Valves for fossil-fuelled power plants
to EN and ANSI standards
Fulfilling the requirements of optimum solutions

The demands placed on components in power plant applications are immense. This is particularly the case for valves that are used to reliably shut off water and steam. These must withstand enormous heat and pressure and have to fulfill the exacting requirements of standards and codes such as DIN/EN, ASME/ANSI or IBR.

Whether in condensate, feed water or steam systems, valves in power plants are subject to the strictest possible regulations – to which KSB’s high-quality products conform one hundred percent.

We do everything possible to offer our customers the very best in products and system solutions. KSB is a loyal partner. And a strong one:

- Over 140 years’ experience
- Present in more than 100 countries
- More than 16,000 employees
- More than 160 service centres worldwide
- Approximately 2,600 service specialists

The KSB valve range for fossil-fuelled power plants
- Globe valves
- Gate valves
- Check valves
- Butterfly valves
- Diaphragm valves
- Ball valves
- Control valves
- Feed water by-pass valves
- Line blind valves

Modern manufacturing, innovative materials, top-quality service

An innovative approach, the latest technology and the know-how of our experts put us in a position to meet each and every requirement stipulated by operators, consultants and engineering contractors for power plants.

KSB manufactures its products to uniform quality standards at all of its locations worldwide. A particular strength is our ability to weld all materials – both to DIN/EN and to ASME/ANSI. In-house rubber and liner production, the manufacturing of diaphragms and the operation of an in-house foundry ensure high quality from the outset. In addition, the processing of new high-temperature materials at up to 725 °C combined with the testing and use of new materials in collaboration with universities and research institutes provides an excellent basis for the continual development of our products.

Individual testing procedures and acceptance tests accompany the entire manufacturing process and include surface crack examinations and radiographic, magnetic particle and ultrasonic testing. Depending on their nature and scope, these are either performed in accordance with the relevant regulations or in line with the specific requirements of the customer.

Alongside products, timing also plays a crucial role in delivering a successful project. We have therefore optimised all of our processes from quotations to production, delivery and installation to ensure that no valuable time is wasted. A further benefit is the close customer liaison possible via our application specialists who are available to support you in almost every country across the globe.
Always close to our customers: Numerous locations across the globe help us support you with our valves on virtually every continent.

**Assured quality – worldwide**
- DIN EN ISO 9001
- DIN EN ISO 14001
- OHSAS 18001
- Pressure Equipment Directive 97/23/EC
- AD 2000-HP0
- DIN EN ISO 3834, -2
- KTA 1401, 1408.3, 3201.3
- AVS D 100/50
- ASME Code Sect. III/NCA-4000 (N, NPT)
- GOST/TR
- IBR
Steam power plant diagram
A selection of reference projects

Our valves for fossil-fuelled power plants have already impressed customers in numerous projects. Worldwide, customers bank on reliable shut-off and control when they select products from KSB.

