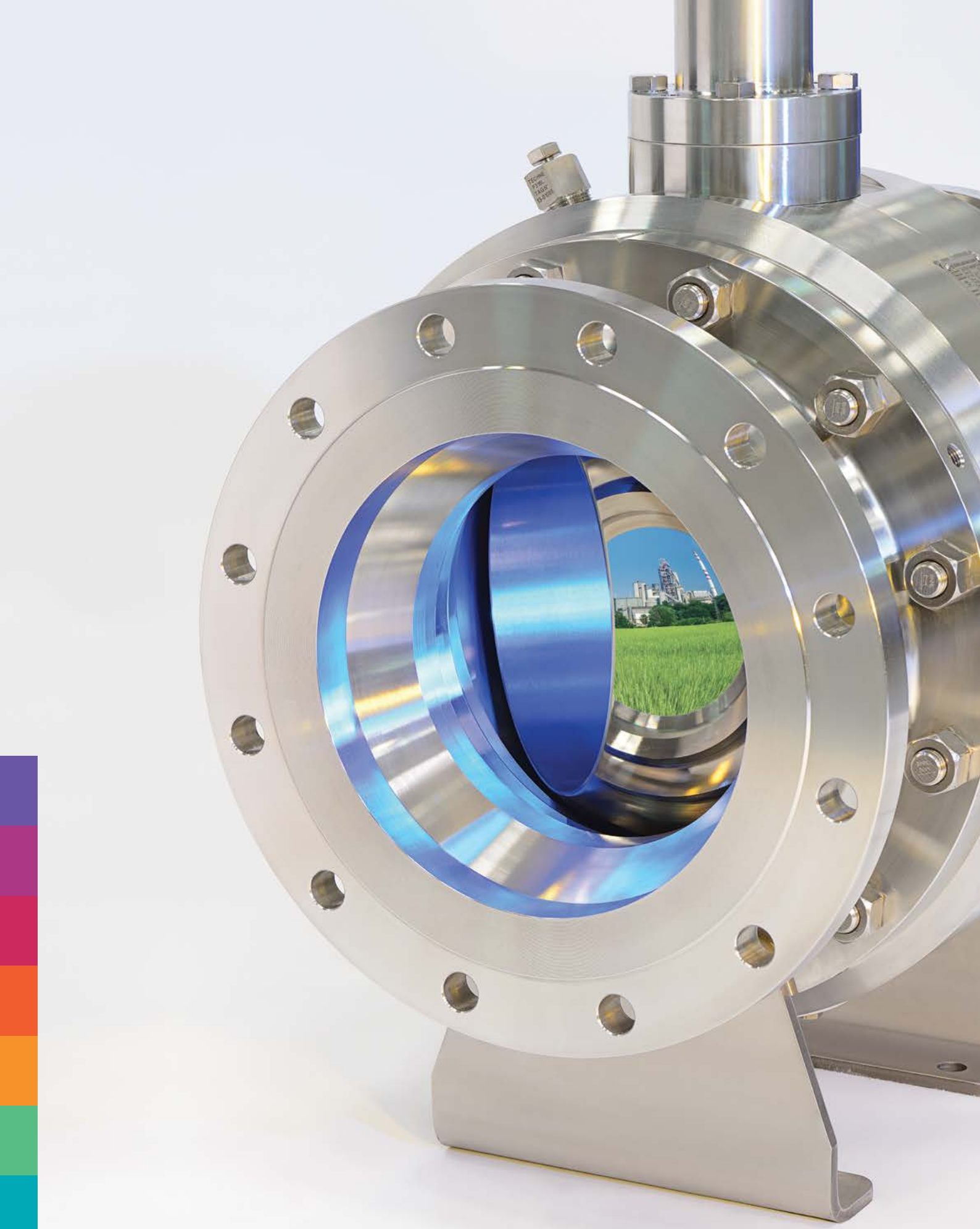


VALVES & ACTUATORS

PRODUCT CATALOGUE

HABONIM

An ITT Company



PERFORMING IN DEMANDING APPLICATIONS

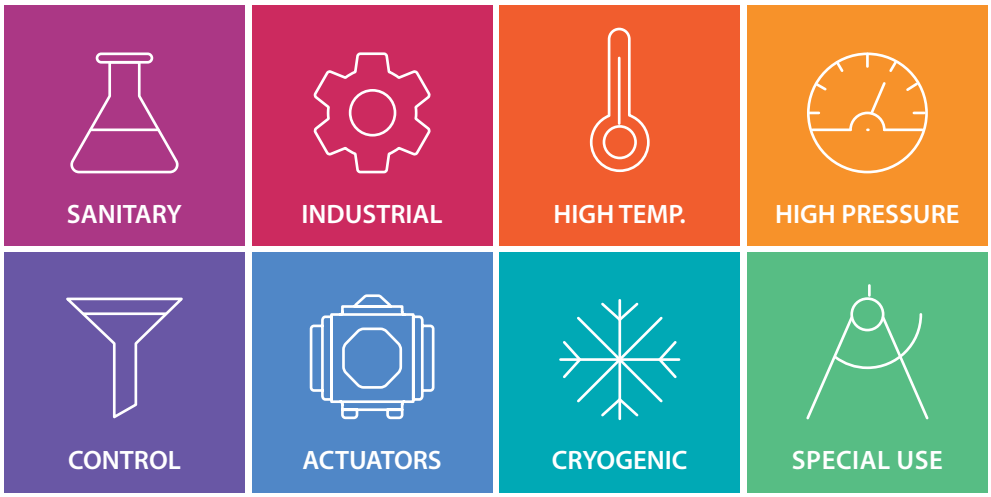
Ball Valves & Actuators for the most demanding, challenging and hazardous applications is our passion and profession for the last 70 years. We believe in designing, manufacturing and supplying control and shutoff components and solutions that improves the overall safety, integrity and sustainability of the systems they are installed in.

Designed, manufactured and tested according to the highest standards, our products allow us to partner within systems that flows and control varied gases and liquids in divers markets especially where extreme temperatures and pressures are involved, hazardous materials are used and system performances are critical.

We are leading in cryogenic ball valve-based control solutions, emergency shutoff ,High Pressure and Severe Service and specially designed solutions. Believing that supplying and developing the most effective, safe and reliable products for the global leaders in the Gas distribution Severe Service and BioTech markets continually challenges us to improve our capabilities and products. Best coping with our prestigious customers' most challenging requirements technically, operationally and commercially is the outcome and our contribution to the development of these high end markets.

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HOW TO USE THIS CATALOGUE

This catalogue provides information in a hierarchical structure starting from Habonim company general information, product families, product lines, product series and to a single product data.

When using information of any level, the aggregate information of the levels above would apply and should be taken into consideration where applicable.

Online Version

A live and up-to-date electronic version of this catalog is available for online use and download on Habonim: www.habonim.com

In the case of discrepancies between the print and electronic versions, we recommend to use the latest version (the version date is printed on the back cover).

Proprietary Note

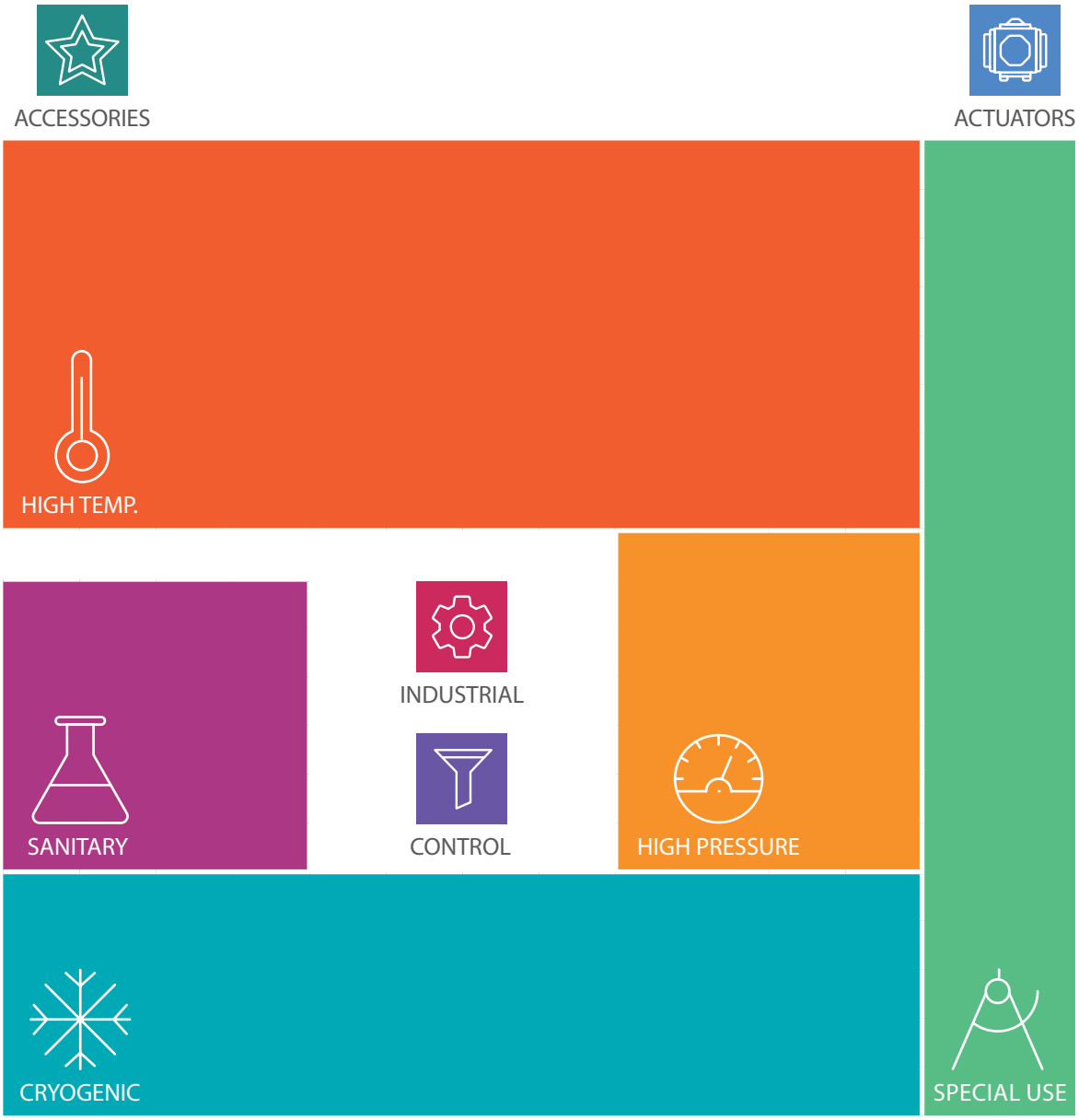
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Disclaimer

The products and datasheets in this catalog reflect current Habonim standard production specifications. Habonim Industrial Valves and Actuators Ltd. Reserves the right to modify products and materials, including modifications undertaken to comply with specific customer requests and technical specifications without further notice.

It is always the system designer and the end-user responsibility to verify all equipment use in their system is properly selected to ensure safety and integrity of their systems. Habonim offers only general information based on common market knowledge and standard market adaptations for its valves. For each system and use, the system designer and end-user must consider the particular operations conditions, media parameters and any other implication of their system for the proper selection of valves to be used on their solely responsibility.

PRODUCT FAMILIES



Temperature	
°C	°F
650	1200
600	1100
550	1000
500	900
450	800
400	750
350	650
300	550
250	480
200	390
150	300
100	200
50	120
0	32
-50	-58
-100	-148
-160	-260
-185	-300
-196	-321
-269	-450

ASME Class			150		300	600	900	1500		2500		6000	
Pressure Bar	-1	0	16	20	40	50	100	150	200	250	350	420	700	1034
Pressure Psi	-14	0	230	290	580	750	1500	2250	3000	3750	5000	6000	10000	15000

ABOUT HABONIM

Sustainability, Safety and Health

Habonim management and employees around the world are dedicated to promoting, in every aspect of their work, the following principles and guidelines:

Sustainability

Habonim management pledges to comply with the relevant laws, standards, and regulations to preserve the environment and promote sustainability at company premises and in our products.

Safety & Health

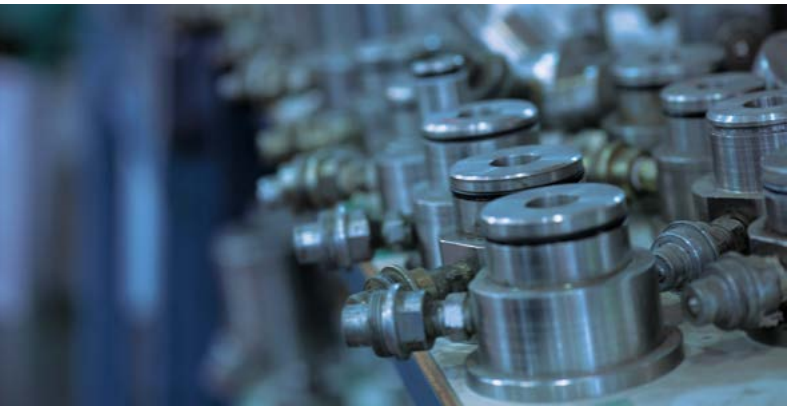
Habonim aspires to a safe and healthy work environment, aiming for zero work accidents and promoting our employee's wellbeing. Management and the entire workforce comply with the relevant laws and regulations necessary to achieve this goal.

Operations

Habonim operates a global infrastructure to best support customers and projects by supplying our catalog standard products, specially adjusted catalog products and custom-made products and sub-systems. Ball valves, actuators and control packages are our core deliveries.

Standard Delivery

With the goal of offering our high-end products as well as our general-use products with best availability, best quality, cost-effectiveness and with simple communication, handling and operation, we mark selected items designated as Standard Offer in most of our product lines with the Green "Standard Delivery" mark in order to provide best availability and supply readiness.





Materials

Habonim uses and stocks metallic, polymeric and other materials used in our products, all sourced from well-recognized manufacturers with the required testing, certifications and documentation.

Heat numbers and materials certificates are managed throughout the manufacturing and assembling process to enable full backtracking for our product components.

Available Certifications, some supply as standard and some per request:

- Materials certificates per EN10204 type 2.2/3.1/3.2
- FDA / USP Class VI compliant for polymers, elastomers, and lubricants where applicable
- CE1935:2004 compliant for polymers, elastomers, and lubricants where applicable

Tagging, Traceability

Each product is tagged for traceability. For product identification, a stainless steel nameplate is placed on the product body.

Traceability of assembly and testing procedures, heat codes, and foundry identification as per B16.34 stipulations where applicable.





ABOUT HABONIM

Cleaning, Assembling and Packing

Habonim manages different levels of cleaning, assembling and packing lines to meet different levels of end product and use requirements:

Commercial Service

Excessive hydrocarbon films, water, rust or mill scale, shop dirt, filings, chips or loose weld spatter is removed from the valve parts.

- Accessible surfaces are inspected for cleanliness by the naked eye under bright white light.
- Inaccessible surfaces are inspected and cleaned indirectly by wiping.
- A sticker on the package indicates the cleaning grade of the product.

Oxygen

A meticulous cleaning and assembly procedure eliminate the ignition hazards that can be caused by the presence of hydrocarbon oil, grease, and metal chips.

Our process of cleaning, assembling and packing refers to international standards in partial or in full:

- ASTM A380 • CGA G 4.1 • EN 12300

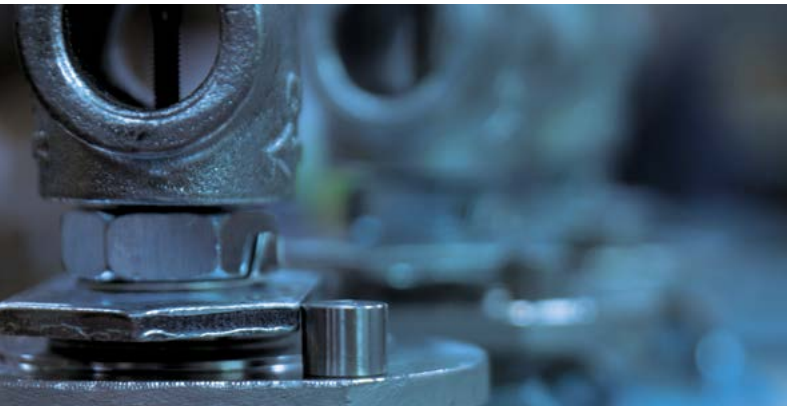
Habonim uses an environment friendly, alkaline-based degreasing process with controlled parameters. Valves are assembled in an oil-free restricted area by personnel who are specially equipped and trained to perform this task. The assembling area, work surfaces, equipment and tools are specially maintained to ensure cleanliness requirements are met.

- Valves are capped ends and plastic bagged
- A sticker on the plastic bag indicating "oxygen use"

High Purity Service

Habonim offers as an option high purity ball valves for gas and water distribution, as well as chemical handling processes. Such valves are cleaned in accordance with CGA G4.1:

- Cleaning, drying and packaging under Class 100,000 conditions
- Assembly under Class 10,000 conditions
- No lubricants used
- 100% helium leak tested
- Capped ends and plastic bagged





Quality

Habonim strives to deliver quality products that meet and exceed customer expectations, providing complete and total satisfaction and to operate, instruct and train employees globally in light of standards such as:

- ISO 9001:2015
- CE PED 2014/68/EU (Module H)
- ATEX 2014/34/EU
- API SPEC Q1: 2013
- TPED 2010/35/EU and TPE - CDG 2009 – for specific product lines
- IEC 61508-2:2010 (SIL 2 / 3) – for specific product lines
- SIL IEC 61508-1,2, 2010/35/ EU – for specific product lines

Habonim's management diligently monitors goals and objectives and continually enhances processes and products as well as the safety and environmental practices in light of the above.

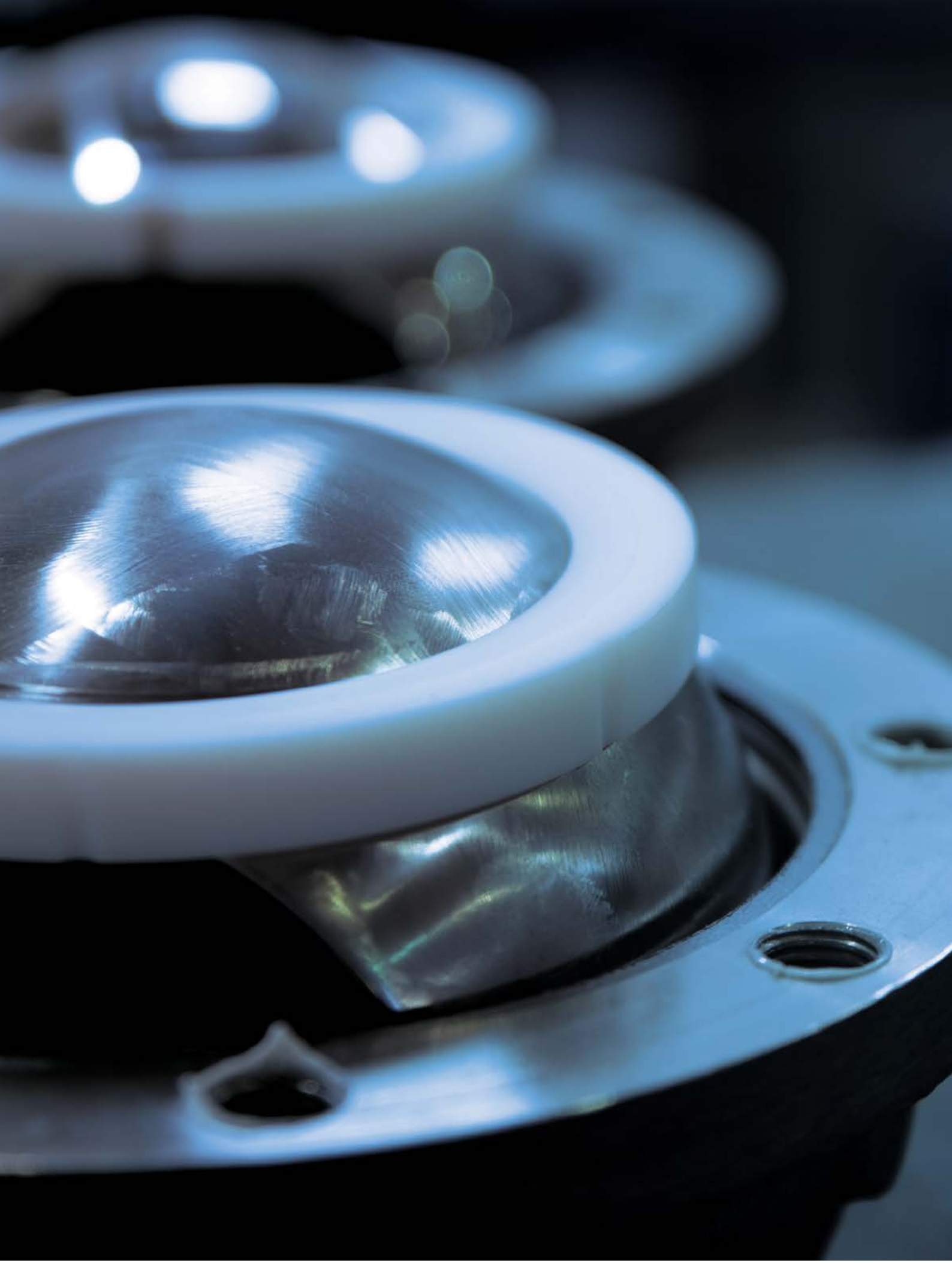
Testing and Laboratories

Habonim operates a wide range of testing laboratories and equipment for ongoing and R&D needs and certifies products for cryogenic, high pressure, aggressive or clean, industrial use and more.

Habonim carries out external and internal testing and certification of products per customers' requests and market trends on a regular basis and offer a wide range of certified products for diverse certification bodies as but not limited to:









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HABONIM BALL VALVES

General

Habonim develops, designs, manufactures, tests, supplies and service ball valves for the global market and is globally leading in some segments of ball valve usage. With high-end products, uncompromised quality, serviceability and innovation to create solutions for the most demanding applications Habonim has gained a long track record of proven success. Habonim's ball valve product line supports extreme cold to extreme heat systems, industrial use up to very high pressures, and meets the specific needs and regulations of a wide range of industries.

Habonim ball valve product lines are subject to the company's regulation, methodologies and certification – for more information, see Habonim introduction chapter.

Design and Engineering

Habonim designs its valves with accordance to international standards and guidelines in full, partial or with reference to. For some an external certification is available:

- API 6D (number 6D-1278)
- ASME VIII Div I
- API608
- ASME B16.34
- ISO 14313
- ISO 17292
- ASME BPE (48SER)
- ISO 15848-1, API641
- Fire safe design per API 607, ISO 10497, API6FA
- Antistatic design per ISO 17292

For relevant valves, Habonim complies or use as guidelines market leading standards such as, but not limited to:

- NACE MR-0175
- NDT/DT (according to ASME B16.34)
- MSS SP-55
- Polymers per TSE/BSE, BAM, FDA, USP, CE1935:2004



Testing

Habonim refers to the following international standards for valve testing:

- API 598
- ISO 15848-2
- API6D
- EN 12266-1/2
- ISO 5208
- BS 6364
- MMS SP-134

Strength/Valve shell leak test:

- Tested per quality system procedures
- By usage of compressed air, nitrogen or water

In-Line Leak Test:

- 100% of valves are tested
- By compressed air, nitrogen or helium
- At 5-7 bar pressure
- Pass criteria:

  - Rate A result (bubble tight shutoff) for soft seated valves

Functional Test:

- 100% of valves are tested
- Torque is tested to design limits

Packing

Habonim valves are delivered as a standard as:

- Valve in open position
- Actuated valves are delivered in fail-safe position
- Ends are capped
- A firm, clean package packed by soft, clean, shock-absorbing material for transportation protection.

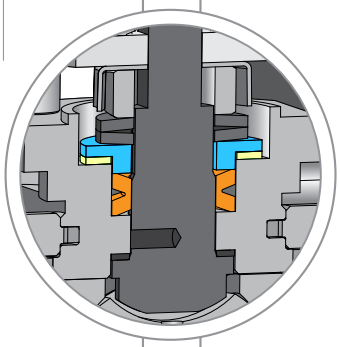


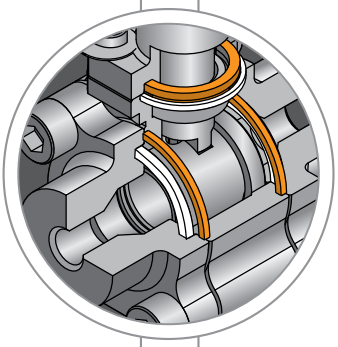


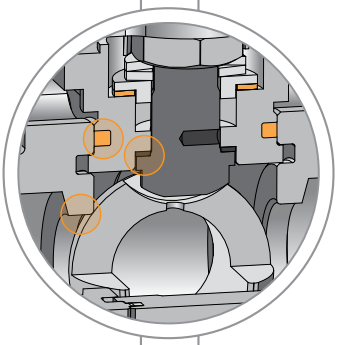
HABONIM BALL VALVES

Total HermetiX™

Registered EU Design
015025978-001







As a standard, most of HABONIM valves are equipped with the Total HermetiX integrity package comprised of three main elements and a superior inline sealing mechanisms in some of them:

Zero fugitive-emission no maintenance stem sealing

- Patented HermetiX™ stem sealing design with zero fugitive emission sealing capability.
- Tested or certified according to ISO 15848-1 and API641 standards.
- Up to 500,000 cycles of operation.
- Field proven for millions of cycles continuous operation.

Double body sealing

- Body-to-ends & body-to-bonnet double sealing for superior sealing.
- Selection of sealing materials for diverse applications.
- Fugitive emission prevention.

Fire-safe

- According to API 607 & ISO 10497 - where applicable.
- Type-tested and certified by leading certification bodies for marine service – for some valve series.
- Clean fire-safe construction guarantees no graphite contamination of the media flow.

Superior In-line sealing

A variety of implemented mechanisms provide extended in-line sealing capabilities such as:

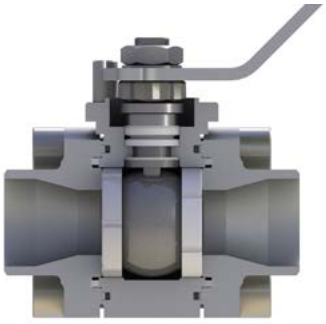
- Bidirectional sealing
- High pressure full Δp sealing
- High & low pressure sealing
- Others



Quarter Turn Valves - Introduction

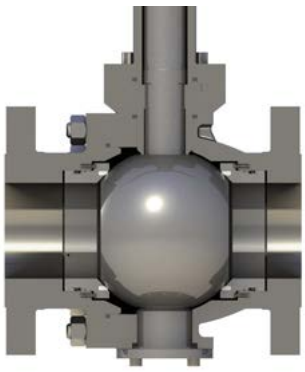
Quarter-Turn Ball Valves Design Styles

HABONIM offers ball valves in a variety of design styles and technologies that is most effectively supports a wide range of applications and use cases. We offer Floating ball style valves and Trunnion-mounted ball style valves with several construction methods.



Floating Ball Valves Design

The floating ball valve is the legacy style for ball valves, the most used and best fit for many industrial applications. The design places the valve ball between seats that holds it in place but without a firm connection to the valve body, hence, it “floats" inside the valve. Assuring a tight seal between the seats and the ball as well as the between the seats and the valve body guaranties the valve in-line sealing by a simple structure with minimal parts. As a rule of thumb, a floating ball valve should be considered as first choice wherever applicable.



Trunnion-Mounted Ball Valves

In a trunnion-mounted valve, the ball rotates only around its vertical axis while being mechanically anchored to the top and bottom of the valve body. This construction balances the torques of the rotating ball and keeps it in a lower range than with similar sized floating ball valves by tolerating the heavy loads applied to the valve trim as a result of large sizes, high pressures and dynamic temperature cycles. The seats are compressed against the ball sphere by the force of the springs and by the line pressure, providing “double block" or “double isolation" capability to the valve. Trunnion-mounted ball valves are often used for larger sizes, higher pressure ratings and dynamic temperatures.



HABONIM BALL VALVES

Habonim Floating Ball Valve Designs

One-piece Design

The standard-port, one-piece, solid-cast body and flange design ensures minimum leak paths. The valve complies with ASME B16.5 for flange dimension and ASME B16.10 for Face-to-Face dimensions. The body includes an ISO 5211 integral mounting pad for easy automation. To facilitate easy assembly and maintenance, the valve is designed with one flange with a side entry that allows all inner parts to be positioned easily, and with a threaded plug that sets all parts under a precise preload with high repeatability. The result is optimum operating torque and bubble tight shut-off. It is possible to modify the ASME-standard flange connections by drilling the flanges to the EN1092 PN16 and PN40 standard. It is also possible to change one flange to a weld-end connection. A thermal jacket (steam jacket) over a one-piece design is the most efficient solution in applications where heating up the valve's outer surface (and the media inside) is mandatory to maintain media flow.



31 series | Vacuum 10^{-6} Tor; ASME B16.34 class 150 | Size ½"-8" (DN15-DN200)
32 series | Vacuum 10^{-6} Tor; ASME B16.34 class 300 | Size ½"-8" (DN15-DN200)

Two-piece Design

This unique full-port two-piece solid-cast body and flanged end design supports high flow capacity. The Habonim two-piece design is available in ASME B16.10 for Face-to-Face dimensions and ASME B16.5 class 150 and ASME class 300 flange dimensions and also in EN 1092 PN16 and PN40. The body includes an ISO 5211 integral mounting pad for easy automation. The valve is designed as a split construction which facilitates easy assembly and maintenance with standard tools. Tightening the end connector to the valve body via the body bolts preloads the complete ball-seat set, ensuring low operating valve torque, repeatability, and bubble tight shut off.



73 series | Vacuum 10^{-6} Tor; ASME B16.34 class 150 | Size ½"-8" (DN15-DN200)
74 series | Vacuum 10^{-6} Tor; ASME B16.34 class 300 | Size ½"-8" (DN15-DN200)
77 series | Vacuum 10^{-6} Tor; EN 1092 flanged PN16 | Size 3"-6" (DN80-DN150)
78 series | Vacuum 10^{-6} Tor; EN 1092 flanged PN40 | Size ½"-2½" (DN15-DN65)



Three-piece Design

The forged, cast, or rolled bar 3-piece design is comprised of a body (center section) and a variety of end connectors (thread, weld, flange) to facilitate a wide range of construction configurations. The swing-out design of the center section allows the end connector to remain a fixed part of the pipe work while the valve itself can be maintained by swinging out the center section only.



26 series | Full port, solid cast | Vacuum 10^{-6} Tor
| In full compliance with ASME B16.34 class 600 | Size 2"-8" (DN50-DN200)

27 series | Standard and full port, forged or rolled bar | Vacuum 10^{-6} Tor
| ASME B16.34 class 2500 (wall thickness) | Size ¼"-2" (DN8-DN50)
| ASME B16.34 class 1500 (wall thickness) | Size 2½"-8" (DN65-DN200)
| Hybrid seats technology as an option

28 series | Standard & full port, forged or rolled bar, robust design, with Hybrid seats technology | Vacuum 10^{-6} Tor
| ASME B16.34 class 2500 (wall thickness) | Size ¼"-8" (DN8-DN200)

47 series | Standard or full port design, forged, cast or rolled bar | Vacuum 10^{-6} Tor
| ASME B16.34 class 900 (wall thickness) | Size ¼"-2" (DN8-DN50)
| ASME B16.34 class 600 (wall thickness) | Size 2½" (DN65)
| ASME B16.34 class 400 (wall thickness) | Size 3"-6" (DN80-DN150)

48 series | ASME BPE Floating Ball 3 Piece | Tube-size design, forged, cast or rolled bar
| Vacuum 10^{-6} Tor
| ASME B16.34 class 300 | Size ½"-1½" (DN15- DN40)| ASME B16.34 class 300
| Size 2"-6" (DN50- DN150)

Three-piece Threaded-Body Design

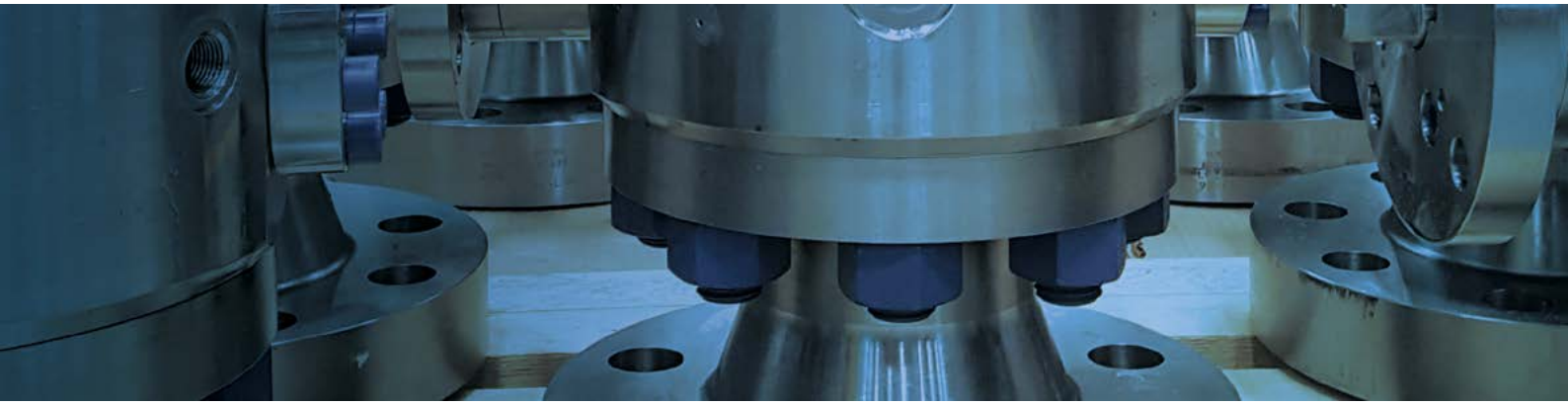
The forged, cast, or rolled bar 3-piece threaded-body design is comprised of a body (center section) and a variety of end connectors (thread, Coned & Threaded) to facilitate a wide range of construction configurations. The no-bolts design of the valve is suitable for high and very-high pressures.



24 series | Standard and full port, Floating ball design, forged or rolled bar
| Vacuum 10^{-6} Tor | In full compliance with ASME B16.34 class 2,500
| Size ¼"-1½" (DN8-DN40)

25 series | Forged or rolled bar | Floating ball design | Vacuum 10^{-6} Tor
| In full compliance with ASME B16.34 for 550 bar (8,000psi)
| Size ¼"-1½" (DN8-DN40)

29 series | Forged or rolled bar | Floating ball design | Vacuum 10^{-6} Tor
| In full compliance with ASME B16.34 for 1,034bar (15,000psi)
| Size ¼"-1½" (DN8-DN40)



HABONIM BALL VALVES

Habonim Floating Ball Valve Designs

Multiport valves

Multiport valves are primarily used to simplify pipe and valve systems by replacing multiple two-way valves with a single multiport valve. They minimize dead legs, optimize drainability, simplify system validation and have a reduced envelope profile for easier installation. Multiport valves allow piping and machine engineers to design a simpler system that saves space and has fewer flow elements and leak paths. One multiport valve can replace multiple two-way valves and automation devices, and provides safe and easy changeover and flow shutoff, all within a confined space. Reducing the quantity of piping and fittings also means faster and more cost-effective construction. Available in a variety of flow patterns and directions and in both automatic and manual configurations, the design possibilities offered by the multiport valve are virtually unlimited.

61 series
| Multiport with three horizontal ports
| Standard or full port design, forged or cast
| Vacuum 10^{-6} Tor
| ASME B16.34 class 600 (wall thickness) | Size ¼"-1½" (DN8-DN40)
| ASME B16.34 class 300 | Size 2"-4" (DN50-DN100)

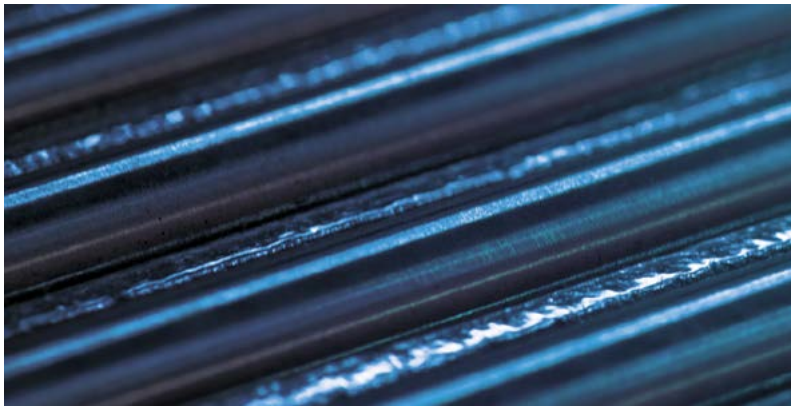
62 series
-
| Multiport with four horizontal ports
| Standard or full port design, forged or cast
| Vacuum 10^{-6} Tor
| ASME B16.34 class 600 (wall thickness) | Size ¼"-1½" (DN8-DN40)
| ASME B16.34 class 300 | Size 2"-4" (DN50-DN100)



Diverter valves

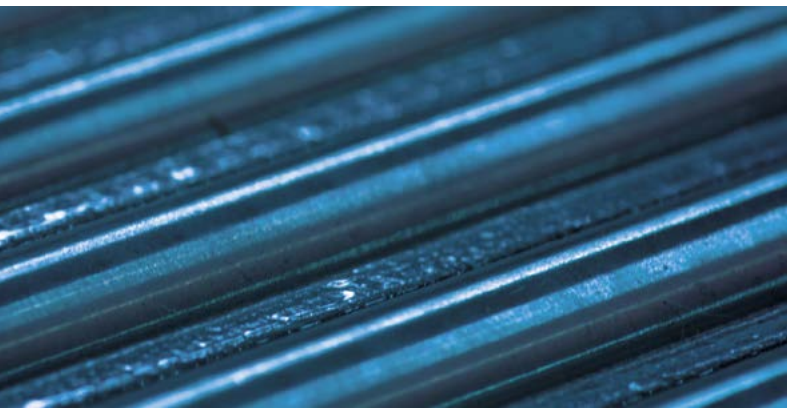
Diverter valves are primarily used to split or combine process flows, or to switch medium among different pieces of process equipment such as pumps, filters, or whole pipelines Diverter valves provide reliable high flow rates in the most severe operating conditions, including vacuum conditions. They can also handle highly viscous media without the need for constant back-flushing. The diverter valves are available with different ball designs to accommodate a wide range of flow patterns. These flexible flow combinations reduce the number of valves in a system, thereby saving costs and facilitating easier control. Because all of the diverter valves have the same body Face-to-Face dimensions, they can be used with all standard end connections.





D31 series	| Bottom entry diverter | Standard port design, cast | Vacuum 10 $^{-6}$ Tor | ASME B16.34 class 150 (wall thickness) | Size ½"-8" (DN15-DN200)
S31 series	| Side entry diverter | Standard port design, cast | Vacuum 10 $^{-6}$ Tor | ASME B16.34 class 150 (wall thickness) | Size ½"-8" (DN15-DN200)
D32 series	| Bottom entry diverter | Standard port design, cast | Vacuum 10 $^{-6}$ Tor | ASME B16.34 class 300 (wall thickness) | Size ½"-8" (DN15-DN200)
S32 series	| Side entry diverter | Standard port design, cast | Vacuum 10 $^{-6}$ Tor | ASME B16.34 class 300 (wall thickness) | Size ½"-8" (DN15-DN200)
D47 series	| Bottom entry diverter | Standard or full port design, forged or cast | Vacuum 10 $^{-6}$ Tor | ASME B16.34 class 600 (wall thickness) | Size ¼"-2½" (DN8-DN65) | ASME B16.34 class 300 (wall thickness) | Size 3"-6" (DN80-DN150)
S47 series	| Side entry diverter | Standard or full port design, forged or cast | Vacuum 10 $^{-6}$ Tor | ASME B16.34 class 600 (wall thickness) | Size ½"-2½" (DN15-DN65) | ASME B16.34 class 300 (wall thickness) | Size 3"-6" (DN80-DN150)
D61 series	| Multiport with three horizontal ports | Additional bottom port available | Standard or full port design, forged or cast | Vacuum 10 $^{-6}$ Tor | ASME B16.34 class 600 (wall thickness) | Size -1" (DN8-DN40) | ASME B16.34 class 300 | Size 2"-4" (DN50-DN100)
D62 series	| Multiport with four horizontal ports | Additional bottom port available | Standard or full port design, forged or cast | Vacuum 10 $^{-6}$ Tor | ASME B16.34 class 600 (wall thickness) | Size -1" (DN8-DN40) | ASME B16.34 class 300 | Size 2"-4" (DN50-DN100)







HABONIM BALL VALVES

Habonim Trunnion-Mounted Ball Valve Designs

Features:

- Specially designed to endure the harsh conditions of the oil & gas, petrochemical and other demanding applications
- Underground, above ground, offshore and onshore installation
- Full differential pressure (Δp) per the valve pressure rating
- Manually applies a maximum operating force of 360N (80 lbf)
- Double block & bleed single valve capability
- Seats preloaded by helical springs
- Antistatic grounding between ball, stem & body as standard
- Bi-directional flow
- Double Piston Effect (DPE) and Single Piston Effect (SPE) designs are both available
- Optional additions for 8" valve size and above:
  - Injection fittings for emergency stem or seat sealant & lubrication maintenance
  - Equipped with lifting lugs
  - Manually operated via gearbox
- Buttweld end valves may be supplied with extended spool pieces (PUPS) to avoid any risk of seat and seal damage during welding and post weld heat treatment operations



External finishing:

- Austenitic stainless steel valves are delivered in their natural finish
- Carbon steel valves are sandblasted and externally coated with paint
- Other painting systems are available upon request

One-Piece Design

52 series | Cryogenic Top Entry Trunnion Mounted | Size ½"-6" (DN15-DN150) | Class 300





Two-Piece Design

The 2-piece cast trunnion-mounted ball valve designs are cost effectively support pressure ratings up to ASME Class 600, serving as the first choice where applicable with ANSI flange ends.



81 series | Full Port | Vacuum 10 $^{-6}$ Tor
| ASME B16.34 class 150 (wall thickness) | Size 2"-16" (DN50-DN400)

82 series | Full Port | Vacuum 10 $^{-6}$ Tor
| ASME B16.34 class 300 (wall thickness) | Size 2"-16" (DN50-DN400)

83 series | Full Port | Vacuum 10 $^{-6}$ Tor
| ASME B16.34 class 600 (wall thickness) | Size 2"-16" (DN50-DN400)

Three-Piece Design

The 3-piece forged body and end design is a robust heavy-duty design for pressure ratings up to ASME Class 2500 With ANSI flange, DIN flange or weald ends.

91 series | Full & Standard Port | Vacuum 10 $^{-6}$ Tor
| ASME B16.34 class 150 (wall thickness) | Size 2"-16" (DN50-DN400)

92 series | Full & Standard Port | Vacuum 10 $^{-6}$ Tor
| ASME B16.34 class 300 (wall thickness) | Size 2"-16" (DN50-DN400)

93 series | Full & Standard Port | Vacuum 10 $^{-6}$ Tor
| ASME B16.34 class 600 (wall thickness) | Size 2"-16" (DN50-DN400)

94 series | Full & Standard Port | Vacuum 10 $^{-6}$ Tor
| ASME B16.34 class 900 (wall thickness) | Size 2"-16" (DN50-DN400)

95 series | Full & Standard Port | Vacuum 10 $^{-6}$ Tor
| ASME B16.34 class 1500 (wall thickness) | Size 2"-12" (DN50-DN300)

96 series | Full & Standard Port | Vacuum 10 $^{-6}$ Tor0
| ASME B16.34 class 2500 (wall thickness) | Size 2"-12" (DN50-DN300)



Three-Piece Threaded Body Design

99 series | forged or rollrd bar | Trunnion ball design | Vacuum 10 $^{-6}$ Tor
| In full compliance with ASME B16.34 for 1,034 bar (15,000psi)
| Size ¼"-1" (DN8-DN25)



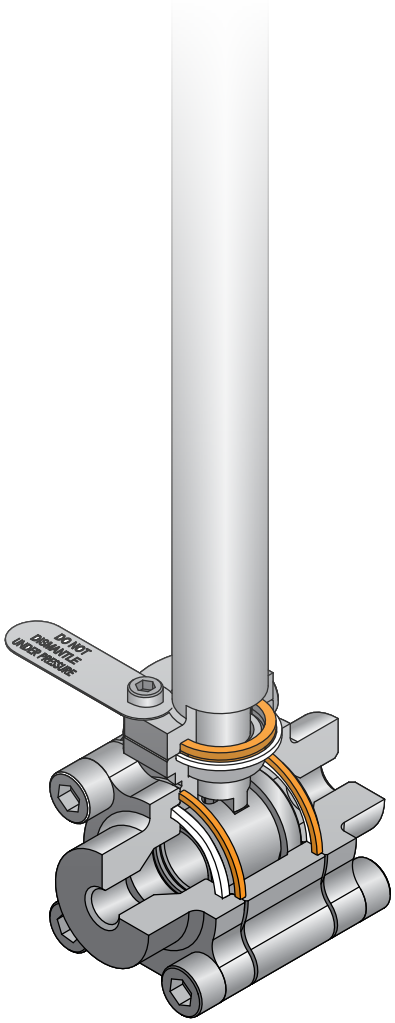


VALVE FEATURES

Fire Safe Design

Valves to be used in explosive or fire-hazard areas need to be (according to some standards and regulations) be designed to prevent in-line leaks for at least 30 minutes when exposed to flames and/or temperatures between 900 - 1000°C. In addition, after cooling down, a fire-safe valve has to be able to be cycled once and seal at an acceptable level of in-line leakage.

