

Delayed Coking Unheading Equipment and Technology

Innovative German Engineering



Over 125 Years ZIMMERMANN & JANSEN

Zimmermann & Jansen is based on a successful family tradition developed over the last one hundred years and has produced valves since its foundation.

An early specialization in products for the iron and steel industry has expanded into other high temperature, severe service areas including the refining, chemical and glass industries.

Zimmermann & Jansen Milestones

1850 The iron foundry and machine shop of Daciers Frères started operation.

1873 The company was purchased by Zimmermann and Brandenburg.

1877 Wilhelm Jansen joined the company and name changed to Zimmermann & Jansen.

1895 The Jansen family became the sole owners.

1927 The company had 45 employees in the office and 200 in the shop.

1945 The family and employees rebuilt the damaged plant and established strong business contacts in the U.S. and U.K.

1961 Opened a manufacturing plant in the United States of America.

1972 Opened a manufacturing plant in South Africa.

2002 The companies Zimmermann & Jansen GmbH and Hermann Rappold & Co. GmbH (RACO) were merged under the new corporate name Z&J Technologies GmbH.

2005 Opening of a manufacturing workshop in Shanghai, China.

Z&J Technologies became worldwide known as manufacturer of big valves designed for high operating temperatures. Today a staff of more than 400 members worldwide is engaged in customer-related solving of problems which represents an integral part of deliveries effected.

In this context long-term experience and application of latest engineering technology and fabrication procedures build the basis.

Z&J continues to lead in customized valves for the Refining Industry.



Z&J Technologies GmbH, Düren / Germany



Zimmermann & Jansen Inc., Humble, Texas / USA

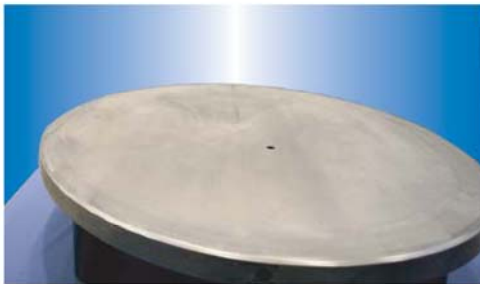


Zimmermann & Jansen S.A. (Pty.) Ltd., Vanderbijlpark / South Africa

Engineering / Design Selection Criteria



Single Disc



Patented Double Disc Design

Single Disc versus Double Disc

Single Rectangular Plate

- Non-Uniform temperature distribution
- Sensitive to distortion
- Resulting in leakage & excess steam consumption

Innovative Double Disc Design

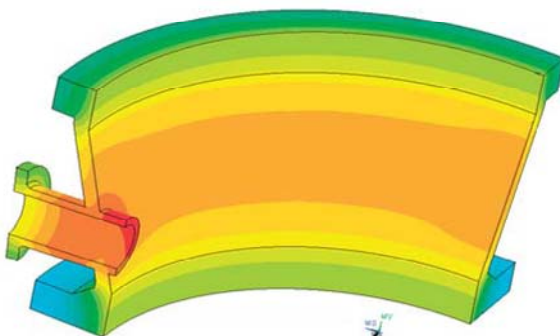
- Round disc, more equal temperature distribution
- Limited distortion, less deformation
- Up to 10 times less calculated steam purge consumption
- Best choice for DC applications

Due to above negative influence of single rectangular plate design Z&J only selected double disc design for DC application.

