VALV TECHNOLOGIES

Valves for the Power Industry

Critical Service Solutions

Critical Service Valve Applications

ValvTechnologies' valves are built to withstand the most severe applications. High-temperature, high-pressure, high-cycling, abrasive, corrosive and caustic media have all been considered in the design of our product line.

LP Feedwater Sustem

- Feed water inlet isolation
- Feed water outlet isolation
- Bypass isolation
- Shell side vents
- Shell side drains
- Level control isolation
- Manual dump to condenser
- Shell side instrument isolation
- Instrument Isolation

HP Feedwater Sustem

- BFP recirc isolation
- BFP discharge isolation
- BFP turbine above and below seat drains
- Feedwater heater isolation inlet and outlet
- Feedwater heater bypass
- Shell side water level control isolation/ heater drain
- Feed water drains
- Shell side drains and vents
- Instrument isolation
- Molecular sieve absorber isolation
- First and second stage separator isolation

Boiler System

- Economizer drains and vents
- Water wall header drains and vents
- Mud drum blowdown
- Steam drum gauge/sight glass isolation
- Start-up, drum level control
- Steam drum continuous blowdown and block
- Steam drum instrument isolation
- Secondary superheater header drains and vents
- Secondary superheater instrument isolation
- Primary superheater header drains and vents
- Reheat superheat header drains and vents
- Reheat superheat instrument isolation
- Electronic relief valve and isolation

Sootblower System

- Sootblower header isolation
- Sootblower control valve isolation
- Sootblower control valve downstream block
- Sootblower header crossover isolation
- Individual sootblower isolation
- Sootblower drains
- Instrumentation

Hot and Cold Reheat Steam Lines

- Drains and vents

Turbine Steam and Extraction System

- Main steam drains
- Main steam stop before and after seat drains
- Main steam turbine isolation, double block and bleed
- Main steam attemperator/superheat/ reheat spray isolation
- HP turbine bypass
- Turbine drains
- Extraction steam isolation
- Extraction steam drain valves

Combined Cycle/ Co-Generation

- BFP recirc
- BFP recirc isolation
- HP economizer drains/vents
- IP economizer drains/vents
- LP steam drum drains/vents
- HP/IP drum pressure and level transmitter instrumentation
- Saturated steam isolation
- Steam drum gauge/sight glass isolation
- Superheater drains/vents
- Hot reheater and main steam isolation drains, vents
- Electronic relief valve
- Main steam start-up vent
- Main steam attemperator/superheat spray isolation
- Turbine bypass system
- Fuel gas heat exchanger
- Instrument isolation
- Emergency gas valve isolation

ValvTechnologies provides field-proven solutions for severe service applications.

V Series Metal Seated Ball Valves

The flagship of the ValvTechnologies' product line

1. Integral metal seat

With our patented HVOF RiTech® coating technology, the integral seat in ValvTechnologies' valves is resistant to the attack of abrasive and corrosive production applications.