Habonim fire-safe valves include body seals fabricated from graphite, which is well-known as a fire-retardant material. In the event of fire, the valve's soft seats melt and the ball is pressed against a metallic fire lip on the downstream end connector thus preventing in-line leakage. The fire also burns off the stem's thrust seal, causing the stem, which has a machined chamfer at its root, to be pushed up and form a metal-to-metal seal with the valve body and prevent leakage. For stem sealing Habonim is using the patented HermetiX seal, a unique polymer-based graphite-free stem seal that, even after its polymer materials have melted, allows the stem to stay aligned and fully operable after cool-down. During normal operation, our polymer-based stem seal allows 500,000 operation cycles without maintenance, making it remarkably more durable than porous graphite seals, which have to undergo maintenance every 5,000 cycles without refurbishment. This design has been tested and certified to API 607 and ISO 10497 standards.



Tongue & Groove Body Seal Design

A 'tongue' machined on one side of the valve body and a matching 'groove' machined on the opposite side provides a perfect interlock system that precisely aligns the body and ends along the valve's center axis, thus increasing accuracy and repeatability during valve assembly and maintenance. The tongue & groove design is used most of our fire valves so that the expanded body seal is fully encapsulated and compressed in the event of a fire. The tongue & groove design forces fluid emissions to flow in a labyrinth pattern, thus ensuring zero leakage into the atmosphere.

Body Bolts

Instead of long through-way bolts and nuts, all of our 3-piece fire-safe valves use double the number of one-size-up short bolts threaded into the body. In the event of fire these bolts minimize thermal expansion and prevent external leakage.





Ball Configurations

Our mirror-polished solid balls ensure tight shutoff and long service life. All balls come with specially rounded leading edges to eliminate excessive seat wear during rotation. Our balls technology can supports change to variety of metals (some are available only upon request) such as Stainless Steel 316 (CF8M), Alloy-C276, Alloy-C22, Monel 400, 254SMO, Duplex, Super Duplex, Inconel 625, Titanium and more. Ball materials other than Stainless Steel 316 (CF8M), are marked for clear identification.

There are different styles related to the ball port itself:

- Standard port ball (also known as reduced port) - The flow through the ball is one size smaller than the pipe's size resulting in a flow area smaller than the pipe's area. The reduced flow area increases the flow velocity (assuming a constant flow discharge) and the head-loss over the valve.
- Full port ball - Has an over-sized ball so that the ball's port is the same as the pipe's inner diameter, thus reducing friction loss. Flow is unrestricted but the valve is larger so full-port balls are typically used where free flow is particularly important such as in pipelines that require pigging.
- Tube size ball (also known as true port) has a port which is identical to the tube's inside diameter. This configuration is used mainly in the pharmaceutical industry where dead legs and pockets of contamination are unacceptable.

Pressure Equalizing Hole

Balls typically have a hole in the stem slot to equalize the pressure over the ball sphere. The pressure inside the ball port and the pressure in the valve cavity are identical and hence no stress is applied to the ball sphere. The pressure equalizing hole is eliminated in the following cases:

- High surface finish requirements, mechanically polished or electro-polished
- Diverter valves
- Valves with cavity filler seats
- Double block and bleed valves
- Pharmaceutical or other applications with very high sanitary requirements



Minimum stress on the ball by adding a pressure equalizing hole



VALVE FEATURES

Ball Configurations

Cavity Pressure Relief

This safety feature is for valve applications where a trapped cavity must be avoided a 3 mm hole is included in the upstream ball sphere so that any pressure that builds up in the valve cavity will be released into the upstream pipeline. The use of a cavity pressure relief hole feature is mandatory when using ammonia, chlorine or any other liquid media that is at risk of transforming into a gas and thus elevating the pressure within the valve cavity in an uncontrolled manner. A valve which includes the 'P250' code will always be unidirectional, and will include an arrow flow plate attached to the valve body. Improper installation in the opposite direction will cause an in-line leak.



3 mm relief hole face the upstream

'C' Ball

Habonim offers a two-way ball with its upstream sphere completely machined through the ball port and thus has a C shape. This feature is mainly used where media tends to crystalize on the upstream ball sphere such as, for example, molten sugar or baked ground coffee. When a standard valve is in the closed position and a solid layer has adhered to the ball's upstream sphere, subsequent valve operation will erode the upstream soft seat, loosen the pre-load of the ball seats set, and rapidly degrade the valve's functionality. With a 'C' ball media solidification is impossible as there is no surface area on which the media can accumulate. The upstream seat withstands the media unscratched; the pre-load of the ball seat set as well as the functionality of the valve remain intact for a longer period of time.



Upstream sphere completely machined in a 'C' ball

Multiport and Diverter Ball

Multiport and diverter ball designs are used primarily to split or combine process flows or to switch medium between alternative pieces of process equipment. The diverter ball configuration can be either bottom entry or side entry. The diverter ball has the same sphere diameter as standard 2-way balls so the same soft parts can be used. Multiport balls have numerous flow configurations, which are described in detail in the Multiport chapter of this catalog. The multiport ball has a larger sphere diameter than a diverter ball, allowing a firm grip of four seats vs. two seats in the diverter configuration.



Diverter ball with isometric T port construction

V-Ball

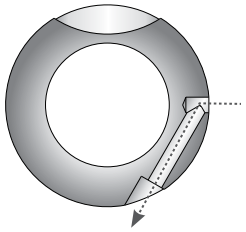
The V ball is used in control valve solution for less demanding applications, such as clear liquid at a maximum pressure drop of 6 bar (87 psi), or clean gas at a maximum pressure drop of 10 bar (145 psi), and maximum temperatures of 120-°C (248-°F) for both. The V ball design is comprised of a floating characterized ball, mounted between two seats, which maintain a trim preload and bubble-tight shut-off and low torque demand. V-Balls come in a variety of 'V' and 'slot' shapes, and can be custom designed to meet any control requirement. The V-Ball is available in a wide range of high-alloy materials and coatings for highly corrosive applications.



Characterized ball for flow control applications

Downstream Pressure Relief Ball

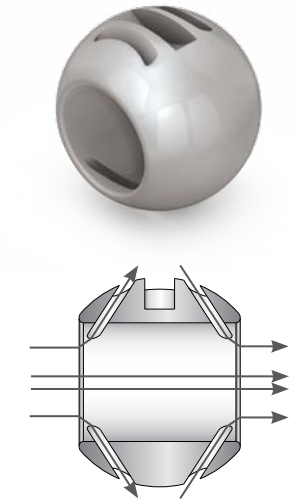
Habonim ball downstream pressure relief is designed with a diagonal hole in the downstream sphere toward the bottom of the ball. In the open position the flow runs smoothly through the valve. When the valve is closed the downstream pressure is vented through the diagonal tunnel and out via a third port incorporated into the valve body so that the relieved pressure can be diverted safely to a secured area. This feature is mainly used for pressure gauges and instrumentation service. This design eliminates the need to install an additional downstream pressure vent valve.



Special diagonal tunnel vents downstream pressure when the valve is closed.

CIP/SIP

Habonim 'CIP' ball code is mainly used in sanitary and biopharm applications. in clean applications the main ball valve problem is contamination caused by impurities trapped in the cavity between the ball's outer sphere and the valve body's inside diameter. To overcome this problem Habonim has designed a special ball that allows the stream to clean the valve cavity thoroughly during the CIP/SIP process, with the valve in the full open position. The bottom line: Bidirectional and streamlined flow with a high Cv, and self-cleaning of hidden cavities.



With the valve in the open position, special tunnels flush the valve cavity constantly



VALVE FEATURES

Seat Configurations

Standard Seat

A flexible, precision-machined seat that provides the highest seal capabilities (EN12567 Rate A) in high pressure and vacuum conditions. Its unique design reduces valve torque, facilitating a more compact, lower-weight automated package. The design also reduces wear, thus extending the life of the seat. The seat perimeter has pressure-equalizing slots to allow pressure to penetrate into the body cavity for better sealing and for avoiding upstream seat collapse into the valve cavity while turning the valve ball from the open to closed position under high differential pressure.



Standard seat

Self-Relieving-Seat (SRS)

The Self Relieving Seat (SRS) is used mainly in syltherm and dowtherm services in the chemical and biopharm industries. Both syltherm and dowtherm have a high thermal expansion coefficient and in trapped cavities (such as when the valve ball is in its closed position) even a moderate temperature increase will cause dramatic pressure build-up that can cause cessation of valve operation, seat swelling, and even valve shell failure. The SRS is designed to flex and allow the trapped pressure to escape into the pipeline, while shutting off as soon as the peak pressure is relieved. The pressure relief is achieved by a special internal groove that is machined into the seat radii facing the ball. Additional radial grooves enable the pressure to bypass the ball and access the internal groove. The seat sealing surface is in the central internal section and provides tight shutoff. The outer section of the seat above the internal groove gives the support needed to the ball when higher line pressure pushes the ball toward the downstream seat, thus preventing "crushing" of the seat. SRS seats can be used with a differential pressure up to ASME Class #300.



Self-Relieving-Seat (SRS)

Seat-seal

In some use cases valve must seal the pressure at the upstream side, which contradicts the traditional floating ball mode of operation (where sealing is typically done on the downstream seat only). Habonim's solid one-piece seat-seal design blocks the flow through the back of the seat, generating an upstream seal. Seat-seal can be used with differential pressure up to ASME Class300. For higher differential pressures use either a valve with hybrid seats, or a dual floating ball valve integrated into a one block or trunnion mounted valve.



Seat-seal

Hybrid Seat

When a soft seated floating ball valve is held even momentarily at mid position, the upstream seat is only partially supported by the ball and can be pushed towards the valve cavity by the force of the stream. This deformation is amplified with increased media density, high differential pressure and/or high velocity. Under these extreme conditions the deformation can: cause the ball to grip the unsupported area of the soft seat and jam the valve; slice the seat by the port edge of the ball; or trigger stem twisting (caused by excessive torque applied by the operator trying to close the valve). Habonim's line of Hybrid seats were developed especially to overcome the problems posed by high differential pressure applications. The combination of a metallic housing and polymer insert offers the stiffness of a metal seat with the bubble tight shutoff leakage rate and operating torque of a soft seat. Different hybrid seat designs were developed to meet the needs of different applications, and are designated by the metallic housing design.



Hybrid seat

Seat Configurations

Cavity filler seat

The cavity filler seat design minimizes crevices and gaps between the ball and the valve body, thus reducing the risk of trapped contaminants. Because the valve body is specially machined with a larger bore diameter to fit the special cavity filler seat dimensions, they cannot be retrofit into a standard valve body. The cavity filler seat is a one piece seat-seal design and is therefore suitable for use with the Habonim 3-piece product line.

Note: A valve with a cavity filler seat cannot be used in fire-safe service.



Cavity filler seat

Metal seat

Habonim metal seats are used for extreme service applications where high temperature, abrasion and/or corrosion restrict the use of soft seats. The metal seats are mate lapped with the ball for enhanced engagement and sealing. A variety of surface treatments and coatings can be applied to the seat's outer surface to withstand corrosion, galling and other forms of wear.



Metal seat

V-port seat

Superior control performance and accuracy is designed into the geometry of the downstream V-port. The precision wire cut 'V' shape of a metal seat, enables equal percentage flow characteristics, while S-port design ('Slot') provides linear flow characteristics. V-Port valve assembly, comprised of a ball and wire cut metal seat, lapped together into a single seamless component. V-port design provides the high rangeability and precision throttling required for clean or dirty liquids and gases, as well as fibrous suspension applications. The streamlined flow passage allows for high recovery, maximum efficiency and excellent erosion resistance.



V-port seat



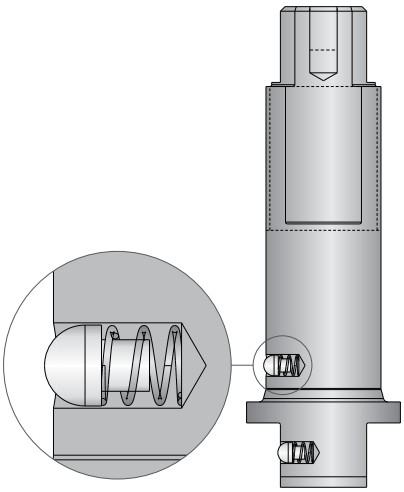
VALVE FEATURES

Stem Design

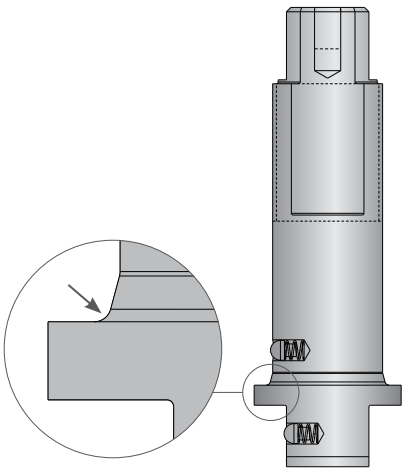
A crucial component in a quarter-turn ball valve is the stem, which transfers the torque from the operator to rotate the ball and control its movement. The stem geometry and surface finish is crucial to minimize stem leak and maximize ease of operation. The stem is a dynamic element and, in most cases, is the only element that protrudes from the pressure vessel and is thus subject to safety issues as well. Habonim's robust stem design complies with ASME B16.34 and API 6D and can endure at least twice the valve's nominal torque. To solve a major safety issue, the stem is designed to be "blowout-proof". Because it is inserted into the valve body from within, the stem will not release under pressure. All Habonim stems are, by default, fire-safe design. A special chamfer is machined at the root of the stem so that, in the event of fire, the stem is pushed upwards and seals against the valve body - metal to metal engagement. Various stem materials are available, from austenitic stainless steel to nickel alloys, to titanium for light and moderate torque requirements, and for high cycle applications or high torque demands. The stem top planes for valve sizes ½" (DN15) up to 2½" (DN65) are typically a Double-D shape, while 3" (DN80) stems and above typically have a square shaft (although a Double-D stem can be provided upon request by adding the 'WR' suffix to the valve description).

Anti-Static Design

An anti-static device provides for electrical continuity between the body, ball and shaft of the valve and is used to discharge static electricity buildup on electrically isolated balls. According to the EN ISO 17292 standard, all valves with a size up to 2" (DN ≤ 50) require a stem/body contact, while larger valve sizes also require a ball/stem contact. The anti-static feature shall have electrical continuity across the discharge path with a resistance not exceeding 10 Ω from a power source not exceeding 12 VDC when type tested on a new, dry, as-built valve after pressure testing and cycling of the valve at least five times. The Habonim anti-static device, in which contact is made via a spring loaded stainless steel element, complies with EN ISO 17292 and is, in fact, built-in to all Habonim valve product lines, without exception.



Anti-static design



Stem design

Stem Seals

The valve trim - and the valve stem seal design in particular - determine the quality of a valve. The stem seal must perform two tasks: keep the media within the boundaries of the pressure vessel, and allow uninterrupted leak-free continuous open/closed quarter-turn rotation.

Unlike the valve body's static seal, the stem seal is subject to dynamic operation of the valve, as well as to side loads resulting from actuator misalignment or from the operator forcing the handle incorrectly. The valve trim typically comprises two Belleville springs assembled Face-to-Face, which preload the stem seal. This self- adjusting mechanism compensates for wear and pressure/temperature differentials - ensuring a leak-tight seal and extended service life. Habonim's trim design for heavy-duty service, such as high cycle applications, uses four or even six sets of Belleville springs so as to maintain preload over a longer operational cycle life. The Belleville springs are compressed by the stem nut, which is locked to prevent unintentional release during cycles.

Habonim's stem seal design, consisting of a live-loaded thrust bearing and anti-abrasion ring combined with a stem seal, significantly increases valve cycle life over conventional ball valves and extends the time between adjustments.



VALVE FEATURES

Stem Seals

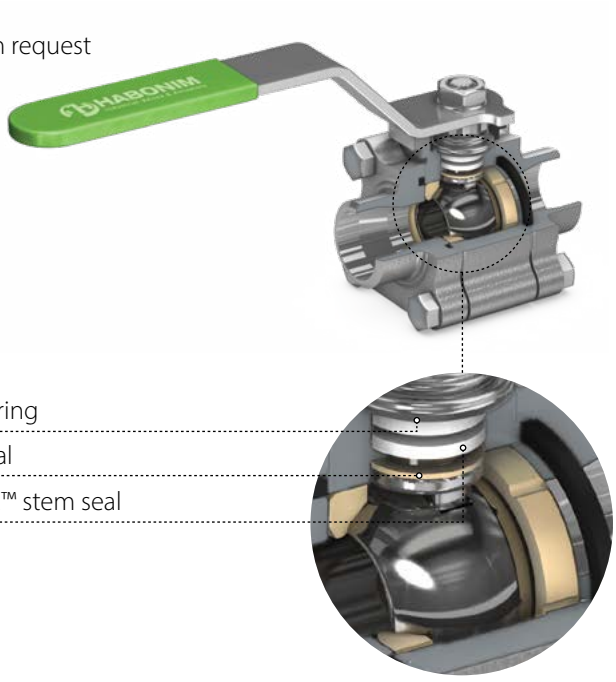
Graphite-free fire safe HermetiX™ stem seal

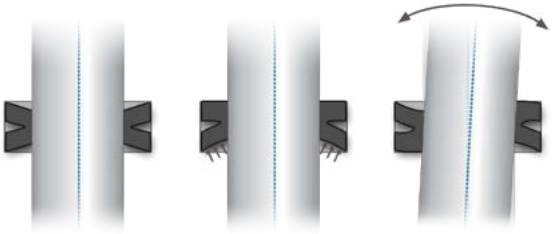
The patented HermetiX™ stem seal is named for its distinctive "X"-shaped design. The flexible "X" shape creates a dynamic sealing arrangement so that, in the event of pressure buildup or side load, the HermetiX™ adjusts dynamically to prevent fugitive emissions. The result is a superior stem seal design compared with the conventional flat stem seals currently available on the market.

The HermetiX™ Fire-safe. This patented design includes a polymer based stem seal and a unique fire safe certified construction. The graphite-free stem seal, suitable for use in hazardous industries such as chemical, petrochemical, oil & gas, Food & Beverages is designed to operate for 500,000 cycles without refurbishment. The HermetiX™ fire safe valve offers the ultimate solution - an exclusive graphite free stem seal that eliminates the risk of graphite disintegration after prolonged valve cycles, protecting both line materials and air quality. The HermetiX™ fire safe valve meets the requirements of fire-safe API 607 / ISO 10497 standards, as well as the stringent ISO 15848-1 standard.

Features

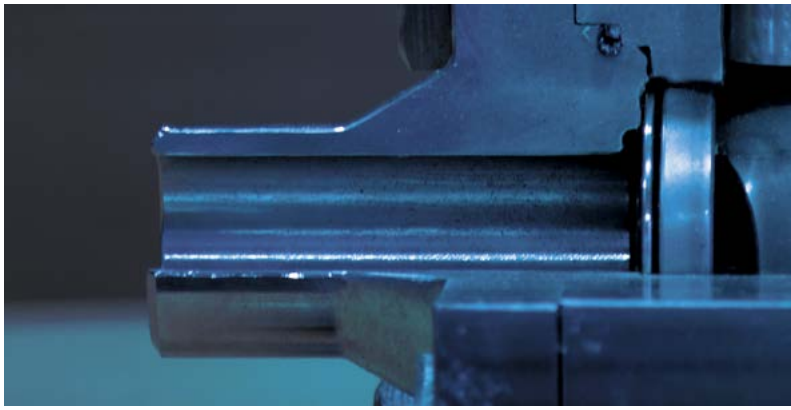
- Prevents media contamination from graphite particles
- FDA, CE1935:2004 approved polymer or other materials is available upon request
- Fugitive emission certified to ISO 15848-1 and API 641
- Habonim patented design
- Designed to operate for 500,000 cycles without refurbishment
- Prevents media contamination from graphite particles
- Ensures uninterrupted production
- Increases site safety
- Anti-static as standard



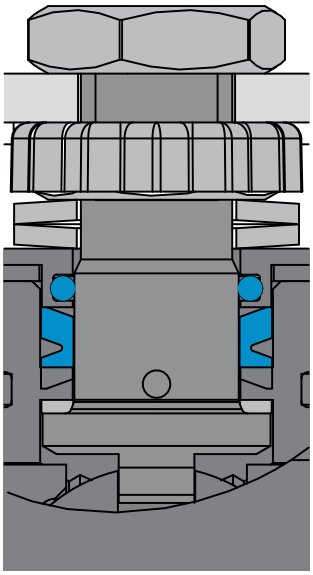


No pressure Pressure build-up Side load





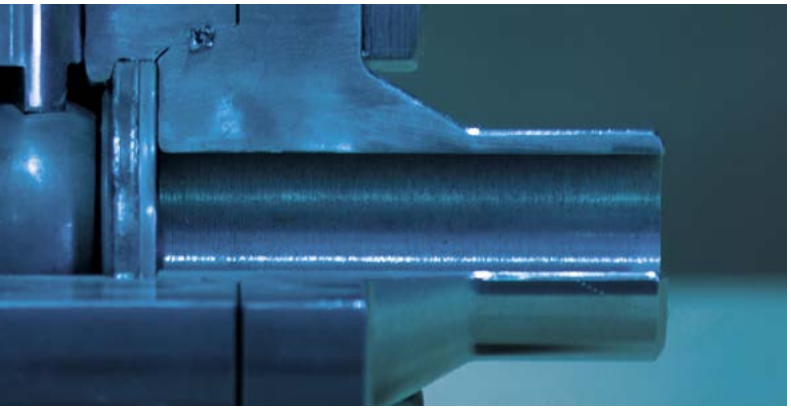
High Cycle (HC) Stem seal



High cycle service is defined by Habonim engineering as continuous operation for more than one hour at a frequency greater than 1 cycle / 180 seconds.

When designing a valve for high cycle service parameters, such as heat dissipation due to friction of metallic and plastic parts, resistance to fatigue stress, and mean time between maintenance activities must be taken into consideration.

For high cycle applications Habonim recommends the use of valve stems made of high tensile material. The stem will be polished for a high degree of surface roughness. The stem thrust seal will always be made from highly wear-resistant plastic material. A Viton O-ring is inserted into a customized follower. The complete trim assembly is preloaded by a double or even triple Belleville spring stack. All of these design features give the valve a particularly long service life.





VALVE FEATURES

End Connections

Habonim offers a variety of end connections for its 3-piece valves, supporting the industry standard connections for piping in diverse applications and geographies.



TC/TCI/TCD

Tri-Clamp end - designed to ASME BPE (TC) standard, allows fast connection or removal of the valve from the line. Mainly used in the pharmaceutical and food & beverage industries.



BW

Buttweld end for various pipe schedule - designed to ASME B16.25, EN12627-4, BW code stands for buttweld schedule 40, for different pipe schedule BW should be followed by the relevant schedule number (5,10,80,160)



SW

Socket-weld end one piece solid cast designed to ASME B16.11 and EN 12760. Leaving a 1 mm gap (average) between the pipe end and the socket inner plan is a common welding practice to avoid internal stress due to thermal expansion during the welding process



XBW

Extended buttweld end for various pipe schedule - one piece solid cast - special design for in-line welding save labor cost and keep the integrity of the product factory tested.



XSW

Extended Socket-weld end one piece solid cast - special design for in-line welding save labor cost and keep the integrity of the product 'factory tested'



BWO / BWI / BWD

Buttweld end for various tube standards - designed to ASME BPE (BWO), ISO 1127 (BWI) and DIN 11850 (BWD). The length of this end doesn't allow the use of orbital welding.

Standard	Sizes	Wall thickness (mm)	End Connection (19-22)	End Connection Length
ISO 1127	3/8"-3/4"	1.6	BWI1.6	Short
			ETI1.6	Extended
	1"-2-1/2"	2.0	BWI2.0	Short
			ETI2.0	Extended
	Over 2-1/2"	2.3	BWI2.3	Short
			ETI2.3	Extended



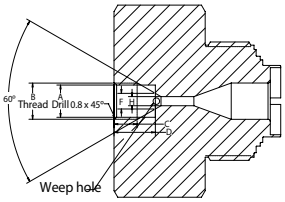
ETO / ETI / ETD

Extended buttweld end for various tube standards - designed to ASME BPE (ETO), ISO 1127 (ETI) and DIN 11850 (ETD). One piece solid cast with sufficient length to allow the use of orbital welding.
Habonim ETD end connections are designed in accordance to EN10357 – Series A.
Habonim ETI end connections are designed in accordance to EN10357 – Series C.
Dimensions of the end-connections tube ends are suitable to be welded on tubes that meet this standard.
For other tube sized ends please contact a Habonim representative.

CTM

Coned and Threaded type female connection to be used with Coned & Threaded medium-pressure tubing and connection components.
Female connection geometry and sizes per the Below.

Size	Dimensions - mm (inches)					
	A	B	C	D	F	H
02	9.9(25/64)	7/16-20	7.1(.28)	12.7(.28)	4.8(.19)	2.8(.109)
03	13.1(33/64)	9/16-18	9.6(.38)	9.6(.38)	7.9(.31)	5.2(.203)
06	19.1(3/4)	13/16-16	11.1(.44)	11.1(.44)	12.7(.50)	9.1(.359)
07	32.9(1.19/64)	3/4-14	12.7(.50)	12.7(.50)	16 (.63)	11.1(.438)
10	45.47(1.79)	1 3/8-12	20.6(.81)	20.6(.81)	22.4(.88)	14.3(.562)





NPT / BSPT / DIN2999 / DIN3852

Female thread end designed to ASME B1.20.1 NPT
EN 10226-1 BSPT/DIN2999/DIN3852 and more



LL / LM

Compression ends for metric (code LM followed by the tube OD in mm) or imperial (code LL) tube dimensions. mainly used in instrumentation services, with sizes up to 1" (DN25)

Flanged			
150	ASME B16.5 #150 RF	PN16	EN1092 PN16 RF
300	ASME B16.5 #300 RF	PN40	EN1092 PN40 RF
600	ASME B16.5 #600 RF	PN63	EN1092 PN63 RF
900	ASME B16.5 #900 RF	PN100	EN1092 PN100 RF
		PN160	EN1092 PN160 RF



150/300/600/900 | PN16/40/63/100/160

Raised Face flange ends designed to ASME B16.5 or EN1092 for a variety of pressure classes.
Valve Face To Face sizes are per Habonim catalog data only.



MNPT / MBSPT

Male thread end designed to ASME B1.20.1 NPT
EN 10226-1 BSPT/DIN2999/DIN3852 and more



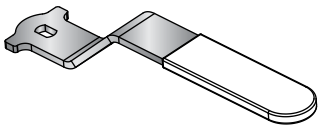
Grayloc©

Grayloc© compatible hub designed to fit an opposite hub for an easy low or high pressure connection Using a self-energized seal (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

VALVE FEATURES

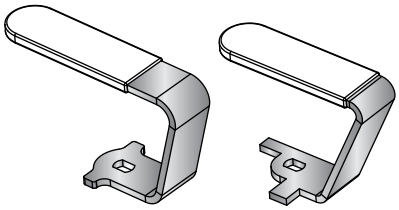
Handles

A valve handle is the interface between the operator's hand and the valve trim. Habonim's handles are designed for safe operation, with a firm and comfortable grip. To facilitate ease of operation, the handle length ensures that the maximum force required at the handle-end to apply the breakaway torque will never exceed 360 N (80 lbf). The handles are manufactured in a variety of technologies: casting, forging, punching, and laser cut and welding. The standard materials are zinc plated carbon steel and stainless steel. Habonim's range of handle designs addresses the diverse needs of multiple applications.



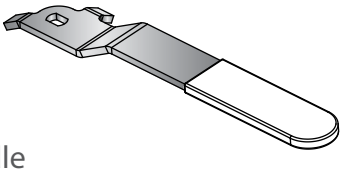
The 'SHARK' handle

Habonim's standard handle for valves with an ISO 5211 top pad.



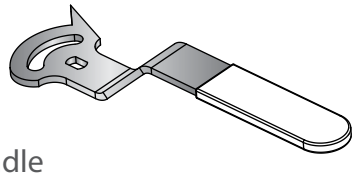
The 'SCORPION' handle

Habonim's special handle for confined spaces. There are two types to accommodate valves with or without an ISO 5211 top pad. To specify a valve with the SCORPION handle add the '-SCRP' suffix to the valve code.



The 'POINTER' handle

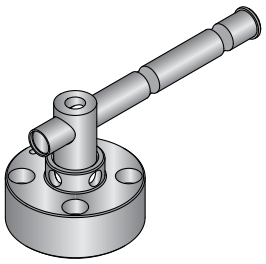
Habonim's standard handle for valves without an ISO5211 top pad.



The 'ADJUSTABLE' handle

Habonim's special handle for manually controlled valves. It is supplied as part of a kit that includes a lock-in-place mechanism and a mirror-polished scale for clear identification of the valve's angular position. To specify a valve with the ADJUSTABLE handle add the '-ADJ' suffix to the valve code.





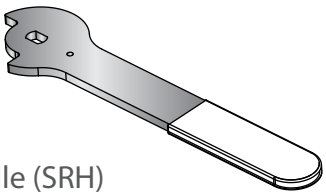
The T-Handle (TH)

Habonim's special handle designed for trailers with its compact footprint and lockable option. Available in the following Habonim high-pressure TPED certified series: 24, H24, H25 and H29.
The rod can be moved from side to side to increase leverage for a better user interface experience.
To specify a valve with the T-Handle, add the '-TH' suffix to the valve code.



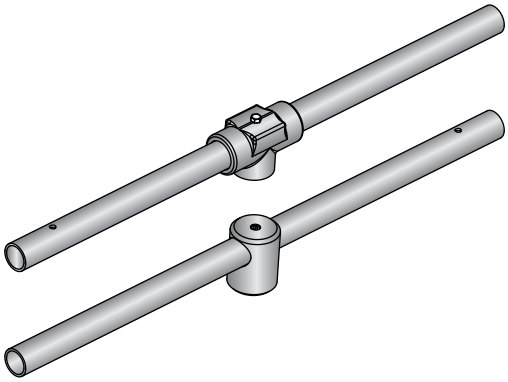
The Oval handle (OVL)

Habonim's special handle designed to avoid unintentional movement of the valve handle. It is also used in confined spaces where the handle must not protrude beyond the valve's Face-to-Face plate. To specify a valve with the OVAL handle add the '-OVL' suffix to the valve code.



The Spring Return Handle (SRH)

An extra thick handle design to withstand the severe impact during valve closing. This handle is part of the SRH unit.



Habonim's standard handle for large valves (2½" and above)

Habonim's standard handle for large (2½" and above) cryogenic, high pressure and metal-seated valves, and for large (3" and above) standard valves. It provides a firm grip and smooth operation. The maximum force required at the handle-end to apply the breakaway torque shall not exceed 360 N (80 lbf). Habonim supplies valves with 2½" standard port and above for manual operation with handles attached to or packed with the valve. (with the exemption of 47 series which is for 3" standard port and above). If the valve is to be automatically actuated, Habonim removes the handle and prepares the valve stem seal accordingly. To specify a valve prepared for automated actuation, add the '-BS' (bare shaft) suffix to the valve code. The '-BS' suffix does not apply to valves size up to and including 2.





CRYOGENIC VALVES

General 38

Trunnion

Top Entry 43

3 Piece 47

2 Piece 57

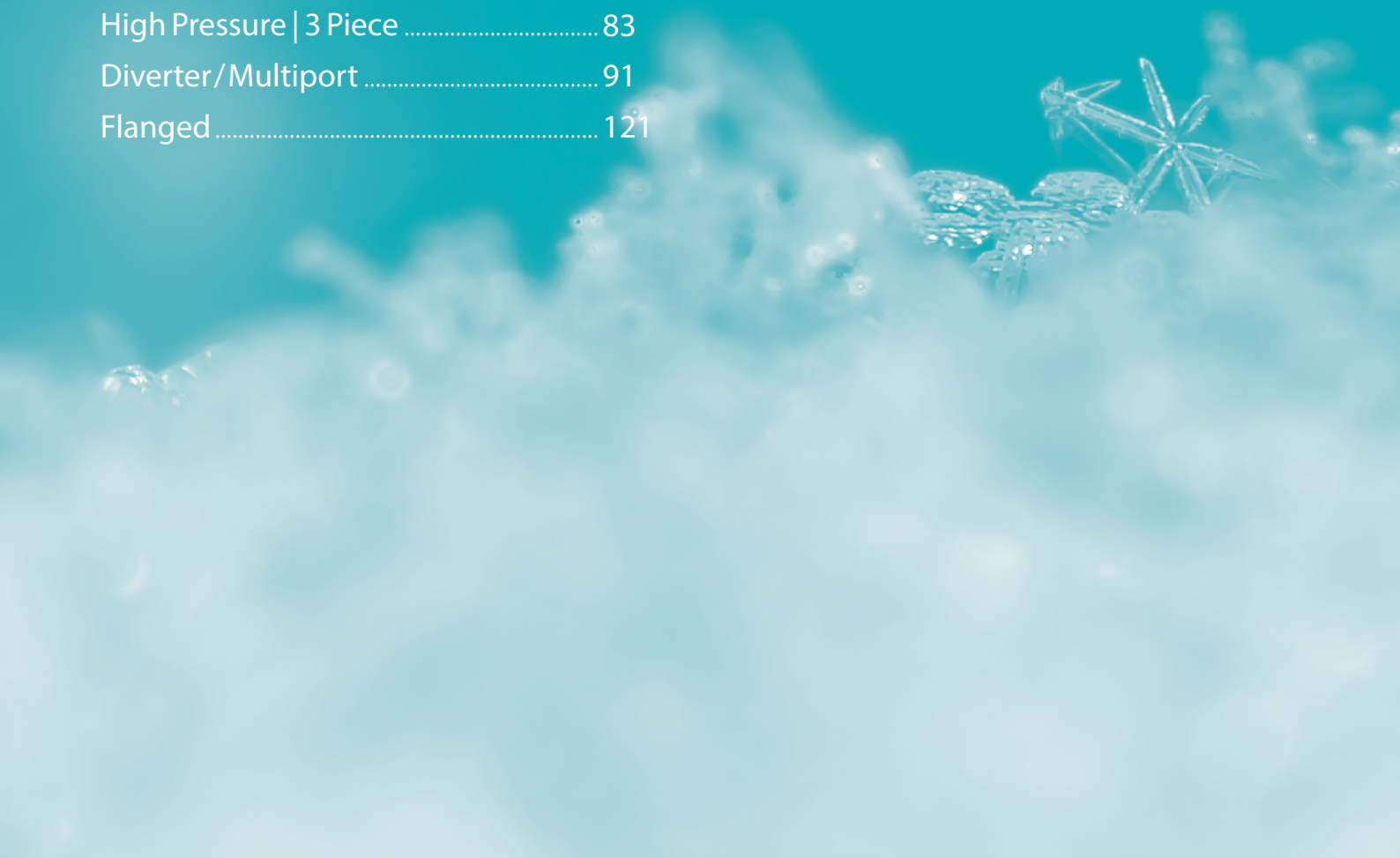
Floating Ball

3 Piece 65

High Pressure | 3 Piece 83

Diverter/Multiport 91

Flanged 121



CRYOGENIC VALVES

General

Habonim's cryogenic product line valves are subject to the general Habonim valves design, materials, practices, methodologies and certifications – for more information, see Valves General chapter.

Habonim cryogenic valves are equipped with the Total HermetiX integrity package for superior sealing, safety and environmental care.

Cleaning, Assembling and Packing

Cryogenic Service

A meticulous cleaning and assembly procedure eliminate the ignition hazards that can be caused by the presence of hydrocarbon oil, grease, and metal chips. Habonim uses an environment friendly, alkaline-based degreasing process with controlled parameters. Valves are assembled in a controlled area by personnel who is specially equipped and trained to perform this task. The assembling area, work surfaces, equipment and tools are specially maintained to ensure that cleanliness requirements are met.

- Valves are cleaned and degreased for oxygen service
- Valves ends are capped, valves are plastic bagged
- A sticker on the plastic bag indicating "cryogenic use"

Quality

Reference Standards

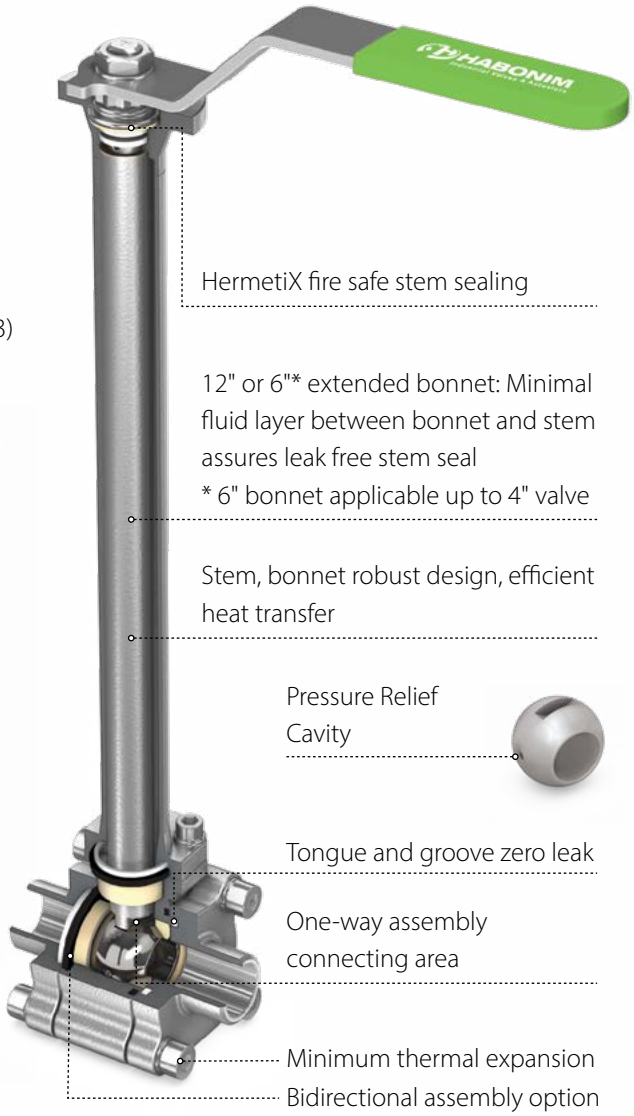
- Design, testing & inspection according to BS 6364:1984 (amendment 3)
- Testing EN 14432:2014
- Testing EN 1626:2008 (with liquefied Nitrogen per request)
- NDT per ASME B16.34 - optional



Diverter valve



Multiport valve



Quick Selection Table

Total Hermetix™ | **Port:** Standard Port | Full Port | Tube Size | **End Connections:** Threaded | Flanged | Welded | Ordering Code

Temperature: Cryogenic Down to -269°C (-452°F)

Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12 — MWP (ASME Class / DIN PN)
Trunnion Mounted Ball	Top Entry	OC	C52	TH	Full	Welded	300							300							
	3 Piece	OC	C91	TH	Standard	Flanged										150					
		OC	C92	TH	Standard	Flanged										300					
		OC	C93	TH	Standard	Flanged										600					
		OC	C94	TH	Standard	Flanged										900					
		OC	C95	TH	Standard	Flanged										1500					
		OC	C96	TH	Standard	Flanged										2500					
	2 Piece	OC	C81	TH	Full	Flanged										150					
		OC	C82	TH	Full	Flanged										300					
		OC	C83	TH	Full	Flanged										600					
Floating Ball	3 Piece	OC	C47	TH	Standard	Threaded	600							300							
		OC	C47-BD	TH	Standard	Threaded	300														
		OC	C26/C26-BD	TH	Full	Threaded							600								
		OC	C28	TH	Standard	Threaded	2500								(Δp up to 103bar/1494psi)						
	Diverter 3 Pcs.	OC	DC47	TH	Standard	Threaded			600												
	Multiport 3 Pcs.	OC	C61/DC61		Standard	Threaded	600							300							
	Multiport 3 Pcs.	OC	C62/DC62		Standard	Threaded	600							300							
	1 Piece	OC	C31/C31-BD	TH	Standard	Flanged			150												
		OC	C32/C32-BD	TH	Standard	Flanged			300												
	1 Piece 2 Piece	OC	C73/C73-BD	TH	Full	Flanged			150												
		OC	C74/C74-BD	TH	Full	Flanged			300												
		OC	C77/C77-BD	TH	Full	Flanged										PN16					
		OC	C78	TH	Full	Flanged			PN40												

ASME Class			150		300		600	900		1500		2500		6000	
Pressure Bar	-1 *	0	16	20	40	50	100	150	200	250	350	414	700	1034	
Pressure psi	-14 *	0	230	290	580	750	1500	2250	3000	3750	5000	6000	10000	15000	

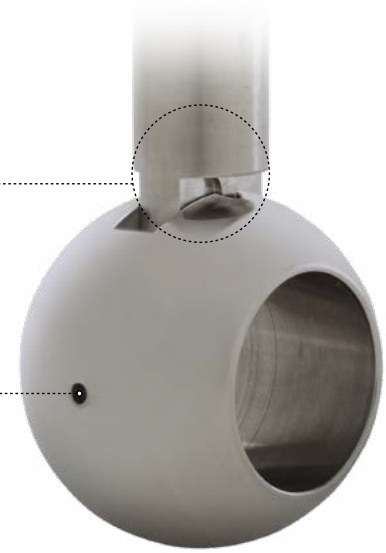
* Vacuum 10^{-6} Tor



CRYOGENIC VALVES

One-Way Assembly

An integral rib is machined at one of the stem flats to match a groove in the ball that faces the relief hole. A "T" mark on the stem tip shows the relief hole direction. These two features ensure a one-way assembly for safe operation and maintenance.



Cavity Pressure Relief

Each cryogenic valve is equipped with a mechanism that prevents pressure buildup in the valve cavity, eliminating the risk that liquefied-gas evaporation will over - pressure the valve body by releasing over-pressured media from the cavity area back to the line.

Habonim uses a variety of such mechanisms:

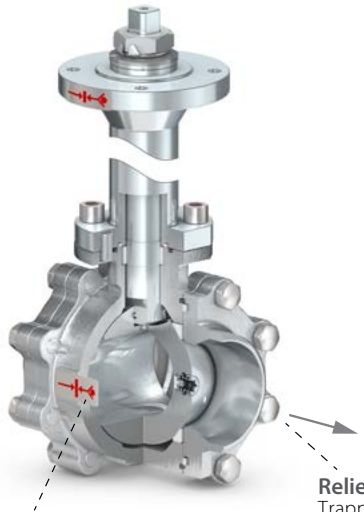
- Relief hole on the upstream sphere of the ball to prevent pressure buildup in the cavity
- Patented spring loaded seat construction with piston effect for cavity pressure relief
- Single seat active seal construction - no closed cavity
- Pressure Relief Valve, patented solution



"T" mark on stem showing the relief hole direction

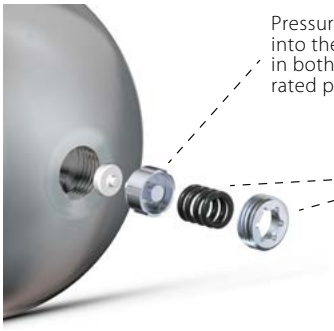
Ball with an Integral Pressure Relief Device*

* Designed according to EN ISO 4126-1 "Safety devices for protection against excessive pressure"



Tag
Sealing direction tag indicates bidirectional work and predefined pressure relief side.

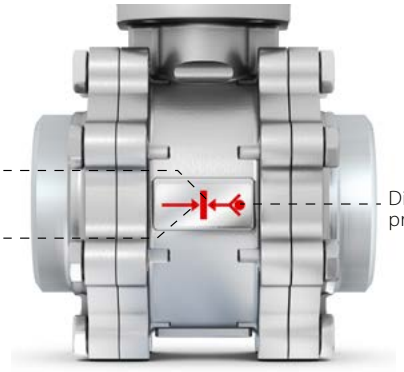
Relief direction
Trapped fluid pressure released to the upstream direction.

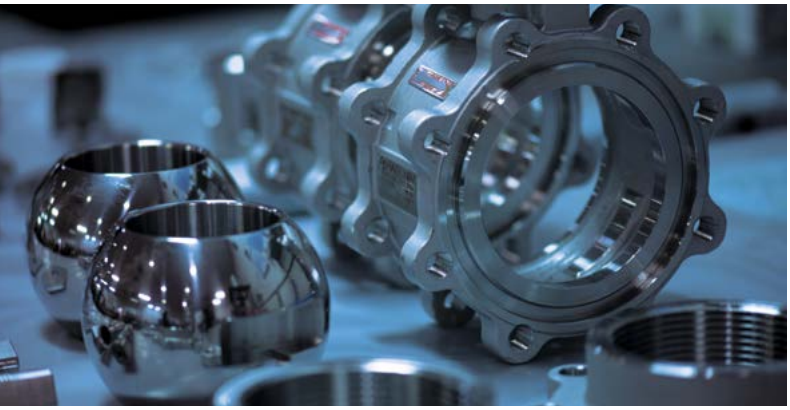


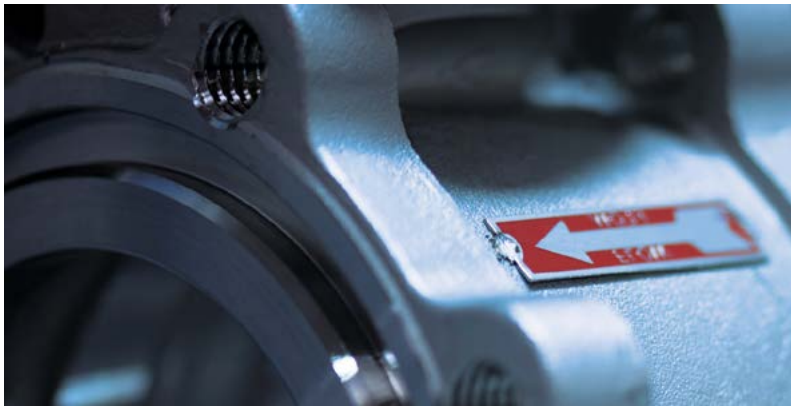
Pressure relief device is embedded into the ball. Providing sealing in both directions up to the valve's rated pressure.

Spring and Nut, allows precise set-point adjustment of the relief device.