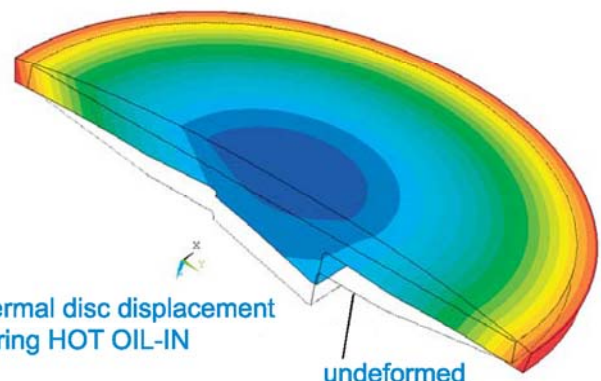
The Zimmermann & Jansen engineering and design departments at our various locations remain in constant contact and share technological advances through our engineer exchange program. We upgrade our engineering and design capabilities after extensive review and testing of new software, continued education, in house training and quality programs based on ISO-9001. Z&J complies fully with customer and process licensor specifications, additionally providing the advantages of its design patents.

The design process starts with our customer specification. It continues with Z&J's long history of specialized design, along with the results of our research and development department.

The latest CAD and FEA software are utilized. Quality checks continue throughout the design, engineering and drafting phases. All designs are checked with FEA for mechanical and thermal stresses before being presented to our customer for review prior to manufacture.



temperature distribution during HOT OIL-IN



thermal disc displacement during HOT OIL-IN

undeformed

Manufacturing

Complete Solutions

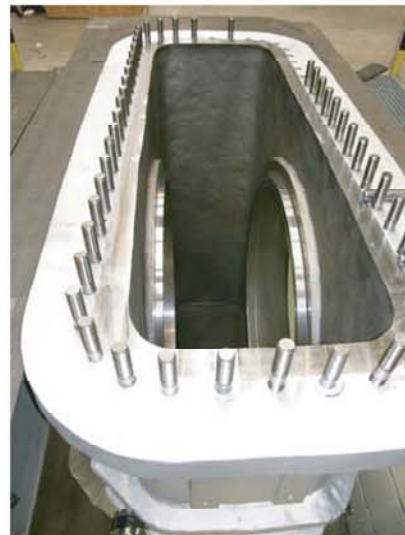
Zimmermann & Jansen's designers and drafts people have worked for years in close co-operation with both the manufacturing and quality departments, who utilize the latest equipment and documentation for scheduling, tracking and process control.

Zimmermann & Jansen's welding technology is characterized by investment in equipment and know-how. This includes the latest developments in submerged arc, plasma welding and EB welding for weldments and overlays.

Zimmermann & Jansen's machine shops employ state-of-the-art equipment, ranging from manual control to CNC machines, including very large vertical and horizontal mills, lathes and grinding machines.

Spacious bays, equipped with large heavy lifting capacity overhead cranes, enable the assembly and testing departments to complete the products.

QA/QC control all phases of manufacture.



5



Remote Control Unit



Condensate Vessel



Hydraulic Backup System



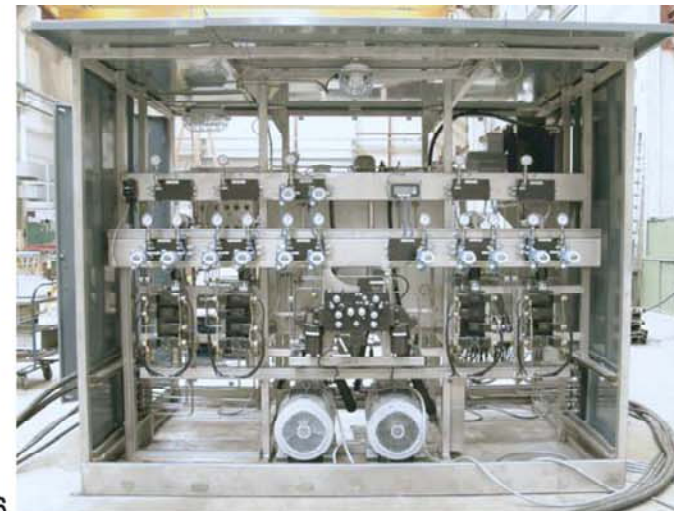
Top and Bottom Purge Systems



6



Z&J offers complete solutions for mechanical, hydraulic and control equipment.



