

NON-CONTACT RISING STEM BALL VALVE

EXTENDED SERVICE LIFE AND
LOW MAINTENANCE DESIGN



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INTRODUCTION

RED POINT®

Red Point® Alloys BV (Red Point) is a world leader in non-commodity valves, with over 30 years of experience in fast-track delivery, special materials, and design. Red Point's manufacturing capabilities cover ball, check, gate, globe, double block and bleed, and non-commodity valves. With engineering, production, assembling, and testing all handled in-house, Red Point® delivers urgently needed valves within limited time periods. Clients can rely on the flexibility, technical expertise, and dedicated staff offered by Red Point®, making it the perfect business partner for all valve requirements.

APPLICATIONS AND INDUSTRY SECTORS

Red Point® is widely recognized as a valued supplier to a diverse range of industries. The RSBV remains the top choice for the oil and gas industry, fulfilling the need for robust and mechanically reliable valves to prevent leakage.

PRODUCTION AND TESTING

Once the customer-approved designs are received, our highly skilled team initiates the production process. Using advanced high-speed machinery, we manufacture your valves to precise specifications. At Red Point®, we continuously invest in cutting-edge technology, ensuring top-quality results.

Post-production, each valve undergoes rigorous in-house testing. Our thorough testing includes hydro-tests on the body and seat, followed by a low-pressure air-test. Additionally, we offer the option for additional tests on valves and materials, such as fugitive emission, high-pressure gas, PMI, or NDE tests, upon request. It's worth noting that we produce the helix stem in-house using state-of-the-art machinery.

All valves are thoroughly tested in-house, adhering to applicable international standards or specific client requirements.

MATERIALS

Red Point® offers an extensive range of valves, catering to our customers' specific material requirements. Our capabilities are enabled by a vast inventory of exotic materials and long-standing relationships with reliable suppliers.

QUALIFICATION CERTIFICATIONS

Over the years, Red Point® has obtained a comprehensive array of qualifications, certifications, and customer approvals.

Our valves are meticulously designed and manufactured in compliance with the latest industrial standards, featuring well-documented valve data books and design validation records. Quality is ingrained in our philosophy, and all our employees are highly educated, trained, and fully committed to delivering products of the highest quality. This is endorsed by the following certifications of our quality management system:

- ISO 9001:2015
- API spec Q1 and API-6D License
- API-6A License
- Achilles JQS Qualification
- AD 2000 Merkblatt W0/A4 and TRD100
- ISO 45001:2018
- ATEX 94/9/EC cat 2

Industry Sectors:



Petrochemicals



Upstream Exploration & Production



Upstream Exploration & Production



Downstream Processing



Biofuels



Wastewater



NON-CONTACT RISING STEM BALL VALVE (RSBV)

Red Point® offers an exceptional range of valves designed to cater to diverse industries and their unique applications. The Non-Contact Rising Stem Ball Valve (RSBV) is specifically engineered with friction-free sealing. It achieves this by detaching the ball from the seat through linear movement before rotation, resulting in reduced wear and tear and long-term sealing performance with minimal maintenance.

The valve's non-contact ball movement, combined with the single-seated design, allows for a broad operating temperature range from minus -29°C up to 450°C. This unique feature is made possible by the minimal impact of thermal expansion, making the RSBV suitable for diverse temperature conditions.

The RSBV stands out with its distinct quarter-turn helix-shaped stem mechanism. This design is fully enclosed within the valve body, providing comprehensive protection against environmental factors, and eliminating the requirement for frequent lubrication.

TYPICAL APPLICATIONS FOR RPA'S NON-CONTACT RSBV:

- Molecular sieve switching valves
- Isomerization,
- Gas dehydration and regeneration,
- Hydrogen service,
- Cryogenic service, and high-temperature service.

KEY FEATURES

UNIQUE RSBV FEATURES AND BENEFITS

Reliable Bottom Trunnion Design:

Incorporating a specially designed bottom trunnion, the valve ensures protection against solid particle ingress.

Weld-Free Ball and Pin Assembly:

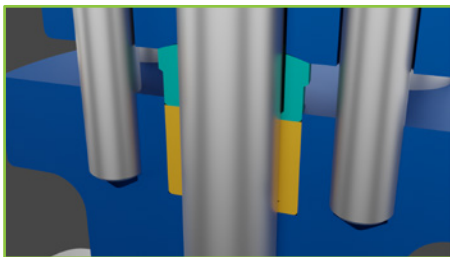
Unlike conventional valves, it employs an innovative design that eliminates the need for welding pins to the ball, preventing potential welding-related issues such as cracking.

Non-Shrink Fitted/Welded Seat Design:

To address concerns related to weld cracking and thermal expansion problems arising from the use of different materials, this valve features a non-shrink fitted/welded seat design.

