Products and services
Overview
Made in Germany
You are getting a top-quality product from the German valve engineering industry

History Siemens-SPPA-W&T in China
In the beginning of the ’90s Siemens Erlangen and Siemens Beijing were looking for further business opportunities on the Chinese market. As Siemens Erlangen and W&T had a long lasting relationship regarding control valves, desuperheater valves and bypass stations, it was decided that Siemens Beijing should also deal with these products for the Chinese market. In connection with Siemens DCS the market was convinced that the common solution of Siemens-W&T was a competitive offer for Chinese power stations.

In the following years the business of Siemens-DCS and W&T-TBS increased consequently under the common mentoring of company members from Erlangen, Beijing and Bielefeld. Middle of the 90’s Siemens founded a joint Venture together with a Chinese I&C company located in Nanjing which later became the SPPA company. The DCS-TBS business was more and more shifted from Beijing to Nanjing and SPPA managed to increase and develop the acceptance of the products throughout the whole market. More and more Chinese power stations were equipped with TBS from SPPA-W&T.

Many successful references were built up which was very helpful for the rapidly increasing power station market from 2005 onwards. Dimensions, pressures and temperatures increased drastically during this period and TBS had to adopt to this requirements. Nowadays bypass systems are used up to huge 1000 MW coal fired power plants handling temperatures and pressures of 620°C and 350 bars. SPPA-W&T took a strong part of the market of thermal power stations and supplied more than … TS to Chinese customers until today. All this experience and Know How is also integrated in the W&T control valve range to increase reliability and efficiency of the plant.
Supply hub

Valves are the connection points for the entire power plant network. They regulate the circuit and control the results. As a prerequisite for the highest possible degree of safety and seamless functioning of the system, they must be in perfect working order and therefore coordinated exactly.
Seamless integration
A one-stop shop

Precise planning
All of the diverse components have to be perfectly harmonised with each other to establish smooth integration into the production process. It is only then that the system can realise its optimum output potential. The basis for achieving this goal is precise planning.

The complete scope
We would be happy to take charge of planning and deliver you all the types of valves that you need to operate your power plant. In addition to this you will receive the appropriate actuator from us. Our offer is rounded off with the commissioning of the system for operation as well as the possibility of hydraulic pipes and field cabling.

Your benefits
A completely integrated system, planned and delivered by hand, means less effort for you, a higher degree of safety and reduced standby and maintenance times. Communication becomes quicker and easier because the system is designed for the highest level of integration during the planning stage.
1. Minimum flow control valves
2. Feed water control valves
3. Level control valves
4. Auxiliary steam control valves
5. High pressure injection cooler
6. Reheater injection cooler
7. High pressure bypass station
8. Reheater safety valve
9. Low pressure bypass station
10. Condensation control valve

Process planning
Bypass stations
HP, IP / LP

Functional scope
Bypass stations ensure a safe current flow through the reheater and the independent operation of the steam generator, even when the turbine inlet is closed. When operated with variable pressure the safety function is also maintained when the pressure quota for the chamber is exceeded. The valve also serves as a safety valve.

Benefits
• For universal use
• Optimum steam conversion over the entire load range due to integrated motive steam nozzle (HP)
• Optimum cooling over the entire load range due to cooling water injection from nozzles at the outlet
• Optimised spray angle and minimised droplet size (MP/LP)
• Optimum water/steam mixing even just after the injection point
• Low-delay steam cooling, in particular in the event of partial loads
• Low-noise and low-vibration operation thanks to installed silencers
• All wear parts can be replaced on site
• All mounting parts can be replaced without mechanical processing
Control valves for boiler / feedwater applications
1. Minimum Flow Control Valve / Leak-off Valve
2. Main Feed Water Control Valve
3. Start-up Feedwater Control Valve
4. Circulation Control Valve
5. Discharge Control Valve
6. Injection Control Valves
Special Control Valves for Boiler applications

Next to steam conditioning there exists another wide field of applications with highest relevance to the most reliable and, even more important, the safest operation of your plant: Boiler applications. The various types of boilers that are typically used in power stations as well as the various operating conditions that must be considered, demand perfectly engineered solutions. With the application of Special Control Valves by Welland & Tuxhorn you can participate in our know-how and long experience with these most pressing challenges.
Application

The minimum flow generally means the lowest continuous flow the pumps are permitted to operate. A decrease of the feedwater flow to the boiler below the minimum flow of the pumps will result into cavitation and an unallowably high heating up of the feedwater pump. However, under certain operating conditions of the boiler (start-up, operation within a wide pressure range, low load operation) the feedwater flow required by the boiler would drop below the minimum flow of the pumps. This most critical operating condition would damage the pumps. With the application of a pump bypass system with a minimum flow - control valve as its key component, a discharge flow above the minimum flow of the pumps is verified at all times. Therefore the minimum flow - control valve can be considered a pump safety valve!
Minimum Flow - Control Valve / Leak Off Valve

Design
Forged bodies: Angled or Z-shaped valves, for welding connections according to DIN, ANSI or other standards.