HPU

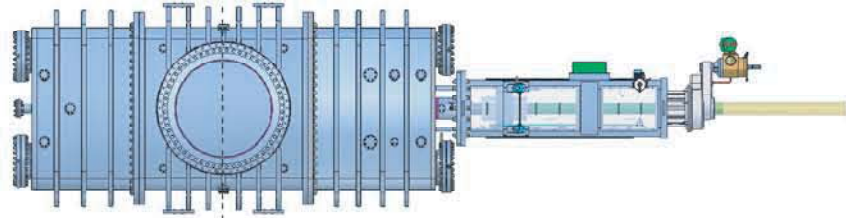
Bottom Unheading Valves

Electric or hydraulic Actuation? It's customers choice

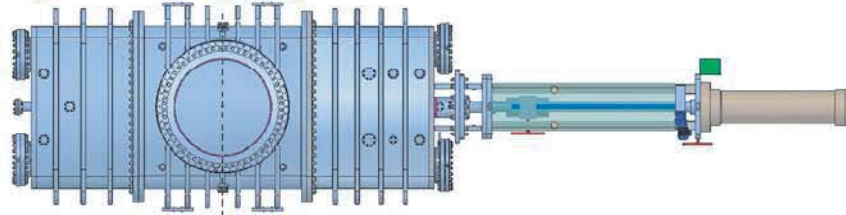
- Different actuator situations possible to suit the customer's specific requirements.