PATENTED
US 12044333







Minimal Thermal Expansion

Using one-size-up and double the amount of body bolts reduces linear thermal expansion and dramatically decreases the likelihood of leakage to the atmosphere.



Indicator on the extended bonnet top

Efficient Heat Transfer

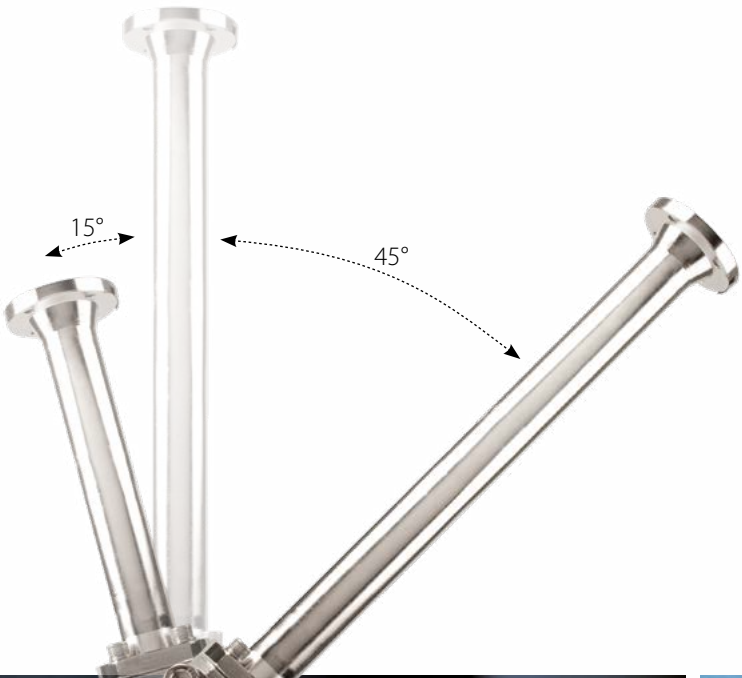
The Habonim standard bonnet length design complies with BS6364 for non-cold-box applications. The long neck bonnet insulates the stem seal from the low temperatures of cryogenic fluids, thus enabling safe and long lasting seal service. A small gap between the bonnet ID and the stem OD, ensurs a thick layer between the media and the stem seal.

Inclination Limitation

The Habonim bonnet design comes in two optional versions. Both are designed to prevent cryogenic liquids from reaching the stem seal. Habonim recommends installation in the vertical position, but allows installation at an angle. The 12" bonnet can be installed up to 45° from the vertical axis to maintain fully BS6364 compliant. The 6" bonnet can be installed up to 15° from the vertical axis.

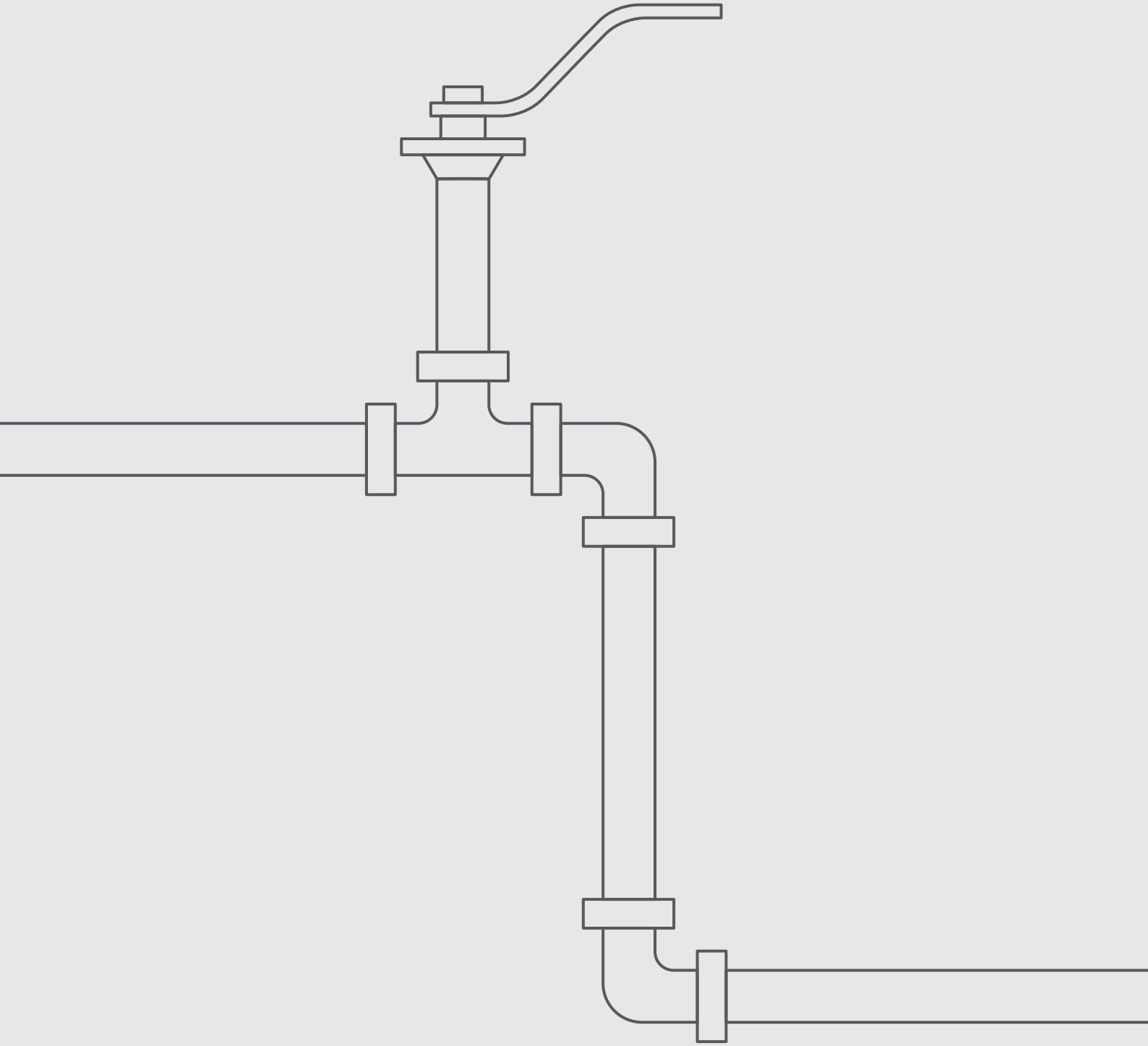


Indicator on valve body







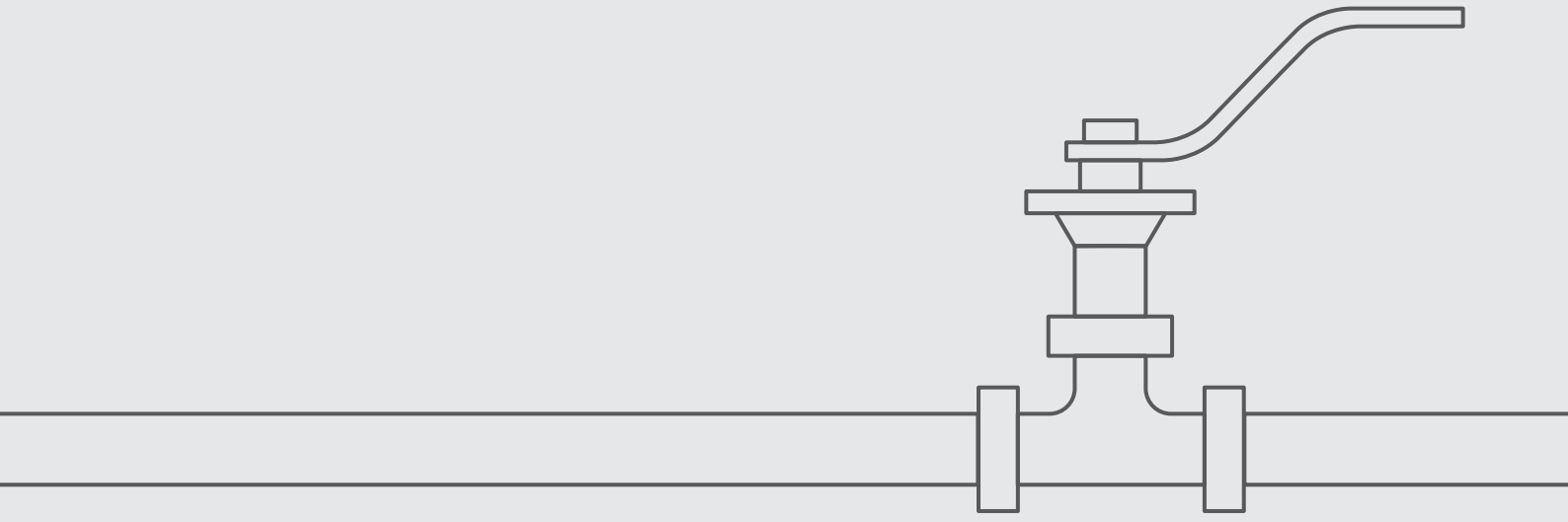


C52

Cryogenic Valves

TRUNNION

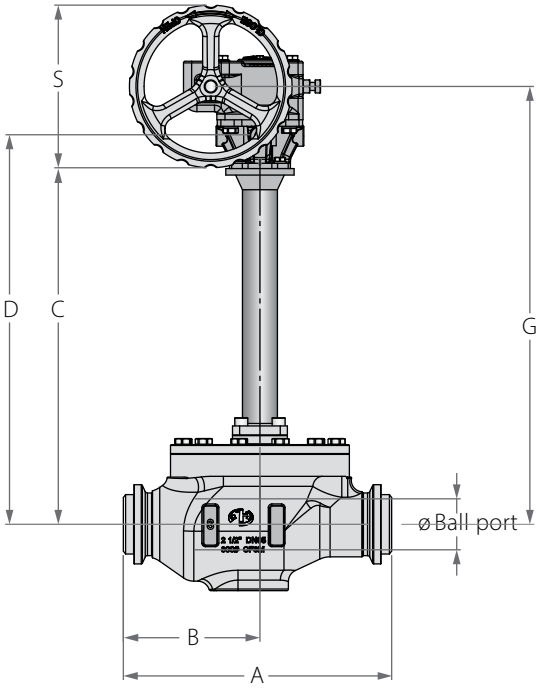
TOP ENTRY



Cryogenic Top Entry Trunnion Mounted Ball Valve

PATENTED
US 11181201

Valve Dimensions



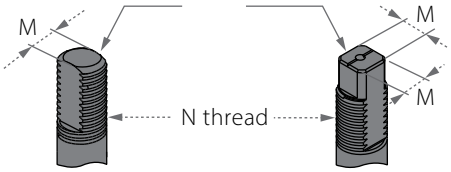
Standard stem tops

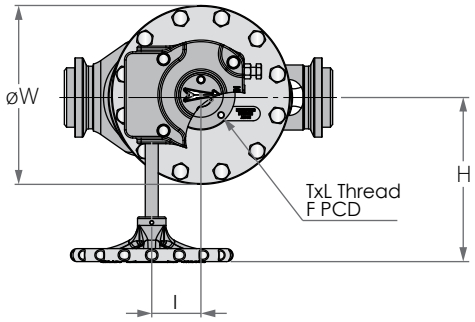
DD Type
for sizes 1½" - 2½"

Stem flats
show valve
ball position

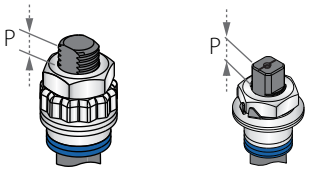
Square Type
for sizes 2" - 6"

Stem groove
shows valve
ball position





Preparation for actuation



½" - 1"
with nut

2" - 6"

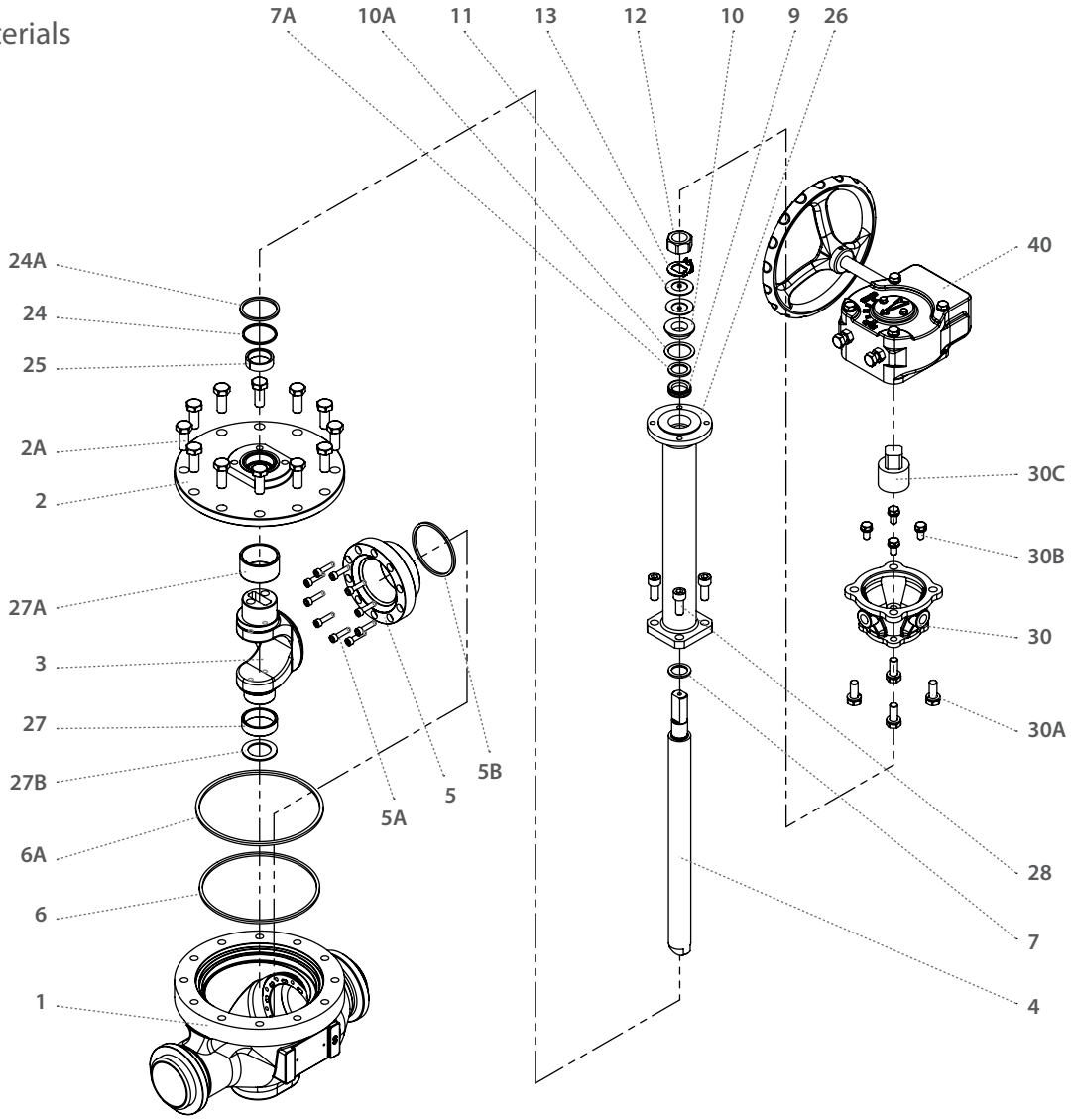
Full Port	Units	Ball port	A	B	C	D	G*	H*	I*	S*	W	M	N	P	F		TxL	Weight [a] kg/lb	KV CV
DN40	mm	38.2	241.0	129.0	380.0	409.0	468.0	192.0	52.0	200.0	169.0	8.7	9/16"-18 UNF	7.1	F05	50.0	M6x8	13.3	164
1½"	inch	1.5	9.49	5.08	14.96	16.10	18.43	7.56	2.05	7.87	6.65	0.34		0.28		1.97		29.3	190
DN50	mm	50.8	292.0	151.0	429.0	471.0	518.0	197.0	52.0	250.0	43.0	13.9	M20x2.5	13.9	F07	70.0	M8x8	24.7	327
2"	inch	2.0	11.50	5.94	16.89	18.54	20.39	7.76	2.05	9.84	1.69	0.55		0.55		2.76		54.5	378
DN65	mm	62.7	330.0	168.0	437.0	479.0	536.0	208.2	60.5	300.0	220.0	13.9	M20x2.5	13.2	F07	70.0	M8x8	31.8	668
2½"	inch	2.5	12.99	6.61	17.20	18.86	21.10	8.20	2.38	11.81	8.66	0.55		0.52		2.76		70.1	772
DN80	mm	74.0	356.0	186	480.0	526.5	601.0	270.0	60.5	400.0	240.0	18.9	1"- 14 UNS	18.3	F10	102.0	M10x15	47.2	823
3"	inch	3.0	14.02	7.32	18.90	20.73	23.66	10.63	2.38	15.75	9.45	0.74		0.72		4.02		104.1	951
DN100	mm	100.0	432.0	220.0	493.0	540.0	614.0	489.0	70.0	400.0	305.0	18.9	1"- 14 UNS	18.3	F10	102.0	M10x15	74.0	1678
4"	inch	4.0	17.01	8.66	19.41	21.26	24.17	19.25	2.76	15.75	12.01	0.74		0.72		4.02		163.1	1940
DN150	mm	150.0	559.0	280.0	589.0	658.0	744.5	372.0	122.5	600.0	410.0	28.5	1½" - 12 UNF	28.5	F12	125.0	M12x15	172.5	4199
6"	inch	6.0	22.01	11.02	23.19	25.91	29.31	14.65	4.82	23.62	16.14	1.12		1.12		4.92		380.3	4854

* Gear position dimensions (G, H, I, S) may be subject to changes in some applications

[a] Weight of the valve bare shaft (without gear & mounting kit)

Cryogenic Top Entry Trunnion Mounted Ball Valve

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Cover	Acc. Ordering Code	1
2A	Cover Bolts	S. Steel	12
3	Ball	S. Steel	1
4	Stem	High Strength S. Steel	1
5*	Hybrid Seat	S. Steel	1
5A	Seat Bolts	S. Steel	10
5B*	Seat Seal	Graphite	1
6*	Cover Inner Seal	TFM	1
6A*	Cover Outer Seal	Graphite	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2

Item	Description	Material specifications	Qty.
12	Stem Nut	S.Steel	1
13	Locking Clip (Tab lock washer for 2" and up)	S.Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Graphite	
25*	Stem Bearing	PTFE	1
26	Bonnet	Acc. Ordering Code	1
27	Upper Ball Radial Bearing	S.Steel	1
27A	Lower Ball Radial Bearing	S.Steel	1
27B*	Lower Thrust Bearing	S.Steel + PTFE	1
28	Bonnet Bolts	S.Steel	4
30	Bridge	S.Steel	1
30A	Bridge Upper Bolts	S.Steel	4
30B	Bridge Lower Bolts	S.Steel	4
30C	Adaptor	S.Steel	1
31	Gear	---	1

* Maintenance kit components

C52

Cryogenic Top Entry Trunnion Mounted Ball Valve - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
3	0		F	C	B	5	2	W	-	6	M	6	Z	C	A	G	/	X	B	W						
Size		Features				Series		Design		Body/Ends material		Ball material	Stem material	Seat material	Inner seal	Outer seal		End connection				Special features				

Size (1-2)		
Code	inch	mm
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
C	Cryogenic design
B	Full port
F	Fire safe

Series (7-8)	
52	ASME #300 Top Entry

Design (9)	
W	Total HermetiX Integrity package

Body & Bonnet (11)	
6	S. Steel

Stem material (12)	
M	High Strength S. Steel

Ball & seat ring material (13)	
6	S. Steel

Seat feature (14)	
Z	Eccentric C-Ball

Seat insert (15)	
C	PCTFE

Primary bonnet seal (16)	
A	TFM

Outer Seal material (17)	
G	Expanded graphite

End Connection (19-22)	
XBW	Butt weld ASME B16.25 SCH40
XBW10	Butt weld ASME B16.25 SCH10
XBW80	Butt weld ASME B16.25 SCH80
ETI1.6	Butt weld ISO 1127, 1.6mm
ETI2.0	Butt weld ISO 1127, 2.0mm
ETI2.3	Butt weld ISO 1127, 2.3mm

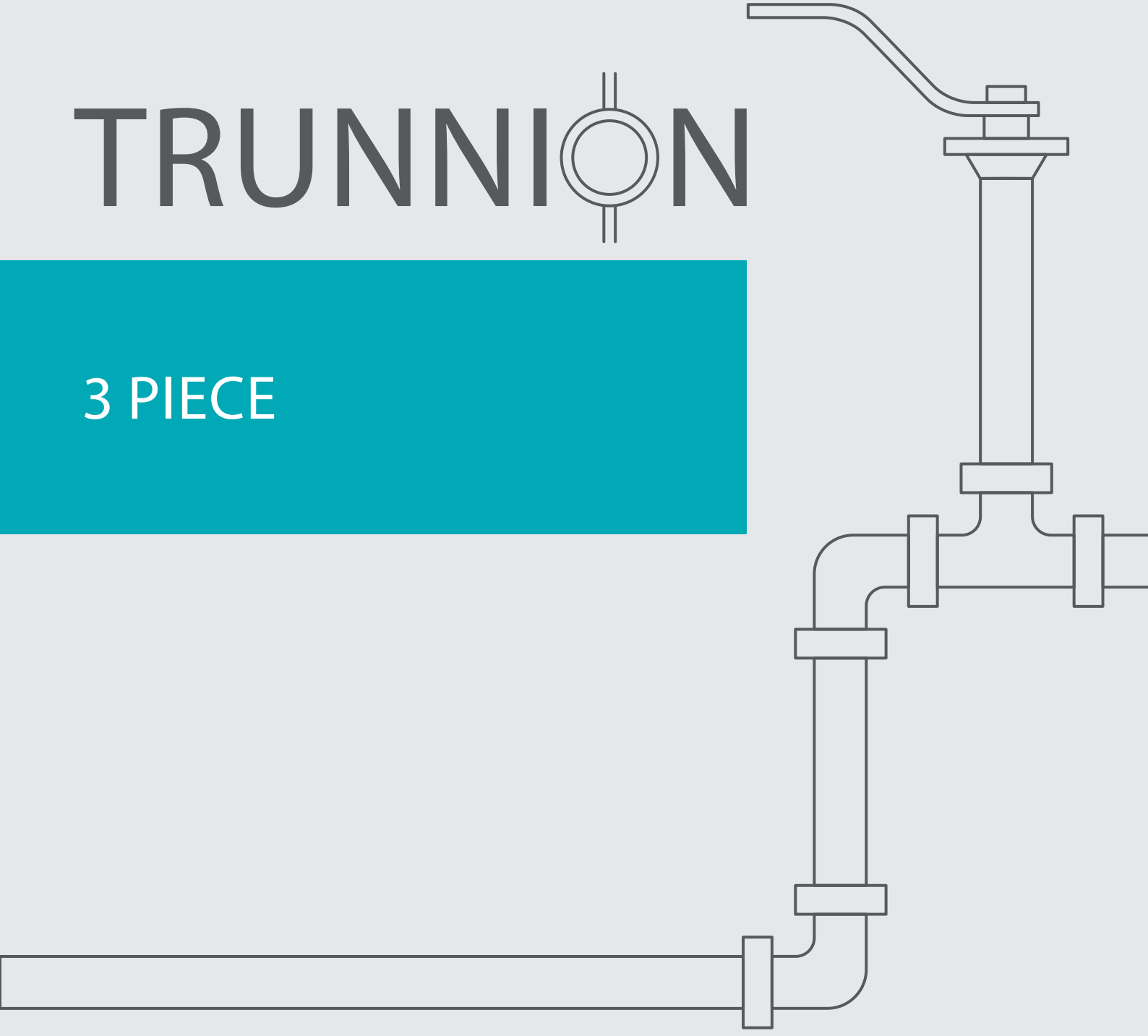
Special Features (24-30)

C91 C92 C93 C94 C95 C96

Cryogenic Valves

TRUNNION

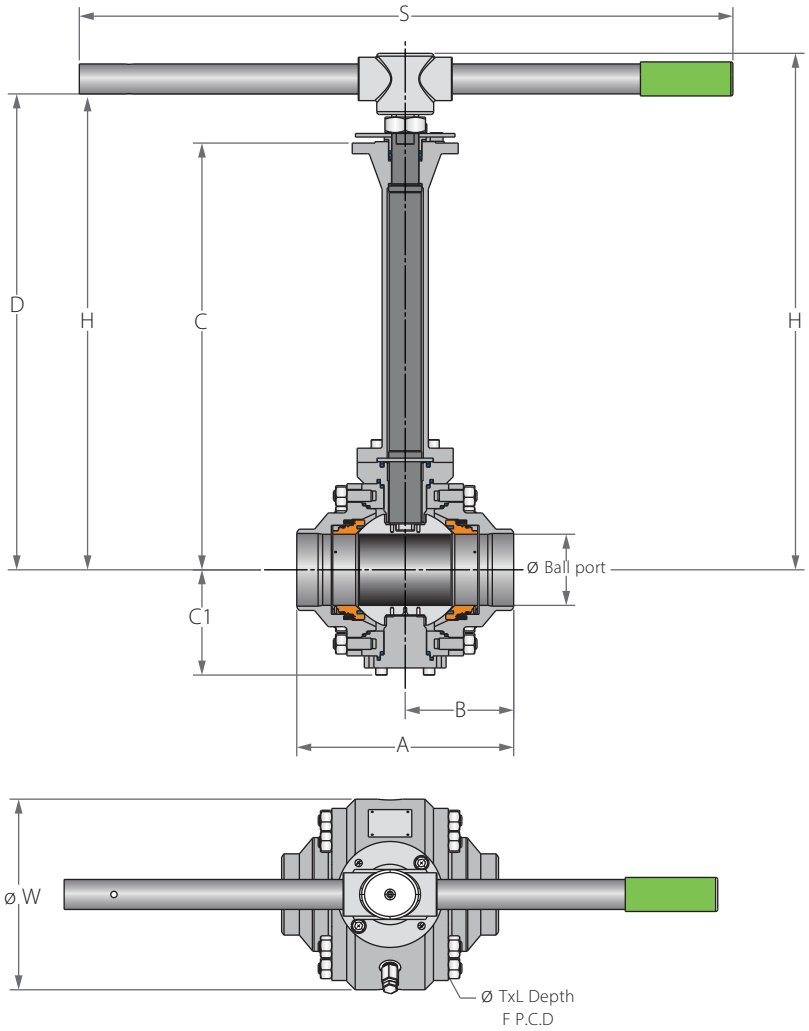
3 PIECE



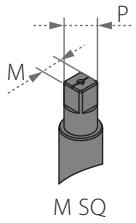
C91 C92 2"-6" | DN50-DN150 | CLASS 150/300

Cryogenic Trunnion Mounted Ball 3 Piece

Valve Dimensions



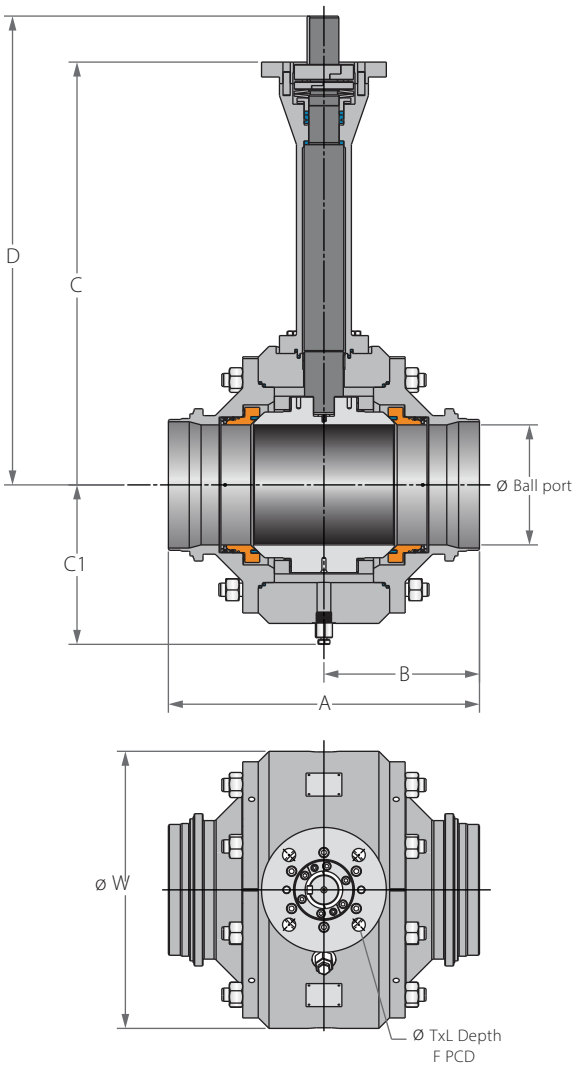
Preparation for actuation



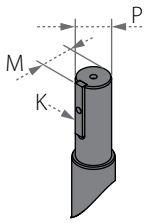
Std. port	Full port	Unit	Ball port	A		B		C	C1	D	W		M SQ	P SQ	H	S	F		TxL	Weight kg/ib		Kv / Cv	
				150	300	150	300				150	300								150	300	150	300
DN80	DN50	mm	49.0	216.0	216.0	108.0	108.0	500.0	94.0	546.0	169.0	169.0	18.9	22.0	525.0	401.0	F10	102.0	M10X15	27	31	400	363
3"	2"	inch	1.93	8.5	8.5	4.25	4.25	19.69	3.7	21.52	6.65	6.65	0.74	0.89	20.7	15.79		4.02	(4 holes)	60	68	463	420
DN100	DN80	mm	74.0	283.0	283.0	141.5	141.5	550.0	117.0	619.1	209.0	219.0	28.45	35.2	638.6	610.0	F12	125.0	M12X15	44	61	1125	952
4"	3"	inch	2.91	11.14	11.14	5.57	5.57	21.65	4.61	24.37	8.23	8.62	1.12	1.39	25.14	24.02		4.92	(4 holes)	97	134	1300	1100
DN150	DN100	mm	100.0	305.0	305.0	152.5	152.5	600.0	139.0	669.1	259.0	268.0	28.45	35.2	662.6	916.0	F12	125.0	M12X15	66	100	2154	1860
6"	4"	inch	3.94	12.01	12.01	6.0	6.0	236.22	5.47	26.34	10.2	10.55	1.12	1.39	26.09	36.06		4.92	(4 holes)	146	220	2490	2150
DN200	DN150	mm	150.0	457.0	457.0	228.5	228.5	607.0	191.0	719.6	355.0	359.0	35.9	43.5	777.1	916.0	F14	140.0	M16X20	180	216	4723	4628
8"	6"	inch	5.91	17.99	17.99	9.0	9.0	23.9.0	7.52	28.33	13.98	14.13	1.41	1.71	30.59	36.06		5.51	(4 holes)	397	476	5460	5350

Cryogenic Trunnion Mounted Ball 3 Piece

Valve Dimensions



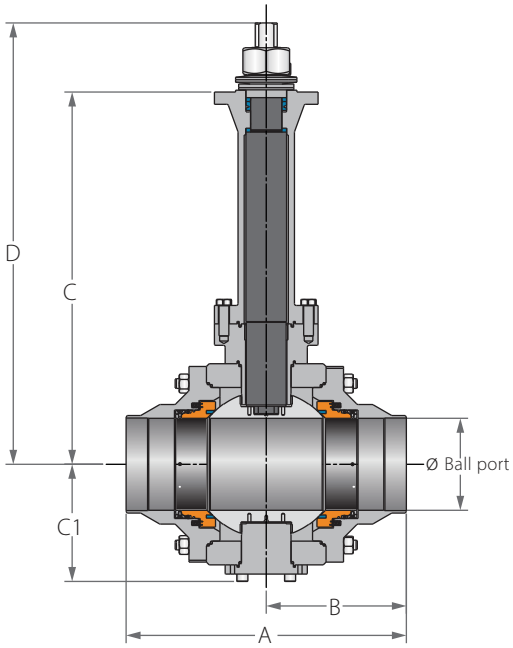
Preparation for actuation

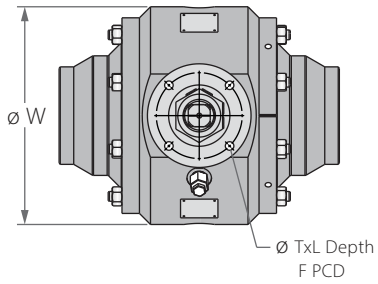


Std. port	Full port	Unit	Ball port	A		B		C	C1	D	W		P	M	K	F		TxL	Weight kg/ib		Kv / Cv	
				150	300	150	300				150	300							150	300	150	300
DN250	DN200	mm	201.0	521.0	521.0	260.5	260.5	708.0	215.0	785.0	459.0	459.0	50.0	54.0	14.0	F16	165.0	22x25 (4 holes)	346	378	9273	8737
10"	8"	inch	7.91	20.51	20.51	10.26	10.26	27.87	8.46	30.91	18.07	18.07	1.97	2.13	0.55		6.5.0		763	833	10720	10100
DN300	DN250	mm	252.0	559.0	559.0	279.5	279.5	713.3	260.0	790.4	550.0	550.0	50.0	54.0	14.0	F25	254.0	18x25 (8 holes)	518	639	15224	14792
12"	10"	inch	9.92	22.01	22.01	11.0	11.0	28.08	10.24	31.12	21.65	21.65	1.97	2.13	0.55		10.0		1142	1409	17600	17100
DN350	DN300	mm	303.0	635.0	635.0	317.5	317.5	800.0	300.0	880.5	610.0	610.0	60.0	63.5	18.0	F25	254.0	18x25 (8 holes)	723	833	23096	22404
14"	12"	inch	11.93	25.0	25.0	12.5	12.5	31.5	11.81	34.67	24.02	24.02	2.36	2.5	0.71		10.0		1594	1836	26700	25900

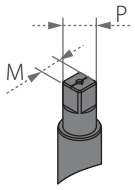
Cryogenic Trunnion Mounted Ball 3 Piece

Valve Dimensions





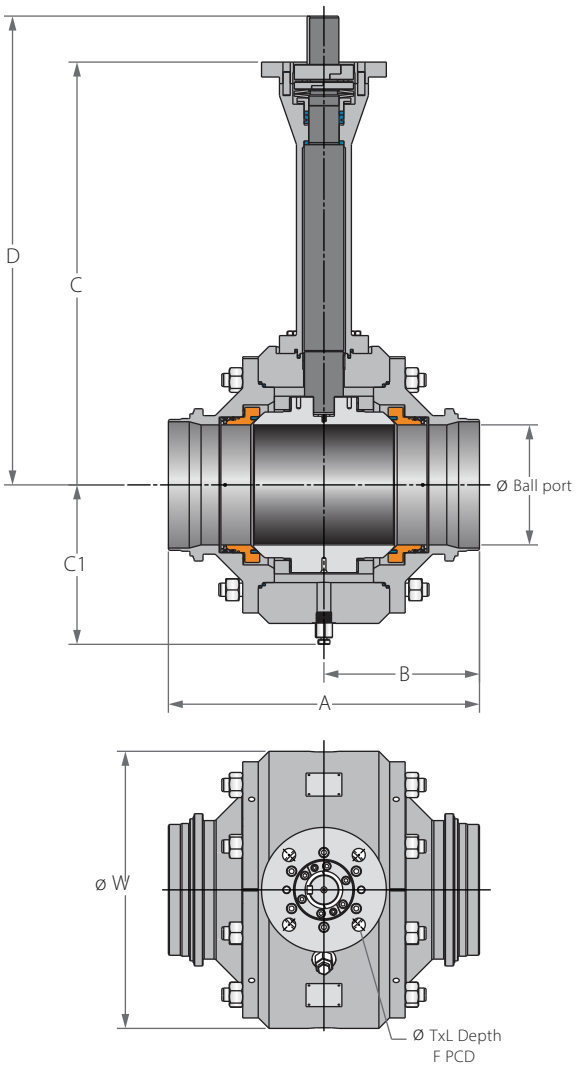
Preparation for actuation



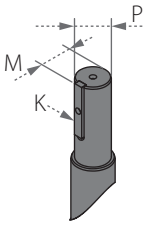
Std. port	Full port	Unit	Ball port	A		B		C		C1		D		W		M SQ	P SQ	F		TxL	Weight kg/ib		Kv / Cv	
				600	900	600	900	600	900	600	900	600	900	150	300						150	300	150	300
DN80	DN50	mm	49.0	292.0	368.0	146.0	184.0	500.0	459.0	119.0	263.0	247.0	507.0	205.0	205.0	18.90	22.70	F10	102.0	M10X15 (4 holes)	49	67	329	294
3"	2"	inch	1.93	11.5	14.49	5.75	7.24	19.69	18.09	4.69	10.35	21.56	19.96	8.07	8.07	0.74	0.89		4.02		108	148	380	340
DN100	DN80	mm	74.0	356.0	381.0	178.0	190.5	550.0	502.0	160.0	152.7	617.0	569.0	270.0	275.0	28.45	35.20	F12	125.0	M12X15 (4 holes)	103	114	874	822
4"	3"	inch	2.91	14.02	15.0	7.01	7.50	21.65	19.76	6.30	6.01	24.29	22.40	10.63	10.83	1.12	1.39		4.92		227	251	1010	950
DN150	DN100	mm	100.0	432.0	457.0	216.0	228.5	600.0	193.0	184.0	184.0	712.6	259.0	325.0	325.0	35.90	43.50	F14	140.0	M16X20 (4 holes)	166	186	1557	1471
6"	4"	inch	3.94	17.01	17.99	8.50	9.0	23.62	7.60	7.24	7.24	28.06	10.20	12.80	12.80	1.41	1.71		5.51		366	410	1800	1700
DN200	DN150	mm	150.0	559.0	610.0	279.5	305.0	624.5	624.5	214.5	224.0	77.1	755.1	400.0	435.0	35.90	43.50	F14	140.0	M16X20 (4 holes)	342	418	3893	3823
8"	6"	inch	5.91	22.01	24.02	11.0	12.01	24.59	25.30	8.44	8.82	29.02	29.73	15.75	17.13	1.41	1.71		5.51		754	922	4500	4420

Cryogenic Trunnion Mounted Ball 3 Piece

Valve Dimensions



Preparation for actuation

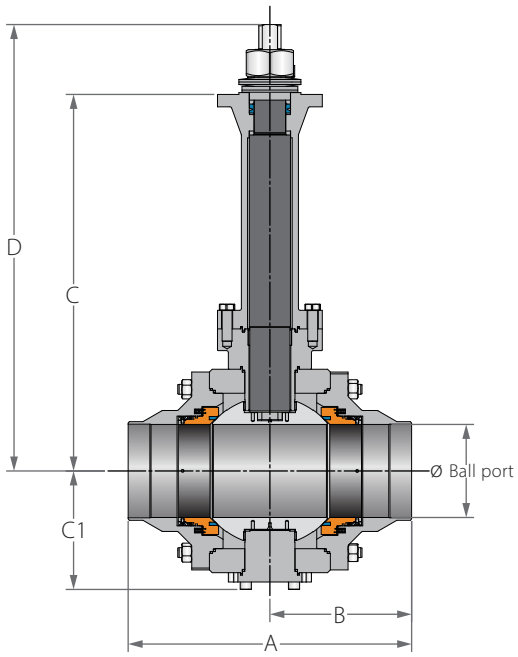


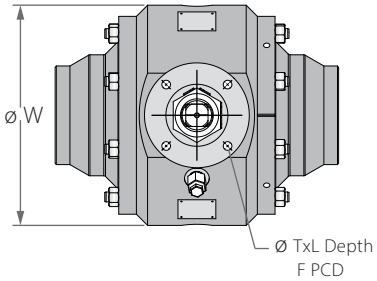
Std. port	Full port	Unit	Ball port	A		B		C		C1		D		W		P	M	K	F		TxL	Weight kg/ib		Kv / Cv	
				600	900	600	900	600	900	600	900	600	900	600	900							600	900	600	900
DN250	DN200	mm	201.0	660.0	737.0	330.0	368.5	696.0	696.0	263.0	263.0	774.0	774.0	500.0	519.0	60.0	63.5	14.0	F25	254.0	18x25 (8 holes)	577	836	7742	7344
10"	8"	inch	7.91	25.98	29.02	12.99	14.51	27.4	27.4	10.35	10.35	30.47	30.47	19.69	20.43	2.36	2.5	0.55		10.0		1272	1843	8950	8490
DN300	DN250	mm	252.0	787.0	838.0	393.5	419.0	739.0	757.0	310.0	326.0	817.0	835.0	595.0	609.0	60.0	63.5	14.0	F25	254.0	18x35 (8 holes)	931	1301	12543	12110
12"	10"	inch	9.92	30.98	32.99	15.49	16.5	29.09	29.8	12.2	12.83	32.17	32.87	23.43	23.98	2.36	2.5	0.55		10.0		2052	2868	14500	14000
DN350	DN300	mm	303.0	838.0	965.0	419.0	482.5	800.0	788.0	344.0	361.0	915.0	903.0	695.0	709.0	72.0	76.5	20.0	F25	254.0	18x35 (8 holes)	1126	1576	19809	18598
14"	12"	inch	11.93	32.99	37.99	16.5	19.0	31.50	31.02	13.54	14.21	36.02	35.55	27.36	27.91	2.83	3.01	0.79		10.0		2482	3474	22900	21500

C95 C96 2"-6" | DN50-DN150 | CLASS 1500/2500

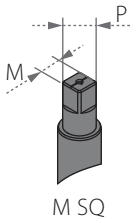
Cryogenic High Pressure Trunnion Mounted Ball 3 Piece

Valve Dimensions





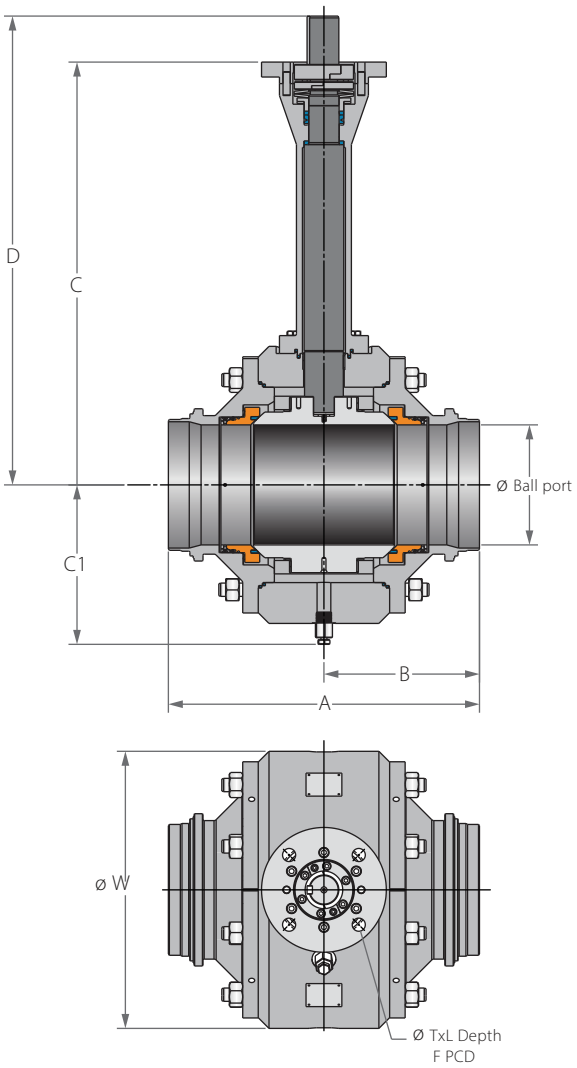
Preparation for actuation



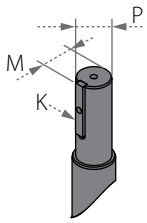
Std. port	Full port	Unit	Ball port		A		B		C	C1	D	W		M SQ	P SQ	F		TxL	Weight kg/ib		Kv / Cv	
			1500	2500	1500	2500	1500	2500				1500	2500						1500	2500	1500	2500
DN80	DN50	mm	49.0	42.0	368.0	451.0	184.0	225.5	500.0	127.0	569.0	215.0	235.0	28.45	35.0	F12	125	M12X15 (4 holes)	90	179	281	260
3"	2"	inch	1.93	1.65	14.49	17.76	7.24	8.88	19.69	5.0	22.4	8.46	9.25	1.12	1.38		4.92		198	395	325	300
DN100	DN80	mm	74.0	62.0	470.0	578.0	235.0	289.0	550.0	201.50	619.0	265.0	305.0	28.45	35.0	F12	125	M12X15 (4 holes)	175	340	735	649
4"	3"	inch	2.91	2.44	18.5	22.76	9.25	11.38	21.65	7.93	24.37	10.43	12.01	1.12	1.38		4.92		386	750	850	750
DN150	DN100	mm	100.0	87.0	546.0	673.0	273.0	336.5	600.0	198.5	712.0	310.0	355.0	35.9	43.5	F14	140	M16X20 (4 holes)	330	646	1384	1228
6"	4"	inch	3.94	3.43	21.5	26.5	10.75	13.25	23.62	7.81	28.03	12.2	13.98	1.41	1.71		5.51		728	1424	1600	1420
DN200	DN150	mm	144.0	131.0	705.0	914.0	352.5	457.0	608.0	272.0	763.0	395.0	485.0	45.9	59.0	F16	165	M20x30 (4 holes)	627	1227	3590	2206
8"	6"	inch	5.67	5.16	27.76	35.98	13.88	17.99	23.94	10.71	30.04	15.55	19.09	1.81	2.32		6.5		1382	2705	4150	2550