Hydraulic Actuators
All our minimum flow - control valves can be equipped with a compact hydraulic actuator. Hydraulic actuators provide you with the following control types:
- Quick open/close, Step to set-point, continuous control

Distinctive features
- Highest possible level of cavitation prevention
- Highest possible level of erosion prevention
- State of the art design minimizing oscillations or vibrations
- Precise characteristic
- Noise levels <75 dB (A)
- Fail-safe technology: Valve opens in case of energy blackouts or malfunctions
- Quick maintenance and servicing due to easy-to-replace internal parts and components - replaceable without mechanical work Long service life

| Seat Ø mm | 40-150 |
| DN from-to Inlet/Outlet mm | 50-300 |
| DN from-to Inlet/Outlet inch | 2-12 |
| PN up to [bar] | 630 |
| PN up to [lbs] | 4500 |
Application
Controlling, regulating and adjusting the flow of feedwater into the boiler. With feedwater control valves by Welland & Tuxhorn all requirements brought on by various boiler types and operating conditions are addressed:
Drum boilers require a feedwater level control and/or differential pressure control for variable speed drive turbo pumps.
Once-through boilers require additional means to reduce the amount of the feed water flow, especially when the outlet of the feedwater pumps cannot be throttled any further.
Full-load operation requires control valves that cause the smallest
possible pressure drop. The control valves are set up to handle the entire amount of feedwater flow into the boiler. For this application the control valves are arrayed in the main feedwater line. Start-ups, shut-downs and low load operation require management of high pressure differences with a considerable low flow of feedwater.

**Design**

Cast or forged bodies, straight, angled or Z-shaped, for welding connections or with flanges, according to DIN, ANSI or other standards

<table>
<thead>
<tr>
<th>Seat Ø mm</th>
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<tbody>
<tr>
<td>DN from-to Inlet/Outlet mm</td>
<td>200-600</td>
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<tr>
<td>inch</td>
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<tr>
<td>PN up to [bar]</td>
<td>630</td>
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<tr>
<td></td>
<td>[lbs] 4500</td>
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</tbody>
</table>

**Distinctive features**
- Highest possible level of cavitation prevention
- Highest possible level of erosion prevention
- State of the art design minimizing oscillations or vibrations
- Precise characteristic
- Noise levels <80 dB (A)
- Quick maintenance and servicing due to easy-to-replace internal parts and components - replaceable without mechanical work
Application
During low-load operation as well as during start-ups, the boiler requires only relatively small amounts of feedwater (approx. up to 30 % in compare to Full-Load operation). At the same time pressure fluctuations are substantially greater than they are during full-load operation.
Low-load control valves by Welland & Tuxhorn not only master these challenges safely and reliably, but as well they provide you with an outstandingly high rangeability.
Start Up Feedwater Control Valves

Design
Forged bodies: Straight, angle or Z-shaped valves, for welding connection, manufactured according to DIN, ANSI, or other standards.

Distinctive features
- Highest possible level of cavitation prevention
- Highest possible level of erosion prevention
- State of the art design minimizing oscillations or vibrations
- Precise characteristic
- Noise levels <75 dB (A)
- Quick maintenance and servicing due to easy-to-replace internal parts and components - replaceable without mechanical work

| Seat Ø mm | 50-200 |
| DN from-to | Inlet/Outlet mm | 100-300 |
|           | inch         | 4-12    |
| PN up to  | [bar]       | 630     |
|           | [lbs]       | 4500    |
As soon as the feedwater is heated up, the level control within the separator is realized with a circulation control valve. By means of a pump in combination with a circulation control valve boiling water is reintroduced into the circuit in front of the evaporator.

Forged bodies, angled and Z-shaped valves for welding connections, manufactured according to DIN, ANSI, or other standards.

**Distinctive features**
- Highest possible level of cavitation prevention
- Highest possible level of erosion prevention
- State of the art design minimizing oscillations or vibrations
- Precise characteristic
- Noise levels <85 dB (A)
- Quick maintenance and servicing due to easy-to-replace internal - replaceable without mechanical work

**Circulation Control Valve**

| Seat Ø mm | 100-250 |
| DN from-to | Inlet/Outlet | mm | 100-400 |
|           |           | inch | 4-16 |
| PN up to  | [bar] | 630 |
|           | [lbs] | 4500 |
Application
During start-up as well as during low-load operation the level of water inside of the separator needs to be controlled. With the use of a discharge control valve water or boiling water can be discharged and reintroduced into the circuit by applying one of following methods:
Using a flash tank at atmospheric pressure
Using the feed water tank.
Discharge Control Valve / Blow Down Valve

**Design**
Forged bodies in angled shape with welded connections fulfilling DIN, ANSI or other standards. Outlet size 2-3 nominal diameter levels greater than the inlet size due to evaporation. Separated seat and control area.