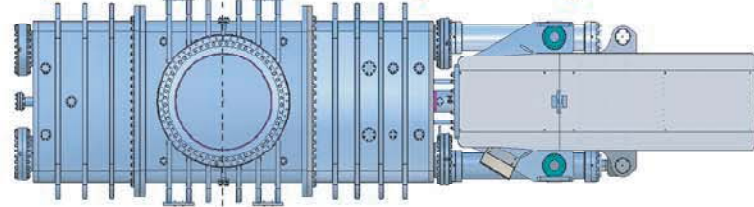
Electric Actuation



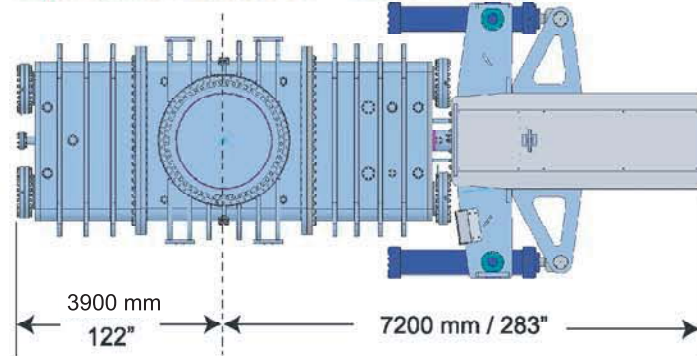
Hydraulic Single Cylinder Actuation



Hydraulic Actuation - Compact Design

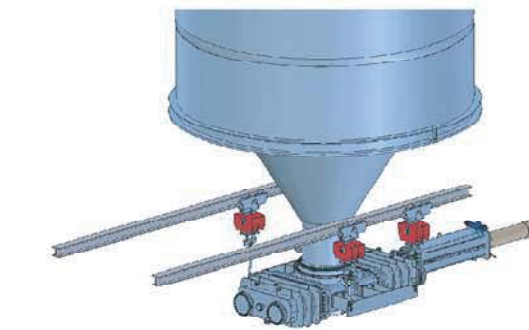
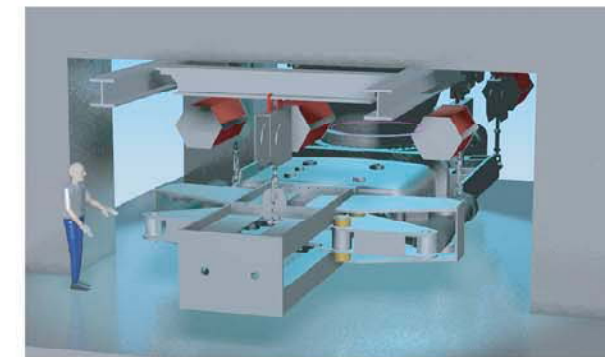
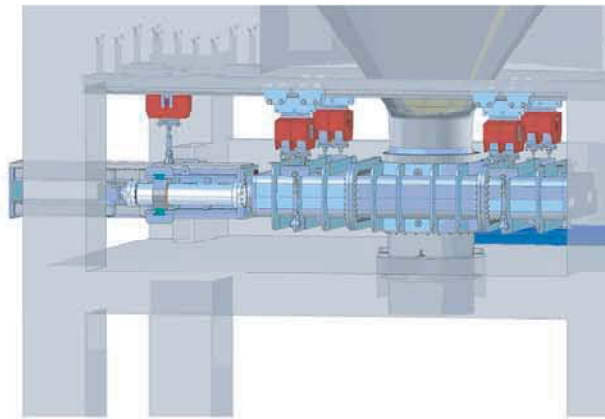