Cryogenic High Pressure Trunnion Mounted Ball 3 Piece

Valve Dimensions



Preparation for actuation

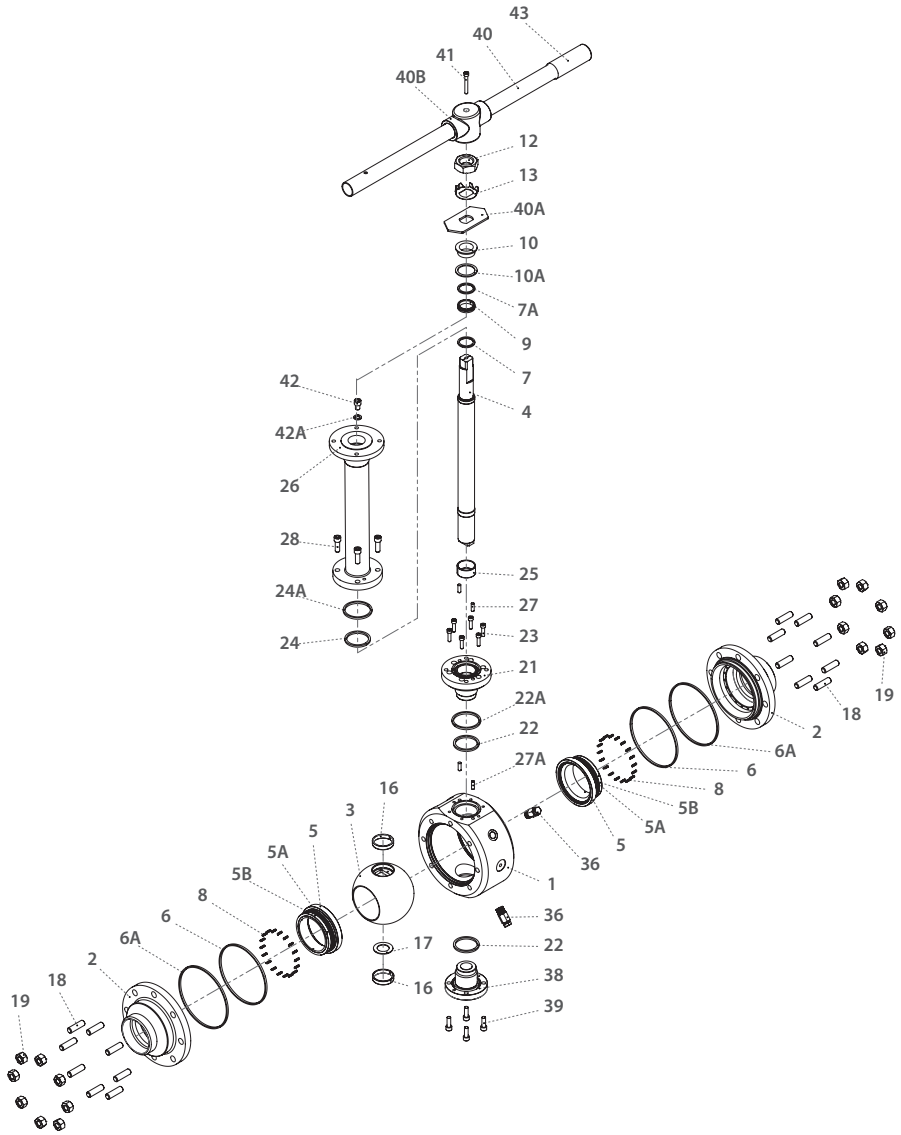


Std. port	Full port	Unit	Ball port		A		B		C	C1	D	W		P	M	K	F		TxL	Weight kg/ib		Kv / Cv	
			1500	2500	1500	2500	1500	2500				1500	2500							1500	2500	1500	2500
DN250	DN200	mm	192.0	179.0	832.0	1022.0	416.0	511.0	705.0	273.0	780.0	485.0	550.0	72.0	76.9	20.0	F25	254.0	18x25 (8 holes)	1000	2330	6963	4758
10"	8"	inch	7.56	7.05	32.76	40.24	16.38	20.12	27.76	10.75	30.71	19.09	21.65	2.83	3.03	0.79		10.0		2205	5137	8050	5500
DN300	DN250	mm	239.0	223.0	991.0	1270.0	495.5	635.0	742.0	374.0	846.0	585.0	675.0	98.0	104.4	28.0	F35	356.0	32x45 (8 holes)	1900	3623	11418	7389
12"	10"	inch	9.41	8.78	39.02	50.0	19.51	25.0	29.21	14.72	33.31	23.03	26.57	3.86	4.11	1.1		14.01		4189	7987	13200	8542

C91 C92 C93 C94 C95 C96 2"-6" DN50-DN150

Cryogenic Trunnion Mounted Ball 3 Piece

Components & Materials



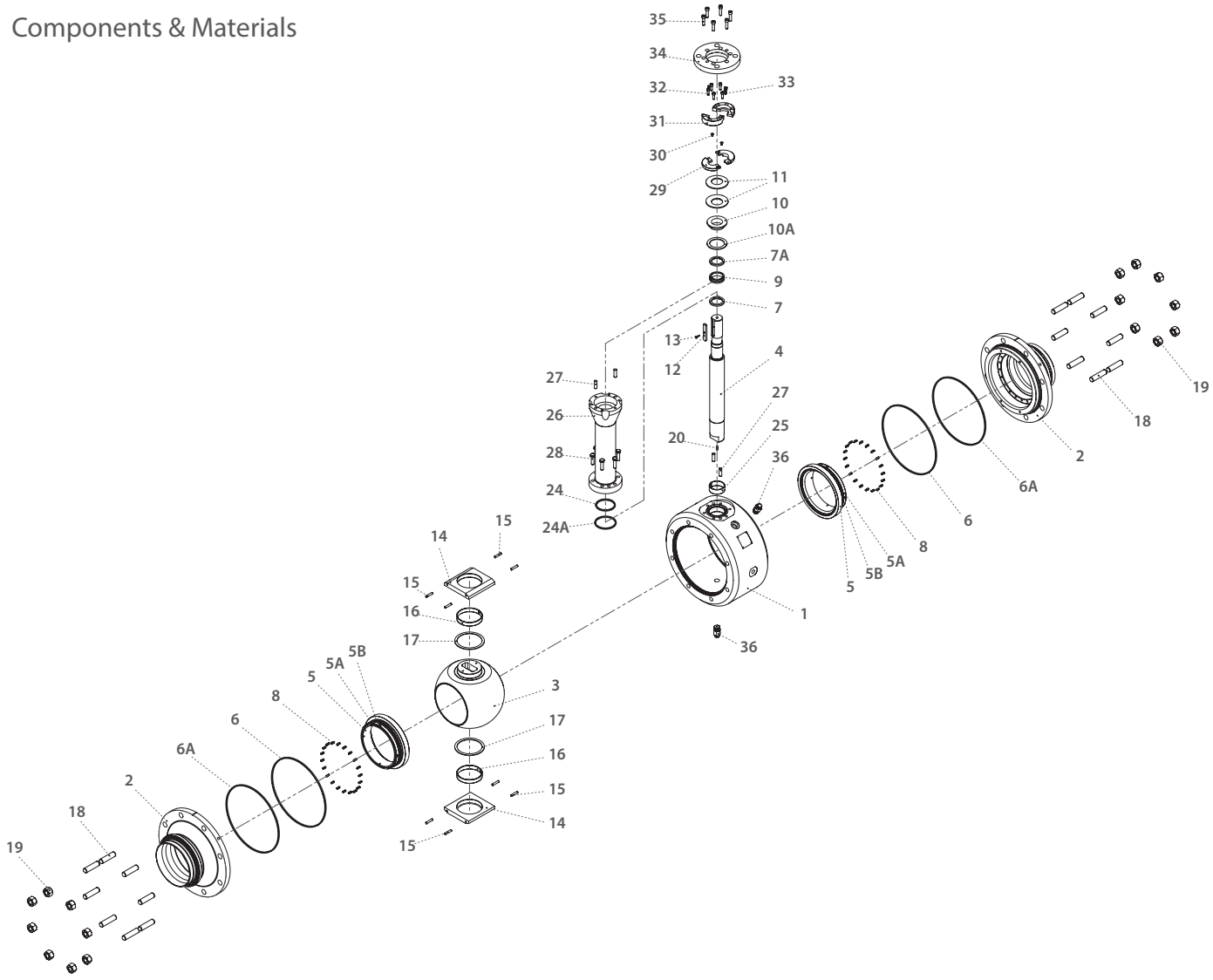
Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A	Seat Insert	Acc. Ordering Code	2
5B*	Seat Seal	PTFE+Elgiloy, Graphite	2
6*	Body Inner Seal	TFM, Graphite	2
6A*	Body Outer Seal	Graphite	2
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Seat Spring	Inconel 750	20-32
9	Stem Seal	HermetiX TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
16	Ball Bearing	PMT 316	2
17	Ball Thrust Washer	PMT 316	2
18	Body Studs	ASTM A320-B8M	8-40
19	Body Nut	A194 8M	8-40
20	Anti-Static Spring	S. Steel	1

Item	Description	Material Spec. ASTM	Qty.
21	Gland Plate	A479 316/ 316L	1
22*	Gland Plate Seal	Graphite	1
22A*	Outer Trunnion Seal	Graphite	1
23	Gland Plate Bolts	ASTM A320-B8M	6-8
24*	Bonnet Seal	HNBR, VITON	1
24A*	Bonnet Outer Seal	Graphite	1
25	Stem Bearing	PMT 316	1
26	Bonnet	S. Steel	1
27	Bonnet Pins	S. Steel	2
27A	Gland Pins	S. Steel	2
28	Bonnet Bolts	ASTM A320-B8M	4-8
36	Plug Drain	S. Steel	2
37	Tag (not shown)	S.Steel	1
38	Outer Trunnion	A479 316	1
39	Outer Trunnion Bolts	ASTM A320-B8M	4-8
40	Pipe Handle	S. Steel	1
40A	Stop Plate	S. Steel	1
40B	Wrench Head	S. Steel	1
41	Wrench Head Bolt	S. Steel	1
42	Stop Bolt	S. Steel	2
42A	Spring Washer	S. Steel	2
43	Stem Key Bolt	PCV	1

* Maintenance kit components

Cryogenic Trunnion Mounted Ball 3 Piece

Components & Materials



Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5	Seat	Acc. Ordering Code	2
5A	Seat Insert	Acc. Ordering Code	2
5B*	Seat Seal	PTFE+Elgiloy, Graphite	2
6*	Body Inner Seal	HNBR, VITON	2
6A*	Body Outer Seal	Graphite	2
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Seat Spring	Inconel 750	20-44
9	Stem Seal	HermetiX TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Key	S. Steel	1
13	Stem Key Bolt	S. Steel	1
14	Trunnion Plate	A479 316	2
15	Trunnion Plate Pin	S. Steel	8

Item	Description	Material Spec. ASTM	Qty.
16	Ball Bearing	PMT 316	2
17	Ball Thrust Washer	PMT 316	2
18	Body Studs	ASTM A320-B8M	16-40
19	Body Nuts	A194 8M	16-40
20	Anti-Static Spring	S. Steel	1
24*	Bonnet Seal	HNBR, VITON	1
24A*	Bonnet Outer Seal	Graphite	1
25	Stem Bearing	PMT 316	1
26	Bonnet	S. Steel	1
27	Bonnet Pins	S. Steel	4-6
28	Bonnet Bolts	ASTM A320-B8M	4-8
29	Bonnet Follower	A479 316	2
30	Bonnet Follower Bolt	ASTM A320-B8M	2
31	Stem Key Bolt	A479 316	2
32	Iso Plate	ASTM A320-B8M	6-8
33	Upper Gland Bolts	ASTM A320-B8M	2
34	Iso Plate	A479 316	1
35	Iso Plate Bolt	ASTM A320-B8M	4-8
36	Plug Drain	S. Steel	2
37	Tag (not shown)	S. Steel	2

* Maintenance kit components

C91 C92 C93 C94 C95 C96

Cryogenic Trunnion Mounted Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0		F	C	B	9	3	W	-	6	M	6	S	C	A	G	/	X	B	W						
Size		Features				Series		Design		Body & ends	Stem	Ball & seat ring	Seat feature	Seat insert	Inner Seal	Outer Seal		End connection				Special features				

Size (1-2)		
Code	inch	mm
20	2"	50
30	3"	80
40	4"	100
60	6"	150
80	8"	200
A0	10"	250
A2	12"	300
A4*	14"	350

* for C91, C92, C93, series only

Features (3-6)	
C	Cryogenic design
F	Fire safe
B	Full port

Series (7-8)	
91	3 Piece design #150 (PN20)
92	3 Piece design #300 (PN50)
93	3 Piece design #600 (PN100)
94	3 Piece design #900 (PN150)
95	3 Piece High pressure #1500 (PN250)
96	3 Piece High pressure #2500 (PN420)

Design (9)	
W	Total HermetiX Integrity package

Body & ends material (11)	
6	S. Steel

Stem material (12)	
M	High Strength S. Steel

Ball & seat ring material (13)	
6	S. Steel

Seat feature (14)	
S	Single Piston Effect (SPE) (API 6D DBB)
D	Double Piston Effect (DPE)
C	DPE & SPE combination (API 6D DIB-2)

Seat insert (15)	
C	PCTFE
A	TFM

Inner Seal (16)	
A	TFM

Outer Seal (17)	
G	Graphite

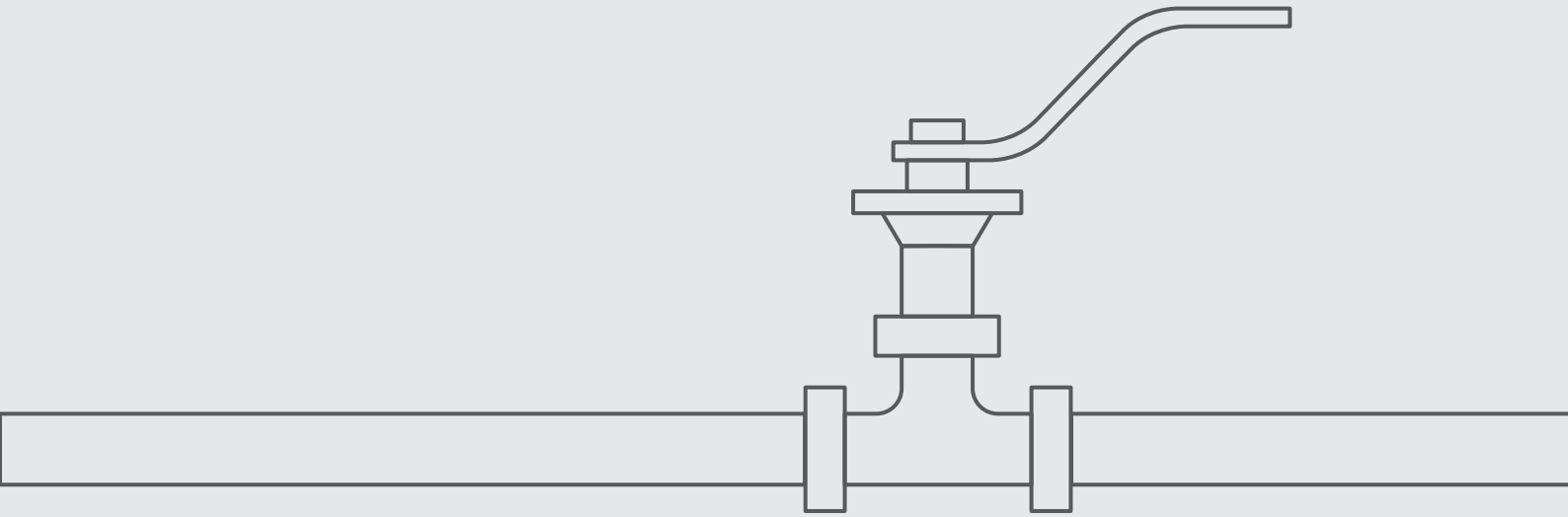
End Connection (19-22)	
Welded ends	
XBW	Extended buttweld sch 40
XBW80	Extended buttweld sch 80
XBW160	Extended buttweld sch 160
XBWXXS	Extended buttweld sch XXS
Flanged Raised face	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
1500	ASME B16.5 #1500 RF
2500	ASME B16.5 #2500 RF
PN16	DIN EN 1092-1 PN16
PN40	DIN EN 1092-1 PN40
PN63	DIN EN 1092-1 PN63
PN100	DIN EN 1092-1 PN100
PN160	DIN EN 1092-1 PN160
PN250	DIN EN 1092-1 PN250
PN320	DIN EN 1092-1 PN320
PN400	DIN EN 1092-1 PN400
Flanged RTJ	
600RTJ	ASME B16.5 #600 RTJ
900RTJ	ASME B16.5 #900 RTJ
1500RTJ	ASME B16.5 #1500 RTJ
2500RTJ	ASME B16.5 #2500 RTJ

C81 C82 C83

Cryogenic Valves

TRUNNION

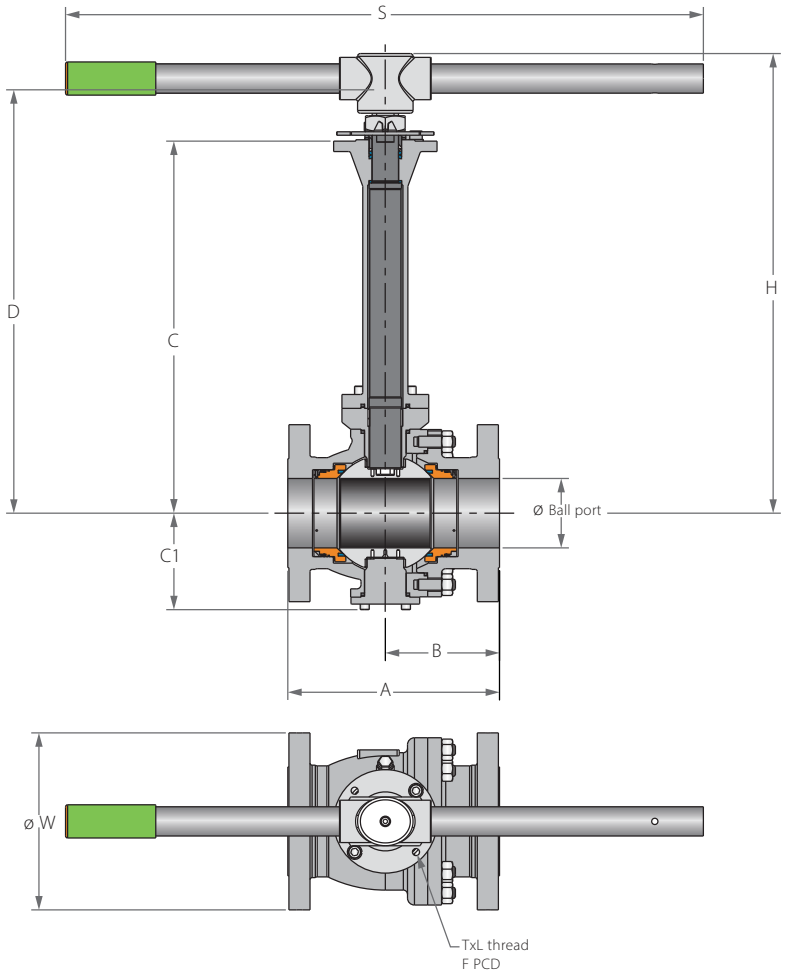
2 PIECE



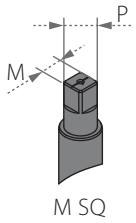
C81 C82 2"-6" | DN50-DN150 | CLASS 150/300

Cryogenic Trunnion Mounted Ball 2 Piece

Valve Dimensions



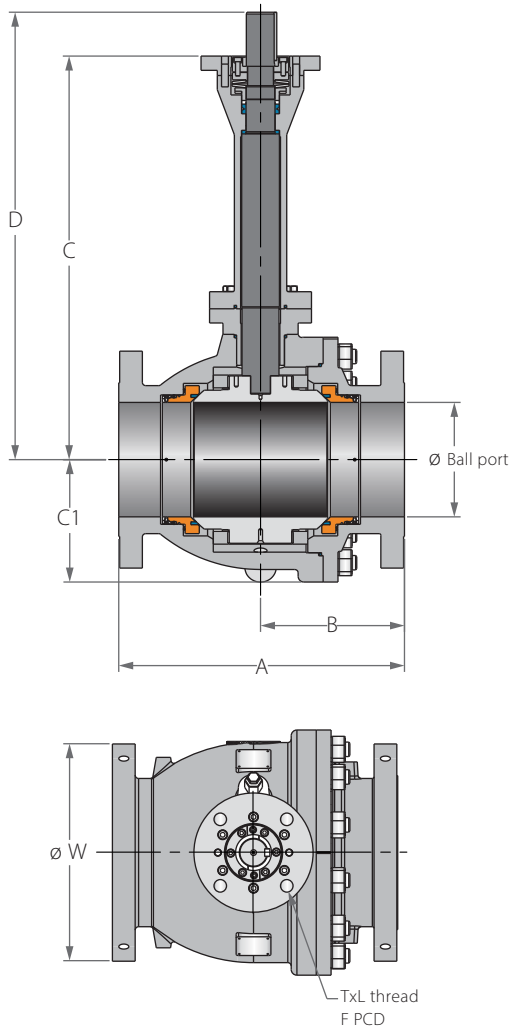
Preparation for actuation



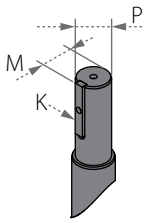
Full port	Unit	Ball port	A		B		C	C1	D	W		M SQ	P SQ	H	S	F		TxL	Weight kg/ib		Kv / Cv	
			150	300	150	300				150	300								150	300	150	300
DN50	mm	49.0	178.0	216.0	89.0	113.5	500.0	94.0	546.5	150.0	165.0	18.9	22.70	525.8	401.0	F10	102.0	M10X15 (4 holes)	24	27	400	363
2"	inch	1.93	7.01	8.5	3.5	4.47	19.69	3.7	21.52	5.91	6.50	0.74	0.89	20.70	15.79		4.02		53	60	463	420
DN80	mm	74.0	203.0	283.0	101.5	154.0	550.0	117.0	619.1	190.0	210.0	28.45	35.20	638.6	610.0	F12	125.0	M12X15 (4 holes)	42	53	1125	952
3"	inch	2.91	7.99	11.14	4.0	6.06	21.65	4.61	24.37	7.48	8.27	1.12	1.39	25.14	24.02		4.92		93	117	1300	1100
DN100	mm	100.0	229.0	305.0	114.5	164.5	600.0	139.0	669.1	230.0	255.0	28.45	35.20	662.6	916.0	F12	125.0	M12X15 (4 holes)	64	76	2154	1860
4"	inch	3.94	9.02	12.0	4.51	6.48	23.62	5.47	26.34	9.06	10.04	1.12	1.39	26.09	36.06		4.92		141	168	2490	2150
DN150	mm	150.0	394.0	403.0	209.1	207.6	607.0	191.0	719.6	280.0	320.0	35.9	43.50	777.1	916.0	F14	140.0	M16X20 (4 holes)	165	176	4723	4628
6"	inch	5.91	15.51	15.87	8.23	8.17	23.9	7.52	28.33	11.02	12.6	1.41	1.71	30.59	36.06		5.51		364	388	5460	5350

Cryogenic Trunnion Mounted Ball 2 Piece

Valve Dimensions



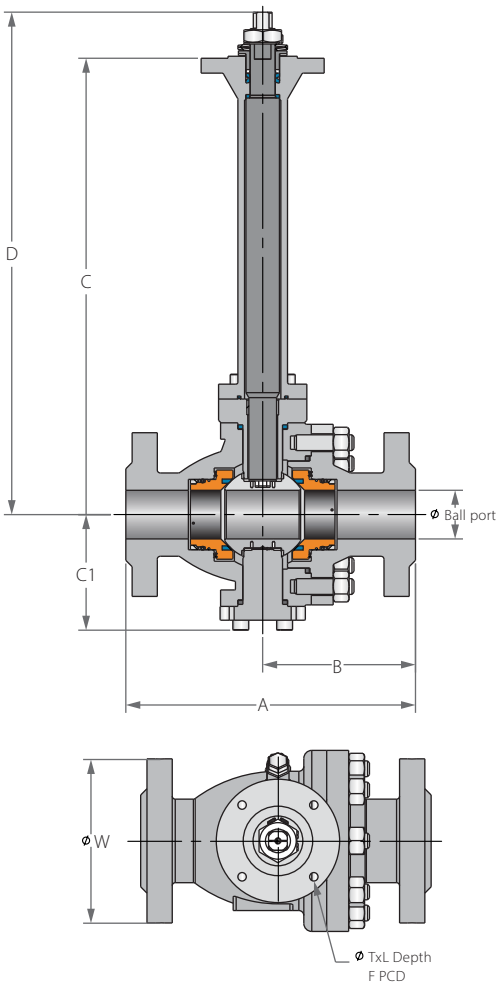
Preparation for actuation



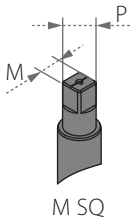
Full port	Unit	Ball port	A		B		C	C1	D	W		P	M	K	F		TxL	Weight kg/ib		Kv / Cv	
			150	300	150	300				150	300							150	300	150	300
DN200	mm	201.0	457.0	502.0	228.5	253.0	708.0	215.0	785.0	345.0	380.0	50.0	54.0	14.0	F16	165.0	22x25 (4 holes)	254	292	9273	8737
8"	inch	7.91	17.99	19.76	9.0	9.96	27.87	8.46	30.91	13.58	14.96	1.97	2.13	0.55		6.50		560	644	10720	10100
DN250	mm	252.0	533.0	568.0	270.0	287.5	713.3	260.0	790.4	405.0	445.0	50.0	54.0	14.0	F25	254.0	18x25 (8 holes)	404	474	15224	14792
10"	inch	9.92	20.98	22.36	10.63	11.32	28.08	10.24	31.12	15.94	17.52	1.97	2.13	0.55		10.0		891	1045	17600	17100
DN300	mm	303.0	610.0	648.0	298.0	313.0	800.0	300.0	880.50	485.0	520.0	60.0	63.5	18.0	F25	254.0	18x25 (8 holes)	594	671	23096	22404
12"	inch	11.93	24.02	25.51	11.73	12.32	31.5	11.81	34.67	19.09	20.47	2.36	2.5	0.71		10.0		1310	1479	26700	25900

Cryogenic Trunnion Mounted Ball 2 Piece

Valve Dimensions



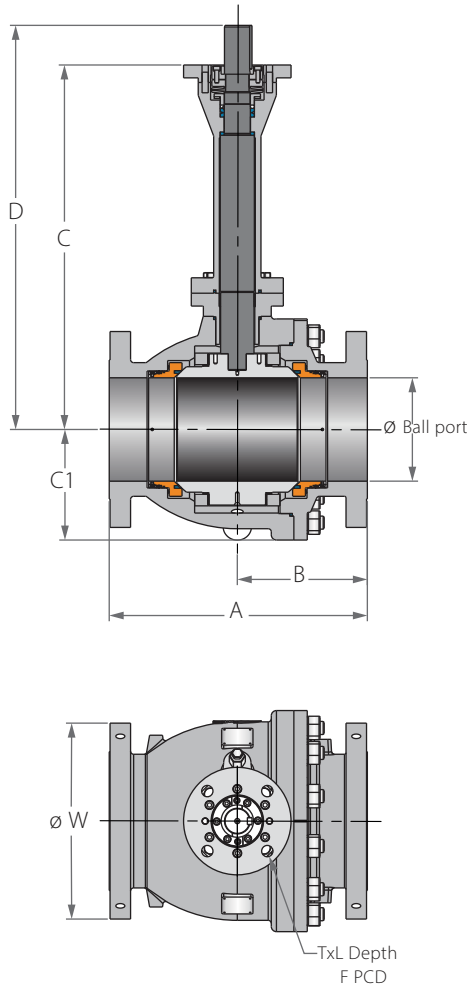
Preparation for actuation



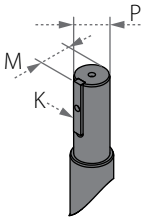
Full port	Unit	Ball port	A	B	C	C1	D	W	M SQ	P SQ	F		TxL	Weight kg/ib	Kv / Cv
DN50	mm	49.0	292.0	131.0	500.0	119.0	547.5	165.0	18.9	22.7	F10	102.0	M10X15 (4 holes)	43	329
2"	inch	1.93	11.5	5.16	19.69	4.69	21.56	6.5	0.74	0.89		4.02		95	380
DN80	mm	74.0	356.0	161.0	550.0	160.0	617.0	210.0	28.45	35.2	F12	125.0	M12X15 (4 holes)	84.5	874
3"	inch	2.91	14.02	6.34	21.65	6.3	24.29	8.27	1.12	1.39		4.92		186	1010
DN100	mm	100.0	432.0	216.0	600.0	184.0	712.6	275.0	35.9	43.5	F14	140.0	M16X20 (4 holes)	139	1557
4"	inch	3.94	17.01	8.50	23.62	7.24	28.06	10.83	1.41	1.71		5.51		306	1800
DN150	mm	150.0	559.0	278.0	624.5	214.5	737.1	355.0	35.9	43.5	F14	140.0	M16X20 (4 holes)	275	3893
6"	inch	5.91	22.01	10.94	24.59	8.44	29.02	13.98	1.41	1.71		5.51		606	4500

Cryogenic Trunnion Mounted Ball 2 Piece

Valve Dimensions



Preparation for actuation



Full port	Unit	Ball port	A	B	C	C1	D	W	P	M	K	F		TxL	Weight kg/ib	Kv / Cv
DN200	mm	201.0	660.0	330.0	696.0	263.0	774.0	420.0	60.0	63.5	14.0	F25	254.0	18x25 (8 holes)	475	7742
8"	inch	7.91	25.98	12.99	27.4	10.35	30.47	16.54	2.36	2.5	0.55		10.0		1047	8950
DN250	mm	252.0	787.0	400.0	739.0	310.0	817.0	510.0	60.0	63.50	14.0	F25	254.0	18x35 (8 holes)	725	12543
10"	inch	9.92	30.98	15.75	29.09	12.2	32.17	20.08	2.36	2.50	0.55		10.0		1598	14500
DN300	mm	303.0	838.0	419.0	800.0	344.0	915.0	560.0	72.0	76.5	20.0	F25	254.0	18x35 (8 holes)	928	19809
12"	inch	11.93	32.99	16.50	31.50	13.54	36.02	22.05	2.83	3.01	0.79		10.0		2046	22900

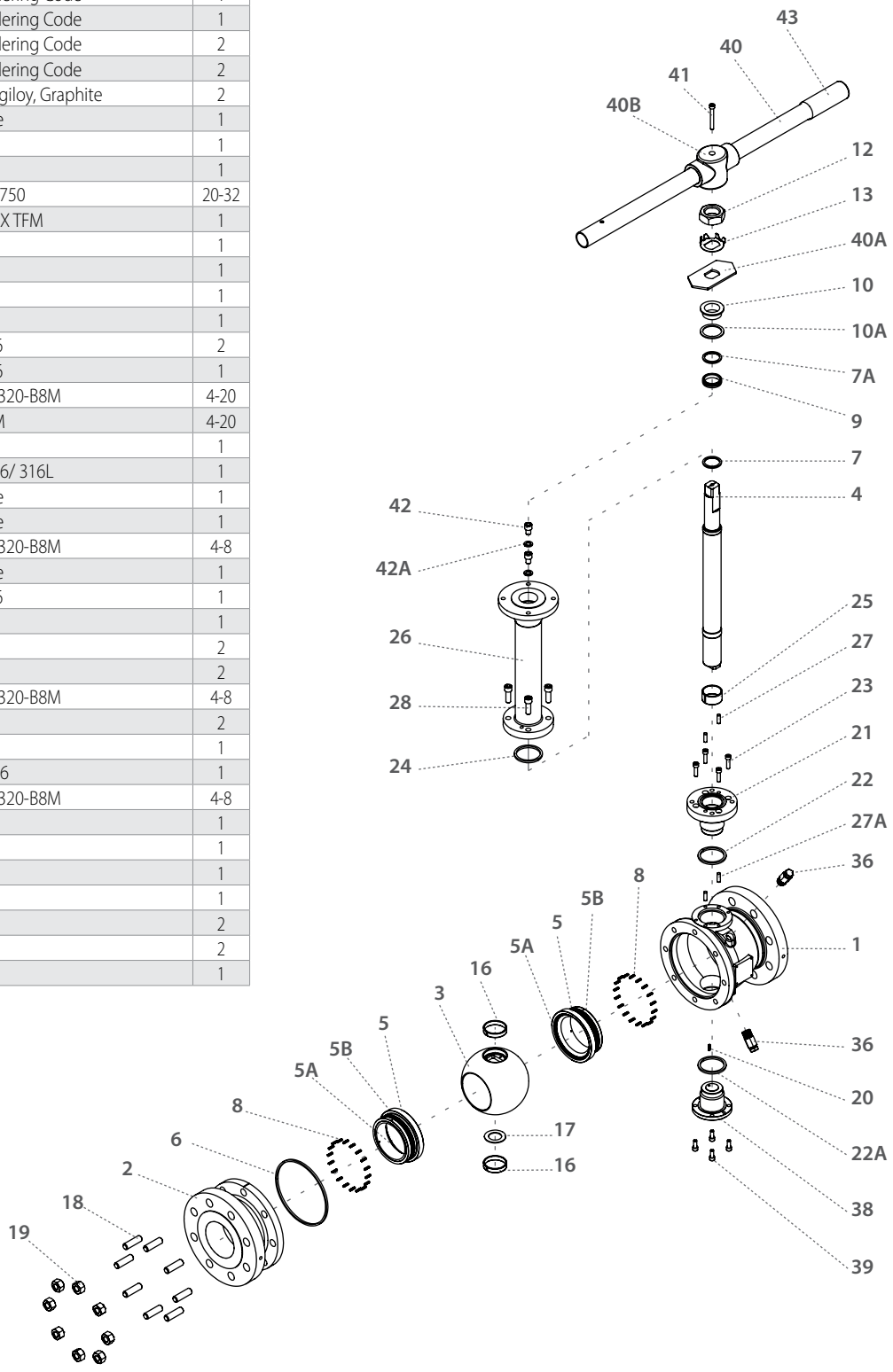
C81 C82 C83 2"-6" | DN50-DN150

Cryogenic Trunnion Mounted Ball 2 Piece

Components & Materials

Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A*	Seat Insert	Acc. Ordering Code	2
5B*	Seat Seal	PTFE+Elgiloy, Graphite	2
6*	Body Seal	Graphite	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Seat Spring	Inconel 750	20-32
9 *	Stem Seal	HermetiX TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
16	Ball Bearing	PMT 316	2
17	Ball Thrust Washer	PMT 316	1
18	Body Stud	ASTM A320-B8M	4-20
19	Body Nut	A194 8M	4-20
20	Anti-Static Spring	S. Steel	1
21	Gland Plate	A479 316/ 316L	1
22*	Gland Plate Seal	Graphite	1
22A*	Outer Trunnion Seal	Graphite	1
23	Gland Plate Bolts	ASTM A320-B8M	4-8
24*	Bonnet Seal	Graphite	1
25	Stem Bearing	PMT 316	1
26	Bonnet	S. Steel	1
27	Bonnet Pins	S. Steel	2
27A	Gland Pins	S. Steel	2
28	Bonnet Bolts	ASTM A320-B8M	4-8
36	Plug Drain/ Vent Valve	S. Steel	2
37	Tag (not shown)	S.Steel	1
38	Outer Trunnion	A479 316	1
39	Outer Trunnion Bolts	ASTM A320-B8M	4-8
40	Pipe Handle	S. Steel	1
40A	Stop Plate	S. Steel	1
40B	Wrench Head	S. Steel	1
41	Wrench Head Bolt	S. Steel	1
42	Stop Bolt	S. Steel	2
42A	Spring Washer	S. Steel	2
43	Sleeve	PCV	1

* Maintenance kit components



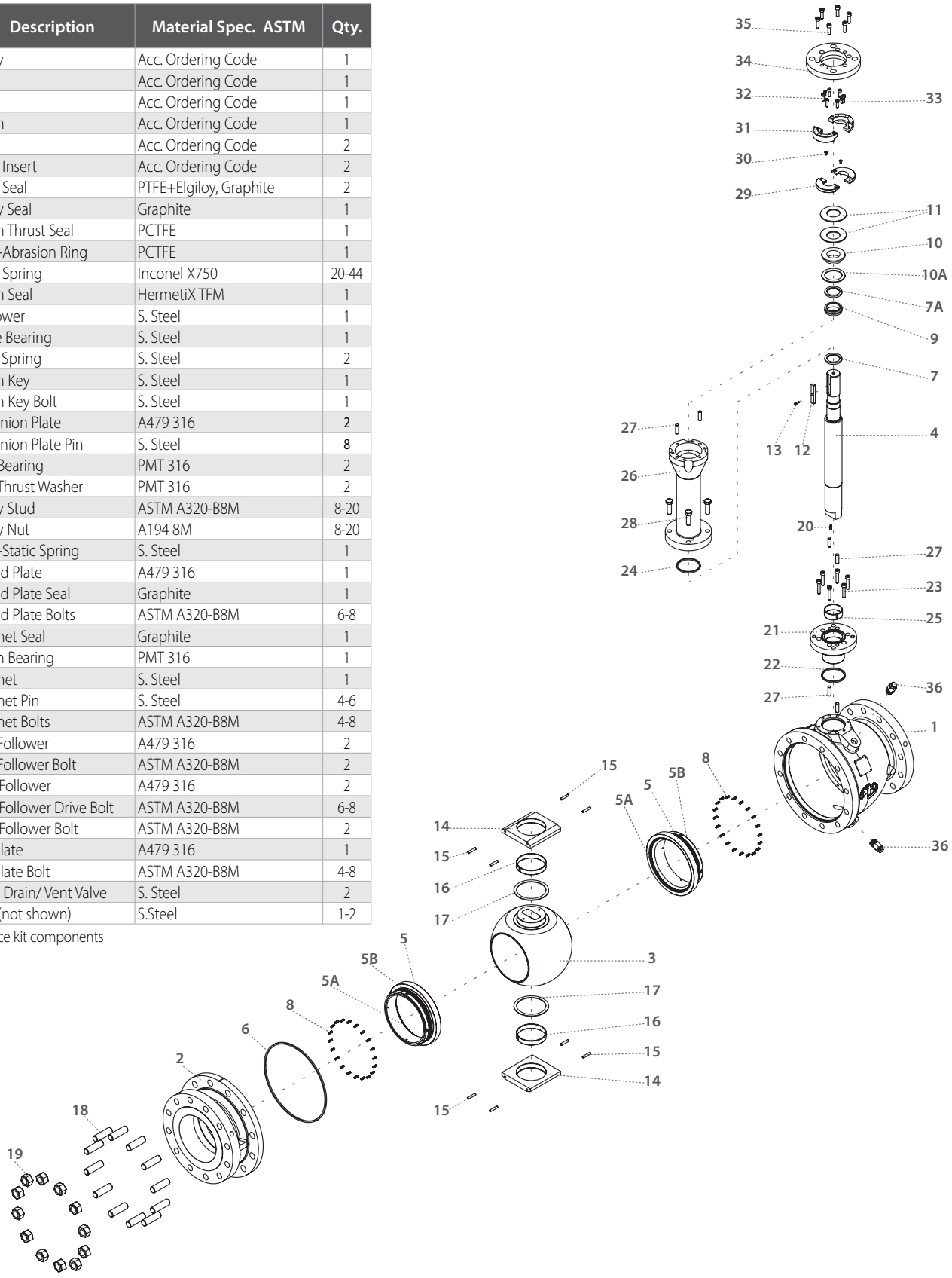
Cryogenic Trunnion Mounted Ball 2 Piece

Components & Materials

Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A*	Seat Insert	Acc. Ordering Code	2
5B*	Seat Seal	PTFE+Elgiloy, Graphite	2
6*	Body Seal	Graphite	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Seat Spring	Inconel X750	20-44
9*	Stem Seal	HermetiX TFM	1
10	Follower	S. Steel	1
10A	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Key	S. Steel	1
13	Stem Key Bolt	S. Steel	1
14	Trunnion Plate	A479 316	2
15	Trunnion Plate Pin	S. Steel	8
16	Ball Bearing	PMT 316	2
17	Ball Thrust Washer	PMT 316	2
18	Body Stud	ASTM A320-B8M	8-20
19	Body Nut	A194 8M	8-20
20	Anti-Static Spring	S. Steel	1
21(1)	Gland Plate	A479 316	1
22(1)*	Gland Plate Seal	Graphite	1
23(1)	Gland Plate Bolts	ASTM A320-B8M	6-8
24*	Bonnet Seal	Graphite	1
25	Stem Bearing	PMT 316	1
26	Bonnet	S. Steel	1
27	Bonnet Pin	S. Steel	4-6
28	Bonnet Bolts	ASTM A320-B8M	4-8
29	Bot Follower	A479 316	2
30	Bot Follower Bolt	ASTM A320-B8M	2
31	Top Follower	A479 316	2
32	Top Follower Drive Bolt	ASTM A320-B8M	6-8
33	Top Follower Bolt	ASTM A320-B8M	2
34	Iso Plate	A479 316	1
35	Iso Plate Bolt	ASTM A320-B8M	4-8
36	Plug Drain/ Vent Valve	S. Steel	2
37	Tag (not shown)	S.Steel	1-2

* Maintenance kit components

(1) At 8" size



C81 C82 C83

Cryogenic Trunnion Mounted Ball 2 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
8	0		F	C	B	8	1	W	-	6	M	6	S	C	A	G	/	1	5	0						
Size		Features				Series		Design		Body & ends	Stem	Ball & seat ring	Seat feature	Seat insert	Inner Seal	Outer Seal		End connection				Special features				

Size (1-2)		
Code	inch	mm
20	2"	50
30	3"	80
40	4"	100
60	6"	150
80	8"	200
A0	10"	250
A2	12"	300

Features (3-6)	
C	Cryogenic design
B	Full port
F	Fire safe

Series (7-8)	
81	ASME B16.5 #150 Flanged RF
82	ASME B16.5 #300 Flanged RF
83	ASME B16.5 #600 Flanged RF

Design (9)	
W	Total HermetiX Integrity package

Body & ends material (11)	
6	S. Steel

Stem material (12)	
M	High Strength S. Steel

Ball & seat ring material (13)	
6	S. Steel

Seat feature (14)	
S	Single Piston Effect (SPE) (API 6D DBB)

Seat insert (15)	
C	PCTFE

Inner Seal (16)	
A	TFM

Outer Seal (17)	
G	Graphite

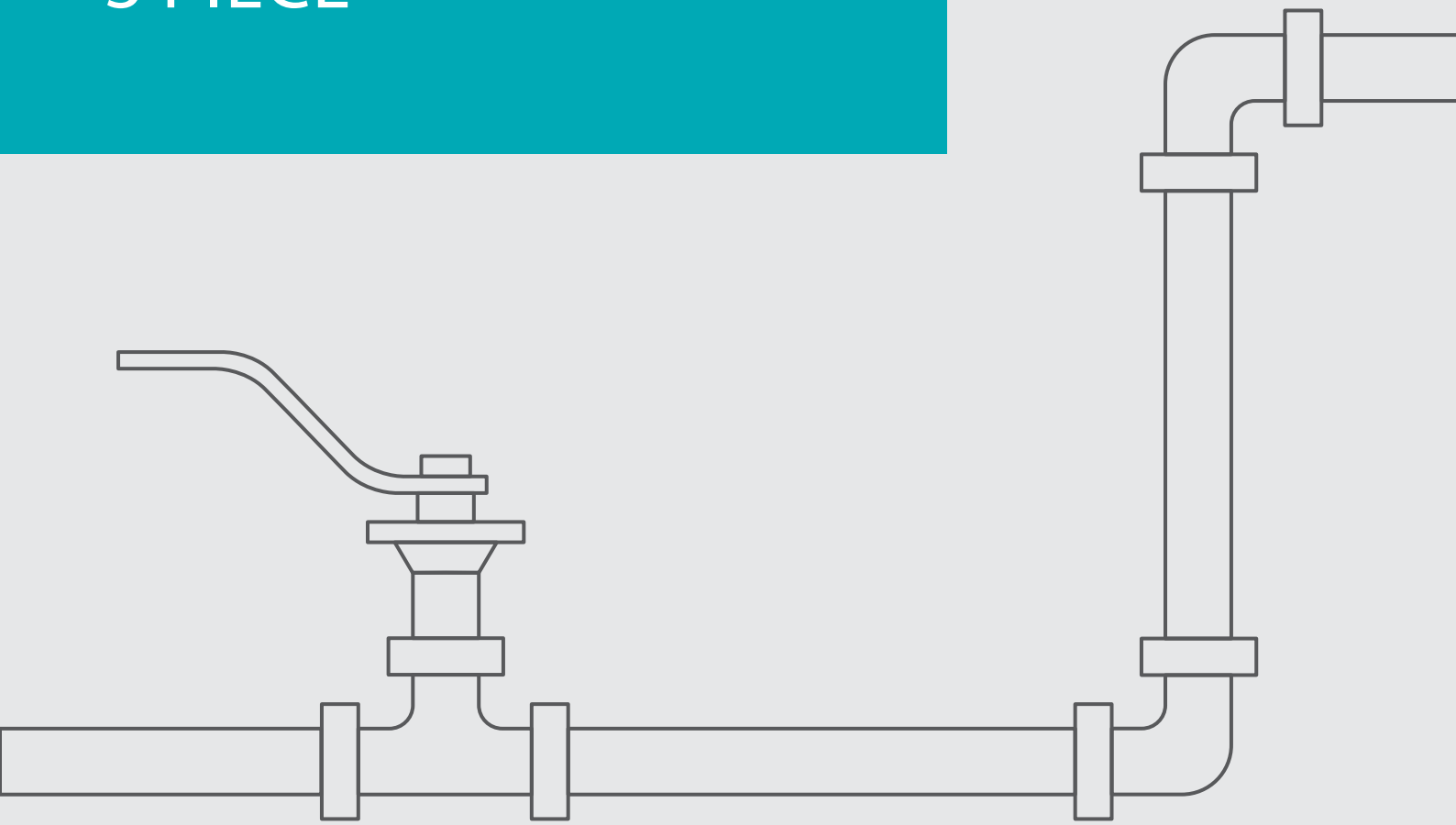
End Connection (19-22)	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF

