrigation, and drainage pumping stations, power stations, fire-fighting systems, ship building and the petrochemical industry.

Technical Data

Q gpm:	up to 12,328
H ft:	up to 558
p psi:	up to 363
T °F:	up to +221
rpm:	up to 3,600

Amarex KRT Auxiliary pump



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

Applications: Water and waste water engineering, seawater desalination, in power stations, handling of all types of abrasive or aggressive waste water in industry, especially untreated waste water containing long fibers and solid substances, fluids containing gas/air as well as raw, activated and digested sludge.

Technical Data

Q gpm:	up to 47,550
H ft:	up to 328
T °F:	up to +140
rpm:	up to 3,600

KWP/KWP-Bloc Auxiliary Pump



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, and free-flow impeller. Design to ATEX.

Applications: Handling of cooling water in power stations, handling of pre-treated sewage, waste water, all types of slurries without stringy substances and pulps up to 5% bone dry with a maximum density of 1.1 kg/dm³.

Technical Data KWP

Q gpm:	up to 5,720
H ft:	up to 328
p psi:	up to 145
T °F:	up to +536
rpm:	up to 3,600

The backbone of every mining operation

HPK-L Auxiliary pump

Design: Horizontal, radially split volute casing pump pin back pull-out design to EN 22 858/ISO 2858/ISO 5199, single-stage, single-entry, with radial impeller. TÜV certification to German Steam Boiler Regulations TRD for HPK or option. Design to ATEX.

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

Technical Data

Q gpm:	up to 18,270
H ft:	up to 600
p psi:	up to 580
T °F:	up to +464 (hot water) up to +662 (thermal oil)



HPH Auxiliary pump

Design: Horizontal, radially split volute casing pump in back pull-out design, single-stage, single-entry, with centerline pump feet and radial impeller. TÜV certification to German Steam Boiler Regulations TRD on option. Design to ATEX.

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

Technical Data

Q gpm:	up to 7,925
H ft:	up to 740
p psi:	up to 1,595
T °F:	up to +608



Auxiliary pumps

CPKN Auxiliary pump



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, conical seal chamber, heatable volute casing (CPKN-CHs) and/or semi-open impeller (CPKNO). Design to ATEX.

Applications: Handling of cooling water and condensate, and of aggressive liquids in the chemical and petrochemical industries, in refineries as well as in fire-fighting systems.

Technical Data

Q gpm:	up to 18,270
H ft:	up to 600
p psi:	up to 360
T °F:	up to +752

RPH Auxiliary pump



Design: Horizontal, radially split volute casing pump in back pull-out design to API 610, 9th edition or ISO 13709 (heavy duty), with radial impeller, single-stage, single-entry, centerline pump feet with inducer, if required. Design to ATEX available.

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

Technical Data

Q gpm:	up to 18,270
H ft:	up to 880
p psi:	up to 740
T °F:	up to +752

Multitec Auxiliary pump



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

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.

Technical Data

Q gpm:	up to 3,740
H ft:	up to 2,060
p psi:	up to 910
T °F:	up to +392
rpm:	up to 3,600

Flue gas desulphurization pumps

The backbone of every mining operation

KWPKC DN 400-1000 Pump for flue gas desulphurization

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

Applications: As absorber recirculation (scrubber) pump.

Technical Data

Qgpm:	up to 70,450
H ft:	up to 100
T °F:	up to +248



KWPK DN 40-350 Pump for flue gas desulphurization

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.

Technical Data

Q gpm:	up to 13,200
H ft:	up to 200
T °F:	up to +248



FGD (GIW) Pump for flue gas desulphurization



Design: Metal or elastomer lined pump with impellers available in a variety of corrosion and abrasion resistant alloys. Efficiencies approaching 90% of best efficiency point.

Applications: Absorber recirculation in flue gas desulphurization.

Technical Data

Q gpm:	up to 79,250
H ft:	up to 165
p psi:	up to 100
T °F:	up to +248

LCC (GIW) Pump for flue gas desulphurization



Design: High performance, low maintenance slurry pump recommended for coarse or fine particles from solids-laden waste water to aggressive slurries of an abrasive and/or corrosive nature.

Applications: Mineral processing, power generation, flue gas desulphurization, mine dewatering, handling of aggregate, ash, tailings, industrial slurries, dredge.

Technical Data

Q gpm:	up to 17,000
H ft:	up to 245
p psi:	up to 230
T °F:	up to +248

Hot thermal pumps

The backbone of every mining operation

YNK/KRHA Main HTF feed pump

Design: Horizontal, radially split, single-stage, double-entry boiler feed booster pump (booster system) with single or double cast steel volute casing. Fully complaint API 610 BB2 design

Applications: Handling of feed water in power stations, industrial facilities and concentrated solar power systems.