Hydraulic Actuation - Wide Design

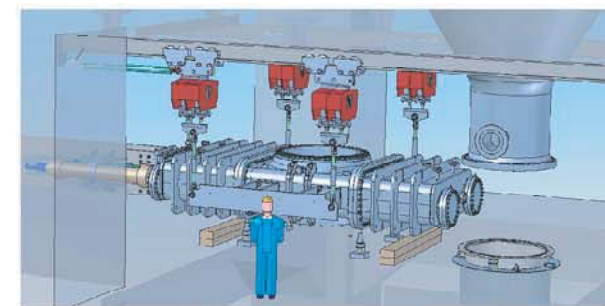


All Actuators Designed and Manufactured by Z&J

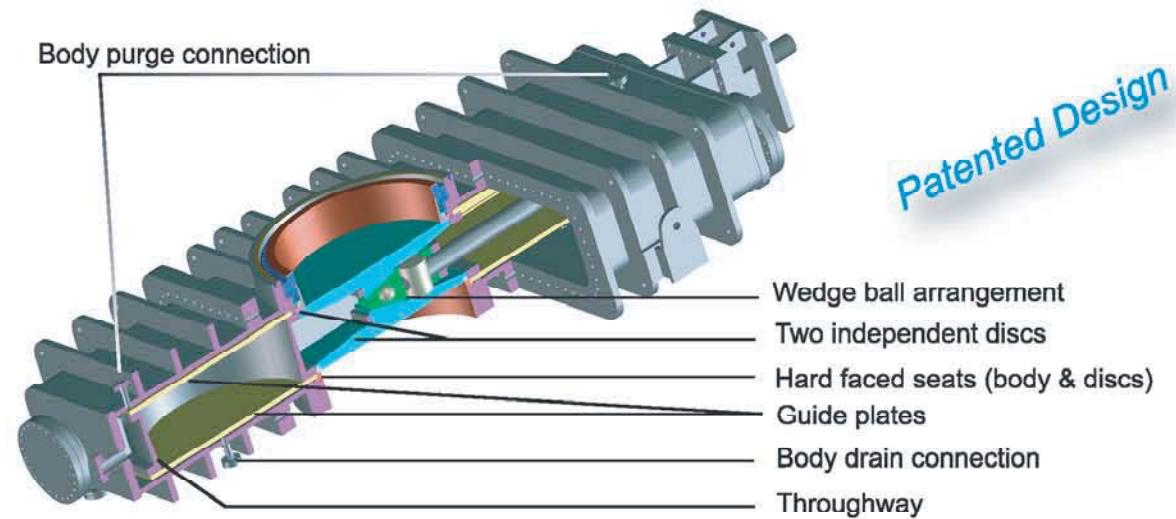
Valve in Operating Position



Valve in Maintenance Position



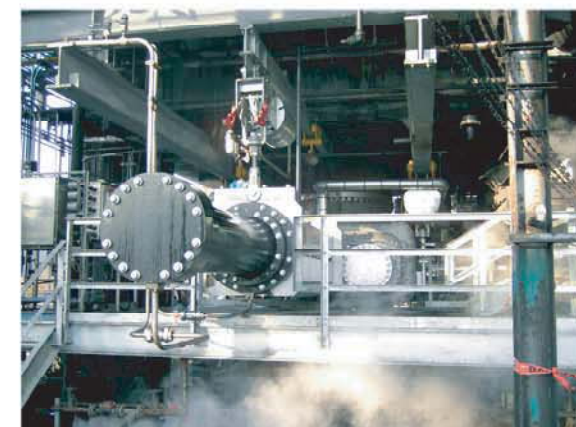
All wear parts can be easily removed when the valve is in maintenance position (The valve will remain assembled).



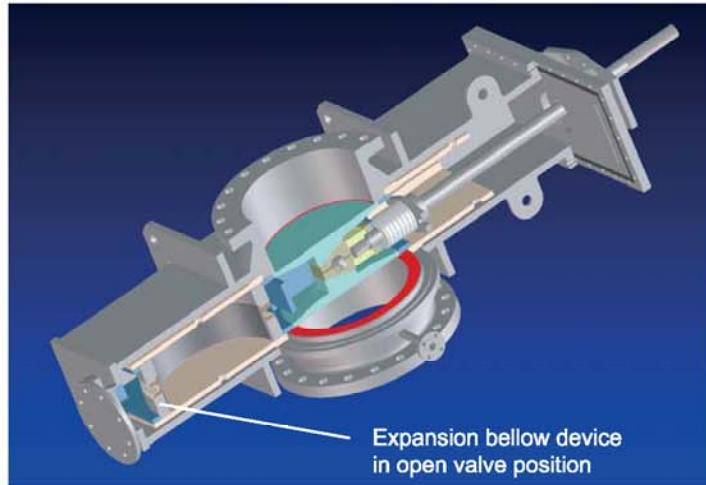
Double Disc Unheading Valve ... in Manufacturing