**Distinctive features**
- Highest possible level of cavitation prevention
- Highest possible level of erosion prevention
- State of the art design minimizing oscillations or vibrations
- Precise characteristic
- Quick maintenance and servicing due to easy-to-replace internal - replaceable without mechanical work
- Long service life

<table>
<thead>
<tr>
<th>Seat Ø mm</th>
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<tr>
<td>DN from-to</td>
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<td>Inlet mm</td>
<td>80-300</td>
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<td>inch</td>
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<tr>
<td>Outlet mm</td>
<td>2-3 times larger than DN of inlet</td>
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<tr>
<td>inch</td>
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<tr>
<td>PN up to</td>
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<tr>
<td>[bar]</td>
<td>630</td>
</tr>
<tr>
<td>[lbs]</td>
<td>4500</td>
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</tbody>
</table>
Application

In the first place the amount of cooling water as required by the consumer must be controlled and adjusted precisely. This task is compromised by great pressure fluctuations at the point of consumption, when the pressure on the inlet side of the valve however keeps steady. To achieve satisfying operating results Injection Control Valves far mostly follow an equal percentage opening characteristic. To a great extent, this ensures a linear flow characteristic. When used in boiler applications, the injection control valves are in constant operation.
Injection Control Valves
Single-stage for superheater / multi-stage for reheater

Typical design (single-stage)
Forged bodies: Straight, angled or Z-shaped valves, for welding connections, according to DIN, ANSI or other standards.

Typical design (multi-stage)
Forged bodies: Straight, angled or Z-shaped valves, for welding connections, according to DIN, ANSI or other standards.

Distinctive features
- Adaptable to prevalent operational conditions
- Pressure decrease stepwise (with multi stage design)
- Highest possible level of cavitation prevention
- State of the art design minimizing oscillations or vibrations
- Noise level <80 dB (A)
- Precise characteristic
- Quick maintenance and servicing due to easy-to-replace internal parts - replaceable without mechanical work
- Long service life
A variety of applications
As well as steam conditioning and control valves we also provide you with the appropriate actuator components. Hydraulic actuating systems are particularly suitable for plants with high operating pressures and high requirements in terms of accuracy and precision of regulation.
Actuator
Hydraulic, pneumatic, electric

We also offer electric or pneumatic actuator. Each type is harmonised exactly with our valves and integrated perfectly. This reduces your costs, increases the safety of your plant and ensures seamless, trouble-free operation.

Developed by us
Based on our years of project experience, over time we have designed and developed our own hydraulic actuating system. Accordingly the adaption of the appropriate hydraulic drive can be perfectly matched to the requirements of the valve. Your very benefit is the significant increase of the reliability and safety of plants operated by you.
Cooling spacer with stuffing box

Valve stem and 5-stages control/throttle element

Actuator coupling

Integrated cooling water injection / motive steam assistance
Improved CO2 balance
Since 2008 we have been running a research project together with other manufacturers, with the aim of increasing power plant efficiency. CO2 emissions can be decreased, making an important contribution towards protecting the environment.

Increasing efficiency
Long term testing of materials and components with high strength at high temperatures helps to increase the steam temperature and therefore increase the efficiency of the power plant by around 20%.

Our valve has been installed in the 725 °C high temperature material test facility (HWT II) at the large-scale coal power plant in Mannheim.

At a glance
Description: valve with integrated steam header
Operation: with hydraulic drive
Live steam: design: 725 °C / 205 bar
Nominal width: DN 80/150
Total weight: 420 kg
Stroke: 50 mm
Valve housing material: alloy 617mod
Our Quality

Our quality
Our consistently high product quality is the result of a well-thought-out concept: we implement a range of quality assurance measures and comply with all the requirements of DIN EN, VdTÜV, AD-2000, TRD, as well as ASME, ANSI, IBR and RTN. Our quality assurance system is approved by the following regulations: DIN EN ISO 9001:2000, Directive 97/23 EG (DGRL), KTA 1401 and ASME. We have our products inspected and evaluated by recognised authorities.
Reference projects

**EUROPE**

- Austria
- Belgium
- Bulgaria
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Italy
- Ireland
- Norway
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey

**AMERICA**

- Argentina
- Brazil
- Chile
- Mexico
- Nicaragua
- Panama
- Peru
- Uruguay
- USA
- Venezuela

**AFRICA**

- Algeria
- Egypt
- Morocco
- Nigeria
- South Africa
- Sudan
- Tunisia
- Zimbabwe

**ASIA**

- China
- India
- Indonesia
- Japan
- Malaysia
- Pakistan
- Philippines
- Singapore
- Thailand
- Turkey

**OTHER**

- Australia
- Brazil
- Canada
- China
- India
- Indonesia
- Japan
- Mexico
- Nigeria
- Pakistan
- South Africa
- Turkey

- United Arab Emirates
- United Kingdom
- United States
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</table>
Custom-made systems with service
Fine-tuning in all areas

Individual solutions
Welland & Tuxhorn deliver provides you with a system solution tailor-made to your requirements, designed by a qualified team of engineers.

Our service
After a product is delivered, an experienced team of service technicians is available for consultation during the start-up phase, or to carry out routine inspection work. As maintenance is integrated into our production process, the knowledge gained from this influences the development of new products.