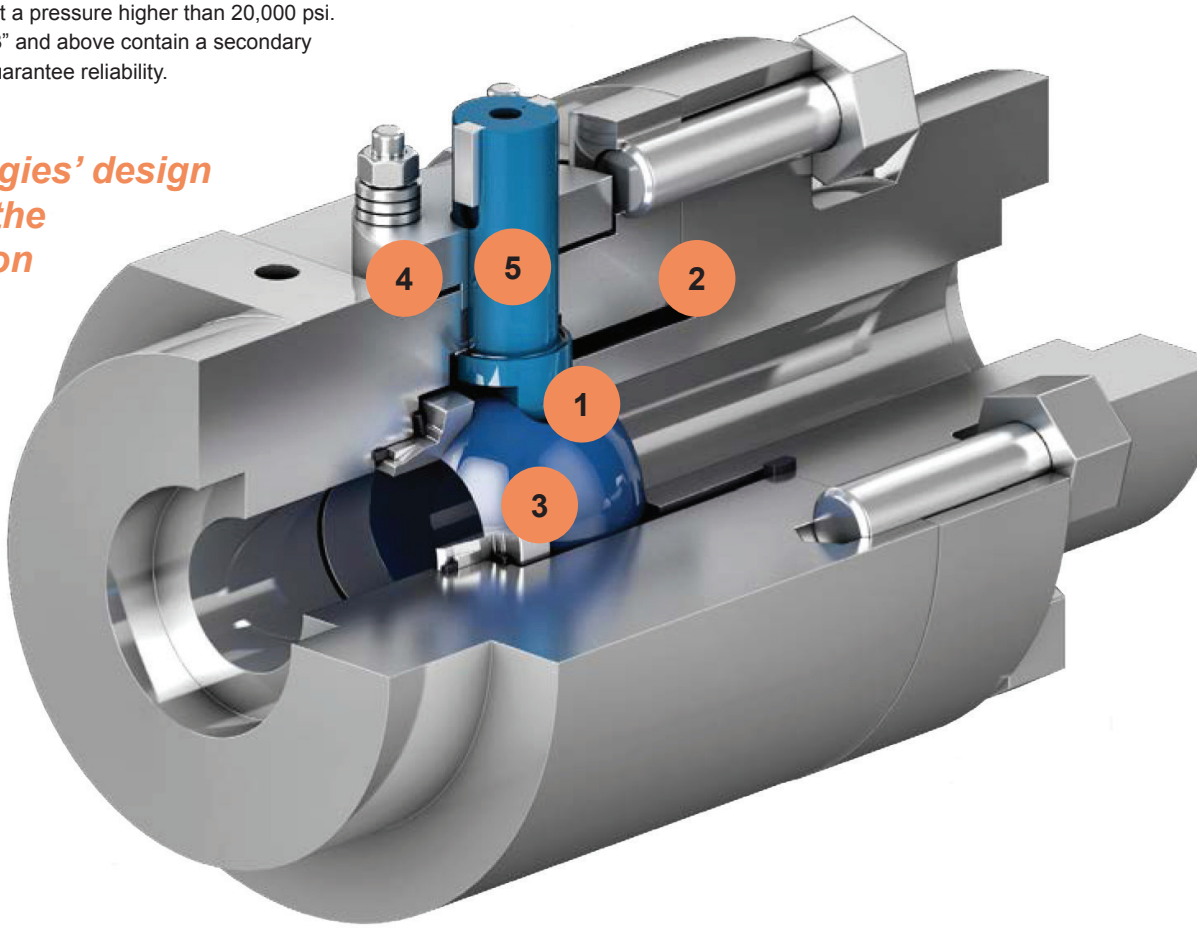
2. Body seal ring

ValvTechnologies employs a field-proven seal ring technology to ensure sealing under all operating conditions, up to 1400°F. The body seal ring is loaded at a pressure higher than 20,000 psi. In addition, valves sized 3" and above contain a secondary Grafoil® seal to further guarantee reliability.

ValvTechnologies' design features are the implementation of extensive industry experience.

3. Patented coating process

The sealing surfaces are overlaid with tungsten or chromium carbide using our HVOF RiTech® coating process. These surfaces have a hardness of 68 - 72 Rc to provide uninterrupted operation in the most severe conditions with zero-leakage.



3. High-integrity Seat Surfaces

The NexTech® gland packing design features a four-stud, live-loaded assembly designed for heavy industrial applications. The packing material is high-purity Grafoil® surrounded by carbon fiber/Inconel anti-extrusion rings. The six Belleville® springs (per stud) provide constant load pressure through extreme thermal shocks and prevent wear leaks in high cycle service. This state-of-the-art system allows the NexTech® to achieve a class "B" designation in ISO 15848 testing, a distinction usually reserved for low-temperature elastomer sealing systems.

4. Solids Resistance

In addition to the carbide coatings which will allow the valve to function in highly abrasive applications, the individual valve parts have additional seals to prevent interference from solids in the system. This provides for outstanding performance in catalyst systems, streams with solids contamination and polymers.