C47 C47-BD C26 C26-BD

Cryogenic Valves

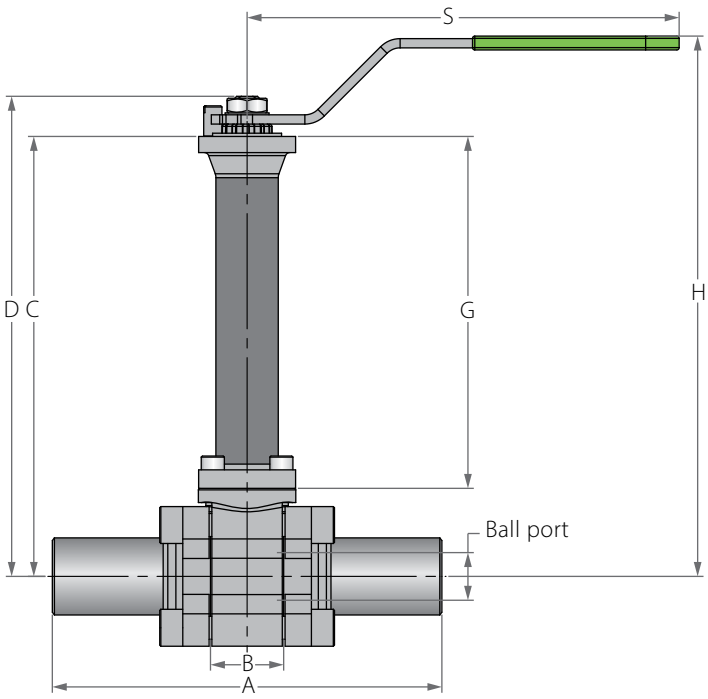
FLOATING BALL

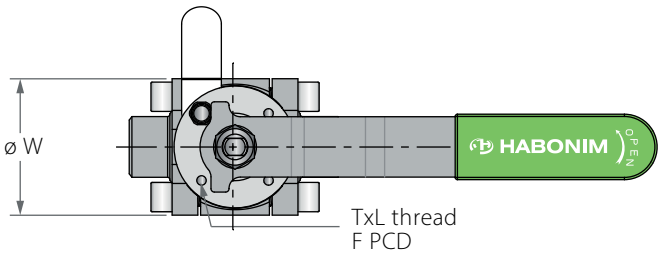
3 PIECE



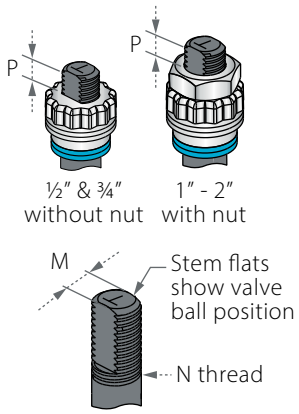
Cryogenic Floating Ball 3 Piece

Valve Dimensions





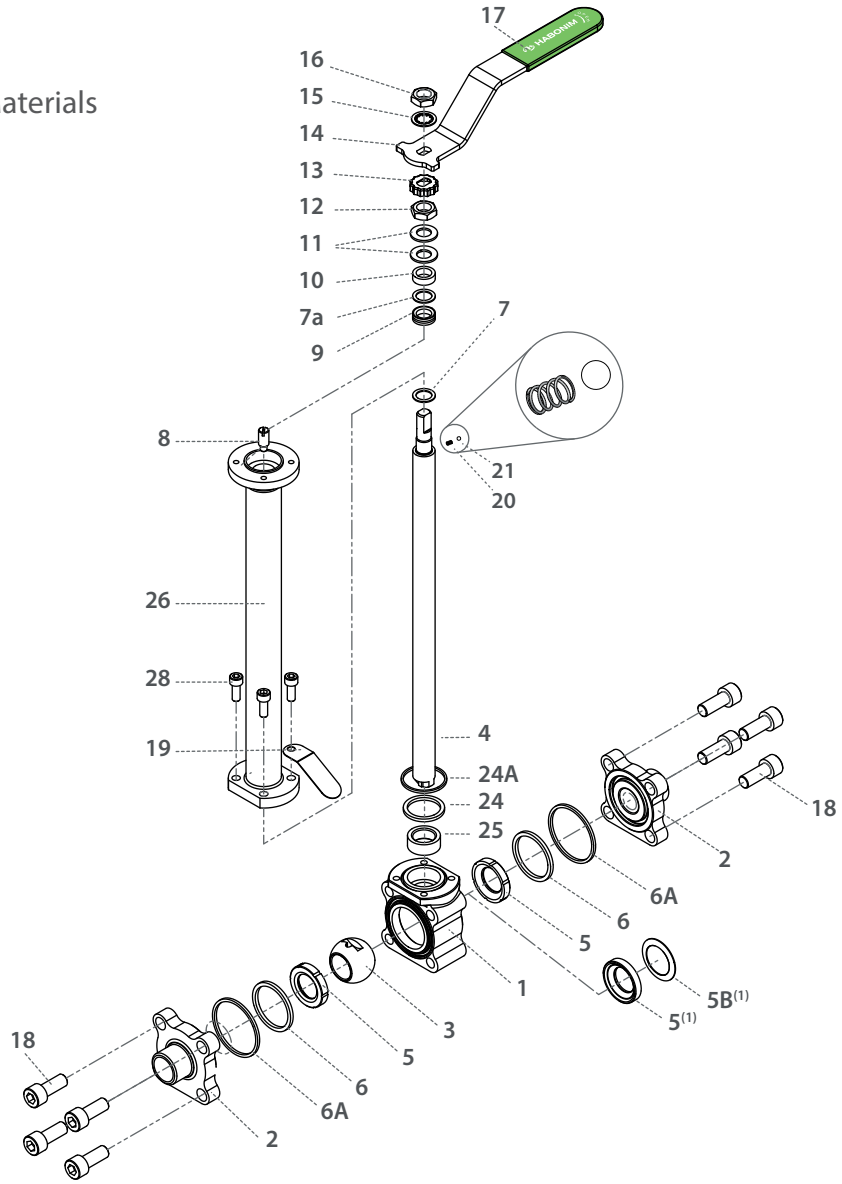
Preparation for actuation



Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				S	W	M	N	P	F		TxL	Weight kg/lb		Kv
						C	D	H	G	C	D	H	G									Std.	6"	Cv
	DN8	mm	11.15	65.8	20.6	333.0	341.9	366.0	304.0	181.4	190.3	214.4	152.4	150.0	4.6	5.5	⅜"	7.20	F03	36.0	M5X7	1.60	1.28	2.6
	¼"	inch	0.44	2.59	0.81	13.11	13.46	14.41	11.97	7.14	7.49	8.44	6.0	5.91	1.81	0.22	UNF	0.28		1.42		3.53	2.82	3.0
DN15	DN10	mm	11.15	65.8	20.6	333.0	341.9	366.0	304.0	181.4	190.3	214.4	152.4	150.0	46.0	5.5	⅜"	7.20	F03	36.0	M5X7	1.6	1.28	7
½"	⅜"	inch	0.44	2.59	0.81	13.11	13.46	14.41	11.97	7.14	7.49	8.44	6.0	5.91	1.81	0.22	UNF	0.28		1.42		3.53	2.82	8
DN20	DN15	mm	14.3	70.55	24.55	335.4	344.3	368.0	304.0	183.8	192.7	216.4	152.4	150.0	52.0	5.5	⅜"	7.20	F03	36.0	M5X7	1.8	1.48	10
¾"	½"	inch	0.56	2.78	0.97	13.2	13.56	14.49	11.97	7.24	7.59	8.52	6.0	5.91	2.05	0.22	UNF	0.28		1.42		3.97	3.26	12
DN25	DN20	mm	20.6	93.65	31.75	342.15	359.65	383.0	304.0	190.55	208.05	231.4	152.4	187.0	60.5	7.54	7/16"	7.20	F04	42.0	M5X7	3	2.65	28
1"	¾"	inch	0.81	3.69	1.25	13.47	14.16	15.08	11.97	7.50	8.19	9.11	6.0	7.32	2.38	0.3	UNF	0.28		1.65		6.61	5.84	32
DN32	DN25	mm	25.4	108.25	41.25	346.65	364.15	388.0	304.0	195.05	212.55	236.4	152.4	187.0	69.0	7.54	7/16"	7.2	F04	42.0	M5X10	3.7	3.35	37
1¼"	1"	inch	1.0	4.25	1.62	13.65	14.34	15.28	11.97	7.68	8.37	9.31	6.0	7.32	2.72	0.30	UNF	0.28		1.65		8.16	7.39	43
DN40	DN32	mm	31.8	115.45	48.25	347.55	377.05	400.0	304.0	195.95	225.45	248.40	152.40	237.0	79.20	8.71	9/16"	8.0	F05	50.0	M6X8	5.2	4.65	70
1½"	1¼"	inch	1.25	4.55	1.90	13.68	14.84	15.75	11.97	7.71	8.88	9.78	6.0	9.29	3.12	0.34	UNF	0.31		1.97		11.46	10.25	81
DN50	DN40	mm	38.1	127.10	56.3	352.25	381.75	405.0	304.0	200.65	230.15	253.4	152.4	237.0	90.7	8.71	9/16"	8.5	F05	50.0	M6X8	6.1	5.53	103
2"	1½"	inch	1.5	5.0	2.22	13.87	15.03	15.94	11.97	7.9	9.06	9.98	6.0	9.29	3.57	0.34	UNF	0.33		1.97		13.45	12.19	119

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	TFM	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1

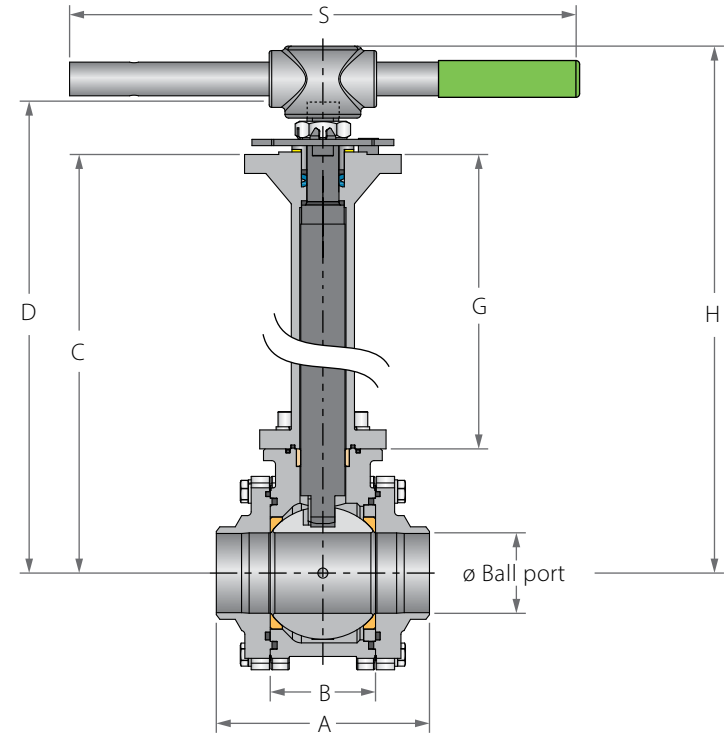
Item	Description	Material specifications	Qty.
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	8
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

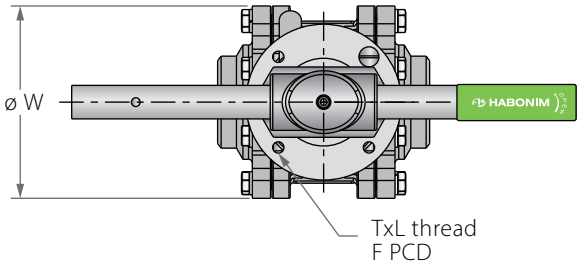
* Maintenance kit components

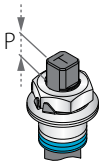
(1) Optional Dynamic seat design

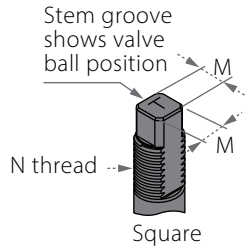
Cryogenic Floating Ball 3 Piece

Valve Dimensions





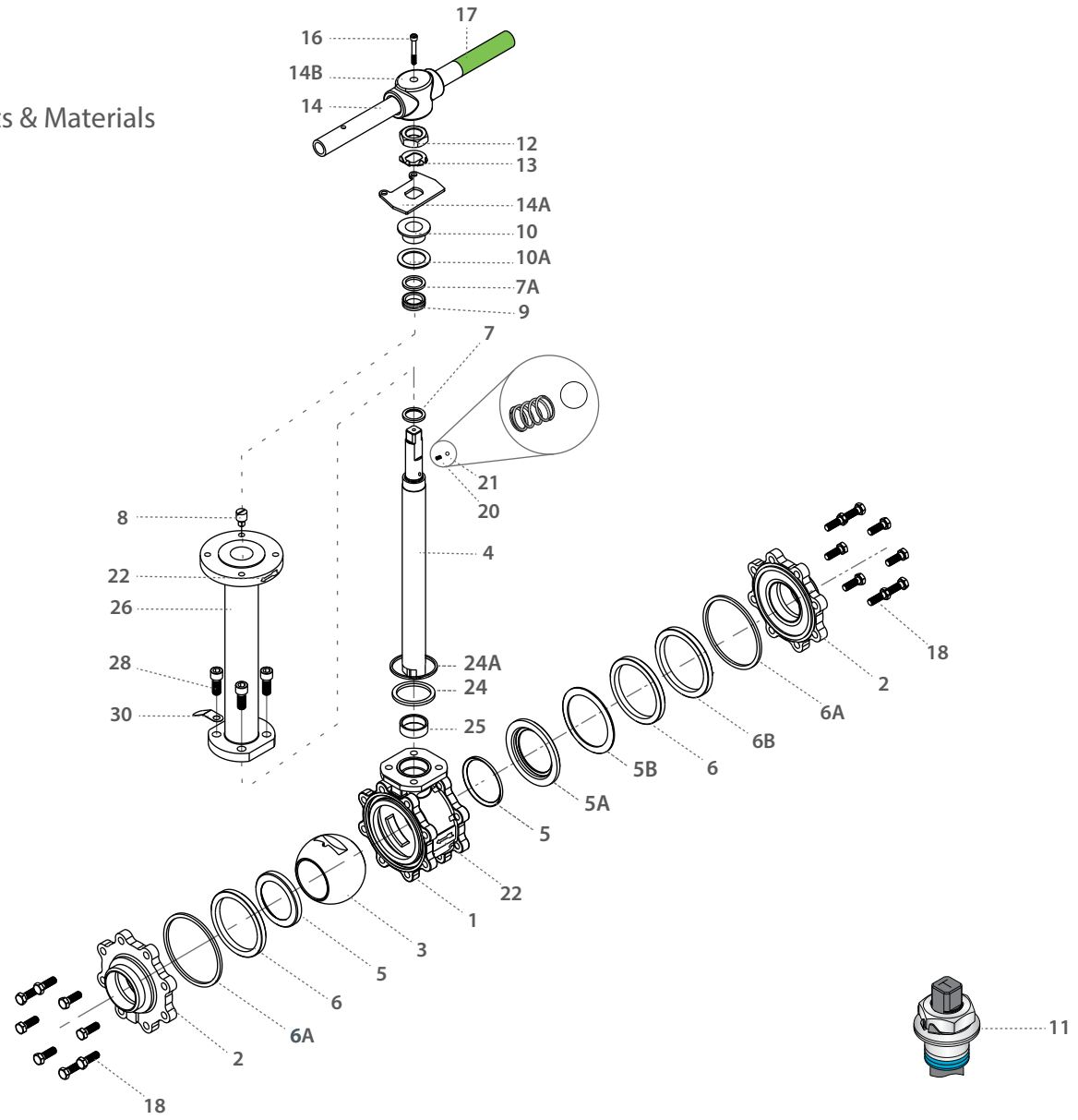




Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				S	W	M	M DD	N	P	F		TxL	Weight kg/lb		Kv
						C	D	H	G	C	D	H	G										Std.	6"	Cv
DN65	DN50	mm	50.80	157.95	72.55	397.5	439.1	464.0	327.5	222.4	264.0	288.9	152.4	401.0	108.0	13.9	13.9	M20x2.5	13.15	F07	70.0	M8x8	12	10.6	205
2½"	2"	inch	2.0	6.22	2.86	15.65	17.29	18.27	12.89	8.76	10.39	11.37	6.0	15.79	4.25	0.55	0.55		0.52		2.76		26.46	23.37	240
DN80	DN65	mm	63.5	169.35	83.25	441.8	488.4	528.0	343.5	250.7	297.3	336.9	152.4	401.0	153.0	18.9	15.9	1"-14 UNS-2A	16.7	F10	102.0	M10x15	20	18.8	385
3"	2½"	inch	2.5	6.67	3.28	17.39	19.23	20.79	13.52	9.87	11.7	13.26	6.0	15.79	6.02	0.74	0.63		0.66		4.02		44.09	41.45	450
DN100	DN80	mm	82.6	213.6	108.8	457.6	504.2	544.0	343.5	266.5	313.1	352.9	152.4	610.0	191.5	18.9	15.9	1"-14 UNS-2A	16.7	F10	102.0	M10x15	30.5	29.3	615
4"	3"	inch	3.25	8.41	4.28	18.02	19.85	21.42	13.52	10.49	12.33	13.89	6.0	24.02	7.54	0.74	0.63		0.66		4.02		67.24	64.6	720
	DN100	mm	100.0	239.0	123.0	466.8	513.4	555.0	343.5	275.7	322.3	363.9	152.4	610.0	217.0	18.9	15.9	1"-14 UNS-2A	16.7	F10	102.0	M10x15	37.3	36.1	744
	4"	Inch	3.94	9.41	4.84	18.38	20.21	21.85	13.52	10.85	12.69	14.33	6.0	24.02	8.54	0.74	0.63		0.66		4.02		82.23	79.59	870
DN150		mm	111.1	346.1	146.1	542.4	611.9	665.0	385.0	309.8	379.3	432.4	152.4	916.0	266.0	28.45	23.75	1½"-12 UNS-1A	26.2	F12	125.0	M12x15	75	71	872
6"		inch	4.37	13.63	5.75	21.35	24.09	26.18	15.16	12.2	14.93	17.02	6.0	36.06	10.47	1.12	0.94		1.03		4.92		165.35	156.53	1020
	DN150	mm	150.0	322	180.0	564.0	633.5	686.6	385.0	331.4	400.9	545	152.4	916.0	328.0	28.45	23.75	1½"-12 UNS-1A	26.2	F12	125.0	M12x15	106	104	23.75
	6"	inch	5.91	12.68	7.09	22.20	24.94	27.03	15.16	13.05	15.78	17.87	6.0	36.06	12.91	1.12	0.94		1.03		4.92		233	229	0.94

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A	Seat Housing	S. Steel	1
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	2
6A*	Outer Seal	Acc. Ordering Code	2
6B	Support Ring	S. Steel	1
7*	Stem Thrust Seal	TFM, PCTFE	1
7A*	Anti-Abrasion Ring	TFM, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM, Graphite	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1

Item	Description	Material specifications	Qty.
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	8
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	2
23	Tag (Not Shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

* Maintenance kit components

Cryogenic Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
1	5			F	C	4	7	W	-	6	6	6	M	A	A	G	/	B	W			-				
Size		Features				Series		Design		Body material	Ends material	Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End connection					Special features			

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
C	Cryogenic design
F	Fire safe
B	Full port
N	Control service

Series (7-8)	
47	3 Piece Floating

Design (9)	
W	Total HermetiX Integrity package

Body material (11)	
6	CF8M
7	Monel
W	Hastelloy-C22

End material (12)	
6	CF3M
7	Monel

Ball material (13)	
6	S. Steel
1	Bronze
7	Monel

Stem material (14)	
M	High Strength S. Steel
6	S. Steel
Z	Inconel

Seat material (15)	
A	TFM
C	PCTFE
P	CF PTFE

Inner Seal Material (16)	
A	TFM
G	Expanded graphite

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
Welded	
BW10	Buttweld schd. 10
BW	Buttweld schd. 40
XBW10	Extended buttweld schd. 10
XBW	Extended buttweld schd. 40
BW5	Buttweld schd. 5
BW80	Buttweld schd. 80
BWO *	Buttweld tube OD
BWD	Buttweld DIN 11860
BWI1.6	buttweld ISO 1127 1.6mm
BWI2.0	buttweld ISO 1127 2.0mm
BWI2.3	buttweld ISO 1127 2.3mm
SW	Socket weld
SWO *	Socket weld tube OD
XBW80	Extended buttweld 80
XSW	Extended socket weld
ETO *	Extended tube OD
ETI1.6	Extended buttweld ISO 1127 1.6mm
ETI2.0	Extended buttweld ISO 1127 2.0mm
ETI2.3	Extended buttweld ISO 1127 2.3mm
ETD	Extended buttweld DIN 11850

* Std. port only

Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
MNPT	Male NPT
BSPT	EN 10226 - Pipe Taper thread
MBSPT	Male BSPT
BSPP	ISO228-1, DIN3852 - Pipe parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	SAE internal straight thread
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF
Clamp	
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)
TC *	Tri-Clamp
LL *	Compression fitting (Imperial) - **No** nuts & Ferrules
LM *	Compression fitting (metric) - **No** nuts & Ferrules
LL-NF *	Compression fitting (Imperial) - **with** nuts & Ferrules
LM-NF *	Compression fitting (metric) - **with** nuts & Ferrules

* Std. port only

** Not available for 1¼" (DN32) Valves

Special Features (24-30)	
SPR	Spring loaded seat, valve 2½" Full port and up
6.0	Short bonnet
B	Body made from rolled bar
SPR	Spring loaded seat, up to 2½" std. port
RJT	Ring Type Joint
EP	Electropolished
Vxx	V port, xx=angle
G...	Internal surface finish(G24, G32)
VBxx	Characterized control ball, xx=angle
FF	Flat face
TPED	TPED / TPE

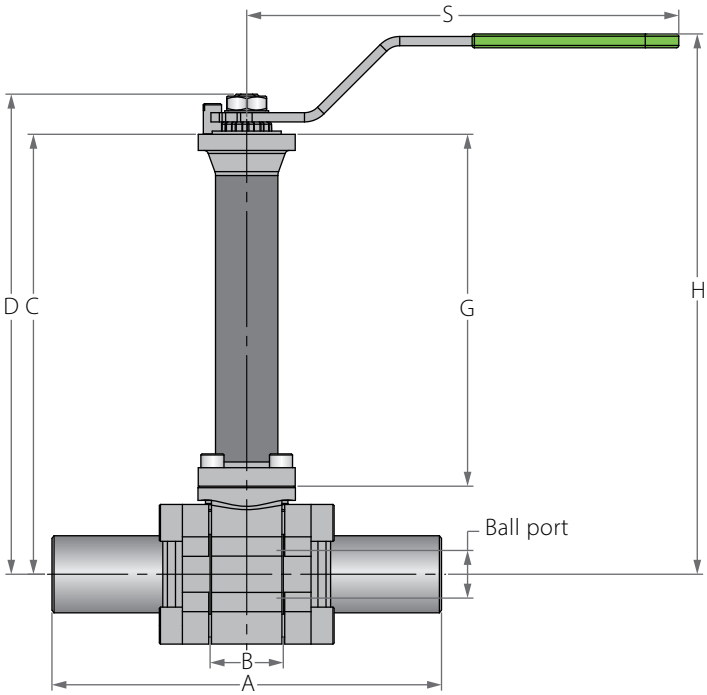


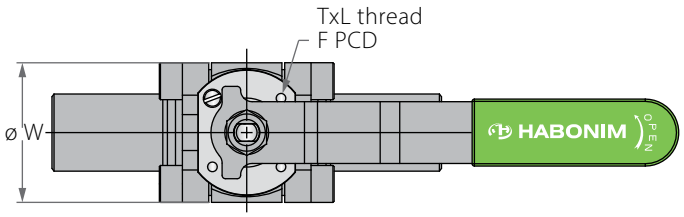
C47-BD 1/4"-2" | DN8-DN50 | CLASS 300

Cryogenic Floating Ball 3 Piece; BD - Bidirectional

PATENTED
US 11009136

Valve Dimensions

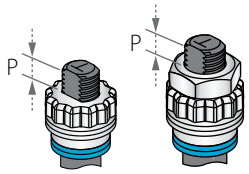


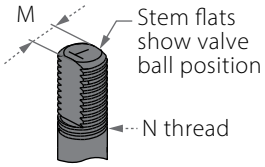


Bidirectional Cryogenic floating ball Valve

- Cryogenic floating ball valves with bidirectional sealing capability allows it to be used on a bidirectional loading and offloading single pipeline as well as a shutoff valve for a storage tank, developing back pressure to the downstream side while empty without upstream line pressure.
- These valves are equipped with all the benefits of the standard cryogenic ball valve on top of the simplicity and flow capabilities of a floating ball design.
- Full Δp
- ASME Class 300
- Special "Piston Effect" at seat design to prevent pressure buildup in the cavity.

Preparation for actuation





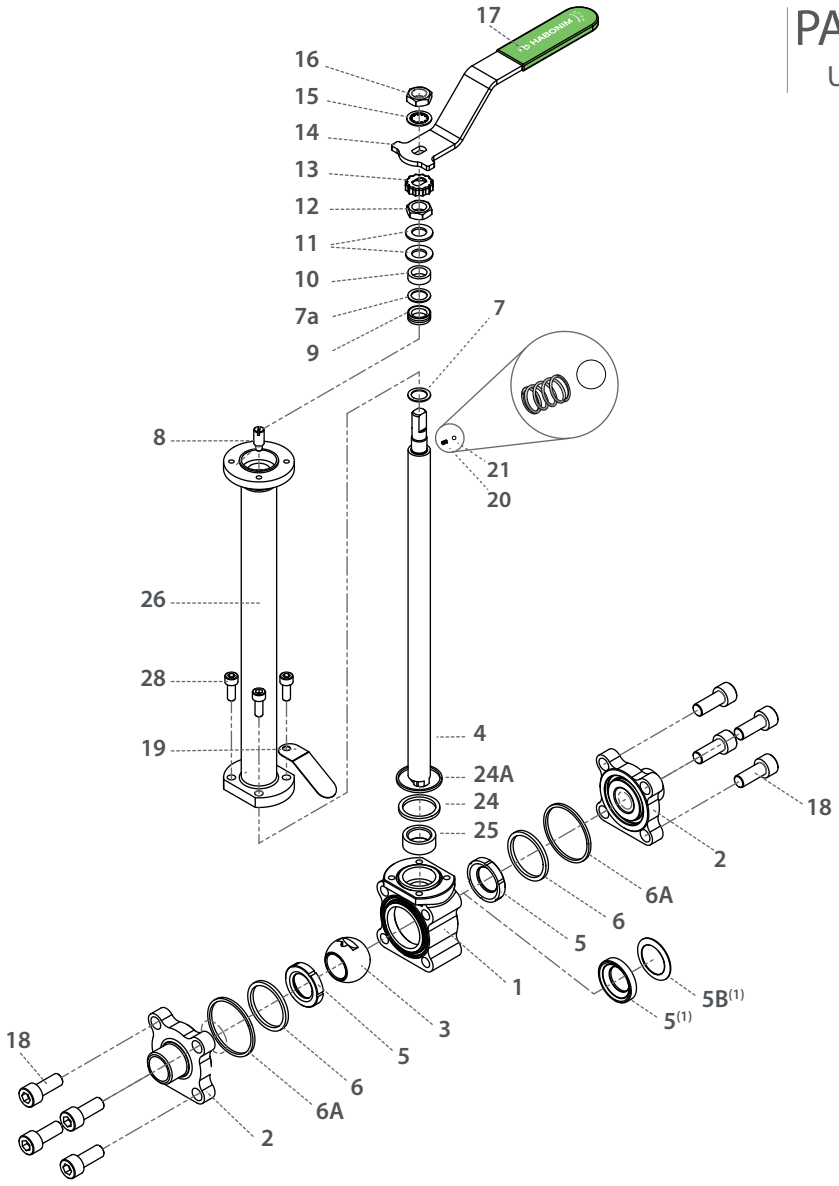
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				S	W	M	N	P	F		TxL	Weight kg/lb		Kv
						C	D	H	G	C	D	H	G									Std.	6"	Cv
	DN8	mm	11.15	65.8	20.6	333.0	341.9	366.0	304.0	181.4	190.3	214.4	152.4	150.0	4.6	5.5	3/8"	7.20	F03	36.0	M5X7	1.60	1.28	2.6
	1/4"	inch	0.44	2.59	0.81	13.11	13.46	14.41	11.97	7.14	7.49	8.44	6.0	5.91	1.81	0.22	UNF	0.28		1.42		3.53	2.82	3
DN15	DN10	mm	11.15	65.8	20.6	333.0	341.9	366.0	304.0	181.4	190.3	214.4	152.4	150.0	46.0	5.5	3/8"	7.20	F03	36.0	M5X7	1.6	1.28	7
½"	⅜"	inch	0.44	2.59	0.81	13.11	13.46	14.41	11.97	7.14	7.49	8.44	6.0	5.91	1.81	0.22	UNF	0.28		1.42		3.53	2.82	8
DN20	DN15	mm	14.3	70.55	24.55	335.4	344.3	368.0	304.0	183.8	192.7	216.4	152.4	150.0	52.0	5.5	3/8"	7.20	F03	36.0	M5X7	1.8	1.48	10
¾"	½"	inch	0.56	2.78	0.97	13.2	13.56	14.49	11.97	7.24	7.59	8.52	6.0	5.91	2.05	0.22	UNF	0.28		1.42		3.97	3.26	12
DN25	DN20	mm	20.6	93.65	31.75	342.15	359.65	383.0	304.0	190.55	208.05	231.4	152.4	187.0	60.5	7.54	7/16"	7.20	F04	42.0	M5X7	3.0	2.65	28
1"	¾"	inch	0.81	3.69	1.25	13.47	14.16	15.08	11.97	7.50	8.19	9.11	6.0	7.32	2.38	0.3	UNF	0.28		1.65		6.61	5.84	32
DN32	DN25	mm	25.4	108.25	41.25	346.65	364.15	388.0	304.0	195.05	212.55	236.4	152.4	187.0	69.0	7.54	7/16"	7.2	F04	42.0	M5X10	3.7	3.35	37
1¼"	1"	inch	1.0	4.25	1.62	13.65	14.34	15.28	11.97	7.68	8.37	9.31	6.0	7.32	2.72	0.30	UNF	0.28		1.65		8.16	7.39	43
DN40	DN32	mm	31.8	115.45	48.25	347.55	377.05	400.0	304.0	195.95	225.45	248.40	152.40	237.0	79.20	8.71	9/16"	8.0	F05	50.0	M6X8	5.2	4.65	70
1½"	1¼"	inch	1.25	4.55	1.90	13.68	14.84	15.75	11.97	7.71	8.88	9.78	6.0	9.29	3.12	0.34	UNF	0.31		1.97		11.46	10.25	81
DN50	DN40	mm	38.1	127.10	56.3	352.25	381.75	405.0	304.0	200.65	230.15	253.4	152.4	237.0	90.7	8.71	9/16"	8.5	F05	50.0	M6X8	6.1	5.53	103
2"	1½"	inch	1.5	5.0	2.22	13.87	15.03	15.94	11.97	7.9	9.06	9.98	6.0	9.29	3.57	0.34	UNF	0.33		1.97		13.45	12.19	119

C47-BD 1/4"-2" | DN8-DN50 | CLASS 300

PATENTED
US 11009136

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5B	Spring Follower	S. Steel	2
5C	Seat Spring	Inconel 718	2
6*	Inner Seal	TFM	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1

Item	Description	Material specifications	Qty.
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	8
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

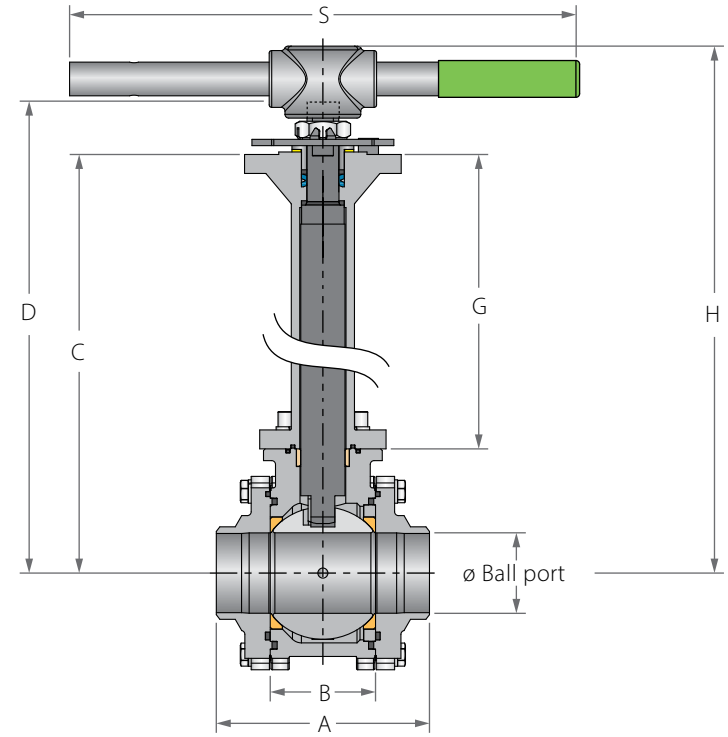
* Maintenance kit components
(1) Optional Dynamic seat design

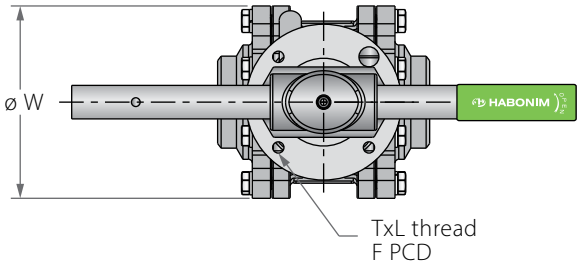
C47-BD 2½"-6" | DN65-DN150

Cryogenic Floating Ball 3 Piece ; BD - Bidirectional

PATENTED
US 12044333

Valve Dimensions

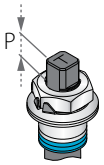


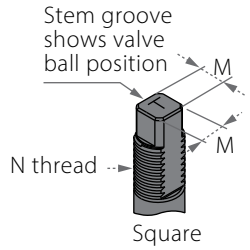


Bidirectional Cryogenic floating ball Valve

- Cryogenic floating ball valves with bidirectional full Δp sealing capability allows it to be used on a bidirectional loading and offloading single pipeline as well as a shutoff valve for a storage tank, developing back pressure to the downstream side while empty without upstream line pressure.
- These valves are equipped with all the benefits of the standard cryogenic ball valve on top of the simplicity and flow capabilities of a floating ball design.
- Full Δp
- Ball with integrated pressure relief device to release any exceeding cavity pressure.

Preparation for actuation





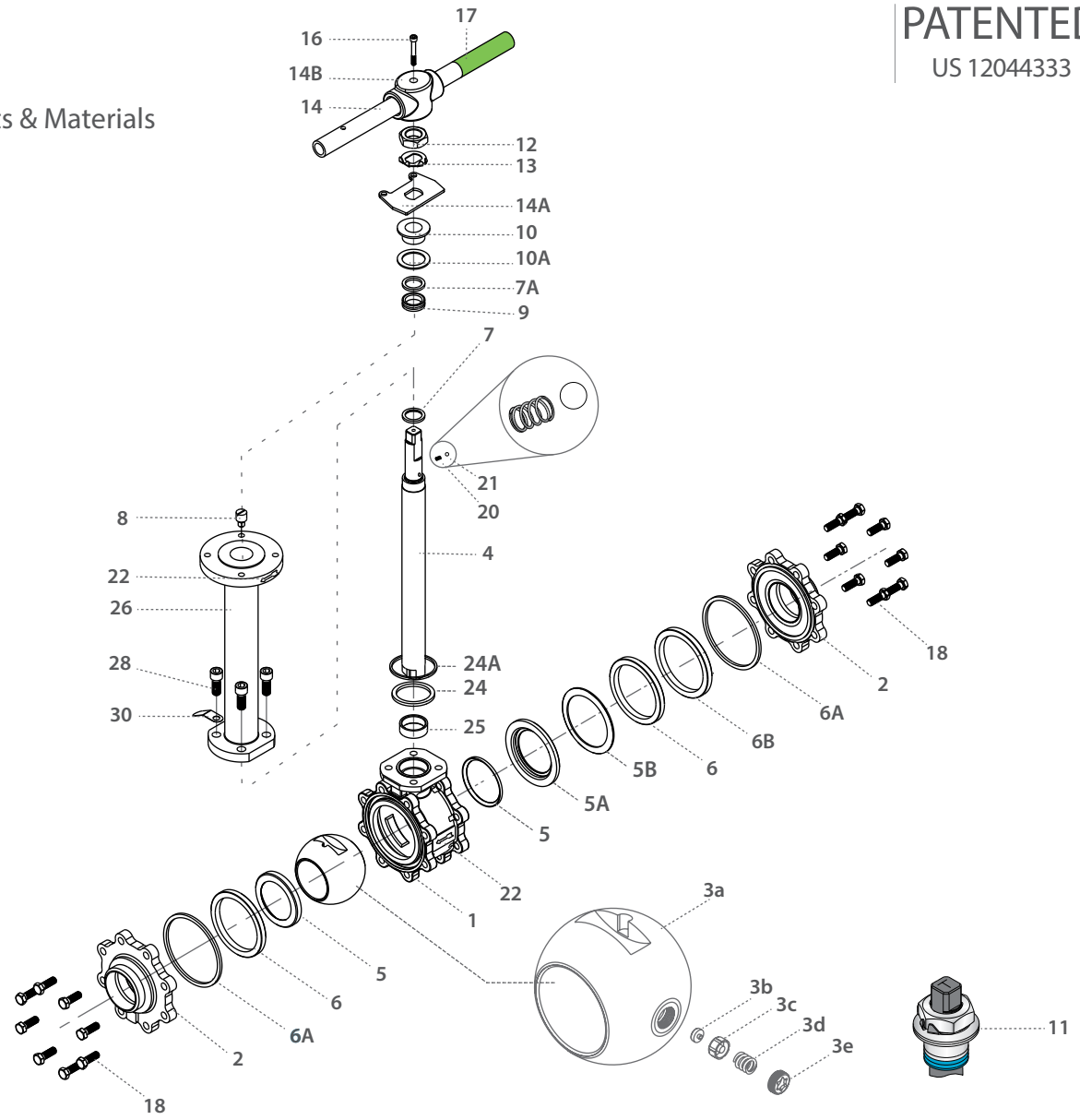
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				S	W	M	M DD	N	P	F		TxL	Weight kg/lb		Kv
						C	D	H	G	C	D	H	G										Std.	6"	Cv
DN65	DN50	mm	50.80	157.95	72.55	397.5	439.1	464.0	327.5	222.4	264.0	288.9	152.4	401.0	108.0	13.9	13.9	M20x2.5	13.15	F07	70.0	M8x8	12	10.6	205
2½"	2"	inch	2.0	6.22	2.86	15.65	17.29	18.27	12.89	8.76	10.39	11.37	6.0	15.79	4.25	0.55	0.55		0.52		2.76		26.46	23.37	240
DN80	DN65	mm	63.5	169.35	83.25	441.8	488.4	528.0	343.5	250.7	297.3	336.9	152.4	401.0	153.0	18.9	15.9	1"-14	16.7	F10	102.0	M10x15	20	18.8	385
3"	2½"	inch	2.5	6.67	3.28	17.39	19.23	20.79	13.52	9.87	11.7	13.26	6.0	15.79	6.02	0.74	0.63	UNS-2A	0.66		4.02		44.09	41.45	450
DN100	DN80	mm	82.6	213.6	108.8	457.6	504.2	544.0	343.5	266.5	313.1	352.9	152.4	610.0	191.5	18.9	15.9	1"-14	16.7	F10	102.0	M10x15	30.5	29.3	615
4"	3"	inch	3.25	8.41	4.28	18.02	19.85	21.42	13.52	10.49	12.33	13.89	6.0	24.02	7.54	0.74	0.63	UNS-2A	0.66		4.02		67.24	64.6	720
	DN100	mm	100.0	239.0	123.0	466.8	513.4	555.0	343.5	275.7	322.3	363.9	152.4	610.0	217.0	18.9	15.9	1"-14	16.7	F10	102.0	M10x15	37.3	36.1	744
	4"	Inch	3.94	9.41	4.84	18.38	20.21	21.85	13.52	10.85	12.69	14.33	6.0	24.02	8.54	0.74	0.63	UNS-2A	0.66		4.02		82.23	79.59	870
DN150		mm	111.1	346.1	146.1	542.4	611.9	665.0	385.0	309.8	379.3	432.4	152.4	916.0	266.0	28.45	23.75	1½"-12	26.2	F12	125.0	M12x15	75	71	872
6"		inch	4.37	13.63	5.75	21.35	24.09	26.18	15.16	12.2	14.93	17.02	6.0	36.06	10.47	1.12	0.94	UNS-1A	1.03		4.92		165.35	156.53	1020
	DN150	mm	150.0	322.0	180.0	564.0	633.5	686.6	385.0	331.4	400.9	545.0	152.4	916.0	328.0	28.45	23.75	1½"-12	26.2	F12	125.0	M12x15	106	104	23.75
	6"	inch	5.91	12.68	7.09	22.20	24.94	27.03	15.16	13.05	15.78	17.87	6.0	36.06	12.91	1.12	0.94	UNS-1A	1.03		4.92		233	229	0.94

C47-BD 2½"-6" | DN65-DN150 | CLASS 300

PATENTED
US 12044333

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3a	Ball With Integrated PRV	S.Steel	1
3b	Insert	MOD PTFE, CF PTFE, PCTFE	1
3c	Piston	S.Steel	1
3d	Spring	INCONEL® X-750	1
3e	Nut	S.Steel	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A	Seat Housing	S. Steel	1
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	2
6A*	Outer Seal	Acc. Ordering Code	2
6B	Support Ring	S. Steel	1
7*	Stem Thrust Seal	TFM, PCTFE	1
7A*	Anti-Abrasion Ring	TFM, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM, Graphite	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

Item	Description	Material specifications	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	8
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	2
23	Tag (Not Shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

* Maintenance kit components

C47-BD

Cryogenic Floating Ball 3 Piece; BD - Bidirectional - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
1	5			F	C	4	7	W	-	6	6	6	M	A	A	G	/	B	W			-	B	D		
Size		Features				Series		Design		Body material	Ends material	Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End connection					Special features			

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
C	Cryogenic design
F	Fire safe
B	Full port
N	Control service

Series (7-8)	
47	3 Piece Floating

Design (9)	
W	Total HermetiX Integrity package

Body material (11)	
6	CF8M
7	Monel
W	Hastelloy-C22

End material (12)	
6	CF3M
7	Monel

Ball material (13)	
6	S. Steel
1	Bronze
7	Monel

Stem material (14)	
M	High Strength S. Steel
6	S. Steel
Z	Inconel

Seat material (15)	
A	TFM
C [1]	PCTFE
P	CF PTFE

[1] up to 2"

Inner Seal Material (16)	
A	TFM
G	Expanded graphite

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
Welded	
BW10	Buttweld schd. 10
BW	Buttweld schd. 40
XBW10	Extended buttweld schd. 10
XBW	Extended buttweld schd. 40
BW5	Buttweld schd. 5
BW80	Buttweld schd. 80
BWO *	Buttweld tube OD
BWD	Buttweld DIN 11860
BWI1.6	buttweld ISO 1127 1.6mm
BWI2.0	buttweld ISO 1127 2.0mm
BWI2.3	buttweld ISO 1127 2.3mm
SW	Socket weld
SWO *	Socket weld tube OD
XBW80	Extended buttweld 80
XSW	Extended socket weld
ETO *	Extended tube OD
ETI1.6	Extended buttweld ISO 1127 1.6mm
ETI2.0	Extended buttweld ISO 1127 2.0mm
ETI2.3	Extended buttweld ISO 1127 2.3mm
ETD	Extended buttweld DIN 11850

* Std. port only

Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
MNPT	Male NPT
BSPT	EN 10226 - Pipe Taper thread
MBSPT	Male BSPT
BSPP	ISO228-1, DIN3852 - Pipe parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	SAE internal straight thread
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF
Clamp	
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)
TC *	Tri-Clamp
LL *	Compression fitting (Imperial) - **No** nuts & Ferrules
LM *	Compression fitting (metric) - **No** nuts & Ferrules
LL-NF *	Compression fitting (Imperial) - **with** nuts & Ferrules
LM-NF *	Compression fitting (metric) - **with** nuts & Ferrules

* Std. port only

** Not available for 1¼" (DN32) Valves

Special Features (24-30)	
BD	Bi-Directional Design
6.0	Short bonnet
B	Body made from rolled bar
RJT	Ring Type Joint
EP	Electropolished
Vxx	V port, xx=angle
G...	Internal surface finish (G24, G32)
VBxx	Characterized control ball, xx=angle
FF	Flat face
TPED	TPED / TPE