... on Site



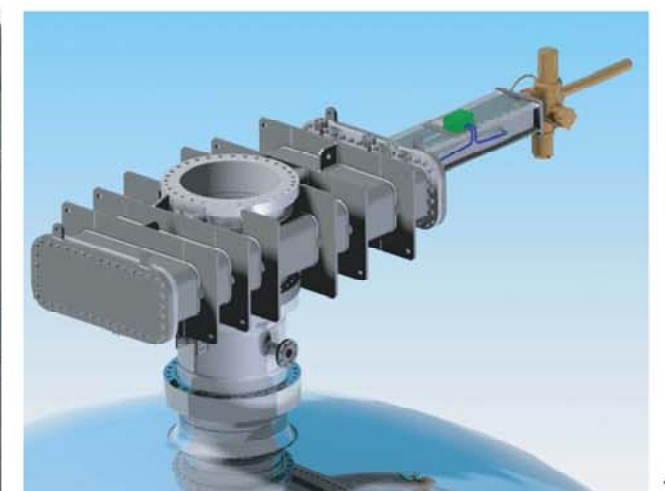
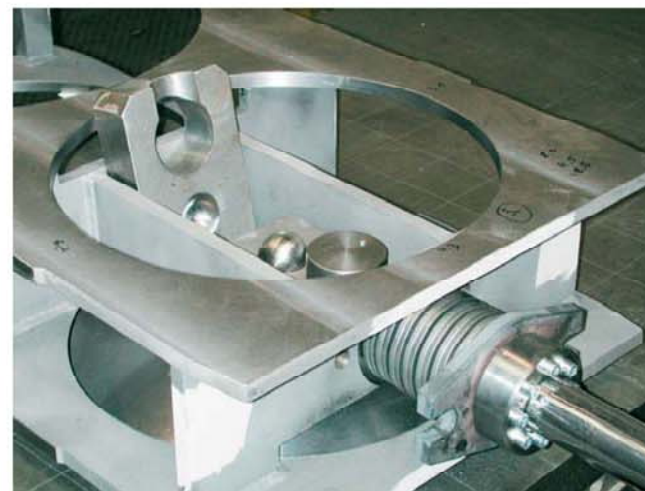
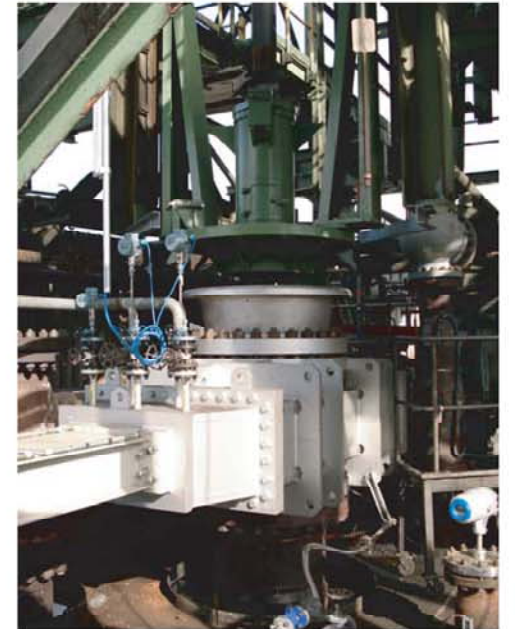
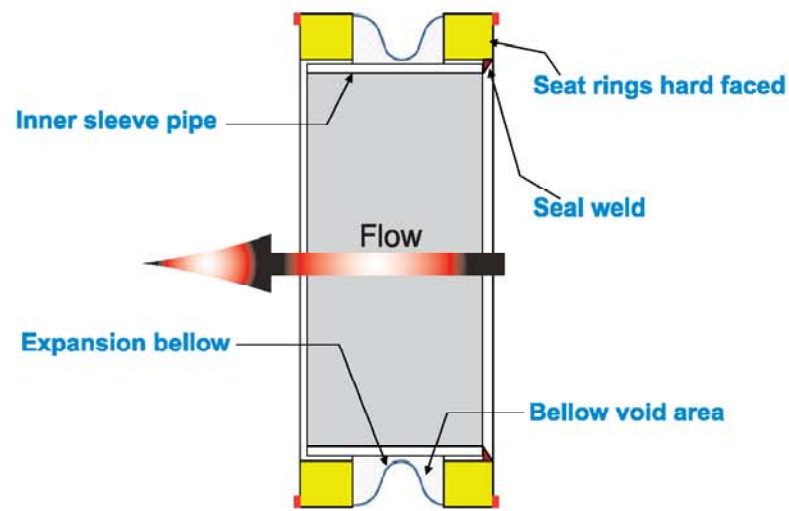
Valves for Top Unheading • Inlet Isolation • Overhead and Blowdown