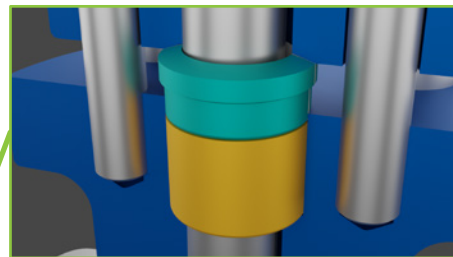
Proven Lightweight Outside Screw and Yoke Design:

This valve features a widely recognized and extensively tested Outside Screw and Yoke design, renowned for its reliability and lightweight construction, making it a preferred choice globally.



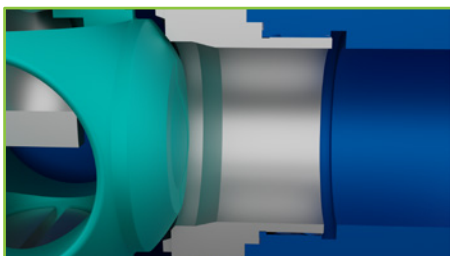
STEM

- The quarter-turn ball valve features a linear movement of the non-rotating stem.
- Careful material selection prevents galling and high friction, ensuring reliable operation.



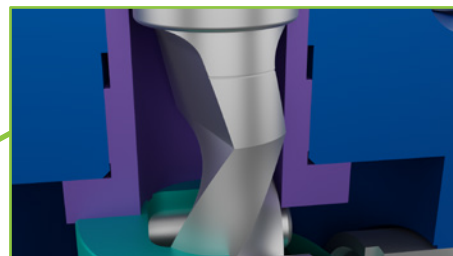
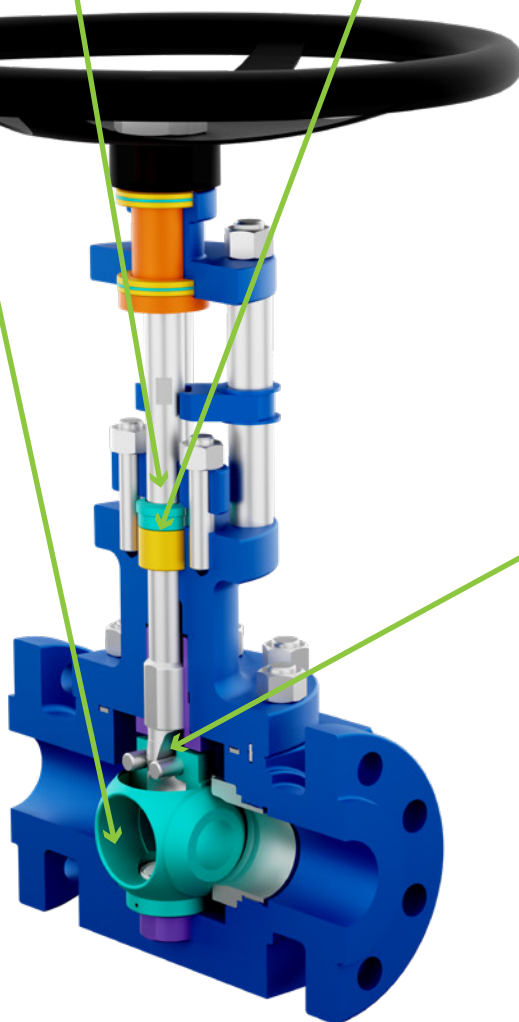
GLAND COVER

- Enhanced personnel safety with an anti-blowout proof stem according to API600/API6D standards.
- In-service adjustable stem packing facilitated by the backseat design.
- Easy in-line inspection and maintenance made possible by the top-entry design.
- The standard Outside Screw and Yoke configuration make gland packing adjustment hassle-free.



BALL OVERLAY, SEAT

- Reliable, mechanically energized metal-to-metal sealing.
- Stellite overlay ball and seat surfaces lapped to achieve required leakage rates, including zero leakage if needed.
- Robust construction without weak points like springs, soft seals, coupling cam constructions with pins, or lubricated seals required for maintaining sealing.
- Optimal performance in high-temperature operations with continuously fluctuating temperatures (thermal expansions) and pressures, thanks to the single seat design with no valve body cavity.



HELIX DESIGN AND BALL

- The helix stem design ensures prolonged service life and minimal maintenance by allowing non-contact, friction-free opening and closing, making it perfect for frequent cycling.
- Smooth 90-degree rotation without rubbing or friction between sealing surfaces (ball-seat)
- Immediate flow before rotation ensures the self-cleaning of the sealing area

CLOSING SEQUENCE OF THE RSBV

1. Valve in Open Position

In the open position, the ball and seat do not make any contact, allowing for a clear and unobstructed flow through the valve.