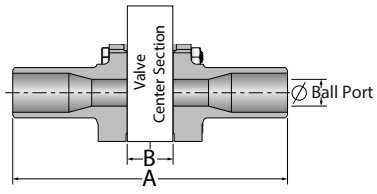
C47 C47-BD

Face To Face Sizes

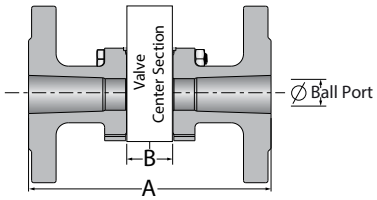
Valve Size	Unit	B		A-XBW / ETI / ETD / GR		A-ETO	A-Flanged CLASS 150 FTF CLASS 300		A-Flanged CLASS 300 FTF CLASS 300		A-Flanged CLASS 600 FTF CLASS 600		A-Flanged DIN PN16-PN100		A-TC
		Std. port	Full port	Std. port	Full port	Std. port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Full port
DN10	mm	20.6	20.6	140.6	143.0	108.6									
⅜"	inch	0.8	0.8	5.5	5.6	4.3									
DN15	mm	20.6	24.6	140.6	147.0	137.0	140.0	140.0	140.0	140.0	165.0	140.0*	130.0	130.0	88.8
½"	inch	0.8	1.0	5.5	5.8	5.4	5.5	5.5	5.5	5.5	6.5	5.5*	5.1	5.1	3.5
DN20	mm	24.6	31.7	147	168.7	147.0	152.0	152	152.0	152	152.0*	152.0*	150.0	150.0	101.6
¾"	inch	1.0	1.2	5.8	6.6	5.8	6.0	6.0	6.0	6.0	6.0*	6.0*	5.9	5.9	4.0
DN25	mm	31.7	41.3	168.7	179.3	164.1	165.1	165.1	165.1	165.1	216.0	165.1*	160.0	160.0	114.3
1"	inch	1.2	1.6	6.6	7.1	6.5	6.5	6.5	6.5	6.5	8.5	6.5*	6.3	6.3	4.5
DN32	mm	41.3	48.4	179.3	189.4	179.3	178.1	178.1	178.1	178.1	178.1*	178.1*	180.0	180.0	
1¼"	inch	1.6	1.9	7.1	7.5	7.1	7.0	7.0	7.0	7.0	7.0*	7.0*	7.1	7.1	
DN40	mm	48.4	56.3	189.4	200.3	184.0	190.0	190.0	190.0	190.0	241.0	190.0*	200.0	200.0	139.8
1½"	inch	1.9	2.2	7.5	7.9	7.2	7.5	7.5	7.5	7.5	9.5	7.5*	7.9	7.9	5.5
DN50	mm	56.3	72.6	200.3	232.6	193.5	216.1	216.1	216.1	216.1	292.0	216.1*	230.0	230.0	158.9
2"	inch	2.2	2.9	7.9	9.2	7.6	8.5	8.5	8.5	8.5	11.5	8.5*	9.0	9.0	6.3
DN65	mm	72.6	83.4	232.6	283.4	222.6	241.0	241.0	241.0	241.0	241.0*	330.0	230.0	270.0	213.0
2½"	inch	2.9	3.3	9.2	11.2	8.8	9.5	9.5	9.5	9.5	9.5*	13.0	9.1	10.6	8.4
DN80	mm	83.4	108.8	283.4	348.8	250.4	282.0	282.0	282.0	282.0	356.0	356.0	280.0	310.0	215.8
3"	inch	3.3	4.3	11.2	13.7	9.9	11.1	11.1	11.1	11.1	14.0	14.0	11.0	12.2	8.5
DN100	mm	108.8	123	348.8	390.0	348.8	305.0	305	305.0	305	432.0	432.0	350.0	350.0	245.4
4"	inch	4.3	4.8	13.7	15.4	13.7	12.0	12.0	12.0	12.0	17.0	17.0	13.78	13.78	9.7
DN150	mm	146.1	180	444.1	420.0	444.1	403.1	403.1	403.1	403.1	559.0	559.0	350.0	480.0	146.1
6"	inch	5.8	7.1	17.5	16.5	17.5	15.9	15.9	15.9	15.9	22.0	22.0	13.78	18.9	5.8

* Complay with class 300 FTF

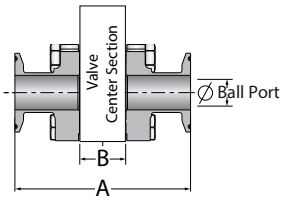
XBW / ETO /ETI / ETD / GR

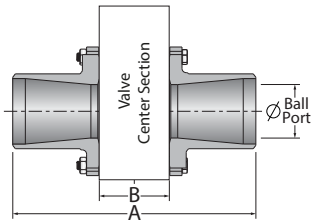


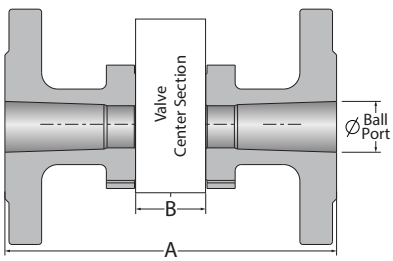
Flanged

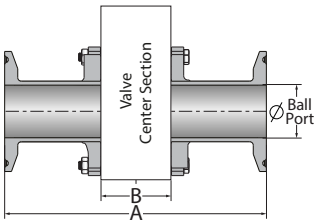


TC



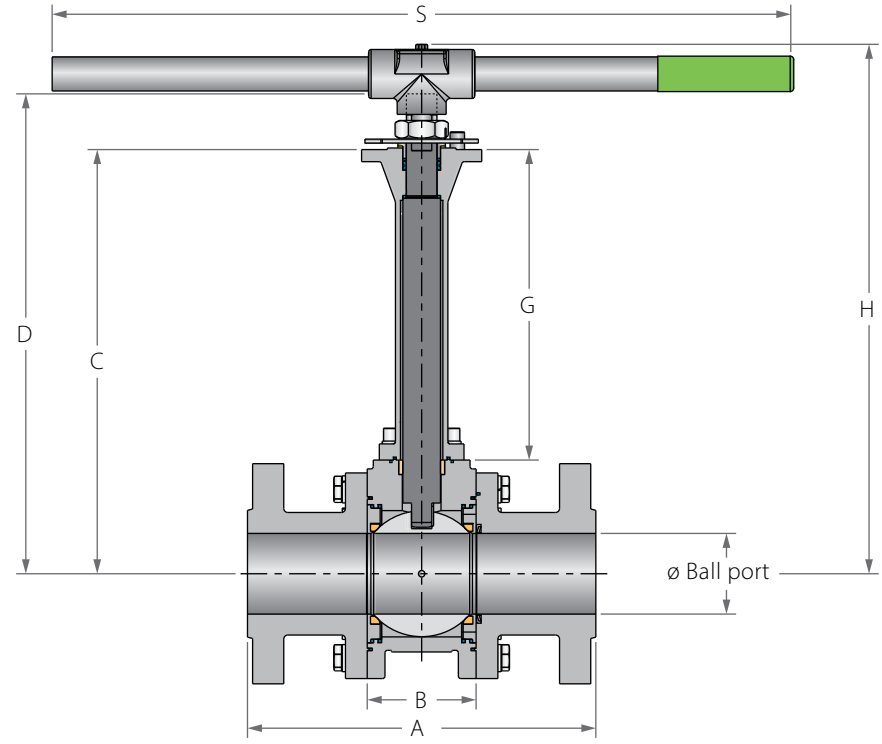


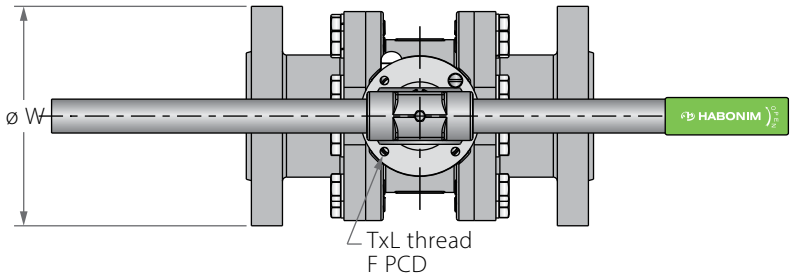




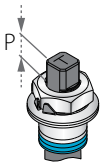
Cryogenic Floating Ball 3 Piece

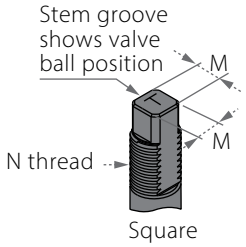
Valve Dimensions





Preparation for actuation

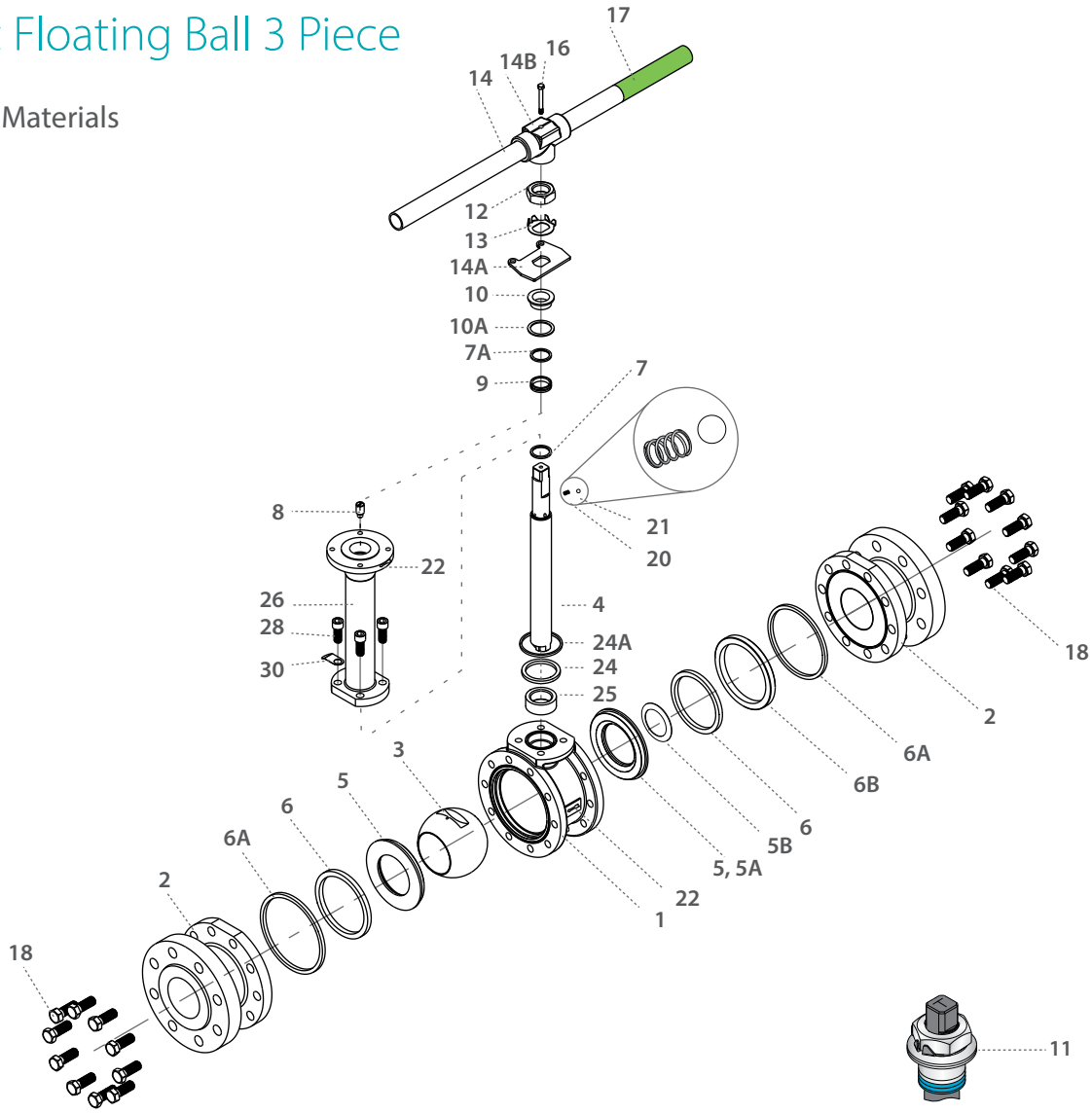




Full Port	Unit	Ball port	A		B	Standard design				6" bonnet				S	W	M	M DD	N	P	F		TxL	Weight Kg/lb (Welded)		Kv
			Welded	#600		C	D	H	G	C	D	H	G										Std.	6"	Cv
DN50	mm	51.05	200.0	292.0	75.0	432.5	479.1	431.0	345.0	239.9	286.5	238.4	152.4	401.0	165.0	18.9	15.9	1" - 14 UNS-2A	16.7	F10	102.0	M10X15	25	22	421
2"	inch	2.01	7.87	11.5	2.95	17.03	18.86	16.97	13.58	9.44	11.28	9.39	6.0	15.79	6.5	0.74	0.63		0.66		4.02		55	48	492
DN80	mm	80.0	356.0	356.0	110.0	511.5	580.6	632.0	385.0	278.9	348.0	399.4	152.4	916.0	210.0	28.45	23.75	1½" UNF-2A	26.2	F12	125.0	M12X15	50	45	983
3"	inch	3.15	14.02	14.02	4.33	20.14	22.86	24.88	15.16	10.98	13.7	15.72	6.0	36.06	8.27	1.12	0.94		1.03		4.92		110	99	1150
DN100	mm	100.0	400.0	432.0	135.0	527.3	596.4	646.5	385.0	294.7	363.8	413.9	152.4	916.0	275.0	28.45	23.75	1½" UNF-2A	26.2	F12	125.0	M12X15	75	70	1807
4"	inch	3.94	15.75	17.01	5.31	20.76	23.48	25.45	15.16	11.6	14.32	16.3	6.0	36.06	10.83	1.12	0.94		1.03		4.92		165	154	2114
DN150	mm	150.0	490.0	559.0	190.0	579.0	691.65	-	385.0	346.4	459.05	-	152.4	-	355.0	35.92	35.92	2" UN-2A	40.0	F14	140.0	M16X20	155	140	4310
6"	inch	5.91	19.29	22.01	7.48	22.8	27.23	-	15.16	13.64	18.07	-	6.0	-	13.98	1.41	1.41		1.57		5.51		341	308	5043
DN200	mm	200.0	500.0	660.0	275.0	630.0	785.0	-	385.0	397.4	510.05	-	152.4	-	420.0	45.9	45.9	2¾" UN-2A	50.0	F16	165.0	M20X30	400	380	7970
8"	inch	7.87	19.69	25.98	10.83	24.8	30.9	-	15.16	15.65	20.08	-	6.0	-	16.54	1.81	1.81		1.97		6.5		880	836	9325

Cryogenic Floating Ball 3 Piece

Components & Materials



Item	Description	Material specifications	Qty.
1	Ball With Integrated PRV	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A	Seat Housing	S. Steel	2
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	2
6A*	Outer Seal	Acc. Ordering Code	2
6B	Support Ring	S. Steel	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1

Item	Description	Material specifications	Qty.
14**	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	20-32
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

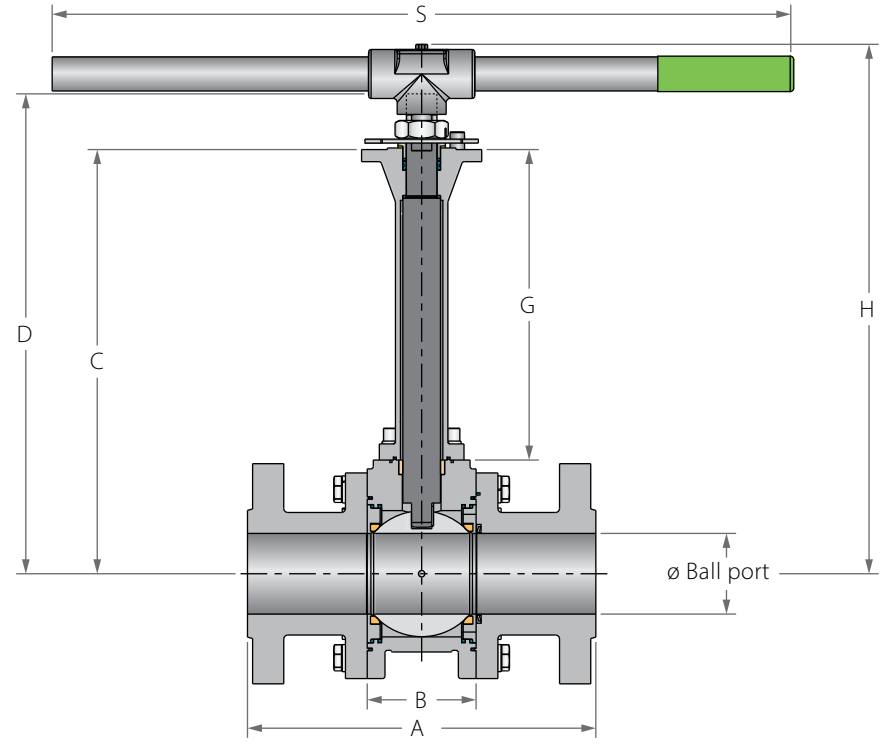
* Maintenance kit components
** Gear operator should be used for size 6" DN150 and above (handle components are not included)

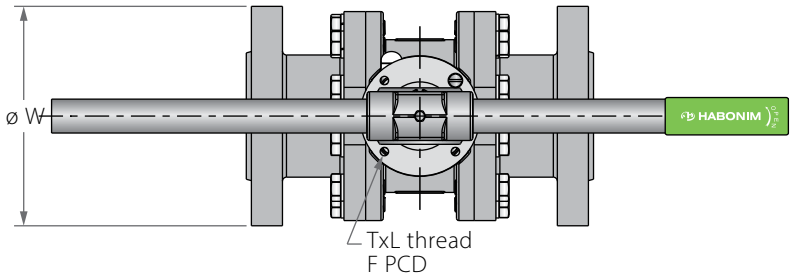
C26-BD 2"-8" | DN50-DN200 | CLASS 600

Cryogenic Floating Ball 3 Piece ; BD - Bidirectional

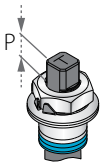
PATENTED
US 12044333

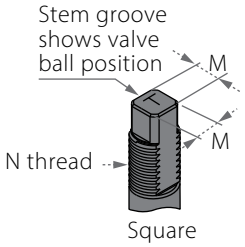
Valve Dimensions





Preparation for actuation



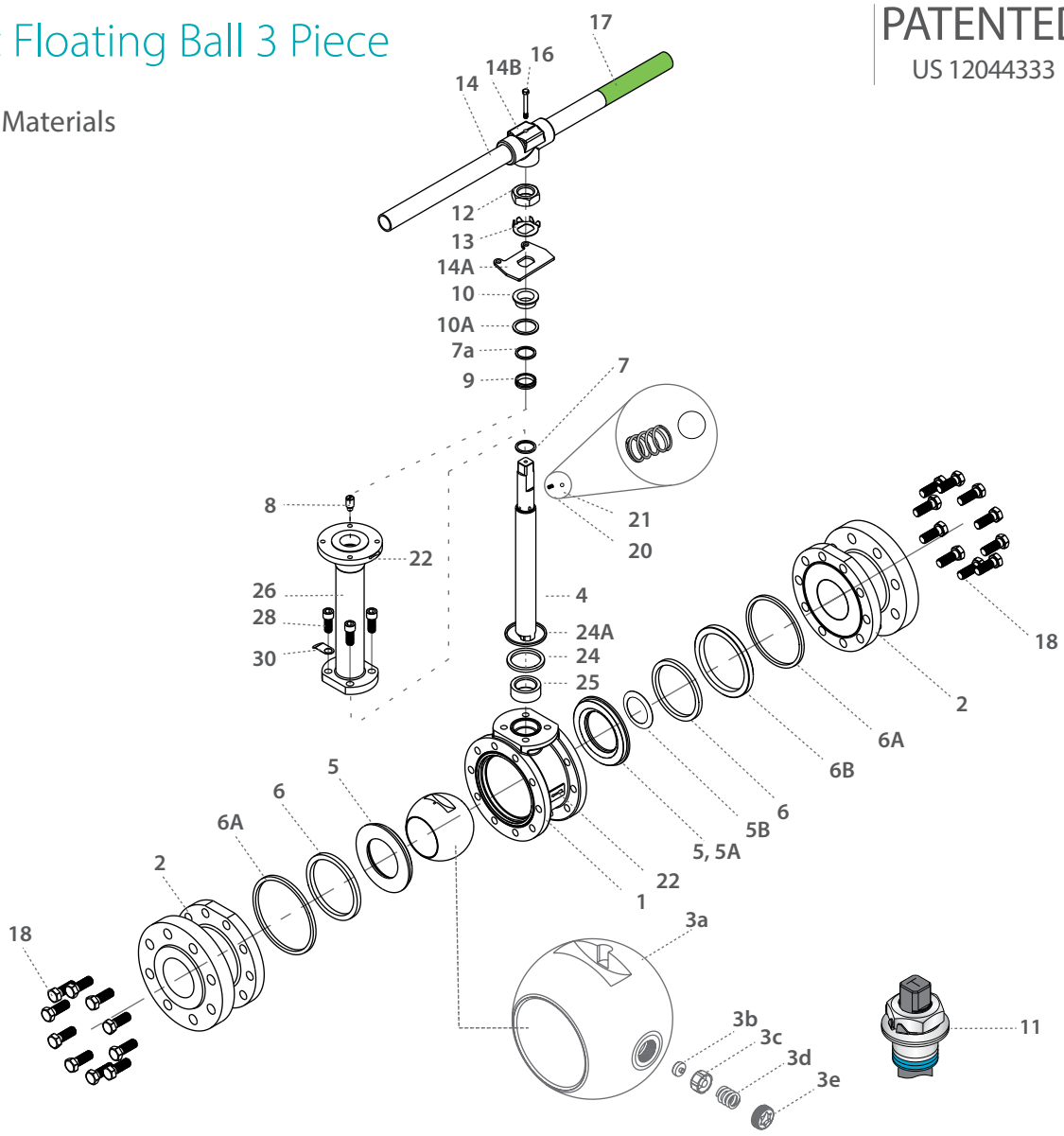


Full Port	Unit	Ball port	A		B	Standard design				6" bonnet				S	W	M	M DD	N	P	F		TxL	Weight Kg/lb (Welded)		Kv
			Welded	#600		C	D	H	G	C	D	H	G										Std.	6"	Cv
DN50	mm	51.05	200.0	292.0	75.0	432.5	479.1	431.0	345.0	239.9	286.5	238.4	152.4	401.0	165.0	18.9	15.9	1" - 14 UNS-2A	16.7	F10	102.0	M10X15	25	22	421
2"	inch	2.01	7.87	11.5	2.95	17.03	18.86	16.97	13.58	9.44	11.28	9.39	6.0	15.79	6.5	0.74	0.63		0.66		4.02		55	48	492
DN80	mm	80.0	356.0	356.0	110.0	511.5	580.6	632.0	385.0	278.9	348.0	399.4	152.4	916.0	210.0	28.45	23.75	1½" UNF-2A	26.2	F12	125.0	M12X15	50	45	983
3"	inch	3.15	14.02	14.02	4.33	20.14	22.86	24.88	15.16	10.98	13.7	15.72	6.0	36.06	8.27	1.12	0.94		1.03		4.92		110	99	1150
DN100	mm	100.0	400.0	432.0	135.0	527.3	596.4	646.5	385.0	294.7	363.8	413.9	152.4	916.0	275.0	28.45	23.75	1½" UNF-2A	26.2	F12	125.0	M12X15	75	70	1807
4"	inch	3.94	15.75	17.01	5.31	20.76	23.48	25.45	15.16	11.6	14.32	16.3	6.0	36.06	10.83	1.12	0.94		1.03		4.92		165	154	2114
DN150	mm	150.0	490.0	559.0	190.0	579.0	691.65	-	385.0	346.4	459.05	-	152.4	-	355.0	35.92	35.92	2" UN-2A	40.0	F14	140.0	M16X20	155	140	4310
6"	inch	5.91	19.29	22.01	7.48	22.8	27.23	-	15.16	13.64	18.07	-	6.0	-	13.98	1.41	1.41		1.57		5.51		341	308	5043
DN200	mm	200.0	500.0	660.0	275.0	630.0	785.0	-	385.0	397.4	510.05	-	152.4	-	420.0	45.9	45.9	2¾" UN-2A	50.0	F16	165.0	M20X30	400	380	7970
8"	inch	7.87	19.69	25.98	10.83	24.8	30.9	-	15.16	15.65	20.08	-	6.0	-	16.54	1.81	1.81		1.97		6.5		880	836	9325

Cryogenic Floating Ball 3 Piece

PATENTED
US 12044333

Components & Materials



Item	Description	Material specifications	Qty.
1	Ball With Integrated PRV	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3a	Ball With Integrated PRV	S.Steel	1
3b	Insert	MOD PTFE, CF PTFE, PCTFE	1
3c	Piston	S.Steel	1
3d	Spring	INCONEL® X-750	1
3e	Nut	S.Steel	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A	Seat Housing	S. Steel	2
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	2
6A*	Outer Seal	Acc. Ordering Code	2
6B	Support Ring	S. Steel	1
7*	Stem Thrust Seal	PCTFE	1
7a*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2

Item	Description	Material specifications	Qty.
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14**	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	20-32
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

* Maintenance kit components
** Gear operator should be used for size 6" DN150 and above (handle components are not included)

C26 C26-BD

Cryogenic Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
4	0			F	C	2	6		-	6	6	6	M	A	A	G	/	B	W			-				
Size		Features				Series		Design		Body material	Ends material	Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End connection					Special features			

Size (1-2)		
Code	inch	mm
20	2"	50
30	3"	80
40	4"	100
60	6"	150
80	8"	200

Features (3-6)	
C	Cryogenic design
F	Fire safe
N	Control

Series (7-8)	
26	3 Piece Floating

Body material (11)	
6	S. Steel

End material (12)	
6	S. Steel

Ball material (13)	
6	S. Steel 316L
7	Monel

Stem material (14)	
M	High Strength S. Steel
Z	Inconel

Seat material (15)	
A	TFM
F	Hybrid Seat (info in special features)

Inner Seal Material (16)	
A	TFM
G	Expanded graphite

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
Welded	
XBW	Extended buttweld schd. 40
XBW80	Extended buttweld 80
BW *	Buttweld schd. 40
BW10	Buttweld schd. 10
BW80	Buttweld schd. 80
SW	Socket weld
XBW10	Extended buttweld schd. 10
XSW	Extended socket weld

* Up to 4" only

Flanged	
600	ASME B16.5 #600 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
Flanged RTJ	
600RTJ	ASME B16.5 #600 RTJ
Clamp	
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

Special Features (24-30)	
BD	Bi-directional design
6.0	Short bonnet
Vxx	V port
VBxx	Characterized control ball

** Not available for 1½" (DN32) Valves

Hybrid Seats (24-27)

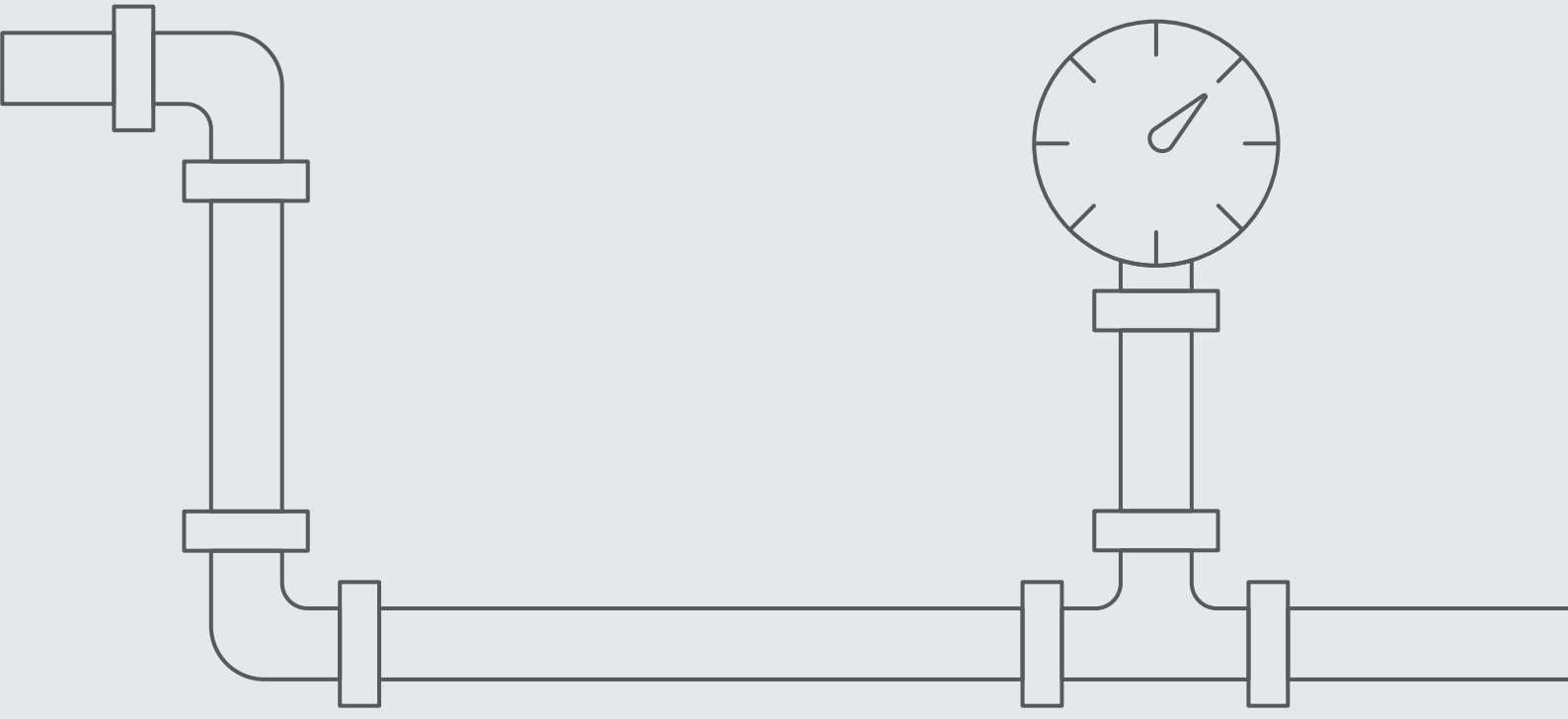
24		25-26		27	
Insert material		Seat Configuration		Seal Type	
A	TFM	00	Unidirectional Spring-Loaded Hybrid Seats	5	Seal 1: TFM; Seal 2: Expanded graphite
P	CF PTFE			6	Seal 1: TFM
C	PCTFE				

C28

Cryogenic Valves

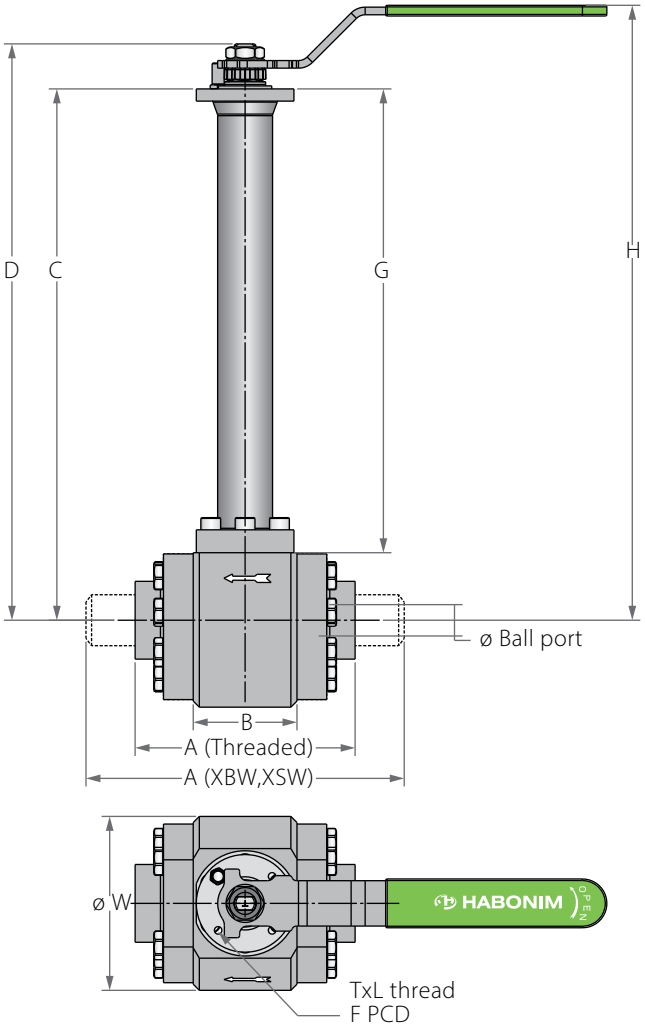
FLOATING BALL

HIGH PRESSURE
3 PIECE

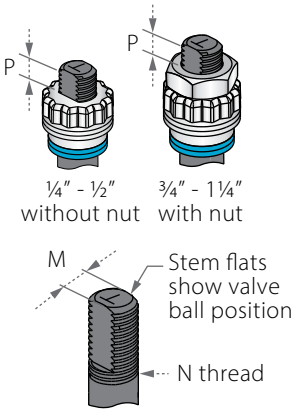


Cryogenic High Pressure Floating Ball 3 Piece

Valve Dimensions



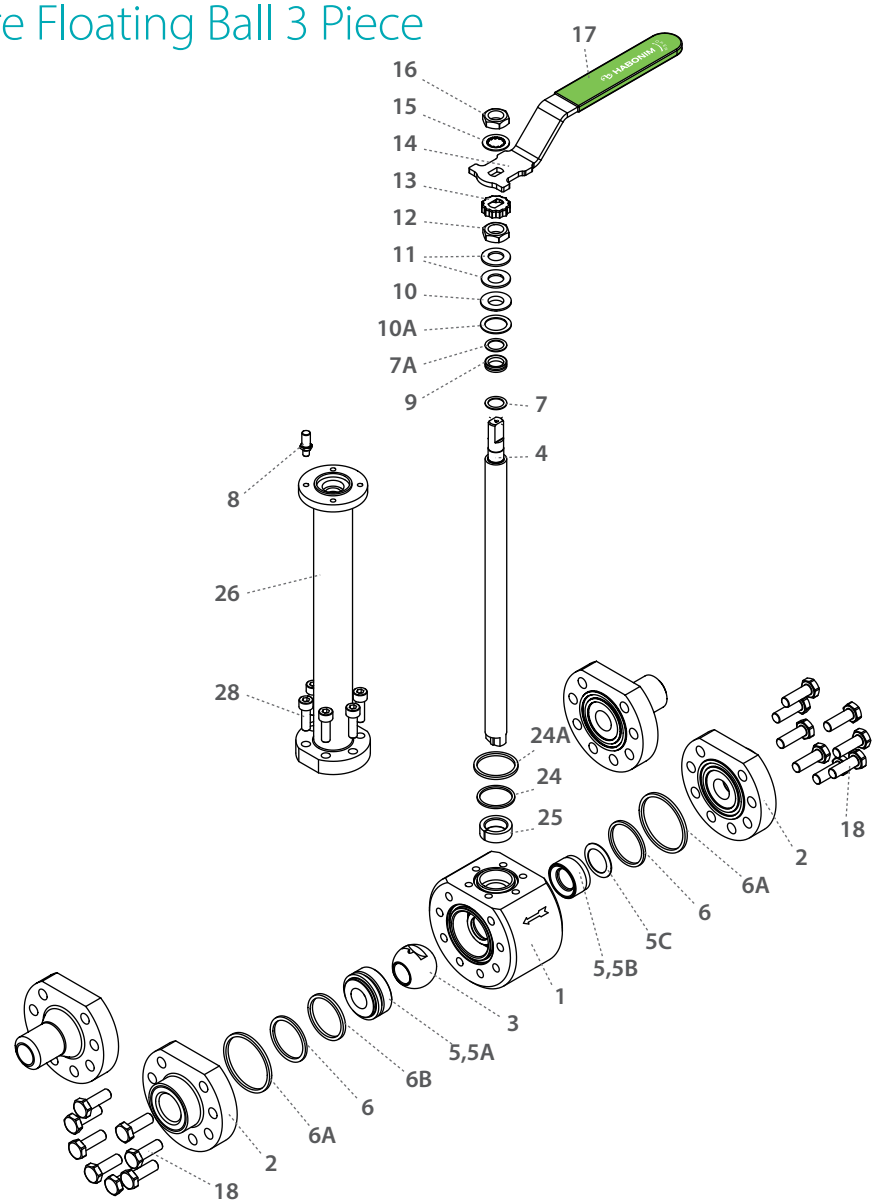
Preparation for actuation



Std. port	Full port	Unit	Ball port	A THD	A XBW/ XSW	B	Standard design				6" bonnet				S	W	M	N	P	F		TxL	Std. bonnet	6" bonnet	Kv
							C	D	G	H	C	D	G	H									Weight kg/lb		Cv
DN15	DN8, DN10	mm	11.15	107.2	173.6	50.0	333.0	341.9	304.0	364.4	181.4	190.3	152.4	212.8	150.0	78.0	5.5	⅜"	6.5	F03	36.0	M5X6	4.0	3.4	7
½"	¼", ⅜"	inch	0.44	4.22	6.83	1.97	13.11	13.46	11.97	14.35	7.14	7.49	6.0	8.38	5.91	3.07	0.22	UNF	0.26		1.42		8.76	7.41	8
DN20	DN15	mm	13.0	120	188.6	60.0	338.6	356.1	304.0	381.1	187.0	204.5	152.4	229.5	187.0	98.0	7.5	7/16"	6.5	F04	42.0	M5X8	6.6	5.8	10
¾"	½"	inch	0.51	4.72	7.43	2.36	13.33	14.02	11.97	15.0	7.36	8.05	6.0	9.04	7.36	3.86	0.30	UNF	0.26		1.65		14.50	12.69	12
DN25	DN20	mm	20.65	144.2	208.6	68	348.25	377.75	304.0	402.75	196.65	226.15	152.4	251.15	237.0	114.0	8.7	9/16"	6.5	F05	50.0	M6X8	10.5	9.4	28
1"	¾"	inch	0.81	5.68	8.21	2.68	13.71	14.87	11.97	15.86	7.74	8.90	6.0	9.89	9.33	4.49	0.34	UNF	0.26		1.97		23.08	20.59	32
DN32	DN25	mm	25.5	152.0	211.6	68.0	355.5	385.0	304.0	410.0	203.9	233.4	152.4	258.4	237.0	124.0	8.7	9/16"	6.5	F05	50.0	M6X9	12.5	11.4	49
1¼"	1"	inch	1.0	5.98	8.33	2.68	14.00	15.16	11.97	16.14	8.03	9.19	6.0	10.17	9.33	4.88	0.34	UNF	0.26		1.97		27.57	25.06	57

Cryogenic High Pressure Floating Ball 3 Piece

Components & Materials



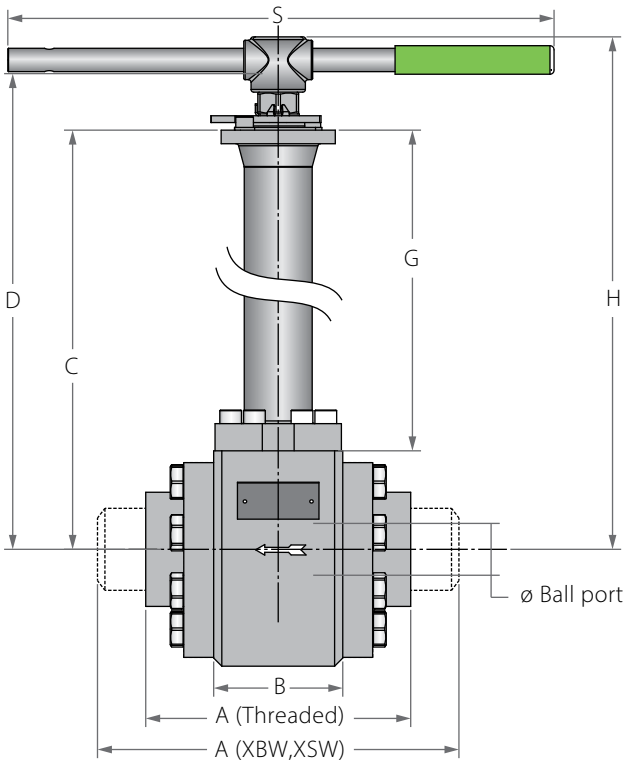
Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A*	Downstream Seat Housing	S. Steel	1
5B	Upstream Seat Housing	S. Steel	1
5C	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	2
6A*	Outer Seal	Acc. Ordering Code	2
6B*	Graphite String	Graphite	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1

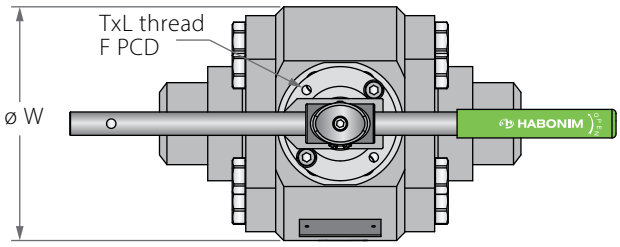
Item	Description	Material specifications	Qty.
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	2
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	12-16
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel 316	1
28	Bonnet Bolts	S. Steel	6

* Maintenance kit components

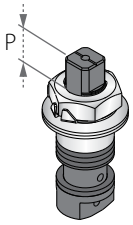
Cryogenic High Pressure Floating Ball 3 Piece

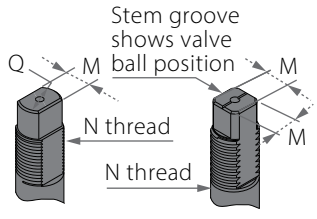
Valve Dimensions





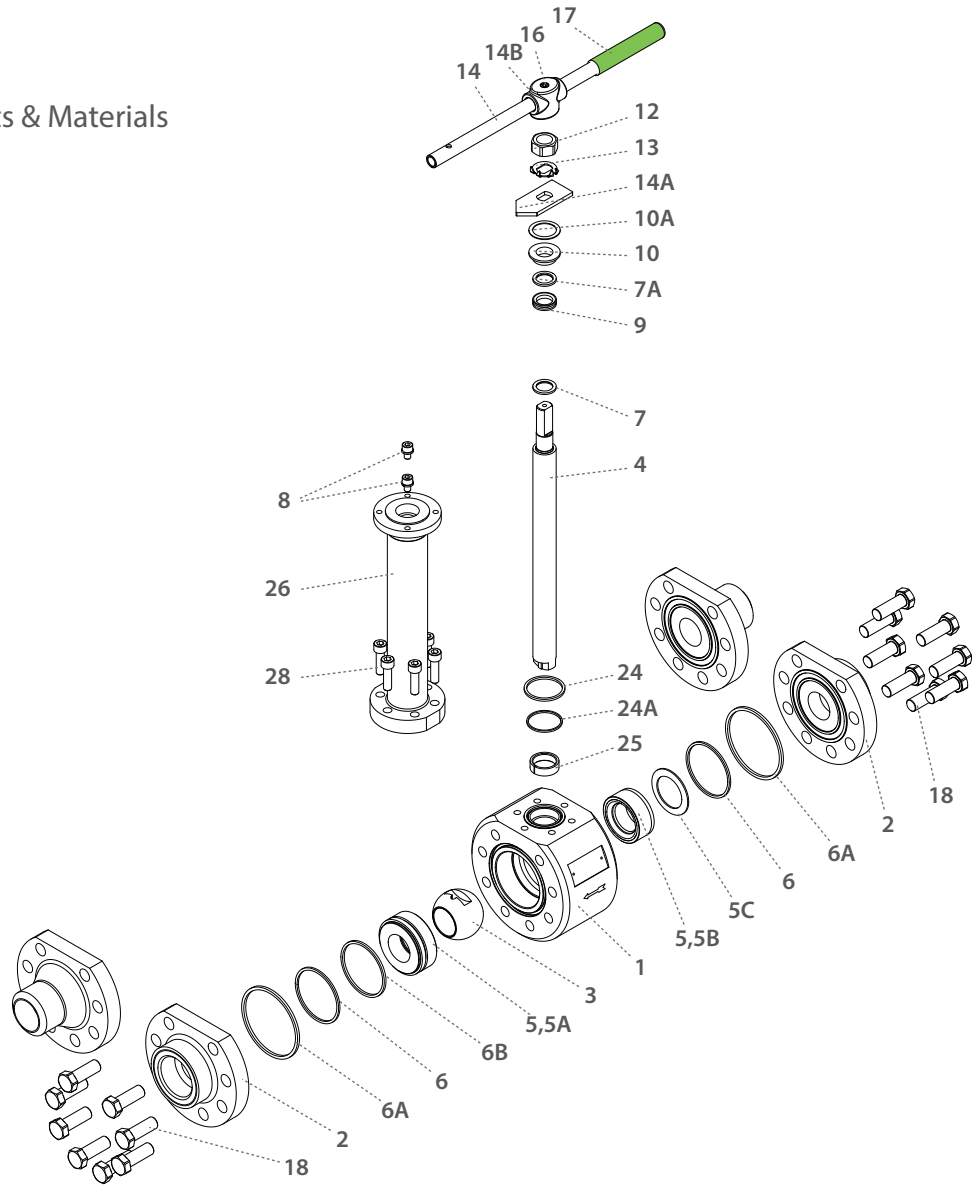
Preparation for actuation





Std. port	Full port	Unit	Ball port	A THD	A XBW/ XSW	B	Standard design				6" bonnet				S	W	M	N	P	F		TxL	Std. bonnet	6" bonnet	Kv
							C	D	G	H	C	D	G	H									Weight kg/lb		Cv
DN40	DN32	mm	31.8	179.0	262.0	95.0	357.0	398.6	304.0	425.6	205.4	247.0	152.4	274.0	400.0	140.0	13.9	M20x2.5	13.5	F07	70.0	M8X12	21.2	19.1	69
1½"	1¼"	inch	1.25	7.05	10.31	3.74	14.06	15.69	11.97	16.76	8.09	9.72	6.0	10.79	15.75	5.51	0.55		0.53		2.76		46.64	42.11	80
DN50	DN40	mm	38.1	195.0	266.0	95.0	376.5	418.1	304.0	445.1	224.9	266.5	152.4	293.5	400.0	172.0	13.9	M20x2.5	14.6	F07	70.0	M8X12	28.7	26.6	102
2"	1½"	inch	1.50	7.68	10.47	3.74	14.82	16.46	11.97	17.52	8.85	10.49	6.0	11.56	15.75	6.77	0.55		0.57		2.76		63.14	58.61	118
DN65	DN50	mm	50.8	225.0	313.4	105.0	392.3	438.8	304.8	479.2	239.9	286.4	152.4	326.8	610.0	199.0	18.9	1"-14 UNS-2A	16.7	F10	102.0	M10X16	36.9	44.1	208
2½"	2"	inch	2.0	8.86	12.34	4.13	15.44	17.28	12.0	18.87	9.44	11.28	6.0	12.87	24.02	7.83	0.74		0.66		4.02		81.18	96.98	241
DN80	DN65	mm	63.5	301.6	403	140	417.0	486.5	300.0	546.5	269.4	338.9	152.4	398.9	916	268.0	28.45	1½"-12 UNF-2A	26.2	F12	125.0	M12X15	99.4	94.7	301
3"	2½"	inch	2.50	11.87	15.87	5.51	16.42	19.15	11.81	21.52	10.61	13.34	6.0	15.70	36.06	10.55	1.12		1.03		4.92		218.77	208.43	348
DN100	DN80	mm	82.7	-	420.0	140.0	434.0	503.5	300.0	563.5	286.4	355.9	152.4	415.9	916.0	298.0	28.45	1½"-12 UNF-2A	26.2	F12	125	M12X15	133.3	128.3	616
4"	3"	inch	3.26	-	16.54	5.51	17.09	19.82	11.81	22.19	11.28	14.01	6.0	16.37	36.06	11.73	1.12		1.03		4.92		293.17	282.30	713
DN150	DN100	mm	100.0	-	510.0	175.0	484.8	597.4	304.8	-	383.2	495.8	203.2	-	-	399.0	35.9	2"-8 UN-2A	40.0	F14	140.0	M16X20	281.8	276.3	746
6"	4"	inch	3.94	-	20.08	6.89	19.09	23.52	12.0	-	15.09	19.52	8.0	-	-	15.71	1.41		1.57		5.51		619.94	607.93	863

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A*	Seat Housing	S. Steel	2
5B[(1)]	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	Graphite, TFM	2
6A*	Outer Seal	Acc. Ordering Code	2
6B*	Graphite String	Graphite	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14**	Handle	S. Steel	1

Item	Description	Material specifications	Qty.
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	8-16
18A	Spring Washer	S. Steel	8-16
19	Body Bolt	S. Steel	8-16
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	Graphite, TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	6-8
30	Dog Tag	S. Steel	1

* Maintenance kit components

** Gear operator should be used for size 3" DN80 (handle components are not included)

C28

Face To Face Sizes

Valve Size	B		A-XBW, XSW, GR		A-Flange #900		A-Flange #900 RTJ		A-Flange #1500		A-Flange #1500RTJ		A-Flange #2500		A-Flange #2500RTJ		PN250-PN400 F3	
	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port
DN8	50.0	-	173.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
¼"	1.97	-	6.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DN10	50.0	-	173.6	-	-	-	-	-	-	-	-	-	-	-	-	-	230.0	-
⅜"	1.97	-	6.83	-	-	-	-	-	-	-	-	-	-	-	-	-	9.06	-
DN15	50.0	60.0	173.6	188.6	216.0	216.0	216.0	216.0	216.0	216.0	216.0	216.0	264.0	264.0	264.0	264.0	230.0	230.0
½"	1.97	2.36	6.83	7.43	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	10.39	10.39	10.39	10.39	9.06	9.06
DN20	60.0	68.0	188.6	208.6	229.0	229.0	229.0	229.0	229.0	229.0	229.0	229.0	273.0	273.0	273.0	273.0	260.0	260.0
¾"	2.36	2.68	7.43	8.21	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02	10.75	10.75	10.75	10.75	10.24	10.24
DN25	68.0	68.0	208.6	211.6	254.0	254.0	254.0	254.0	254.0	254.0	254.0	254.0	308.0	308.0	308.0	308.0	260.0	260.0
1"	2.68	2.68	8.21	8.33	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	12.13	12.13	12.13	12.13	10.24	10.24
DN32	68.0	95.0	211.6	262.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	349.0	349.0	352.0	352.0	300.0	300.0
1¼"	2.68	3.74	8.33	10.31	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	13.74	13.74	13.86	13.86	11.81	11.81
DN40	95.0	95.0	262.0	266.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	384.0	384.0	387.0	387.0	300.0	300.0
1½"	3.74	3.74	10.31	10.47	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	15.12	15.12	15.24	15.24	11.81	11.81
DN50	95.0	105.0	266.0	313.4	368.0	368.0	371.0	371.0	368.0	368.0	371.0	37.01	451.0	451.0	454.0	454.0	350.0	350.0
2"	3.74	4.13	10.47	12.34	14.49	14.49	14.61	14.61	14.49	14.49	14.61	14.61	17.76	17.76	17.87	17.87	13.78	13.78
DN65	105.0	140.0	313.4	403.0	419.0	419.0	422.0	422.0	419.0	419.0	422.0	422.0	508.0	508.0	514.0	514.0	400.0	400.0
2½"	4.13	5.51	12.34	15.87	16.50	16.50	16.61	16.61	16.50	16.50	16.61	16.61	20.0	20.0	20.24	20.24	15.75	15.75
DN80	140.0	150.0	403.0	430.0	381.0	381.0	384.0	384.0	470.0	470.0	473.0	473.0	578.0	578.0	584.0	584.0	450.0	450.0
3"	5.51	5.91	15.87	16.93	15.0	15.0	15.12	15.12	18.50	18.50	18.62	18.62	22.76	22.76	22.99	22.99	17.72	17.72
DN100	150.0	175.0	430.0	510.0	457.0	45.07	460.0	460.0	546.0	546.0	549.0	549.0	673.0	673.0	683.0	683.0	520.0	520.0
4"	5.91	6.89	16.93	20.08	17.99	17.99	18.11	18.11	21.50	21.50	21.61	21.61	26.50	26.50	26.89	26.89	20.47	20.47
DN150	175.0	-	510.0	-	610.0	-	457.0	-	705.0	-	711.0	-	914.0	-	927.0	-	700.0	-
6"	6.89	-	20.08	-	24.02	-	17.99	-	27.76	-	27.99	-	35.98	-	36.50	-	27.56	-

Cryogenic High Pressure Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
4	0			F	C	2	8	W	-	6	6	6	M	F	A	G	/	X	B	W	80	-	C	0	0	5
Size		Features				Series		Design		Body/End material		Ball/Stem material		Seat material		Inner Seal		Outer Seal		End connection			Special features			

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
C	Cryogenic
F	Fire safe
B	Full port
N	Control

Series (7-8)	
28	HP Float 3 piece.