<table>
<thead>
<tr>
<th>Customer</th>
<th>Plant</th>
<th>Type</th>
<th>DN</th>
<th>Material</th>
<th>Operating data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shanghai Dayao Industry Development Co. Ltd.,</td>
<td>Steam power plant 2 x 1000 MW Waigaoqiao Unit II Shanghai, China</td>
<td>ZTS Gate</td>
<td>500</td>
<td>Forged steel for feed water applications WB 36 (1.6368)</td>
<td>T(°C) 500 P (bar) 200</td>
</tr>
<tr>
<td>China</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BASF SE, Germany</td>
<td>Combined cycle power plant 1 x 496 MW BASF Ludwigshafen, Germany</td>
<td>ZTS Gate</td>
<td>350</td>
<td>Forged steel for feed water applications WB 36 (1.6368)</td>
<td>T(°C) 500 P (bar) 199</td>
</tr>
<tr>
<td>Siemens AG, Germany</td>
<td>Steam power plant 1 x 300 MW BFG Gent, Belgium</td>
<td>ZTS Gate</td>
<td>700</td>
<td>Forged steel for high-temperature applications P91 (1.4903)</td>
<td>P(°C) 540 P(bar) 572</td>
</tr>
<tr>
<td>Alstom Power GmbH, Germany</td>
<td>Steam power plant 1 x 912 MW RDK 8, Karlsruhe, Germany</td>
<td>ZTS Gate</td>
<td>250</td>
<td>Forged steel for high-temperature applications P92 (1.4901)</td>
<td>T(°C) 311 P(bar) 608</td>
</tr>
<tr>
<td>Power Machines, Russia</td>
<td>Steam power plant 3 x 660 MW (supercritical) Barh, India</td>
<td>ZTS Gate</td>
<td>500</td>
<td>Forged steel for feed water applications WB36 (1.6368) connecting branch P 355QH1 (1.0571) according ASTM A106GrC</td>
<td>T(°C) 300 P(bar) 394</td>
</tr>
<tr>
<td>CEZ a.s., Czech Republic</td>
<td>Combined cycle power plant 1 x 841 MW Pocerady, Czech Republic</td>
<td>ZTS Gate</td>
<td>600</td>
<td>Forged steel for high-temperature applications P91 (1.4903)</td>
<td>P(°C) 390 P(bar) 560</td>
</tr>
<tr>
<td>ARES Technology, China</td>
<td>Steam power plant 2 X 660 MW Yuanyanghu, China</td>
<td>SICCA Gate</td>
<td>300</td>
<td>Carbon steel for feed water applications A216-WCB Spl.</td>
<td>P(°C) 374 P(bar) 300</td>
</tr>
<tr>
<td>Shanghai Electric Co. Ltd., China</td>
<td>Steam power plant 6 x 600 MW Sasan PP, India</td>
<td>SICCA Gate</td>
<td>350</td>
<td>Carbon steel for feed water applications A216-WCC Spl.</td>
<td>T(°C) 185 P(bar) 44</td>
</tr>
<tr>
<td>Siemens Industrial Turbomachinery AB, Sweden</td>
<td>Combined cycle power plant 1 x 242 MW Diamantina, Australia</td>
<td>SICCA Gate</td>
<td>150</td>
<td>Alloed steel for high-temperature applications A217-WC6 Spl.</td>
<td>P(°C) 518 P(bar) 90</td>
</tr>
<tr>
<td>Shandong Xinwen Mining Co. Ltd., China</td>
<td>Steam power plant 3 x 350 MW Shenhuia Yili, China</td>
<td>SICCA Gate</td>
<td>300</td>
<td>Alloed steel for high-temperature applications A217-WC9 Spl.</td>
<td>P(°C) 540 P(bar) 100</td>
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<tr>
<td>ISGEC Heavy Engineering Ltd., India</td>
<td>Process steam 190 TPH Gail Pata, India</td>
<td>SICCA Gate</td>
<td>400</td>
<td>Alloed steel for high-temperature applications A217-C12A Spl.</td>
<td>P(°C) 515 P(bar) 116</td>
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<tr>
<td>Sterlile Energy Ltd., India</td>
<td>Steam power plant 4 x 600 MW Jharsuguda, India</td>
<td>SICCA Gate</td>
<td>400</td>
<td>Alloed steel for high-temperature applications A217-C12A Spl.</td>
<td>P(°C) 540 P(bar) 170</td>
</tr>
</tbody>
</table>
Combined cycle power plant diagram
Powerful right down to the last detail

ZTS/SICCA

1 Billet-forged steel design makes the body robust and capable of withstanding very high stresses (ZTS)
   - Very dense, homogenous and fine-grained structure
   - Ideal for very high pressures and temperatures
   - Large range of forged steels

Robust and high-strength cast steel body (SICCA)
   - Ideal for very high pressures and temperatures
   - Large range of cast materials

2 Reliable sealing to atmosphere
   - Pressure seal bonnet
   - Graphite gasket, available with metal cap for protection against oxidation (ZTS)
   - Graphite gland packing with packing end rings, available with metal cap for protection against oxidation (ZTS)
   - Compact design

3 Reliable, tight shut-off and service-friendly design
   - Wedge holder with flexibly mounted split wedge. Precise alignment of wedge halves with body; wedge halves are easy to replace.
   - Actuating moments are absorbed by the wedge holder and guide ribs in the body.
   - Straightforward actuator mounting (ZTS with standard DIN/ISO connection flange at the yoke head). No need to dismantle pressure-retaining components.

4 Additional safety and blow-out protection by standard back seat

5 Long service life and high functional reliability
   - Standard stop nut limits wedge action, thus preventing jamming in the closed position. Reliable opening even in the event of temperature transients.
   - Gland packing with non-rotating stem and burnished shank
   - Threaded bush runs in ball bearings for smooth actuation.
   - Hard-faced seat/disc interface made of stellite
Operating data

Nominal size: DN 50-800 / 2" – 32"
Pressure: Up to 600 bar / 8700 psi
Temperature: Up to 650 °C / 1200 °F

Body materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Material number</th>
<th>Temperature limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>P 250 GH</td>
<td>1.0460</td>
<td>Up to 450 °C / 850 °F</td>
</tr>
<tr>
<td>15 NiCuMoNb 5</td>
<td>1.6368</td>
<td>Up to 450 °C / 850 °F</td>
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<tr>
<td>16 Mo 3</td>
<td>1.5415</td>
<td>Up to 530 °C / 990 °F</td>
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<tr>
<td>13 CrMo 4-5</td>
<td>1.7335</td>
<td>Up to 550 °C / 1020 °F</td>
</tr>
<tr>
<td>10 CrMo 9-10</td>
<td>1.7380</td>
<td>Up to 570 °C / 1060 °F</td>
</tr>
<tr>
<td>X 10 CrMoVNb 9-1</td>
<td>1.4903</td>
<td>Up to 650 °C / 1200 °F</td>
</tr>
<tr>
<td>X 10 CrWMoVNb 9-2</td>
<td>1.4901</td>
<td>Up to 650 °C / 1200 °F</td>
</tr>
</tbody>
</table>

Other materials on request.