V1-1

Forged, high-pressure valves
Four-year, zero-leakage warranty*

- 1/4 - 4“
- ANSI/ASME Class 900 - 4500

V1-2

Flanged, low-pressure valves

- 1/2 - 36“
- ANSI/ASME Class 150 - 600

V1-3

Small bore, low and intermediate pressure investment cast valves
Four-year, zero-leakage warranty*

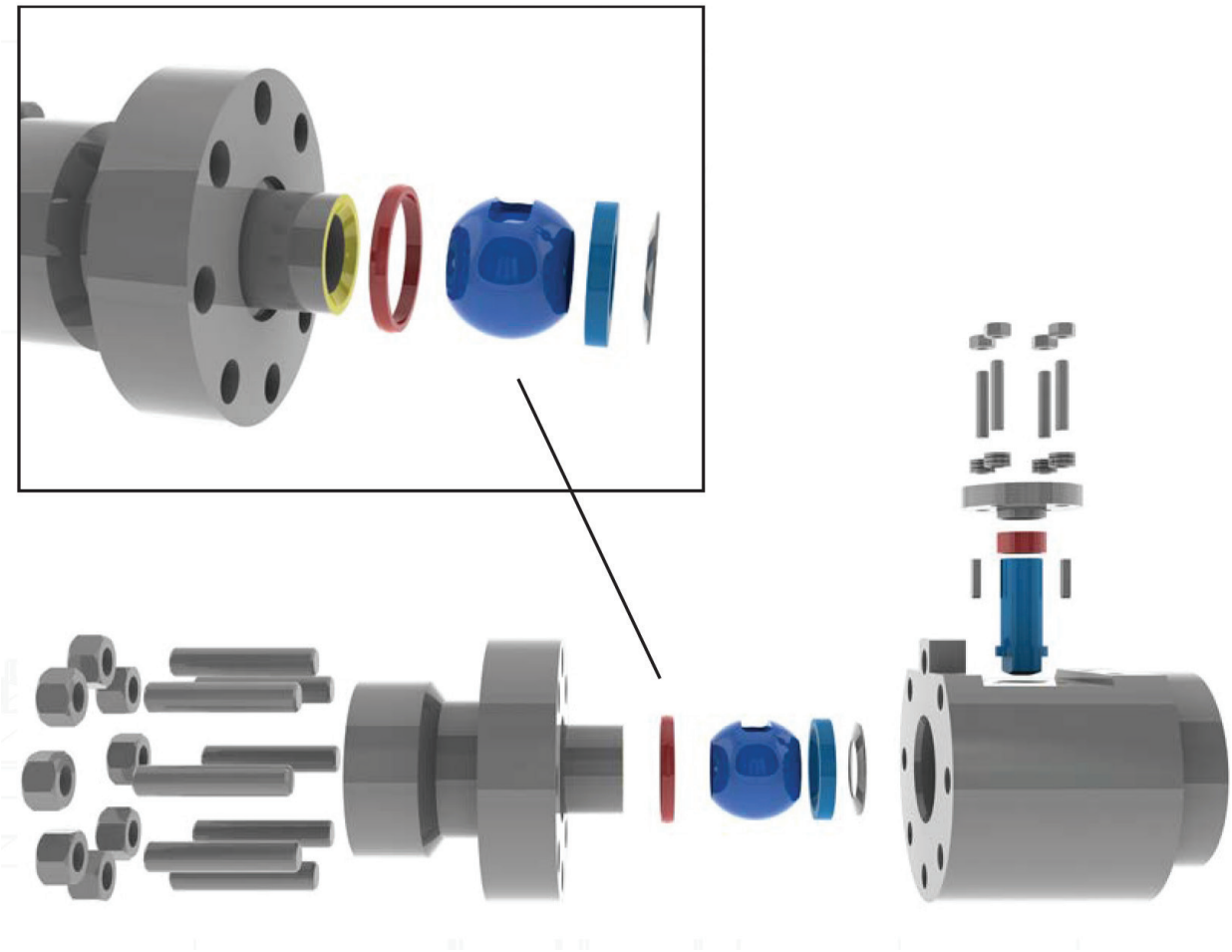
- 1/2 - 2“
- ANSI/ASME 150 - 600

V1-4

Large bore, high-pressure valves

- 4 - 36“
- ANSI/ASME Class 900 - 4500

*Four-year warranty in steam and water applications



PulseJet Performance Features and Benefits	
Features	**Benefits**
Guaranteed zero-leakage shut-off	Enhanced process safety
Quarter-turn operation - readily automated	Increased safety, ease of operation, reduced space requirements
Metal-by-metal seat	Good for highly abrasive service, resistant to solids, reduced maintenance costs, minimum downtime
Custom engineered	Process optimization
Dimensions to ANSI B16.10	Interchangeable with equivalent valves
Single piece anti blow-out stem design	Enhanced personnel safety
Certified to use in SIL-3 and SIL-4 loops	Enhanced process safety
Live-loaded gland system (four-stud design)	Reduced emissions
Stem fugitive emissions per ISO 15848-1 Class B	Reduced emissions, enhanced process safety
Fire safe certification: API-607	Enhanced process safety
Protected seat design	Reduced maintenance costs, minimum downtime
Live-loaded seats	Low-pressure sealing
No elastomers or thermal plastics	Long field life
Double block-and-bleed capable	Enhanced process safety

IsoTech®

Seat protected valves

The IsoTech® addresses the need for true in-line repairability in large diameter, high-energy piping systems. Specifically designed for steam and feedwater applications, the IsoTech® provides bi-directional, zero-leakage shutoff using our HVOF RiTech® coating process.

Technical Data	
Sizes	4 - 36”
Pressure Classes	ASME / ANSI Class 600 - 4500
Materials of Construction	Carbon steel Alloy steel Stainless steel Duplex steel Exotic alloys
In Compliance	ASME B16.34 PED Nuclear ASME III Class 1, 2 and 3 Nuclear Safety Related – 10CFR50 Appendix B SIL
End Connections	Buttweld - standard
Options	Various bypass configurations, actuator mounting
