



# **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 System

- 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 System

- 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.**

# Zero-Leakage V Series Metal Seated Ball Valves

## 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.

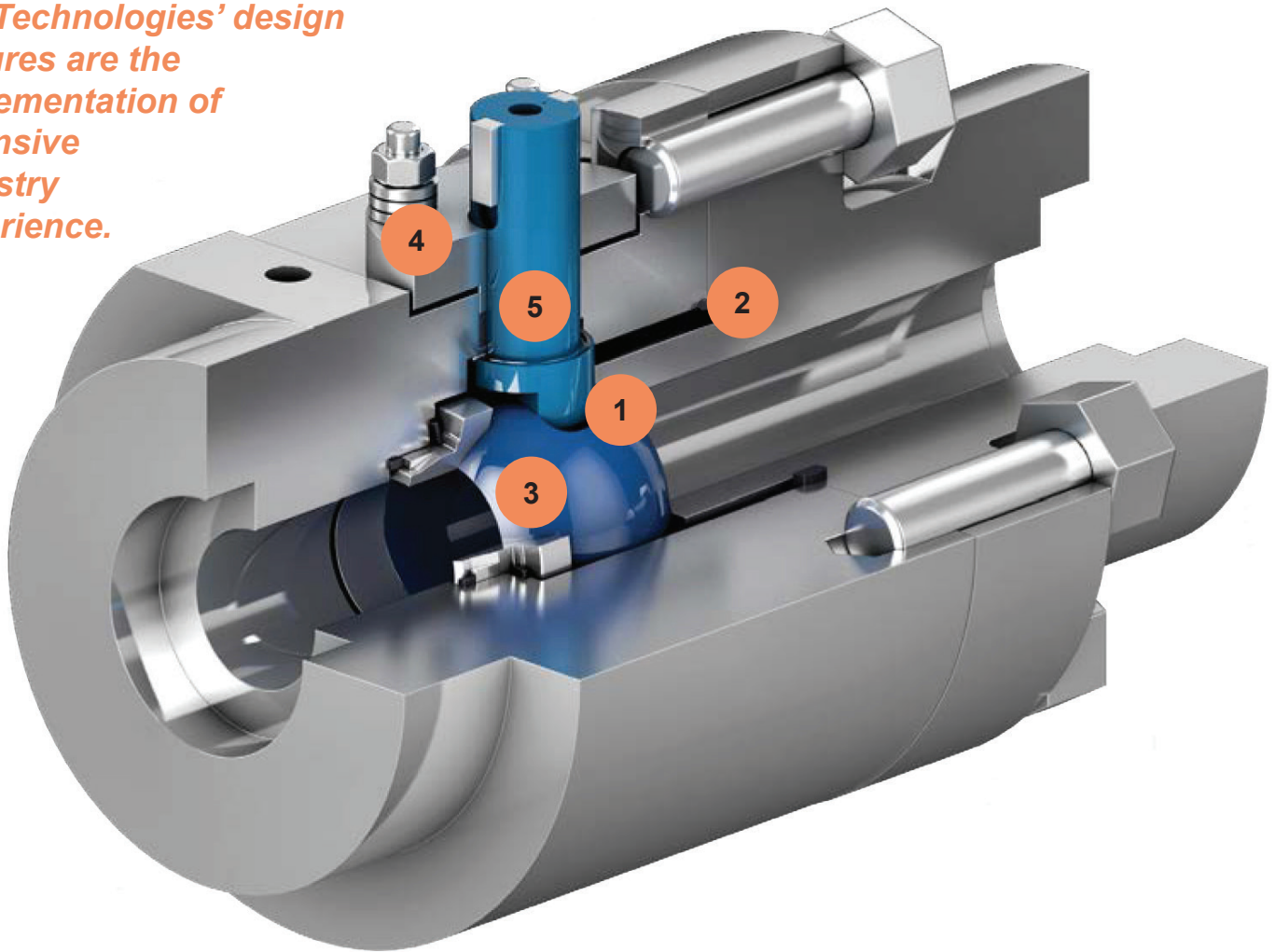
## 2. Body seal ring

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.

## 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.

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



## 4. Live-loaded gland area

The V Series' sealing design features a four stud, live-loaded assembly designed for heavy industrial applications. The sealing material is high purity Grafoil® surrounded by stainless steel wire mesh 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.

## 5. Blow-out proof stem

ValvTechnologies' design utilizes a one-piece, hard-coated, blow-out proof stem that is inserted through the inside of the body cavity eliminating the possibility of blow-out through the gland area. There are no pins, collars or other devices used to retain the stem in the valve body.