2. Valve from Open to Close Position

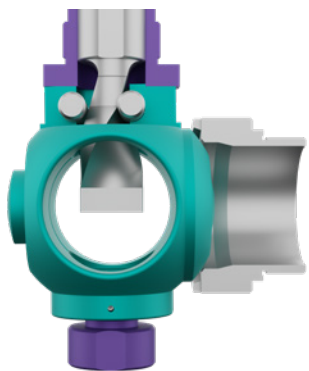
The helix stem moves linearly downwards through the roll pins, enabling a smooth and friction-free 90-degree rotation of the ball.

3. Valve in Closed Position

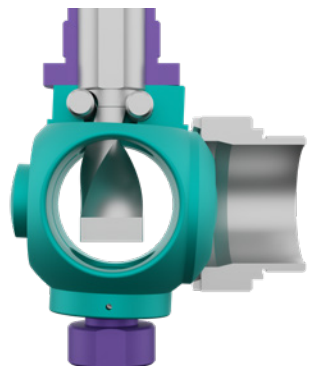
Continuing its descent, the helix stem's top part, featuring a flat angled surface, achieves a complete metal-to-metal sealing position. The ball securely wedges against the seat, resulting in the full closure of the RSBV.

**OPEN**

In the fully open position, the stem is raised to its maximum limit with no contact between the ball and the seat. The valve in its fully open position provides a clear through flow.

**OPEN TO CLOSE POSITION**

The downwards linear movement of the helix passing through the roller bars on the top of the ball cause the ball to rotate 90 degrees. There is still no contact between the ball and the seat during this movement which highlights the friction free /non-rubbing feature of the valve.

**CLOSED POSITION**

In the fully close position, the ball turned 90 degrees and is mechanically wedged toward the seat by the upper part of the helix shaped stem which is flat and angled. The movement of the ball towards the seat achieves the positive metal-to-metal sealing when the valve is fully closed.

DESIGN

DESIGN SPECIFICATIONS

| | |
|---------------------------|---|
| Design Standard: | API / ASME |
| Sizes: | 2" to 16" OR DN50 to DN400 |
| Pressure Rating: | ANSI Class 150-2500 |
| Face to Face: | ANSI B16.10, manufacturer standard or special client request |
| Valve Bore: | Full or Reduced |
| Seat/Ball Overlay: | Stellite 6 |
| End Connections: | Raised Face, Ring Type Joint flanges, Hub end or Butt-welded. |
| Operation: | Handwheel, Actuator |