Warranty	Four year zero-leakage warranty* + delamination guarantee

Receive in-line valve repairability in large-diameter, high-energy piping systems with the ValvTechnologies’ IsoTech®. Proven precisely right for steam and feedwater applications, the IsoTech® offers our rigorous four-year zero-leakage warranty in steam and water applications, against leakage and low-cost maintainability, in addition to the ValvTechnologies’ Delamination Guarantee.

Bonnet Area

- Sufficient mechanical bolting to ensure the seal does not relax during periods when the system is not pressurized
- High seal reliability
- The bonnet does not have to be forced into the valve bonnet throat to allow for the segment rings to be removed

Gland Area Packing

- The stem and gland are hard faced and polished
- The packing has 316SS woven wire mesh anti-extrusion rings top and bottom and Grafoil® center ring
- Proven, superior, multiple Belleville® spring stacks
- Live-loaded stuffing box

Disc and Seat Area

- Discs and seats have been overlaid with the same carbide overlay (68-72 RC) as its counterpart, the ValvTechnologies’ metal-seated ball valve
- Seats are several magnitudes harder than Stellite VI, typically (34-38 RC)
- Lapped to achieve a bubble-tight seal under all pressure conditions, including vacuum
- The large spring load ensures a high initial seal, and the line pressure increases the sealing

Back Seat Area

- The back seat is coated with chrome carbide (typical hardness 68-72 RC) and polished to achieve a bubble-tight seal

•Standard four-year, zero-leakage warranty in steam and water applications available in addition to the ValvTechnologies’ Delamination Guarantee.

ERV

Electronic relief operated system

ValvTechnologies' ERV fulfills the need for a zero-leakage, pilot-operated relief valve. The ERV package combines ValvTechnologies' zero-leakage isolation valve with electronic controls to monitor and regulate system pressure. Whether in a capacity relieving funtion requiring the ASME V-Stamp or simply an overpressure protection application, the ERV provides reliable protection for standard safety valves in many industries.