Operating data

Nominal size: DN 50-600 / 2" – 24"
Pressure: Up to 430 bar / 6250 psi
Temperature: Up to 650 °C / 1200 °F

Body materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Temperature limit</th>
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</thead>
<tbody>
<tr>
<td>ASTM A 216 WCB</td>
<td>Up to 425 °C / 800 °F</td>
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<tr>
<td>ASTM A 217 WC6</td>
<td>Up to 593 °C / 1100 °F</td>
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<tr>
<td>ASTM A 217 WC9</td>
<td>Up to 593 °C / 1100 °F</td>
</tr>
<tr>
<td>ASTM A 217 C12A</td>
<td>Up to 650 °C / 1200 °F</td>
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</table>

Other materials on request.
### Shut-off valves

#### Globe valves

<table>
<thead>
<tr>
<th>DIN</th>
<th>ANSI</th>
<th>DIN</th>
<th>ANSI</th>
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<tbody>
<tr>
<td>1 Low-pressure applications</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2 Medium-pressure applications</td>
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<td></td>
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</tr>
<tr>
<td>3 High-pressure applications</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

#### Gate valves

<table>
<thead>
<tr>
<th>DIN</th>
<th>ANSI</th>
<th>DIN</th>
<th>ANSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Low-pressure applications</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2 Medium-pressure applications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 High-pressure applications</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **BOA H/HE**
- **SICCA 150-300 GLC**
- **STAAL 40 AKD/AKDS**
- **SICCA 150-300 GTC**
- **NORI 40 ZX/L/ZXS**
- **NORI 40 ZXL/ZXS**
- **SICCA 800 GLF**
- **SICCA 800 GTF**
- **NORI 160 ZX/L/ZXS**
- **NORI 160 ZXL/ZXS**
- **SICCA 800 GLF**
- **SICCA 800 GTF**
- **NORI 320 ZXSV**
- **NORI 320 ZXL/ZXS**
- **NORI 500 ZXSV**
- **NORI 500 ZXL/ZXS**
- **SICCA 900-2.500 GLC**
- **SICCA 900-2.500 GLF**
- **SICCA 900-2.500 GTC**
- **ZTS 2.500-4.500**
- **ZTS 1.500-2.500 GTC**
- **SICCA 1.500 GTF**

- PN 10-40 / Class 150-300
- PN 63-160 / Class 600-900
- PN 250-600 / Class 1500-2500

- T up to 450 °C / 850 °F
- T up to 550 °C / 1020 °F
- T up to 650 °C / 1200 °F

[used in combined cycle and steam power plants]
<table>
<thead>
<tr>
<th>Diaphragm valves</th>
<th>Butterfly valves</th>
<th>Check valves</th>
<th>Special-purpose valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN</td>
<td>DIN / ANSI</td>
<td>DIN</td>
<td>DIN</td>
</tr>
<tr>
<td>SISTO-10</td>
<td>SISTO-RSK/RSKS</td>
<td>SISTO-10</td>
<td>SISTO-KB</td>
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<tr>
<td>SISTO-16</td>
<td>NORI 40 RXL/RXS</td>
<td>SISTO-16</td>
<td>SISTO-20</td>
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<tr>
<td>SISTO-KB</td>
<td>STAAL 40 AKK/AKKS</td>
<td>SISTO-KB</td>
<td>SISTO-20</td>
</tr>
<tr>
<td>SISTO-20</td>
<td>MAMMOUTH</td>
<td>SISTO-20</td>
<td>SISTO-20</td>
</tr>
</tbody>
</table>

**Check valves**
- DIN: SISTO-RSK/RSKS
- DIN / ANSI: SISTO-10
- DIN: SISTO-16
- DIN / ANSI: SISTO-KB
- DIN: SISTO-20
- DIN / ANSI: MAMMOUTH

**Special-purpose valves**
- DIN: SISTO-10
- DIN / ANSI: SISTO-KB
- DIN: SISTO-20
- DIN / ANSI: MAMMOUTH

**Feed water by-pass valve**
- DIN: SERIE 2.000

**Start and stop control valves**
- DIN: SICCA 150-300 SCC

**Line blind valves**
- DIN: SICCA 800 PCF
- DIN / ANSI: SICCA 600 SCC

**Other valves**
- DIN: SICCA 1.500-2.500 SCC
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