Design (9)	
W	Total HermetiX Integrity package

Body material (11)	
6	S. Steel 316/316L

End material (12)	
6	S. Steel 316/316L

Ball material (13) ¼"-¾"	
M	High Strength S. Steel

Ball material (13) 1" and up	
6	S. Steel 316/316L
M	High Strength S. Steel

Stem material (14)	
M	High Strength S. Steel

Seat material (15)	
F	Hybrid Seat (info in special features)

Inner Seal Material (16)	
A	TFM
G	Expanded graphite

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
Welded	
XBW80	Extended buttweld schd. 80
XBW160*	Extended buttweld schd. 160
XBWXXS	Extended buttweld schd. XXS
XSW	Extended socket weld

* Std. port only

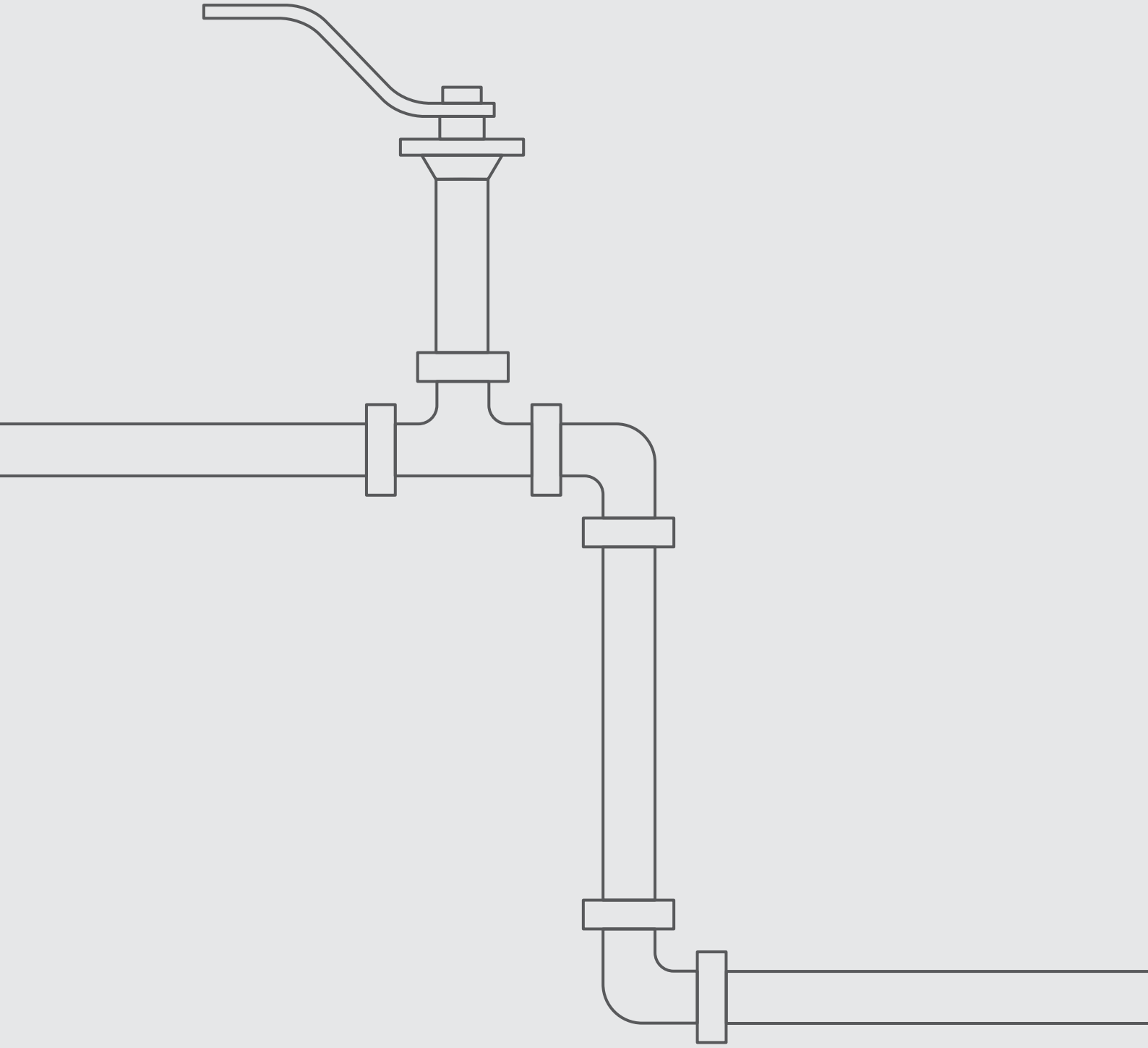
Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226-2 - British Standard Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe parallel thread
DIN3852	DIN3852 EN 10226-1 - Pipe parallel thread
AS5202	SAE internal straight thread
Flanged	
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
1500	ASME B16.5 #1500 RF
2500	ASME B16.5 #2500 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF
PN250	EN 1092-1 PN250 RF
PN400	EN 1092-1 PN400 RF
Flanged RTJ	
600RTJ	ASME B16.5 #600 RTJ
900RTJ	ASME B16.5 #900 RTJ
1500RTJ	ASME B16.5 #1500 RTJ
2500RTJ	ASME B16.5 #2500 RTJ
Clamp	
GR*	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

Hybrid Seats (24-27)

24		25-26		27	
Insert material		Seat Configuration		Seal Type	
C	PCTFE	00	Unidirectional Spring-Loaded Hybrid Seats	5	Seal 1: TFM; Seal 2: Expanded graphite
				6	Seal 1: TFM

Special Features (24-30)	
Vxx	V port
VBxx	Characterized control ball
6.0	Short bonnet

* Not available for 1¼" (DN32) Valves

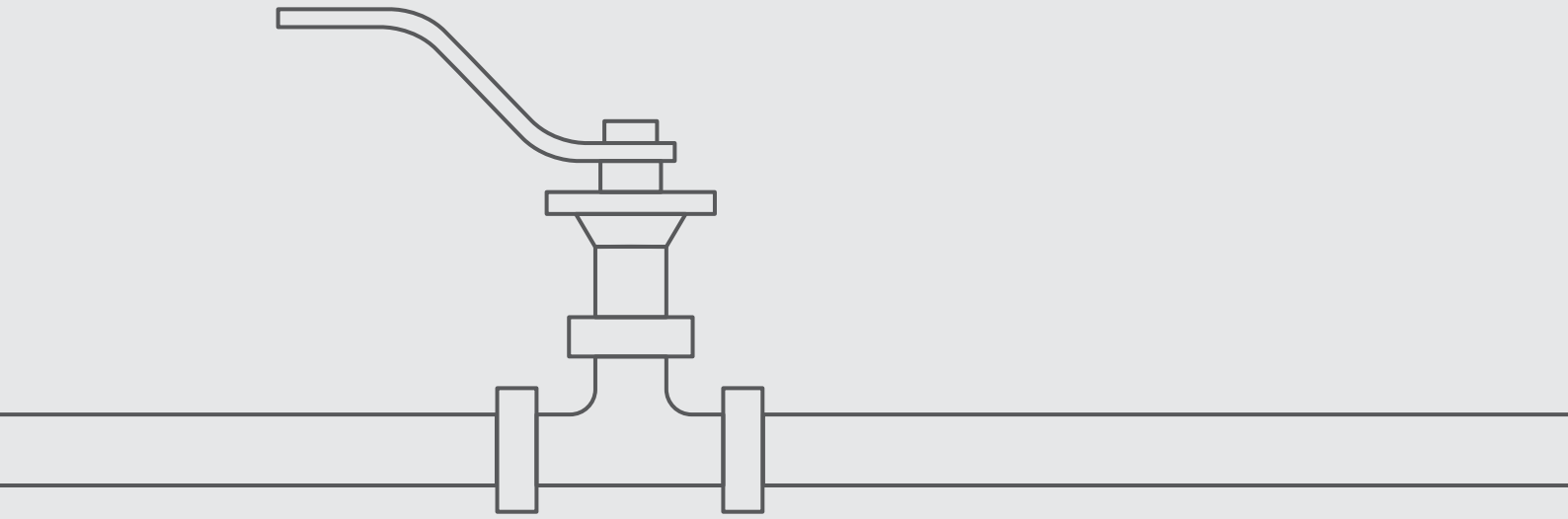


DC47 C61 C62 DC61 DC62

Cryogenic Valves

FLOATING BALL

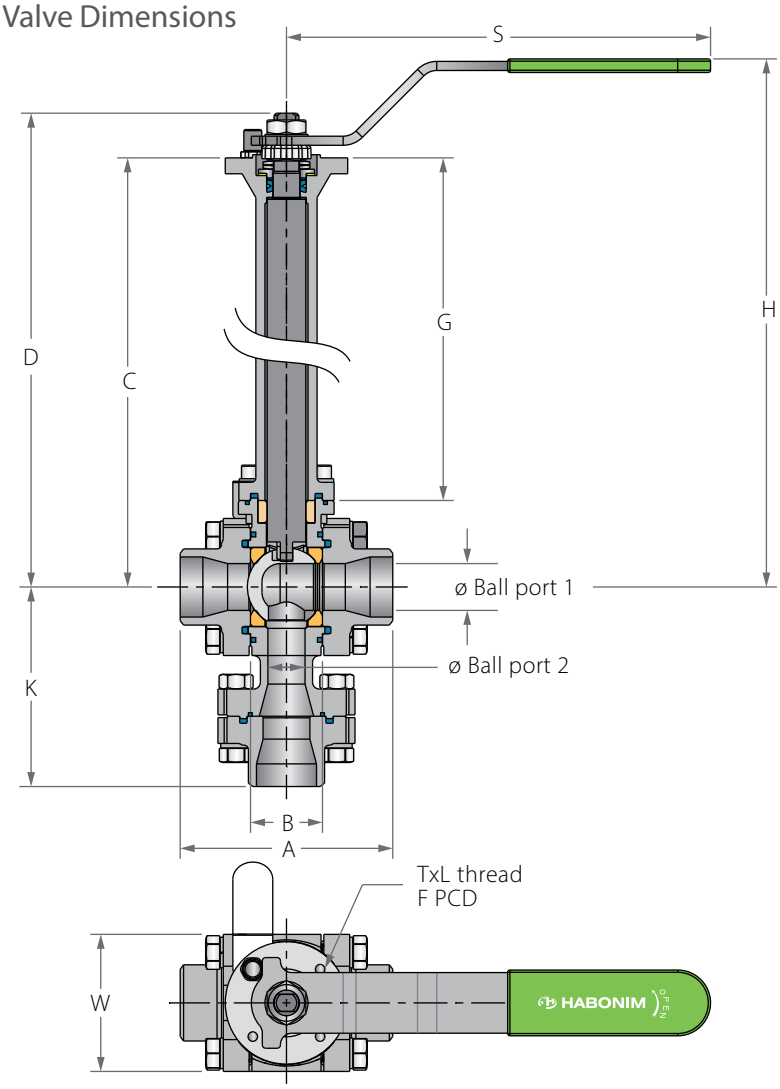
DIVERTER MULTIPORT



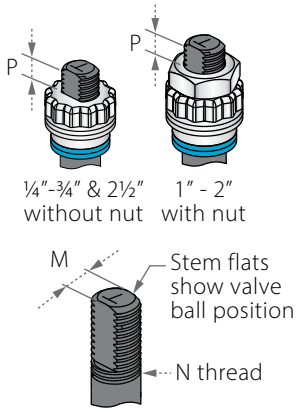
DC47 ½"-2" | DN15-DN50 | CLASS 600

Cryogenic Diverter Bottom Entry Floating Ball

Valve Dimensions



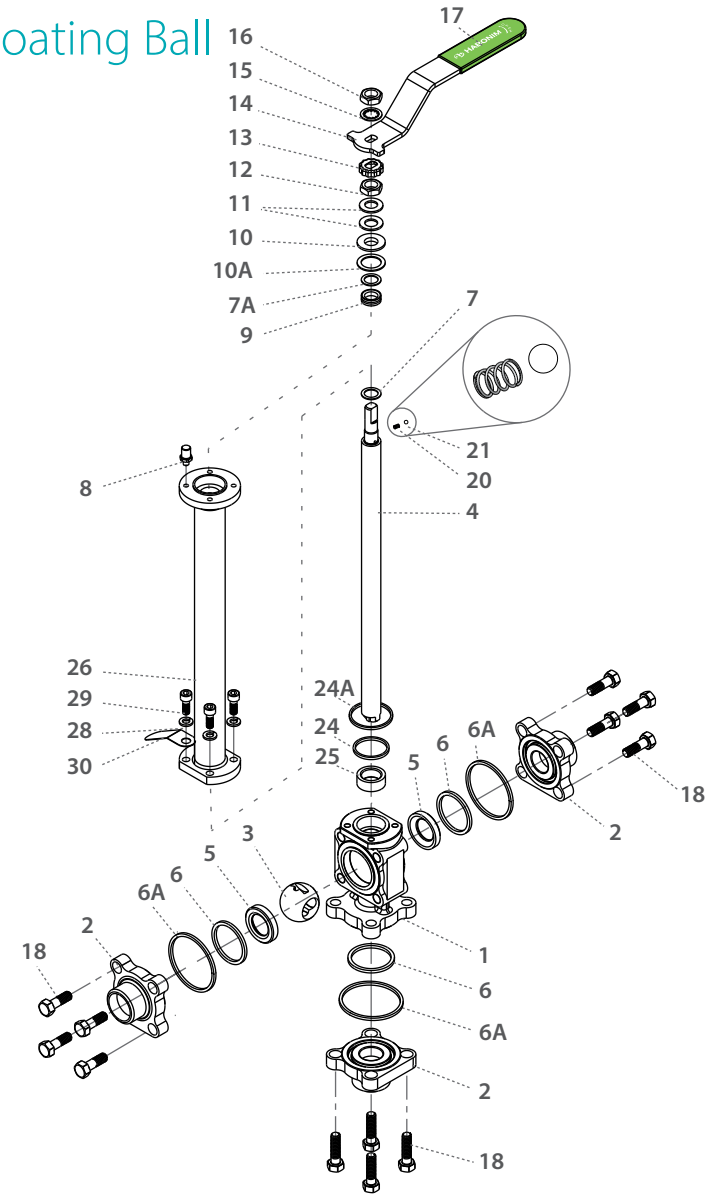
Preparation for actuation



Std. port	Full Port	Unit	Ball port1	Ball port2	A	B	Standard design				6" bonnet				K	S	W	M	N	P	F		TxL	Weight kg/lb	
							C	D	H	G	C	D	H	G										Std.	6"
DN15	DN10	mm	10.5	9.5	65.8	20.6	333.0	341.9	367.3	304.0	181.4	190.3	215.7	152.4	88.2	150.0	45.8	5.5	⅜" UNF	7.2	F03	36.0	M5X7	1.79	1.47
½"	⅜"	inch	0.41	0.37	2.59	0.81	13.11	13.46	14.46	11.97	7.14	7.49	8.49	6.0	3.47	5.91	1.8	0.22		0.28		1.42		3.93	3.23
DN20	DN15	mm	14.3	11.9	70.55	24.55	335.4	344.3	369.6	304.0	183.8	192.7	218.0	152.4	93.7	150.0	52.1	5.5	⅜" UNF	7.2	F03	36.0	M5X7	1.52	1.20
¾"	½"	inch	0.56	0.47	2.78	0.97	13.2	13.56	14.55	11.97	7.24	7.59	8.58	6.0	3.69	5.91	2.05	0.22		0.28		1.42		3.35	2.64
DN25	DN20	mm	20.65	15.9	93.75	31.75	342.15	359.65	387.0	304.0	190.55	208.05	235.4	152.4	119.0	187.0	60.45	7.54	7/16" UNF	7.2	F04	42.0	M5X7	3.19	2.84
1"	¾"	inch	0.81	0.63	3.69	1.25	13.47	14.16	15.24	11.97	7.5	8.19	9.27	6.0	4.69	7.32	2.38	0.3		0.28		1.65		7.02	6.25
DN32	DN25	mm	25.4	20.5	108.0	41.25	346.65	364.15	388.0	304.0	195.05	212.55	236.4	152.4	130.15	187.0	68.8	7.54	7/16" UNF	7.2	F04	42.0	M5X7	4.21	3.75
1¼"	1"	inch	1.0	0.81	4.25	1.62	13.65	14.34	15.28	11.97	7.68	8.37	9.31	6.0	5.12	7.36	2.71	0.3		0.28		1.65		9.25	8.24
DN40	DN32	mm	26.6	31.8	115.35	48.35	347.55	377.05	404.0	304.0	195.95	225.45	252.4	152.4	139.0	237.0	79.15	8.71	9/16" UNF	8.0	F05	50.0	M6X8	5.22	4.65
1½"	1¼"	inch	1.05	1.25	4.54	1.90	13.68	14.84	15.91	11.97	7.71	8.88	9.94	6.0	5.47	9.29	3.12	0.34		0.31		1.97		11.51	10.25
DN50	DN40	mm	38.15	35.0	127.9	56.3	352.25	381.75	409.0	304.0	200.65	230.15	257.4	152.4	149.45	237.0	90.7	8.71	9/16" UNF	8.5	F05	50.0	M6X8	6.68	6.11
2"	1½"	inch	1.50	1.38	5.04	2.22	13.87	15.03	16.1	11.97	7.90	9.06	10.13	6.0	5.88	9.29	3.57	0.34		0.33		1.97		14.72	13.47

Cryogenic Diverter Bottom Entry Floating Ball

Components & Materials



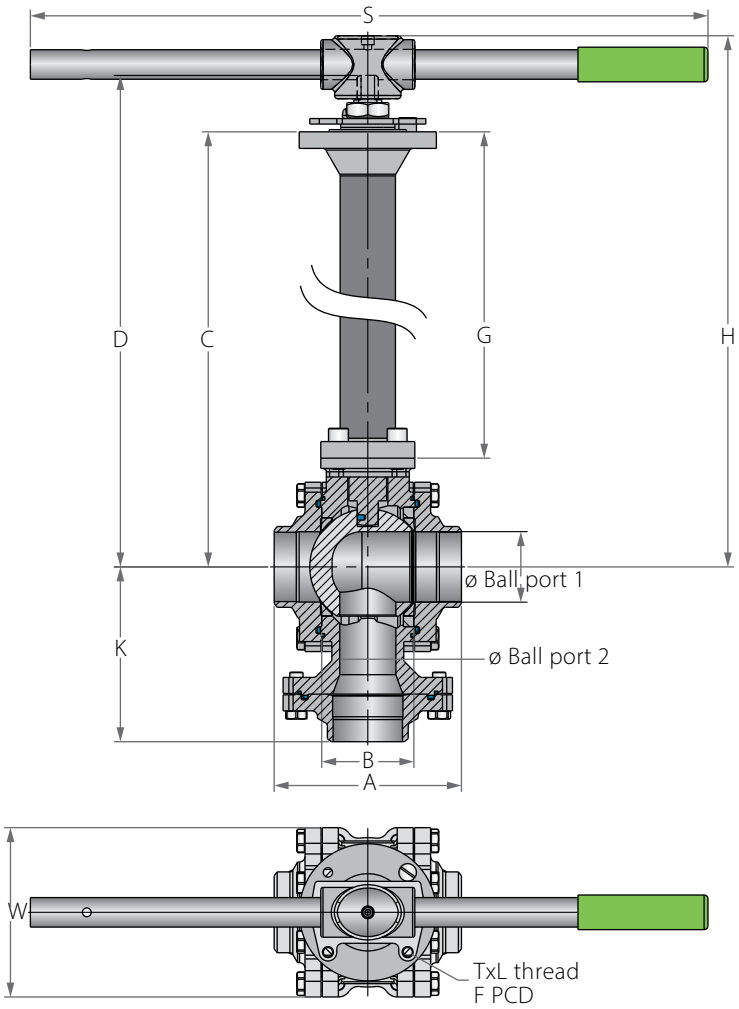
Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	TFM	3
6A*	Secondery Seal	Graphite, TFM	2
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1

Item	Description	Material specifications	Qty.
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	12
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1
24*	Bonnet Seal	TFM	1
24A*	Bonnet Secondery Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	12
30	Dog Tag	S. Steel	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

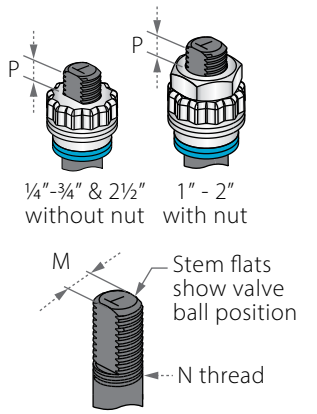
* Maintenance kit components

Cryogenic Diverter Bottom Entry Floating Ball

Valve Dimensions



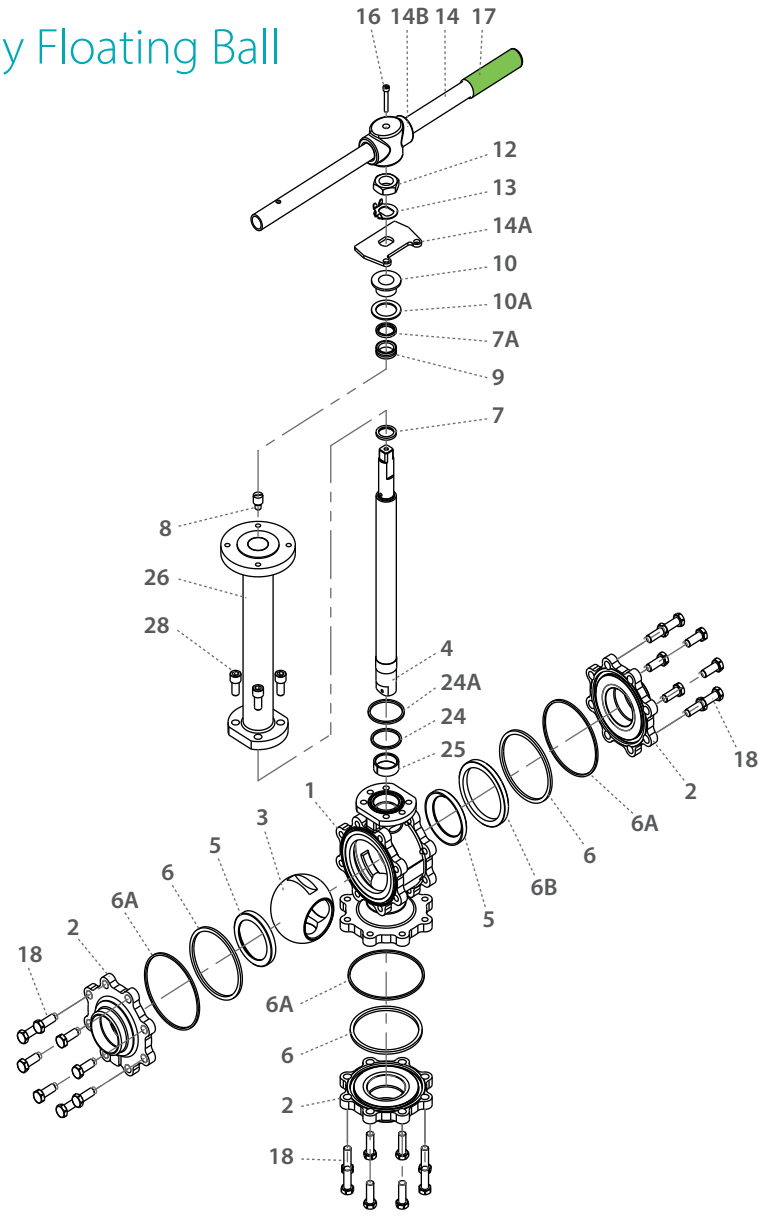
Preparation for actuation



Std. port	Full Port	Unit	Ball port1	Ball port2	A	B	Standard design				6" bonnet				K	S	W	M	N	P	F		TxL	Weight kg/lb	
							C	D	H	G	C	D	H	G										Std.	6"
DN65	DN50	mm	51.0	48.0	157.95	72.55	397.5	439.1	464	327.5	222.4	264.0	288.9	152.4	132.7	400.0	108.0	13.9	M20x2.5	13.15	F07	70.0	M8X8	16	14.5
2½"	2"	inch	2.01	1.89	6.22	2.86	15.65	17.29	18.27	12.89	8.76	10.39	11.37	6.00	5.22	15.79	4.25	0.55		0.52		2.76		35.20	31.90
DN80	DN65	mm	63.75	50.8	169.35	83.25	441.8	488.4	528	343.5	250.7	297.3	336.9	152.4	158.01	610.0	153.0	18.9	1-14"	16.7	F010	102.0	M10X18	24.5	23
3"	2½"	inch	2.51	2.0	6.67	3.28	17.39	19.23	20.79	13.52	9.87	11.70	13.26	6.00	6.22	15.79	6.02	0.74	UNS-2A	0.66		4.02		53.90	50.60

Cryogenic Diverter Bottom Entry Floating Ball

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner seal	TFM	3
6A*	Outer seal	Graphite, TFM	3
6B	Support Ring	S. Steel	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

Item	Description	Material specifications	Qty.
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	24
24*	Bonnet Inner Seal	S. Steel	1
24A*	Bonnet Outer Seal	S. Steel	1
25	Stem Bearing	PTFE	1
26	Bonnet	S. steel 316	1
28	Bonnet Bolt	S. Steel	4

* Maintenance kit components

DC47

Cryogenic Floating Ball Multiport - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
2	0		F	D	C	4	7	W	-	6	6	6	M	A	A	G	/	B	W			-				
Size		Features				Series		Design		Body material	Ends material	Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End connection					Special features			

Size (1-2)		
Code	inch	mm
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80

* Full port only

Features (3-6)	
D	Diverter bottom entry
C	Cryogenic design
F	Fire safe
B	Full port

Series (7-8)	
47	3 Piece Floating

Design (9)	
W	Total HermetiX Integrity package

Body material (11)	
6	S. Steel

End material (12)	
6	S. Steel

Ball material (13)	
6	S. St. 316L

Stem material (14)	
M	High Strength S. Steel
Z	Inconel

Seat material (15)	
A	TFM
C	PCTFE
P	CF PTFE

Inner Seal Material (16)	
A	TFM
G	Expanded graphite

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

Special Features (24-30)	
B	Body made from rolled bar
6.0	Short bonnet
90	90 degrees rotation
180	180 degrees rotation applicable for bottom entry diverter valve L

End connections	
Welded	
BW10	Buttweld schd. 10
BW	Buttweld schd. 40
XBW10	Extended buttweld schd. 10
XBW	Extended buttweld schd. 40
BW5	Buttweld schd. 5
BW80	Buttweld schd. 80
BWO *	Buttweld tube OD
BWD	Buttweld DIN 11860
BWI1.6	buttweld ISO 1127 1.6mm
BWI2.0	buttweld ISO 1127 2.0mm
BWI2.3	buttweld ISO 1127 2.3mm
SW	Socket weld
SWO *	Socket weld tube OD
XBW80	Extended buttweld 80
XSW	Extended socket weld
ETO *	Extended tube OD
ETI1.6	Extended buttweld ISO 1127 1.6mm
ETI2.0	Extended buttweld ISO 1127 2.0mm
ETI2.3	Extended buttweld ISO 1127 2.3mm
ETD	Extended buttweld DIN 11850

* Std. port only

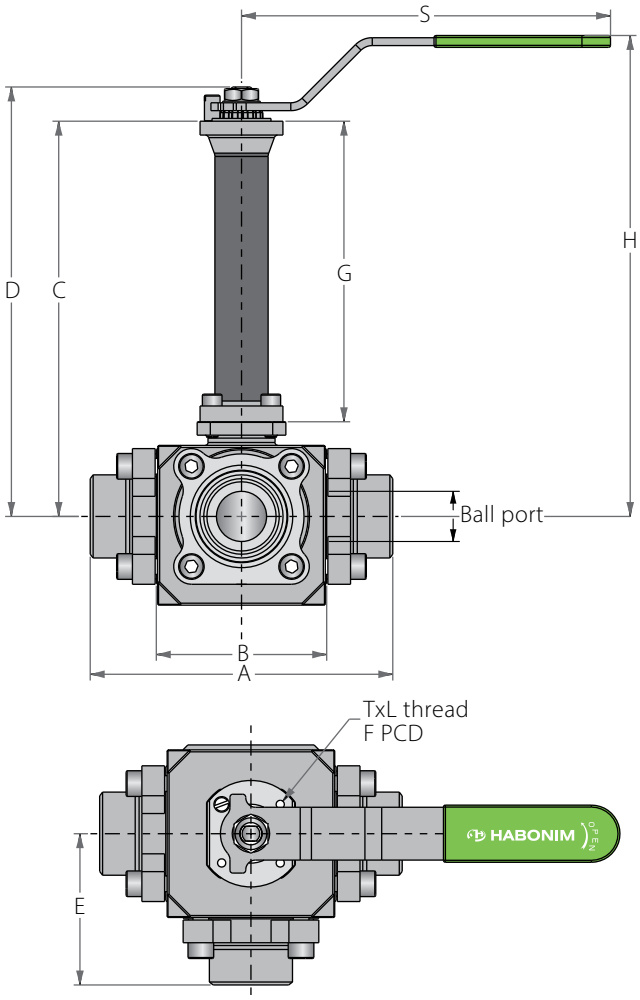
Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
MNPT	Male NPT
BSPT	EN 10226 - Pipe Taper thread
MBSPT	Male BSPT
BSPP	ISO228-1, DIN3852 - Pipe parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	SAE internal straight thread
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF
Clamp	
LL *	Compression fitting (Imperial) - **No** nuts & Ferrules
LM *	Compression fitting (metric) - **No** nuts & Ferrules
LL-NF *	Compression fitting (Imperial) - **with** nuts & Ferrules
LM-NF *	Compression fitting (metric) - **with** nuts & Ferrules
TC *	Tri-Clamp
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

* Std. port only
** Not available for 1¼" (DN32) Valves

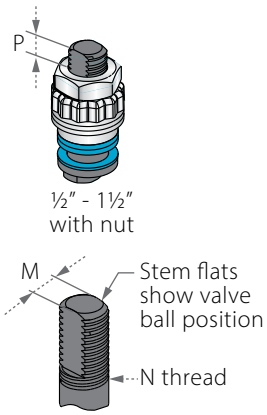


Cryogenic Multiport Floating Ball

Valve Dimensions



Preparation for actuation

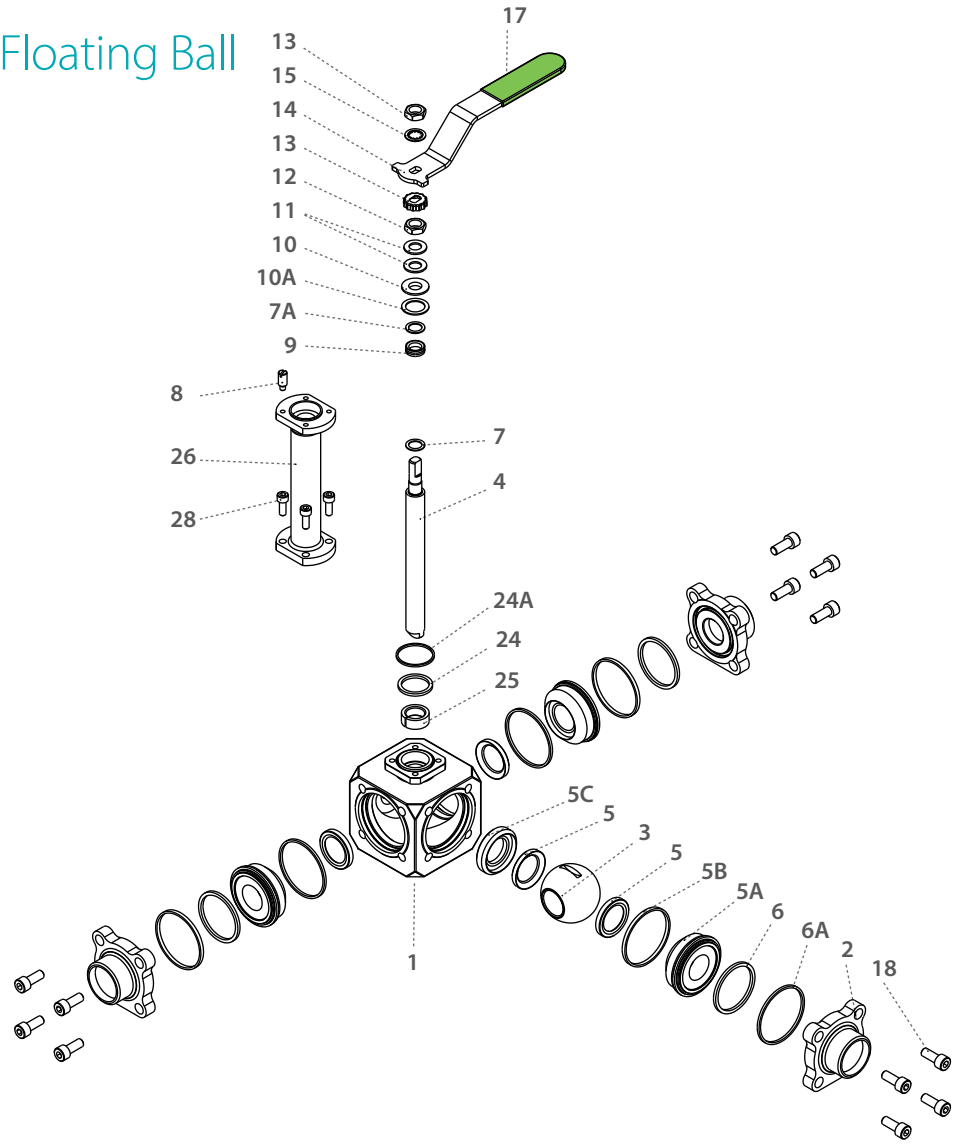


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Ball port	A	B	Standard design				6" bonnet				E	S	M	N	P	TxL	F	PCD	Weight kg/lb	
					C	D	H	G	C	D	H	G									Std.	6"
DN20	DN15	14.3	113.0	67.0	342.1	359.6	384.0	304.0	190.5	208.0	232.0	152.0	A/2	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	3.8	3.3
¾"	½"	0.56	4.45	2.64	13.47	14.16	15.12	11.97	7.50	8.19	9.15	6.0		7.36	0.30		0.23			1.65	8.36	7.26
DN25	DN20	20.6	143.6	81.6	347.0	364.5	389.0	304.0	195.4	212.9	237.0	152.0		187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	5.3	4.8
1"	¾"	0.81	5.65	3.21	13.66	14.35	15.31	11.97	7.69	8.38	9.34	6.0		7.36	0.30		0.23			1.65	11.66	10.56
DN32	DN25	25.4	153.4	86.4	352.0	369.5	394.0	304.0	200.4	217.9	242.0	152.0		187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	7.0	6.5
1¼"	1"	1.0	6.04	3.40	13.86	14.55	15.51	11.97	7.89	8.58	9.54	6.0		7.36	0.30		0.23			1.65	15.4	14.3
DN40	DN32	31.8	164.0	97.0	353.4	382.9	407.0	304.0	201.8	231.3	255.0	152.0		237.0	8.71	9/16" UNF	7.8	M6X9	F05	50.0	9.0	8.5
1½"	1¼"	1.25	6.46	3.82	13.91	15.07	16.02	11.97	7.94	9.11	10.06	6.0		9.33	0.34		0.31			1.97	19.8	18.7

Cryogenic Multiport Floating Ball

Components & Materials



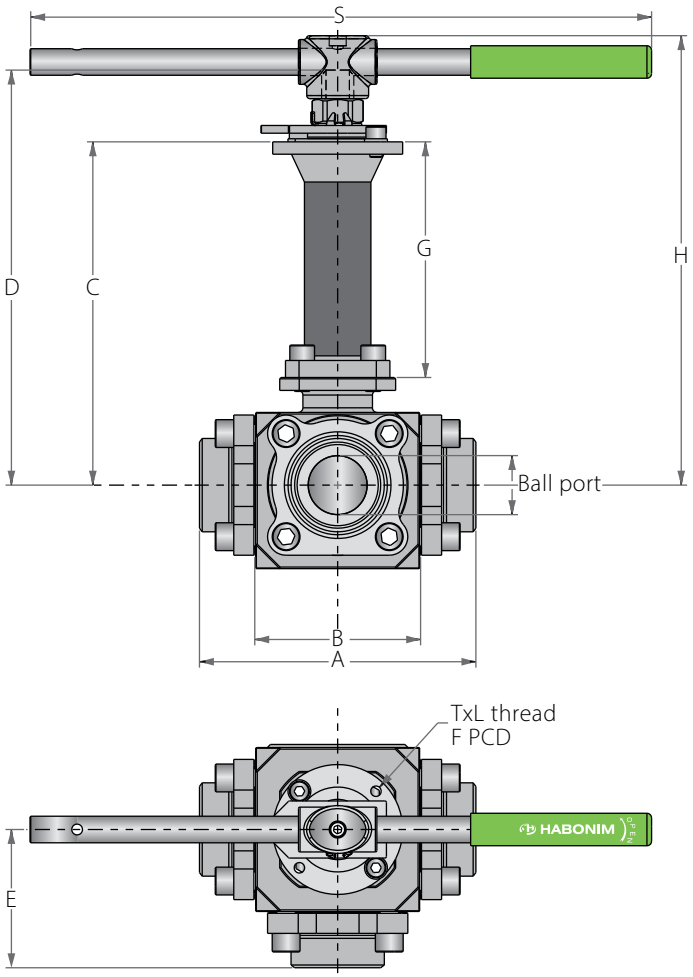
Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support seat	Acc. Ordering Code	3
5B*	Seat Seal	Acc. Ordering Code	3
5C	Back seat support	Acc. Ordering Code	1
6*	Inner seal	Acc. Ordering Code	3
6A	Outer seal	Acc. Ordering Code	3
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1

Item	Description	Material specifications	Qty.
10A	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	12
24*	Bonnet inner seal	Acc. Ordering Code	1
24A*	Bonnet outer seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4