## V Series Metal Seated Ball Valves

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### V1-1

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- Forged, high-pressure valves
- 1/4 - 4"
- ANSI/ASME Class 900 - 4500



### V1-2

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- Flanged, low-pressure valves
- 1/2 - 36"
- ANSI/ASME Class 150 - 600



### V1-3

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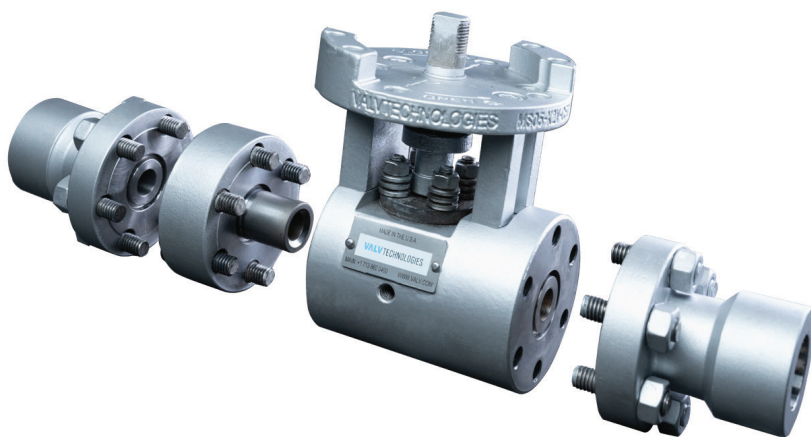
- Small bore, low and intermediate pressure investment cast valves
- 1/2 - 2"
- ANSI/ASME Class 150 - 600



### V1-4

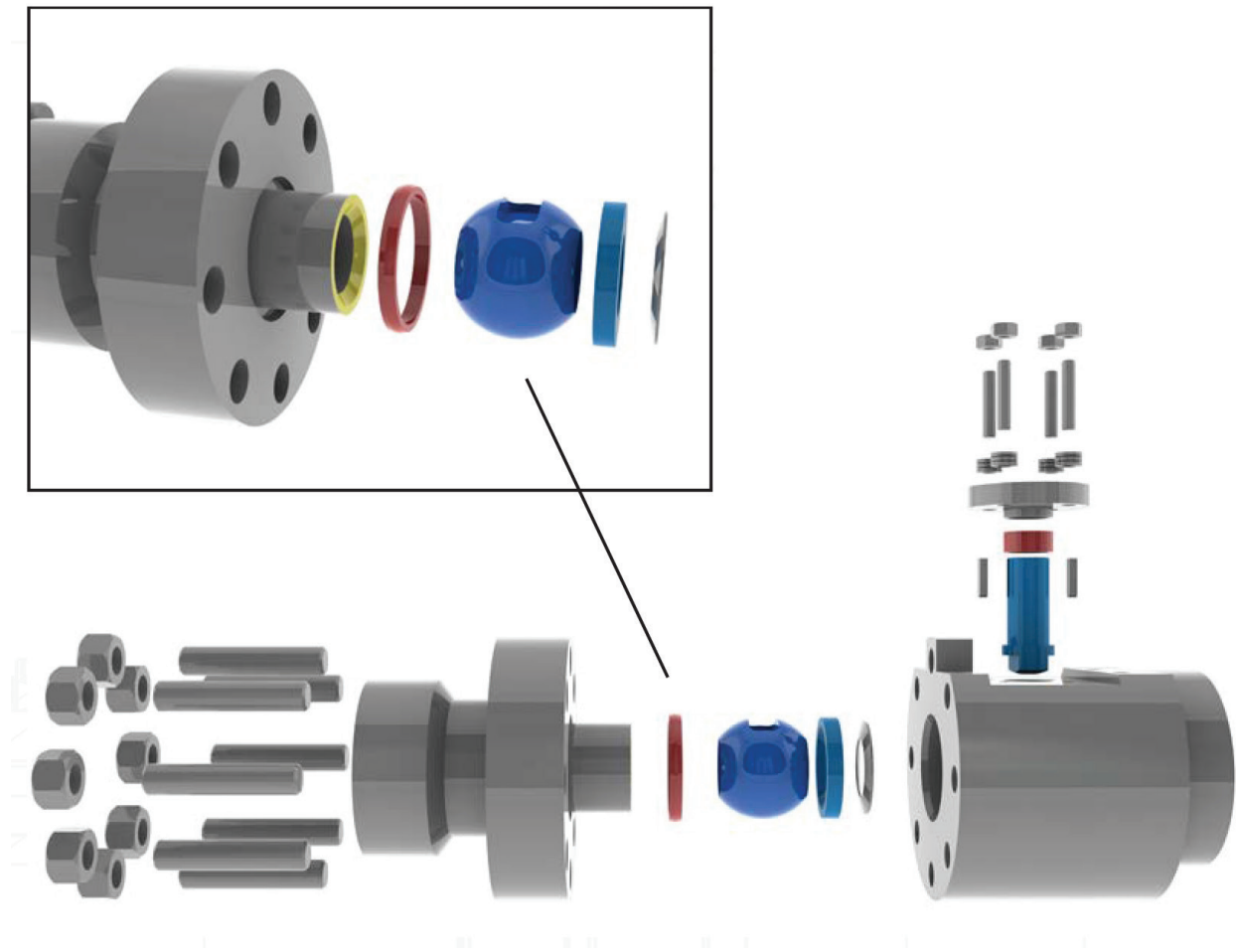
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- Large bore, high-pressure valves
- 4 - 36"
- ANSI/ASME Class 900 - 4500