Top Unheading Valve Installation with Cutting Equipment

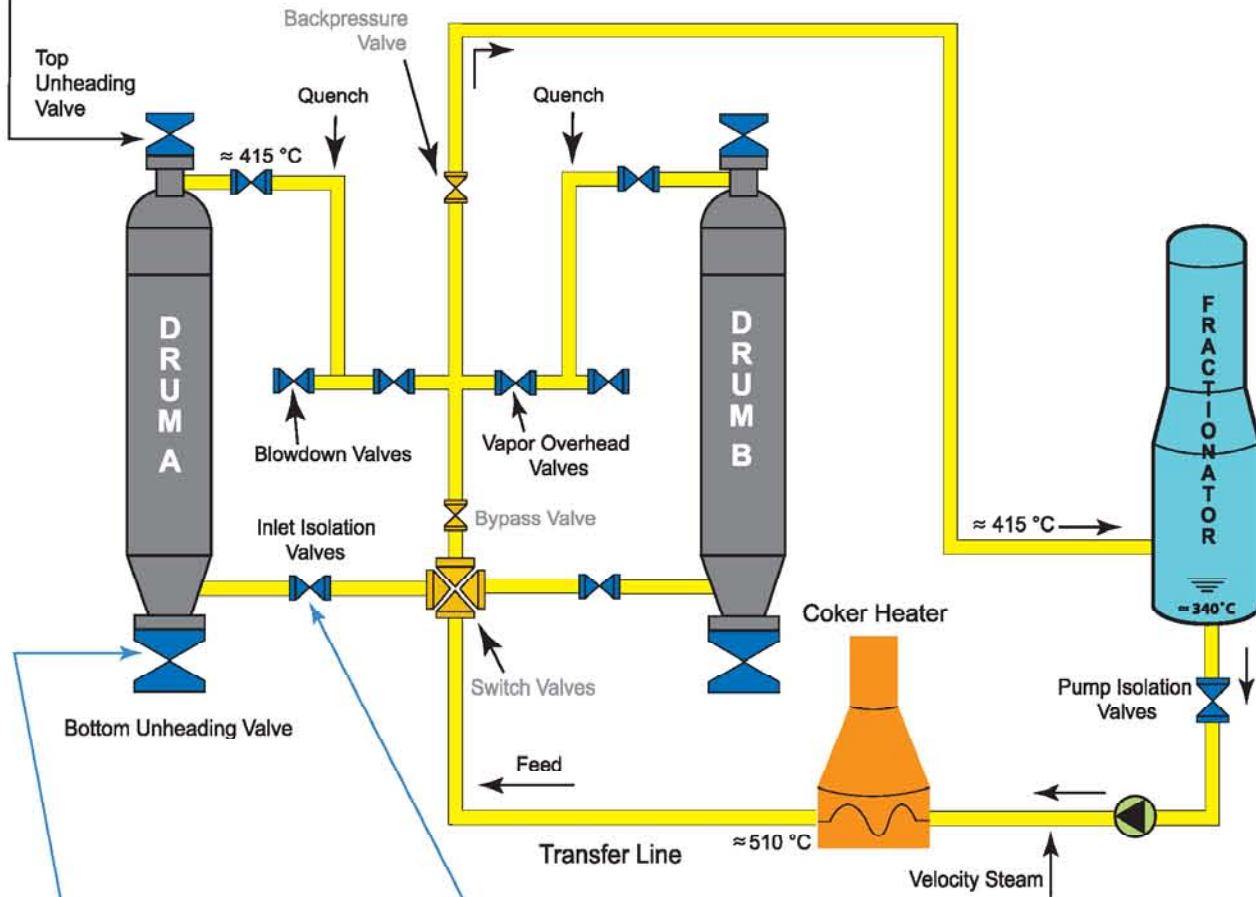


Expansion Bellow



Application of Z&J Valves in Delayed Coker Units

Final Considerations / Advantages / Benefits



Safety

- During unheading no personnel are required on deck due to fully remote operation.
- Real double block and purge due to two independent discs. Highly reliable sealing even during hot oil in phase.
- No spillage of coke or drum water onto the unheading deck due to fixed outlet shute below the valve.

Reliability due to Double Disc Triple Seal Technology

- Well proven patented design used in other severe services such as ethylene, FCCU, phosgene, etc..
- The design assures long term operation.
- The actuator is well oversized to assure 100% operability in open as well as closed position even in most severe situations.
- Field serviceable extremely easy in very short timing.
- Coke feed lines remain mounted.
- No new gaskets necessary after each drum cycle like during manual unheading.
- Drum water drainage through the open valve can be performed.