Technical Data	
Sizes	2 1/2 - 4" and larger
Pressure Classes	ASME / ANSI Class up to 4500
Materials of Construction	Carbon steel Alloy steel Stainless steel Duplex steel Exotic alloys
In Compliance	ASME B16.34 PED Nuclear ASME III Class 1, 2 and 3 Nuclear Safety Related – 10CFR50 Appendix B SIL
End Connections	Buttweld, raised-face flange - standard

Features

- Repeatable tight shut-off, high precision reliability
- Zero-leakage guarantee comes standard
- The optional integrated isolation valve eliminates the need for a costly field weld
- Specially engineered for easy adaptation to existing control suites

Actuator Options

- Pneumatic actuation is customary to the ERV
- Multiple actuator relief options – air, spring, hydraulic, AC/DC electric, failsafe and failsafe last position – extend applicability throughout plant or site

Z Series ERV - Premium Package

Standard with a control box, complete fast-acting actuation package, longer diffuser discharge piping which minimizes noise and maxmizes flow.

R Series ERV - Economical Package

Standard product with a shorter diffuser discharge, without the fast-acting actuation package and control box. As with Z Series, the discharge must be piped to a drip pan for safe reliable operation.

ERV Control Box

ValvTechnologies' ERV control box delivers reliable automation in light-weight, compact packages, optimizing overall productivity in the distribution of power to flow control devices. With state-of-the-art improvements, the ERV control boxes integrates better environmental performance, simplified wiring and control, set point programmability and fault indication.

- Enclosure: NEMA 4X, stainless steel
- Auto/manual function: automatic + DCS auto
- DCS function: dry contact
- Fault indication available
- Pressure transmitter: 4-20mA
- Calibrated by PLC interface
- Actuation / cycle counter

Xactrol® Control Valves

From simple, minimum or normal flow control to a full rangeability over a wide range of pressure drops and conditions, we have the solution for you. The Xactrol® Mark I is designed for minimum or normal flow control conditions as required in a large number of flow control applications. In addition to normal flow control the Mark II design has a second flow port which is designed to handle continuous flow conditions. For applications where high-pressure drops are required, the Mark III design comes with a series of upstream pressure reducing plates to meet the toughest of applications.

Technical Data	
Sizes	1/2 - 36”
Pressure Classes	ASME / ANSI Class 600 - 4500
Materials of Construction	Carbon steel Alloy steel Stainless steel Duplex steel Exotic alloys
In Compliance	ASME B16.34 PED Nuclear ASME III Class 1, 2 and 3 Nuclear Safety Related – 10CFR50 Appendix B SIL
End Connections	Socketweld, buttweld, raised-face flange - standard
Options	Single stage pressure drop, continuous blowdown, multi-stage pressure drop, actuator mounting

Features

- Tight shut-off, high-pressure let-down combination
- MSS-SP-61 or better
- Reduces velocity
- Liquids - eliminates cavitation and flashing
- Gases - eliminates erosion and vibration/noise
- Smaller envelope than comparable globe valve
- Higher Cv than comparable globe valve

Control Options

- Mark I - high-pressure and/or erosive service
- Mark II - high-pressure and/or erosive service with the addition of a second flow port designed to handle continuous flow conditions
- Mark III - high ΔP liquid applications where cavitation and flashin are a concern, high ΔP gaseous applications where fluid is flowing at sonic velocity.

Sky Vent Startup Valves

To address issues of high-temperature, extreme noise and absolute tight shutoff during initial operation of combined cycle plant start-up, ValvTechnologies introduces sky vent valves. Sky vent valves are designed to address the high-performance demands of steam power generation start-up, ensuring plant piping and equipment do not rise in temperature too quickly protecting it from thermal induced stresses. ValvTechnologies’ sky vent valves relieve pressure during a plant trip or upset condition.

Technical Data	
Sizes	6 - 12”
Pressure Classes	ASME / ANSI Class 600 - 4500
Materials of Construction	Carbon steel Alloy steel Stainless steel Duplex steel Exotic alloys
In Compliance	ASME B16.34 PED Nuclear ASME III Class 1, 2 and 3 Nuclear Safety Related – 10CFR50 Appendix B SIL
End Connections	Socketweld, buttweld, raised-face flange - standard
Options	Various control packages

Specialty Valve and Actuator Solutions

ValvXpress®

Quality and dependability in one package - guaranteed

ValvXpress® is perfect for customers who demand quick delivery of a zero-leakage automated valve solution for severe service steam and water applications. The package includes the superior quality of the V1-1 valve and ValvTechnologies' actuator, backed with the best four-year warranty in the industry. ValvXpress® pre-engineered, automated packages are compact, robust and ready to ship.