Technical Data	
Sizes	3/4 - 4"
Pressure Classes	ASME / ANSI Class 3100
Temperature Range	-50 up 1100°F (-45 up 593° C)
Materials of Construction	Carbon steel (A105) Alloy Steel (F22, F91)
In Compliance	ASME B16.34 PED Nuclear ASME III Class 1, 2 and 3 Nuclear Safety Related – 10CFR50
End Connections	Socketweld, buttweld , NPT - standard. Others available upon request
Warranty	Four year zero-leakage warranty*

Features	Benefits
Simplicity of design: 4-piece valve assembly designed for ease of removal while connections remain inline. Field testable after repair, prior to insertion	Field Serviceable Increased efficiencies Ease of use Reduced maintenance costs
Through conduit design: no tortuous flow path. When open it has the highest possible Cv's	Minimized wear & tear Reduced vibration Reduced maintenance
Fixed position - quarter turn: no seating torques required	Minimized stem wear Lower cost of ownership
Hardened blowout proof stem: One piece, inserted through the body & shouldered	Improved safety
Metallic body seal ring: Increases body integrity by eliminating external leakage	Improved reliability Zero leakage
Live load packing gland: Minimum four bolt configuration with shallow stuffing box. Ensures consistent torque at variable pressures & temperatures	Increased reliability
Hard coated & mate lapped seats: High Velocity Hydrogen Fuel (HVOF) chrome carbide hard coating with Rockwell C of up to 72. Mate lapped seats	Wear & corrosion resistant Increased reliability Zero-leakage
Seat designs: Hard coated, both ball and integral downstream seat to the end-cap to eliminate a potential leak path	Increased reliability
Stringent testing: Every valve is tested, documented, and serialized	Increased reliability Increase safety Total traceability
Four-year warranty: The very best in the industry. Covers internal seat leakage as well as external through the packing &/or body seal	Lower costs of ownership Increased reliability



V Series Key Performance Features & 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

## 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' 10 years or 10,000 cycles 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 function 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

### Z Series ERV - Premium Package

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



### 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





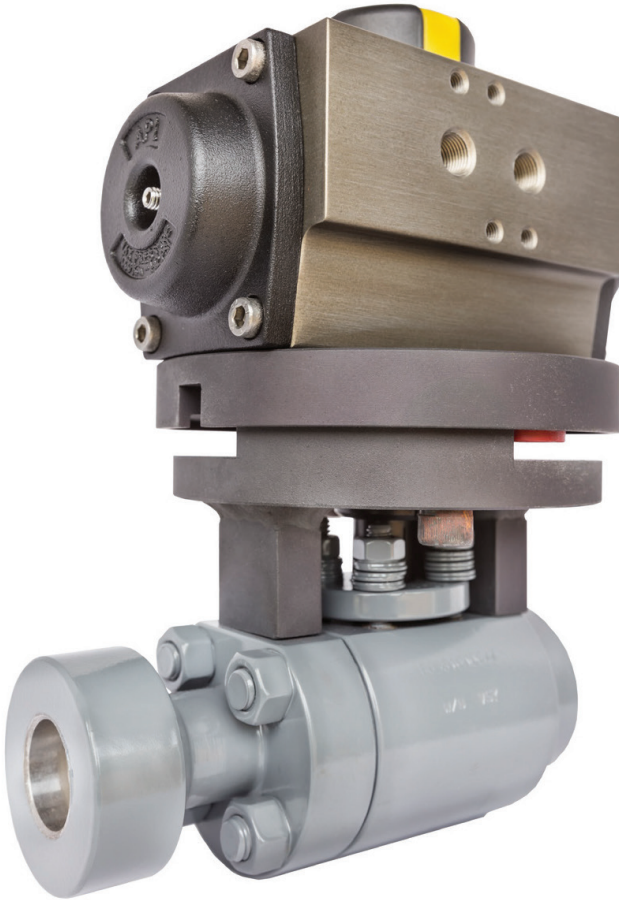
# Sky Vent Startup Valves

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**

# 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. Providing 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 maintenance activities
- 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

### Headquarters & Manufacturing

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**VALV**TECHNOLOGIES