Cost Reduction

- Low maintenance cost.
- Cycle time reduction.
- Low steam consumption.

Main Advantages of the Double Disc Through Conduit Gate Valve

- Real double block and purge performance; triple seal within one valve body due to two independent discs. 100% tight.
- Active mechanical seating force due to central split-wedge-ball arrangement.
- Corrosion and wear resistant hard facing overlay on the seats; no adjustment and replacement of seats required.
- No deposits of solid particles in valve body due to valve gates guided between guide plates.
- All wear parts can be easily removed when the valve is in maintenance position.
- The sealing surfaces are completely covered in each gate end position. Depositing within the valve and on the seats is avoided.
- Disc carrier equipped with throughway in open position.
- Purge steam connections for continuous valve body and seat purge.
- Minimum purge consumption due to reliable metal seating even under hot oil-in situation.
- Emergency manual operation available.
- Automated locking device.
- No cooling water necessary.
- Ability to throttle coke and water mixture.

The Company Vision: Customer satisfaction based on our engineering technology!

Performance and function testing under closely simulated operating conditions at our modern test centers complete and prove our products.

Test capabilities include:

- Positive Material Identification
- Hydrostatic Pressure Tests
- Pneumatic Pressure Tests
- Seat Leakage Tests
- Actuator Operating Tests
- Cold Function Testing
- Hot Stroke Testing
- Simulated Operation Tests
- Other



Quality Assurance



The quality assurance and quality control departments of Zimmermann & Jansen, at all locations, report directly to the President or Managing Director. All programs are in accordance with ISO-9001. The Düren, Germany and Houston, Texas locations are both ISO-9001 certified since 1994. The Vanderbijlpark /SA. plant is certified since 1999.

Quality assurance starts with the receipt of inquiry, providing a proposal, order entry, engineering, design and drafting. The Q/A continues through material purchase, receiving and inspection along with material certifications. It controls manufacturing including fabrication, welding, heat treatment, machining, assembly, testing, document packages, data books and shipping according to ISO-9001 procedures and documentation.

Zimmermann & Jansen's quality assurance is known for its close co-operation with customer's inspection teams and designated third party inspectors.



Our Service At Your Service

Technical Support and Assistance:

In terms of service you benefit from decades of experience accumulated by our highly motivated staff.

Having a service division integrated within our company means that you can rely on our employees always being familiar with the latest manufacturing techniques and products.

Service work that cannot be performed on site at your plant, is transferred to our in-house service facilities.

Just as with a new construction project, a very individual work schedule is precisely defined, executed to the relevant quality standards and subsequently fully documented.

Service Performance:

- Valve Spare Parts
- Shop Service
- Field Service

Inspection and Maintenance for:

- Zimmermann & Jansen Valves
- Other Valve Brands
- Actuators

Scope of Available Shop Service:

- Valve Refurbishment
 - Cleaning/Disassembling
 - Analysis of Valve Condition
 - Determination of Repair Work
- Valve Repair
- Valve Modification
- Spare Parts Fabrication/Installation
- Valve Test
 - Hydrostatic Test
 - Function Test
 - Hot Stroke Test
- Documentation
 - Scope of Repair Work
 - Repair Work Procedures
 - Material Certificates
 - Heat Treat Reports
 - Test Certificates

Field service is understood by our specialist team as being available on site within the shortest possible time - complete with portacabins, erection equipment and special tooling. We are particularly well equipped to handle all types of special valves, various types of drive systems and the servicing of blast furnace plants, oil refineries, chemical plants and float glass units.

We guarantee you a high quality service.



Scope of Available Field Service:

- Valve Maintenance
- Valve Refurbishment
 - Cleaning/Disassembling
 - Analysis of Valve Conditions
 - Determination of Repair Scope with Customer
- Valve Repair
- Valve Modification
- Spare Parts Installation
- Commissioning
- Function Test
- Support During Unit Start-up