Pre-engineered package includes:

- 1/4 - 4" metal seated V1-1 ball valve
- Socket weld and butt weld end connections
- A105, F22, F91 body materials
- ANSI/ASME Class 900 - 4500 pressure classes
- Valve operating conditions to 1400°F (760°C)
- High-cycle pneumatic rack and pinion actuator
- High-cycle mounting hardware
- Limit switch with position indicator - 2-SPDT, quick set cam, IP67, NEMA 4/4X
- NAMUR solenoid - 110V/120V, 230V, 24VDC coils
- Filter/regulator with gauge
- Retainer prevents stem driving into ball

ValvXpress® Actuator

The actuators utilize a rack and pinion design which provides constant torque output in a compact package. The torque output is proportional to the air supply pressure. Twin horizontally opposed cylinders incorporate piston guides to ensure engagement between the rack and pinion. Double acting and spring return models are of comparable compact dimensions.

- **Hard anodized body with high-temperature seals**
- **Maximum working pressure 142 psi / 10 bar**
- **Maximum working temperature 320°F / 160°C**

Turbine Bypass

Specialty solutions

Keep gas turbine and heat recovery system generators (HRSG) online in the event of a steam turbine trip with ValvTechnologies' TBS. Purposefully designed for the new generation of combined-cycle power plants, our TBS combines the proven Xactrol® severe service control valve design with a state-of-the-art de-superheating control system.

Technical Data	
Sizes	
Pressure Classes	ASME / ANSI Class 150 - 4500
Materials of Construction	Carbon steel Alloy steel Stainless steel Duplex steel Exotic alloys
In Compliance	ASME B16.34 PED Nuclear ASME III Class 1, 2 and 3
End Connections	Buttweld, raised-face flange - standard
Options	Various bypass configurations, integral isolation

Rhinoite® Hardfacing

Specialty solutions

The Rhinoite® process uses a specially formulated tungsten carbide pellet made to a predetermined chemistry. It is applied by a patented metal inert gas (MIG) welding process onto a large variety of base metals using various types of weld wires. The process is a two layer application. The process can be adapted to all service environments, in any wear application: erosion, corrosion, adhesion and high-temperature applications (2200ºF). Rhinoite® hardfacing has been a proven leader of hard metaloverlay on elbows, t-sections and choke tubes in chemical plants and refineries for a decade with zero failures. The Rhinoite® hardfacing weld process focuses on minimizing loss of production time by wearing five to seven times longer than bare metal. Rhinoite® hardfacing overlays can be completely refurbished after years of service, reducing overall material and maintenance costs.

Innovative Cycle Isolation Measurement

ValvPerformance Testing™

Cycle isolation eliminates energy losses attributable to poorly performing or leaking steam, water cycle isolation valves

ValvTechnologies encourages end users to apply the principles of asset management to their installed valve population.The ValvPerformance Testing™ program, or cycle isolation measurement, utilizes next generation acoustic monitoring instruments to help customers monitor valve performance. These tools allow predictive and preventative maintenance programs to be fine tuned for very large or very small valve populations. roviding cycle isolation services can be as simple as performing a valve survey, or as comprehensive as the management of all valve work during your next outage - from erecting scaffolds to repairing, installing, welding and stress relieving.

Program highlights:

- 1 - 4% in plant system efficiency increase
- Verifiable and quantifiable leakage results.
- Best-in-class valve leakage diagnostics
- Predictive maintenance savings vs. scheduled maintenanceactivities
- Overall reduction in maintenance costs
- Target only high-value, fast-payback repairs and replacements
- Ease of execution
- Fast results with minimum effort
- Non-intrusive to plant operations

Most plants will see a thermal efficiency (heat rate) system improvement of 1-4%.

Zero-leakage Valve Solutions

Office Locations

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