Technical Data

Q gpm:	up to 16,290
H ft:	up to 919
p psi:	up to 580
T °F:	up to +410
rpm:	up to 1,800



HPK-L Auxiliary pump

Design: Horizontal, radially split volute casing pump pin back pull-out design to EN 22 858/ISO 2858/ISO 5199, single-stage, single-entry, with radial impeller. TÜV certification to German Steam Boiler Regulations TRD for HPK or option. Design to ATEX.

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

Technical Data

Q gpm:	up to 18,270
H ft:	up to 600
p psi:	up to 580
T °F:	up to +464 (hot water) up to +662 (thermal oil)



RPH Auxiliary pump

Design: Horizontal, radially split volute casing pump in back pull-out design to API 610, 9th edition or ISO 13709 (heavy duty), with radial impeller, single-stage, single-entry, centerline pump feet with inducer, if required. Design to ATEX available.

Applications: Refineries, petrochemical and chemical industry, power stations, and concentrated solar power systems..

Technical Data

Q gpm:	up to 18,270
H ft:	up to 880
p psi:	up to 740
T °F:	up to +752





A question of flow.

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 therefore, top quality is guaranteed from the start. We use new high temperature materials and we team up with

universities and research institutes for testing. All of which contributes to continuous further development of our products. Innovation, the latest technology, and our expertise enable us to meet all the demands of power stations 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, diaphragm valve, or ball valve is a better choice. If there is a need, we can modify the standard

product or manufacture special valves such as feed water bypass valves, start and stop control valves, or line blind valves.

See circuits on pages 14 to 19

Shutt-off valves

Globe valves

Gate valves

DIN

ANSI

DIN

- 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/AKDS



NORI 40
ZXL/ZXS



NORI 40
ZXLF/ZXSF



SICCA
800 GLF

- 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



NORI 160
ZXLF/ZXSF



SICCA 900-
2500 GLC



AKGS-A



SICCA
800- 2500 GLF

- 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



NORI 320
ZXLF/ZXSF



NORI 500
ZXLR/ZXSR



SICCA
800-2500 GLF

	Shut-off valves		Non-return valves	
	Diaphragm valves	Butterfly valves		
ANSI	DIN	DIN/ANSI	DIN	ANSI
 <p>SICCA 150-300 GTC</p>	 <p>SISTO-10</p>  <p>SISTO-16</p>	 <p>DANAIS</p>  <p>ISORIA</p>	 <p>NORI 40 RXL/RXS</p>	 <p>SERIE 2000</p>
 <p>SICCA 800 GTF</p>	 <p>SISTO-KB</p>  <p>SISTO-20</p>	 <p>MAMMOUTH</p>	 <p>STAAL 40 AKK/AKKS</p>  <p>SERIE 2000</p>	 <p>SICCA 150-300 SCC</p>
 <p>SICCA 600 GTC</p>  <p>SICCA 900 GTC</p>  <p>SICCA 800 GTF</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>SICCA 1500-2500 GTC</p>  <p>SICCA 1500 GTF</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>

Getting the most out of energy.

Measure us by the performance of your pump or valve after we have brought it technologically up to date 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-one solutions so we can help you plan every

stage of modernization 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 life
- Greater ease of servicing, no maintenance, and reduction in auxiliary systems

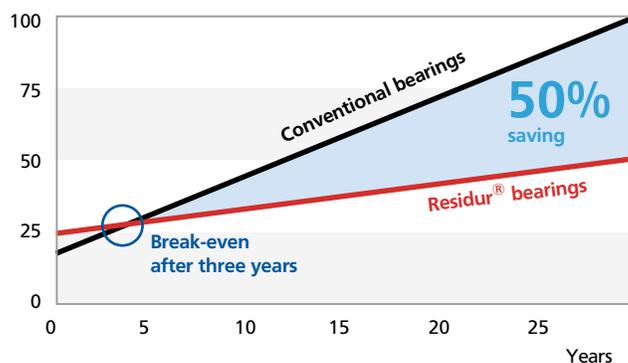


Residur® reduces life cycle costs

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 media handled which costs time and money. Our specially developed Residur® ceramic bearings are lubricated directly by the medium handled and can be retrofitted to a 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. This allows investment costs to be recouped in three years.



Life cycle costs in %



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 behavior 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 leads to optimum stabilization of the rotor and to an extensive reduction of leakage losses, as compared to conventional surfaces. Efficiency increases considerably, energy costs fall noticeably, and operating reliability improves.