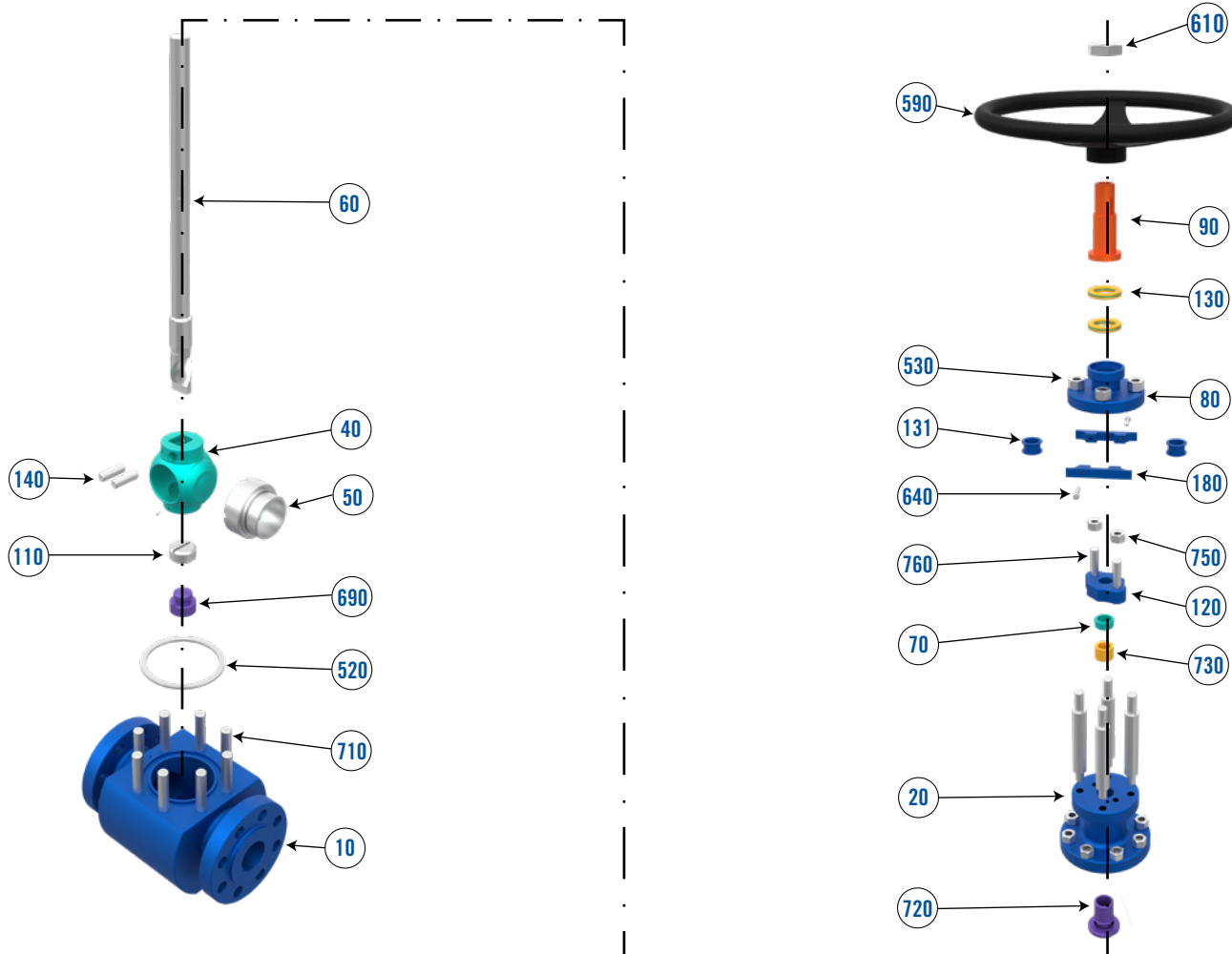
STANDARD FEATURES

| | |
|----------------|---|
| Sealing | Metal seated. Stellite Hard Facing on the ball and, optionally, on the seat |
| Flow | Preferential flow direction |
| Construction | One piece bolted bonnet |
| Port | Reduced bore, full bore |
| Stem retention | Anti blow-out stem |
| Leakage rate | ISO 5208 rate B, C, D (metal seated) API 598 table 1-A |

APPROVALS ON REQUEST

| | |
|------------------------------|--|
| Safety integrity level | SIL 3 |
| Fire safe | API 607, API 6FA, BS 6755, ISO 10497-5 |
| Area classification | ATEX 94/9/EC |
| Pressure equipment directive | PED 97/23/EC |
| Fugitive emission | ISO 15848/1, ISO 15848/2 |
| Construction | API 6D, API 6DSS |





| ITEM NO | DESCRIPTION | STAINLESS STEEL | CARBON STEEL |
|---------|----------------|----------------------|-----------------------|
| 10 | BALLV.BODY | SA-479 SS316 | ASTM A105 |
| 20 | BALLV.BONNET | A182-F316 | ASTM A105 |
| 40 | BALL | A182-F316 + STELLITE | A182 - F51 + STELLITE |
| 50 | SEAT | A182-F316 + STELLITE | A182-F51 |
| 60 | RSBV STEM | A638 Gr660 | A638 Gr660 |
| 70 | GLAND | 316L | 316L |
| 80 | YOKE | 316/316L | 316/316L |
| 90 | YOKEBUSH | CuAl10Ni5Fe4 | AISI 410 |
| 110 | ADJUSTING BUSH | ALLOY 718 | ALLOY718 |
| 120 | GLANDPLATE | AISI 410 | AISI 410 |
| 130 | BEARING | 1-1/4Cr | 1-1/4Cr |
| 131 | BEARING | AISI 410 | AISI 410 |
| 140 | ROLL PIN | ALLOY 718 | ALLOY 718 |

| ITEM NO | DESCRIPTION | STAINLESS STEEL | CARBON STEEL |
|---------|---------------------|--------------------|--------------------|
| 180 | GUIDE | AISI 410 | AISI 410 |
| 520 | SPIRAL WOUND GASKET | ALLOY 625/GRAPHITE | ALLOY 625/GRAPHITE |
| 530 | NUT | A194-8M | A194-2H |
| 590 | HANDWHEEL | 316/316L | 316/316L |
| 610 | LOCKNUT | 316/316L | 316/316L |
| 640 | HS SCREW | A193-B8M CL2 | A193 - B7 |
| 690 | RSBV TRUNNION BALL | A182-F316 | WS 1.4462 |
| 710 | STUDBOLT | A193-B8M CL2 | A193-B7 |
| 720 | RSBV BONNET BUSHING | ALLOY 625 | AISI 410 |
| 730 | STEMPACKING | GRAPHITE | GRAPHITE |
| 750 | NUT | A194-8M | A194-24 |
| 760 | STUDBOLT | A193-B8M CL2 | A193-B7 |

Actual materials of construction will depend on the valve size, pressure class, end configuration and service conditions. Consult Red Point® for a detailed materials list.

This is a partial list of material options. Many alternatives can be provided to match the actual service requirements.



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