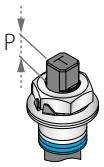
* Maintenance kit components

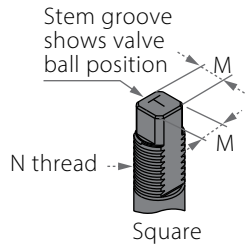
Cryogenic Floating Ball Multiport

Valve Dimensions



Preparation for actuation



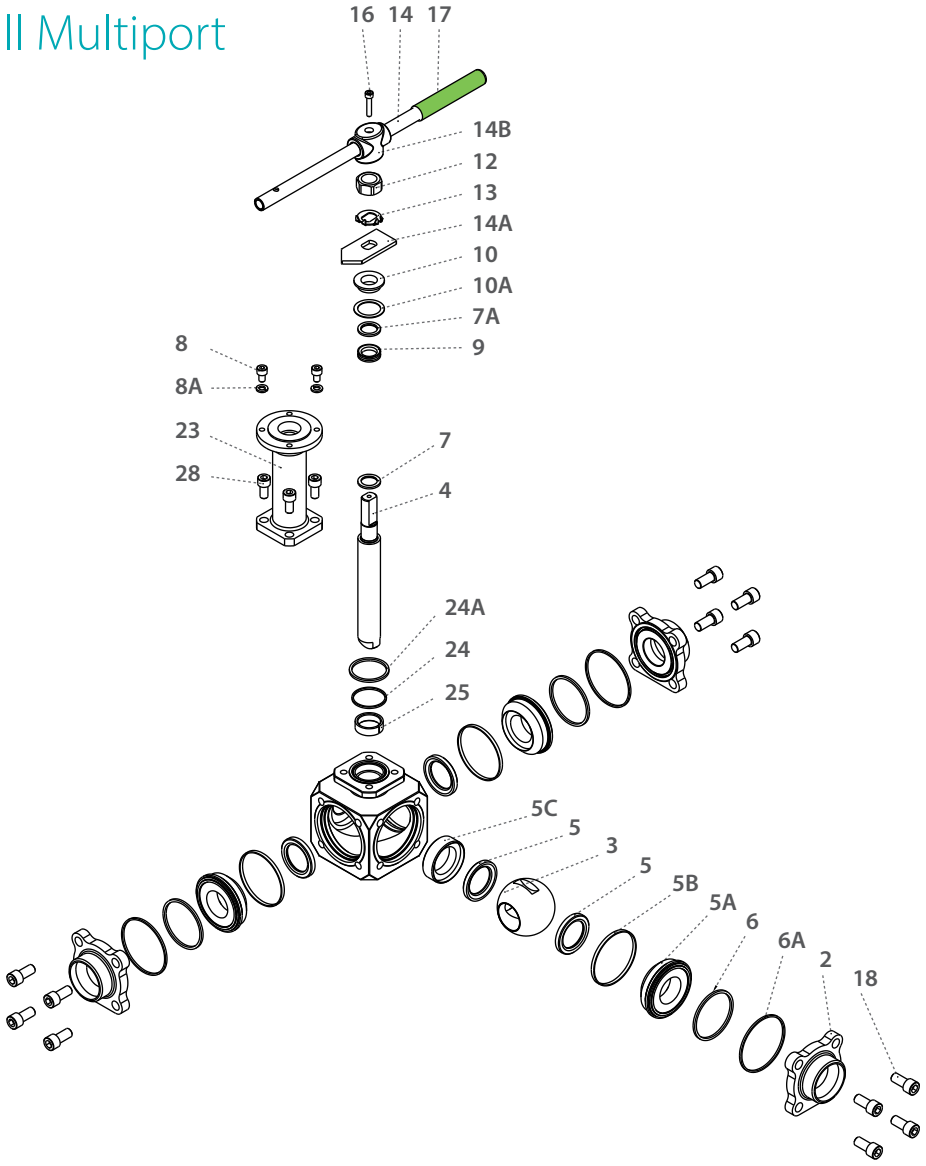


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Ball port	A	B	Standard design				Standard design				E	S	M	N	P	TxL	F	PCV	Weight kg/lb	
					C	D	H	G	C	D	H	G									Std.	6"
DN50	DN40	38.1	177.2	107.2	396.7	438.3	465.0	327.0	187.4	187.4	256.0	152.0	A/2	400.0	13.9	M20x2.5	13.5	M8X10	F07	70.0	16.0	14.5
2"	1½"	1.50	6.98	4.22	15.62	17.26	18.32	12.87	7.38	7.38	10.08	6.0		15.75	0.55		0.53			2.76	35.2	31.9
DN65	DN50	48.0	210.4	125.0	406.1	447.7	475.0	327.0	195.1	195.1	264.0	152.0		400.0	13.9	M20x2.5	13.5	M8X10	F07	70.0	22.5	21.0
2½"	2"	1.89	8.28	4.92	15.99	17.63	18.69	12.87	7.68	7.68	10.38	6.0		15.75	0.55		0.53			2.76	49.5	46.2

Cryogenic Floating Ball Multiport

Components & Materials



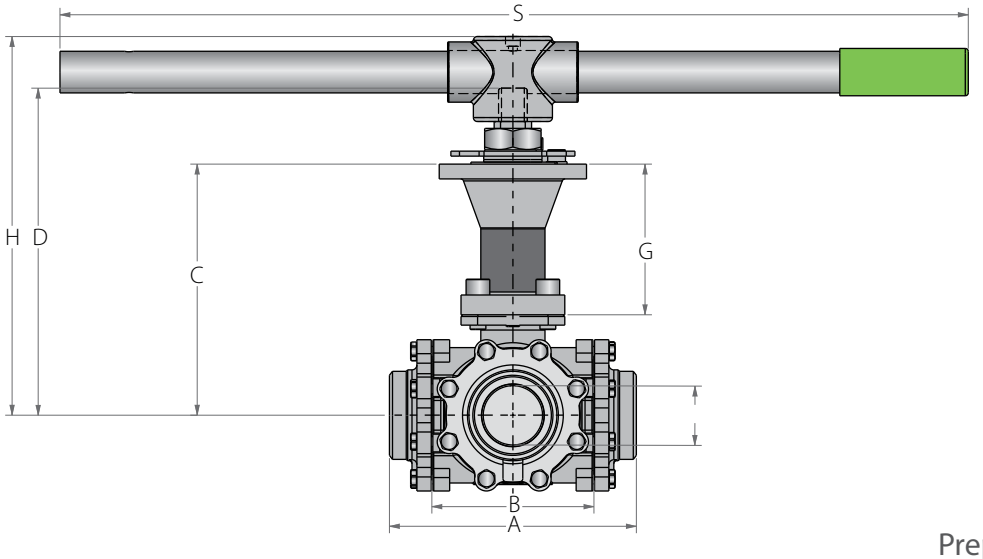
Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	seat Support	Acc. Ordering Code	3
5B*	Seat Seal	Acc. Ordering Code	3
5C	Back seat support	Acc. Ordering Code	1
6*	Inner seal	Acc. Ordering Code	3
6A*	Outer seal	Acc. Ordering Code	3
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	2
8A	Spring washer	S. Steel	2
9*	Stem Seal	TFM	1

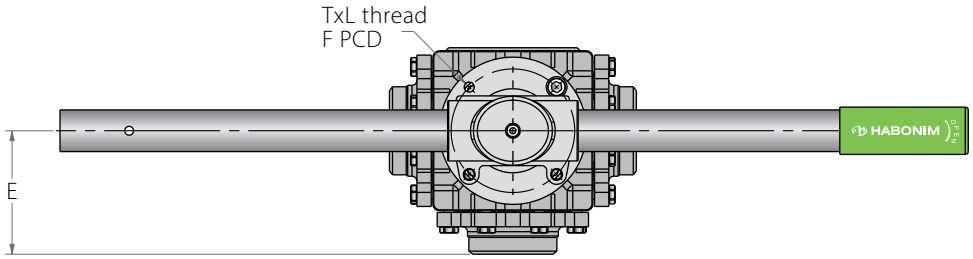
Item	Description	Material specifications	Qty.
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
12	Stem Nut	S. Steel	1
13	Locking clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body bolts	S. Steel	12
24*	Bonnet inner seal	Acc. Ordering Code	1
24A*	Bonnet outer seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4

* Maintenance kit components

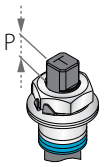
Cryogenic Floating Ball Multiport

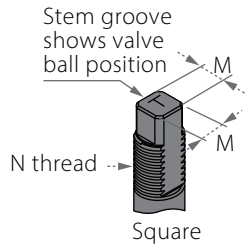
Valve Dimensions





Preparation for actuation



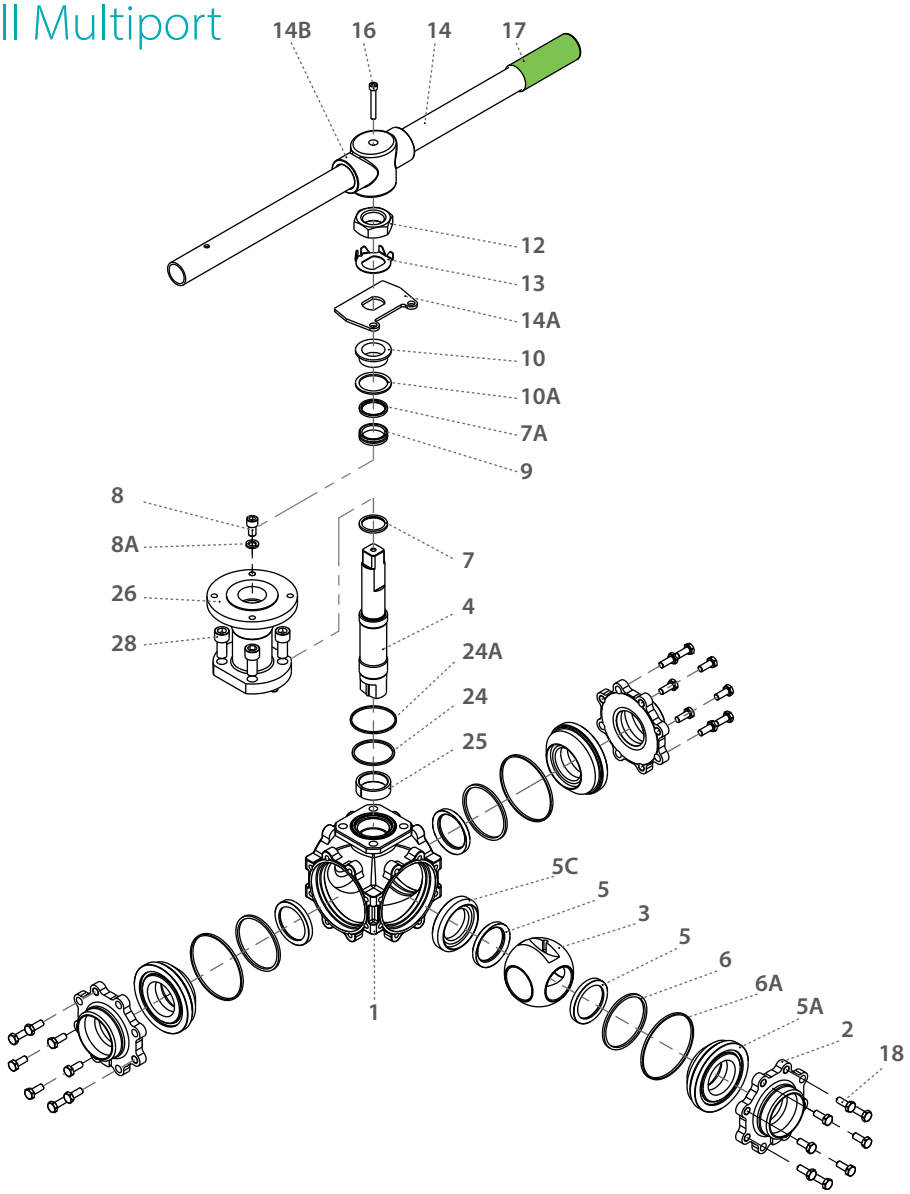


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				E	S	M	M DD	N	P	F		TxL	Weight kg/lb	
						C	D	H	G	C	D	H	G											Std.	6"
DN80	DN65	mm	60.0	249.8	164.0	486.75	555.85	624.65	254.15	244.43	323.25	274.5	152.4	124.9	916.0	28.45	23.75	1½"-12 UNF-2A	26.2	F12	125	M12X15	42.4	41.2
3"	2½"	inch	2.36	9.83	6.46	19.16	21.88	24.59	10.01	9.62	12.73	10.8	6.0	4.91	36.0	1.12	0.94		1.03		4.92		93.45	90.8
DN100	DN80	mm	76.0	309.8	205.0	519.5	588.6	624.65	286.9	257.13	356.0	274.5	152.4	154.9	916.0	28.45	23.75	1½"-12 UNF-2A	26.2	F12	125	M12X15	66.4	65.2
4"	3"	inch	2.99	12.2	8.07	20.45	23.17	24.59	11.3	10.12	14.02	10.8	6.0	11.1	36.0	1.12	0.94		1.03		4.92		146.35	143.7

Cryogenic Floating Ball Multiport

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Seat Housing	S. Steel	3
5B*	Seat Seal	PTFE, Graphite	3
5C	Seat Support	A479 316/316L, B574 N06022, Bronze RG5	1
6*	Body Seal	PTFE, Graphite	3
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2

Item	Description	Material specifications	Qty.
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14**	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	32
18A	Spring Washer	S. Steel	32
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Seal	PTFE, Graphite	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

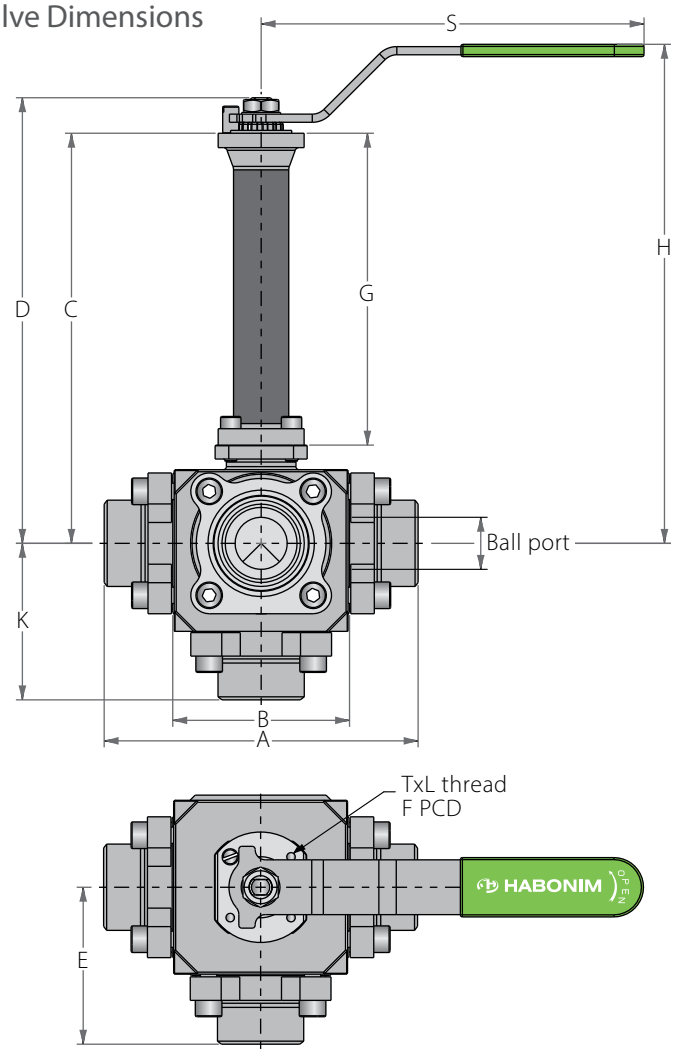
* Maintenance kit components

** Gear operator should be used for size 3" DN80 and above (handle components are not included)

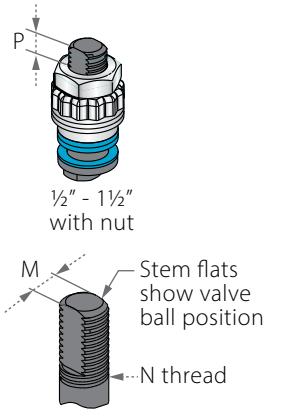
DC61 ¾"-1½" | DN20-DN40 | CLASS 600

Cryogenic Multiport Floating Ball

Valve Dimensions



Preparation for actuation

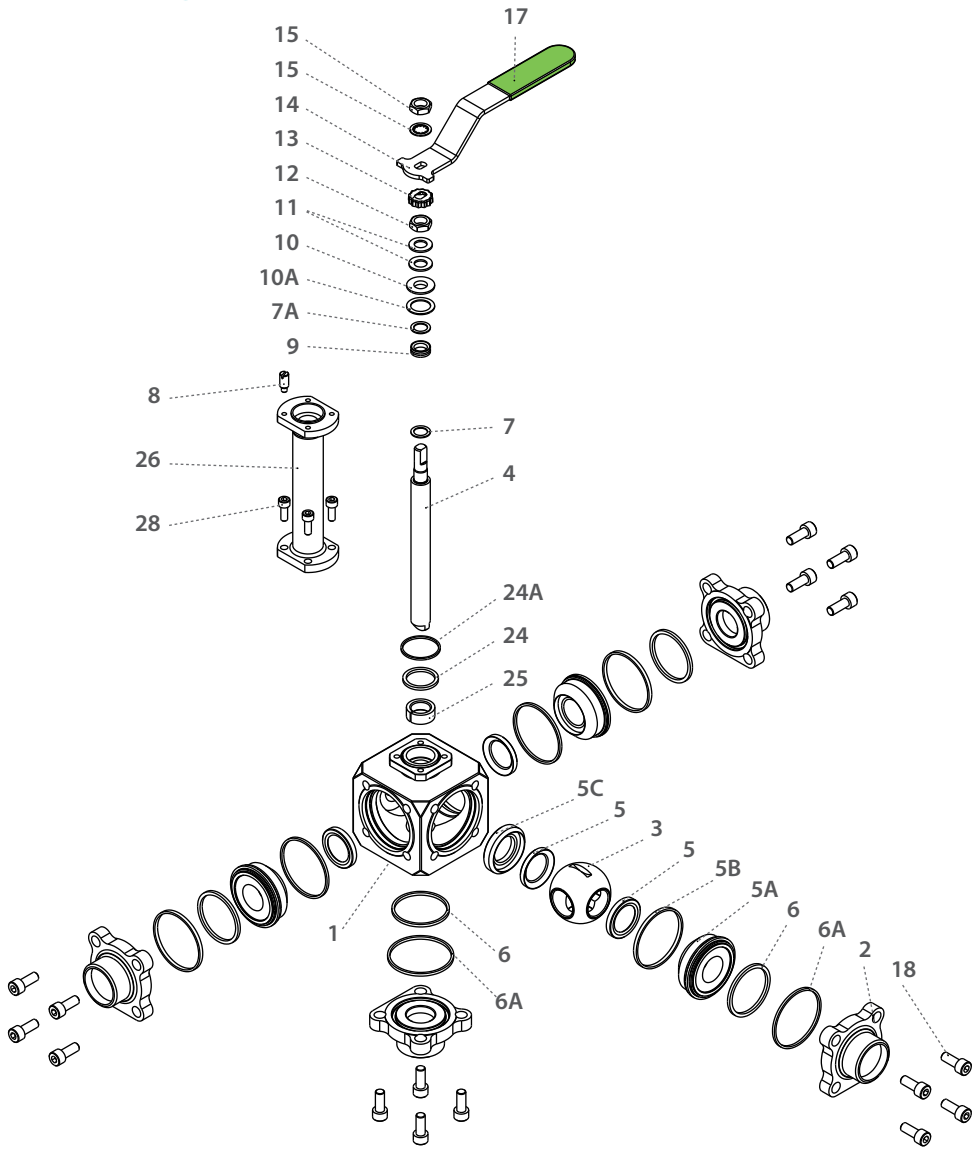


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				E	S	M	N	P	TxL	F	PCD	Weight kg/lb	
						C	D	H	G	C	D	H	G									Std.	6"
DN20	DN15	mm	14.3	113.0	67.0	342.1	359.6	384.0	304.0	190.5	208.0	232.0	152.0	A/2	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	3.8	3.3
¾"	½"	inch	0.56	4.45	2.64	13.47	14.16	15.12	11.97	7.50	8.19	9.15	6.0		7.36	0.30		0.23			1.65	8.36	7.26
DN25	DN20	mm	20.6	143.6	81.6	347.0	364.5	389.0	304.0	195.4	212.9	237.0	152.0		187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	5.3	4.8
1"	¾"	inch	0.81	5.65	3.21	13.66	14.35	15.31	11.97	7.69	8.38	9.34	6.0		7.36	0.30		0.23			1.65	11.66	10.56
DN32	DN25	mm	25.4	153.4	86.4	352.0	369.5	394.0	304.0	200.4	217.9	242.0	152.0		187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	7.0	6.5
1¼"	1"	inch	1.0	6.04	3.40	13.86	14.55	15.51	11.97	7.89	8.58	9.54	6.0		7.36	0.30		0.23			1.65	15.4	14.3
DN40	DN32	mm	31.8	164.0	97.0	353.4	382.9	407.0	304.0	201.8	231.3	255.0	152.0		237.0	8.71	9/16" UNF	7.8	M6X9	F05	50.0	9.0	8.5
1½"	1¼"	inch	1.25	6.46	3.82	13.91	15.07	16.02	11.97	7.94	9.11	10.06	6.0		9.33	0.34		0.31			1.97	19.8	18.7

Cryogenic Multiport Floating Ball

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	4
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support seat	Acc. Ordering Code	3
5B*	Seat Seal	Acc. Ordering Code	3
5C	Back seat support	Acc. Ordering Code	1
6*	Inner seal	Acc. Ordering Code	4
6A*	Outer seal	Acc. Ordering Code	4
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1

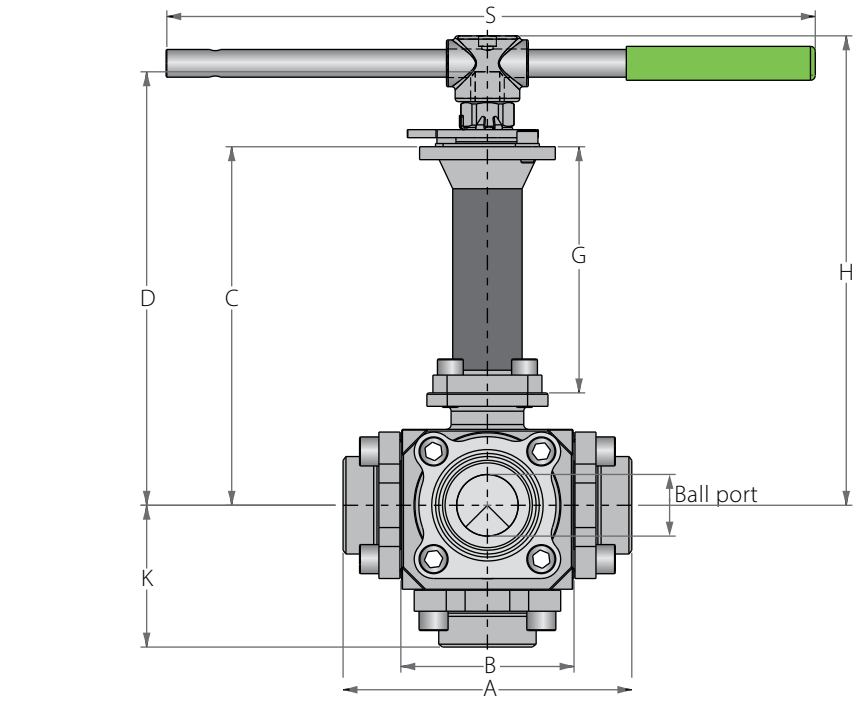
Item	Description	Material specifications	Qty.
10A	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body bolts	S. Steel	16
24*	Bonnet inner seal	Acc. Ordering Code	1
24A*	Bonnet outer seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4

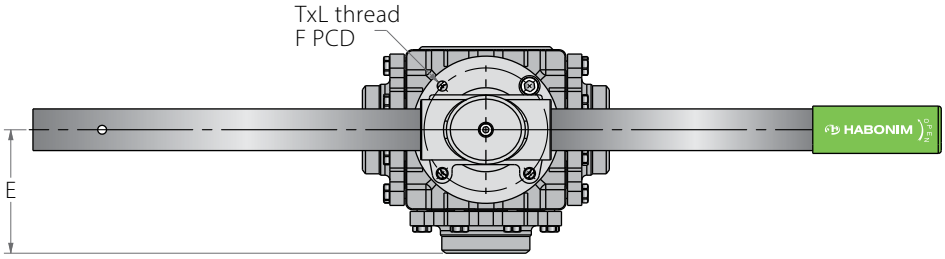
* Maintenance kit components

DC61 2"-2½" | DN50-DN65 | CLASS 300

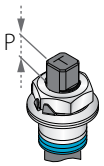
Cryogenic Floating Ball Multiport

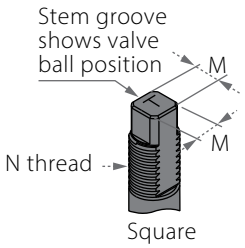
Valve Dimensions





Preparation for actuation



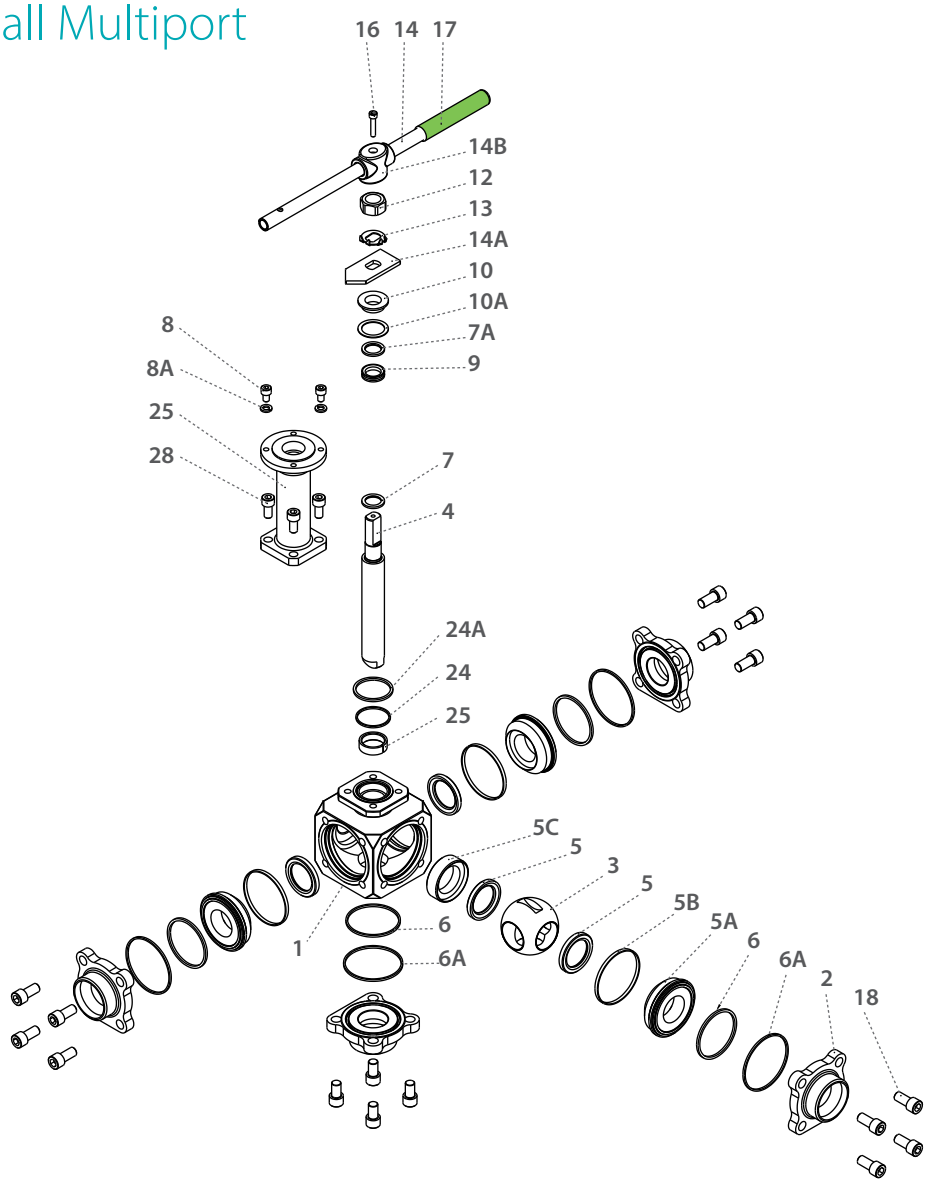


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				Standard design				E	S	M	N	P	TxL	F	PCV	Weight kg/lb	
						C	D	H	G	C	D	H	G									Std.	6"
DN50	DN40	mm	38.1	177.2	107.2	396.7	438.3	465.0	327.0	187.4	187.4	256.0	152.0	A/2	400.0	13.9	M20x2.5	13.5	M8X10	F07	70.0	16.0	14.5
2"	1½"	inch	1.50	6.98	4.22	15.62	17.26	18.32	12.87	7.38	7.38	10.08	6.0		15.75	0.55		0.53			2.76	35.2	31.9
DN65	DN50	mm	48.0	210.4	125.0	406.1	447.7	475.0	327.0	195.1	195.1	264.0	152.0		400.0	13.9	M20x2.5	13.5	M8X10	F07	70.0	22.5	21.0
2½"	2"	inch	1.89	8.28	4.92	15.99	17.63	18.69	12.87	7.68	7.68	10.38	6.0		15.75	0.55		0.53			2.76	49.5	46.2

Cryogenic Floating Ball Multiport

Components & Materials



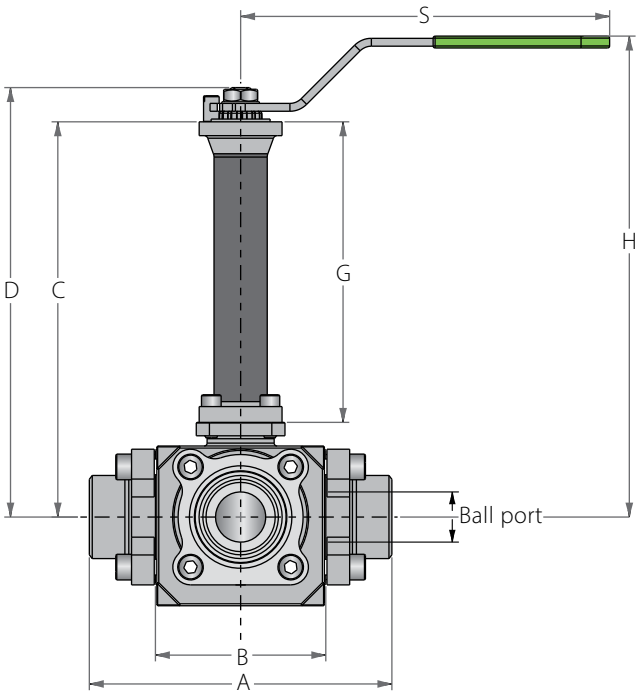
Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	4
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Seat Support	Acc. Ordering Code	3
5B*	Seat Seal	Acc. Ordering Code	3
5C	Back Seat Support	Acc. Ordering Code	1
6*	Inner Seal	Acc. Ordering Code	4
6A*	Outer Seal	Acc. Ordering Code	4
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	2
8A	Spring Washer	S. Steel	2
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1

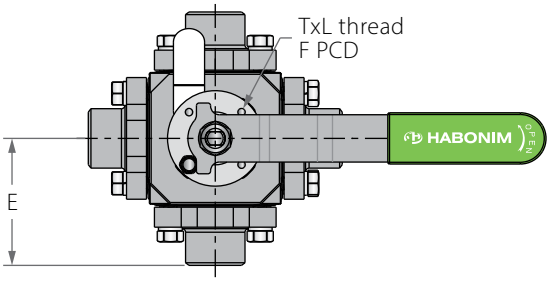
Item	Description	Material specifications	Qty.
10A*	Slide Bearing	S. Steel	1
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16
24*	Bonnet Inner Seal	Acc. Ordering Code	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4

* Maintenance kit components

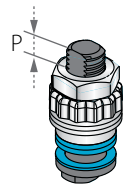
Cryogenic Multiport Floating Ball

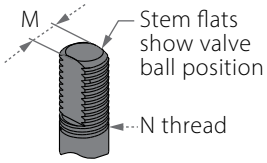
Valve Dimensions





Preparation for actuation



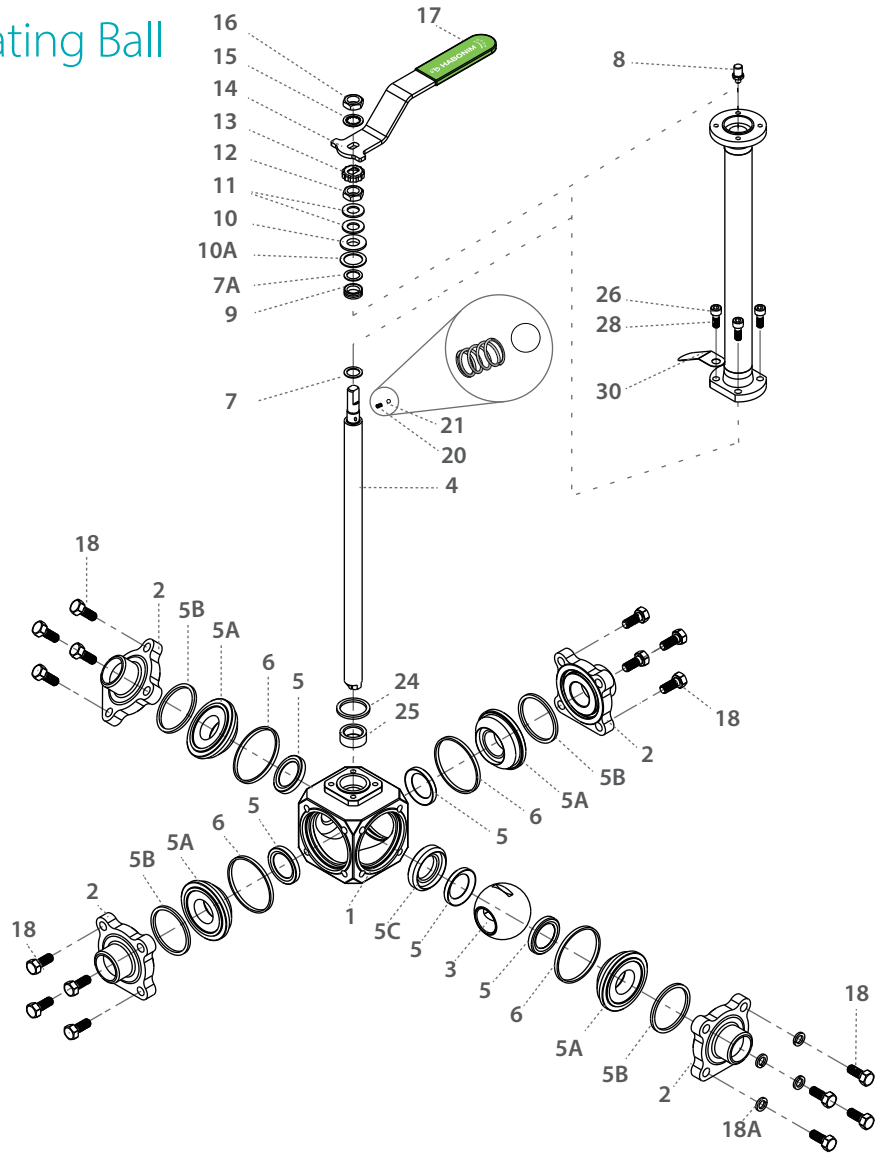


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				E	S	M	N	P	TxL	F	PCD	Weight kg/lb	
						C	D	H	G	C	D	H	G									Std.	6"
DN20	DN15	mm	14.3	113.0	67.0	342.1	359.6	384.0	304.0	190.5	208.0	232.0	152.0	A/2	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42	3.8	3.3
¾"	½"	inch	0.56	4.45	2.64	13.47	14.16	15.12	11.97	7.50	8.19	9.15	6.0		7.36	0.30		0.23			1.65	8.36	7.26
DN25	DN20	mm	20.6	143.6	81.6	347.0	364.5	389.0	304.0	195.4	212.9	237.0	152.0		187	7.54	7/16" UNF	5.8	M5X8	F04	42	5.3	4.8
1"	¾"	inch	0.81	5.65	3.21	13.66	14.35	15.31	11.97	7.69	8.38	9.34	6.0		7.36	0.30		0.23			1.65	11.66	10.56
DN32	DN25	mm	25.4	153.4	86.4	352.0	369.5	394.0	304.0	200.4	217.9	242.0	152.0		187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	7.0	6.5
1¼"	1"	inch	1.0	6.04	3.40	13.86	14.55	15.51	11.97	7.89	8.58	9.54	6.0		7.36	0.30		0.23			1.65	15.4	14.3
DN40	DN32	mm	31.8	164.0	97.0	353.4	382.9	407.0	304.0	201.8	231.3	255.0	152.0		237.0	8.71	9/16" UNF	7.8	M6X9	F05	50.0	9.0	8.5
1½"	1¼"	inch	1.25	6.46	3.82	13.91	15.07	16.02	11.97	7.94	9.11	10.06	6.0		9.33	0.34		0.31			1.97	19.8	18.7

Cryogenic Multiport Floating Ball

Components & Materials



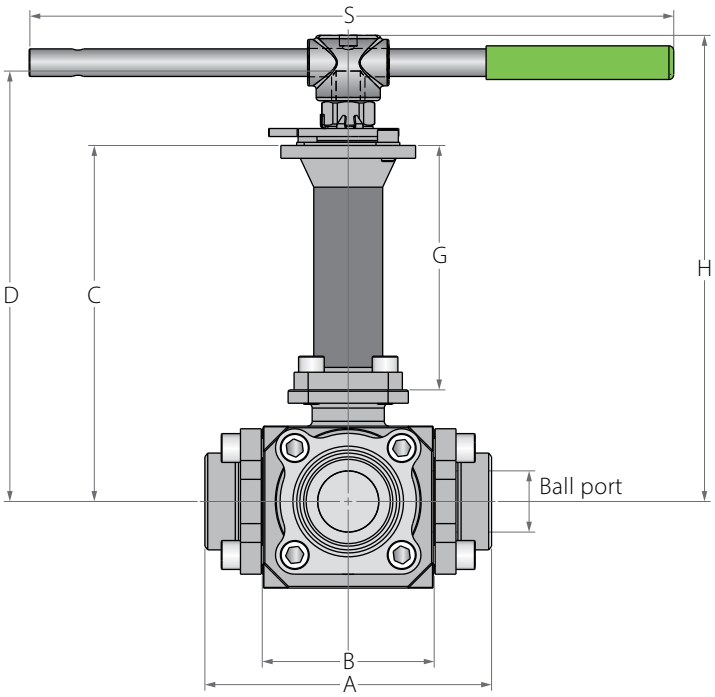
Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	3/4**
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4/5**
5A	Seat Housing	S. Steel	3/4**
5B*	Seat Seal	PTFE, Graphite	3/4**
5C	Seat Support	A479 316/316L, B574 N06022, Bronze RG5	1
6*	Body Seal	PTFE, Graphite	3/4**
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2

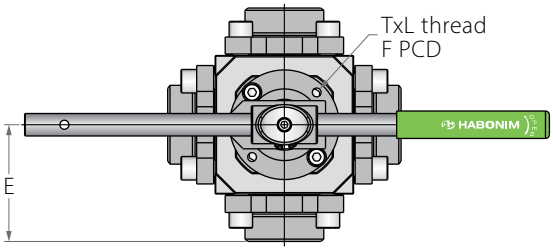
Item	Description	Material specifications	Qty.
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	16
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1
24*	Bonnet Seal	PTFE, Graphite	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

* Maintenance kit components

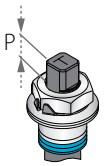
Cryogenic Floating Ball Multiport

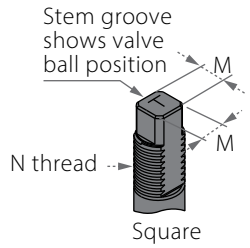
Valve Dimensions





Preparation for actuation



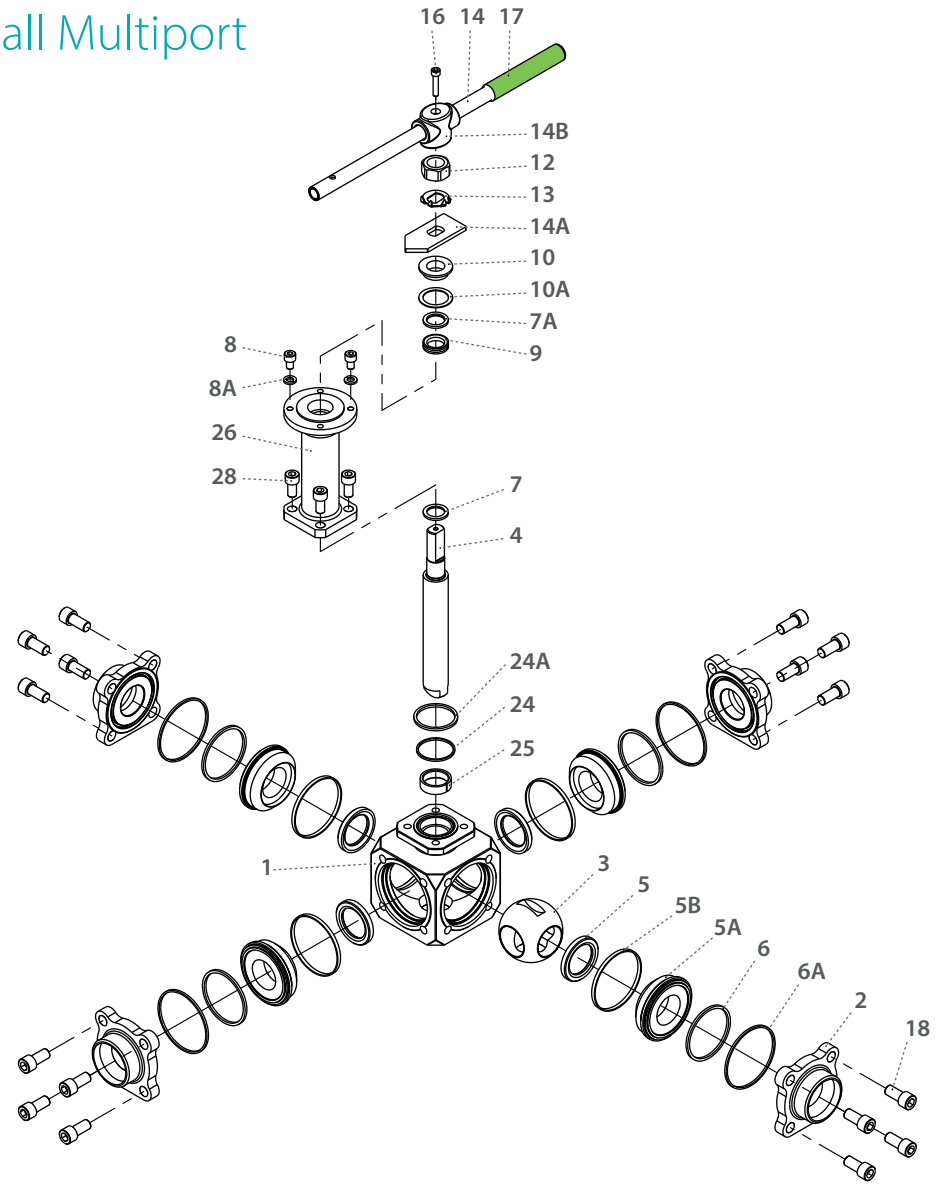


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				E	S	M	N	P	TxL	F	PCD	Weight kg/lb	
						C	D	H	G	C	D	H	G									Std.	6"
DN50	DN40	mm	38.1	177.2	107.2	396.7	438.3	465.0	327.0	187.4	187.4	256.0	152.0	A/2	400.0	13.9	M20x2.5	13.5	M8X10	F07	70.0	16.0	14.5
2"	1½"	inch	1.50	6.98	4.22	15.62	17.26	18.32	12.87	7.38	7.38	10.08	6.0		15.75	0.55		0.53			2.76	35.2	31.9
DN65	DN50	mm	48.0	210.4	125.0	406.1	447.7	475.0	327.0	195.1	195.1	264.0	152.0		400.0	13.9	M20x2.5	13.5	M8X10	F07	70.0	22.5	21.0
2½"	2"	inch	1.89	8.28	4.92	15.99	17.63	18.69	12.87	7.68	7.68	10.38	6.0		15.75	0.55		0.53			2.76	49.5	46.2

Cryogenic Floating Ball Multiport

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Seat Housing	S. Steel	3
5B*	Seat Seal	PTFE, Graphite	3
5C	Seat Support	A479 316/316L, B574 N06022, Bronze RG5	1
6*	Body Seal	PTFE, Graphite	3
7*	Stem Thrust Seal	PCTFE	1
7a*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2

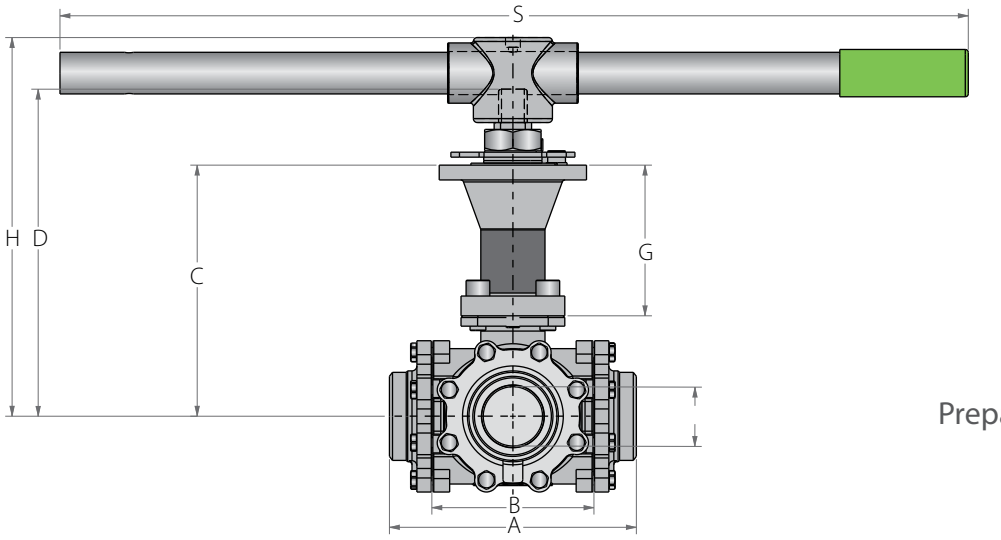
Item	Description	Material specifications	Qty.
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14**	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	16
18A	Spring Washer	S. Steel	16
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Seal	PTFE, Graphite	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

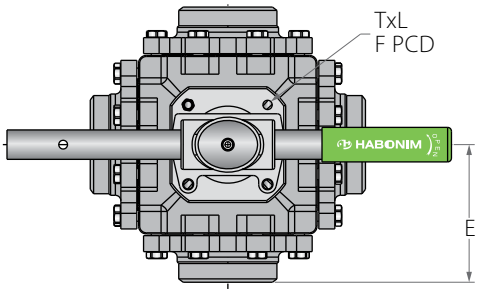
* Maintenance kit components

** Gear operator should be used for size 3" DN80 and above (handle components are not included)

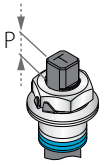
Cryogenic Floating Ball Multiport

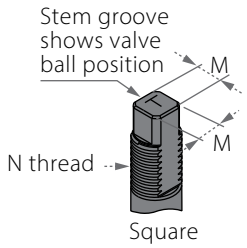
Valve Dimensions





Preparation for actuation



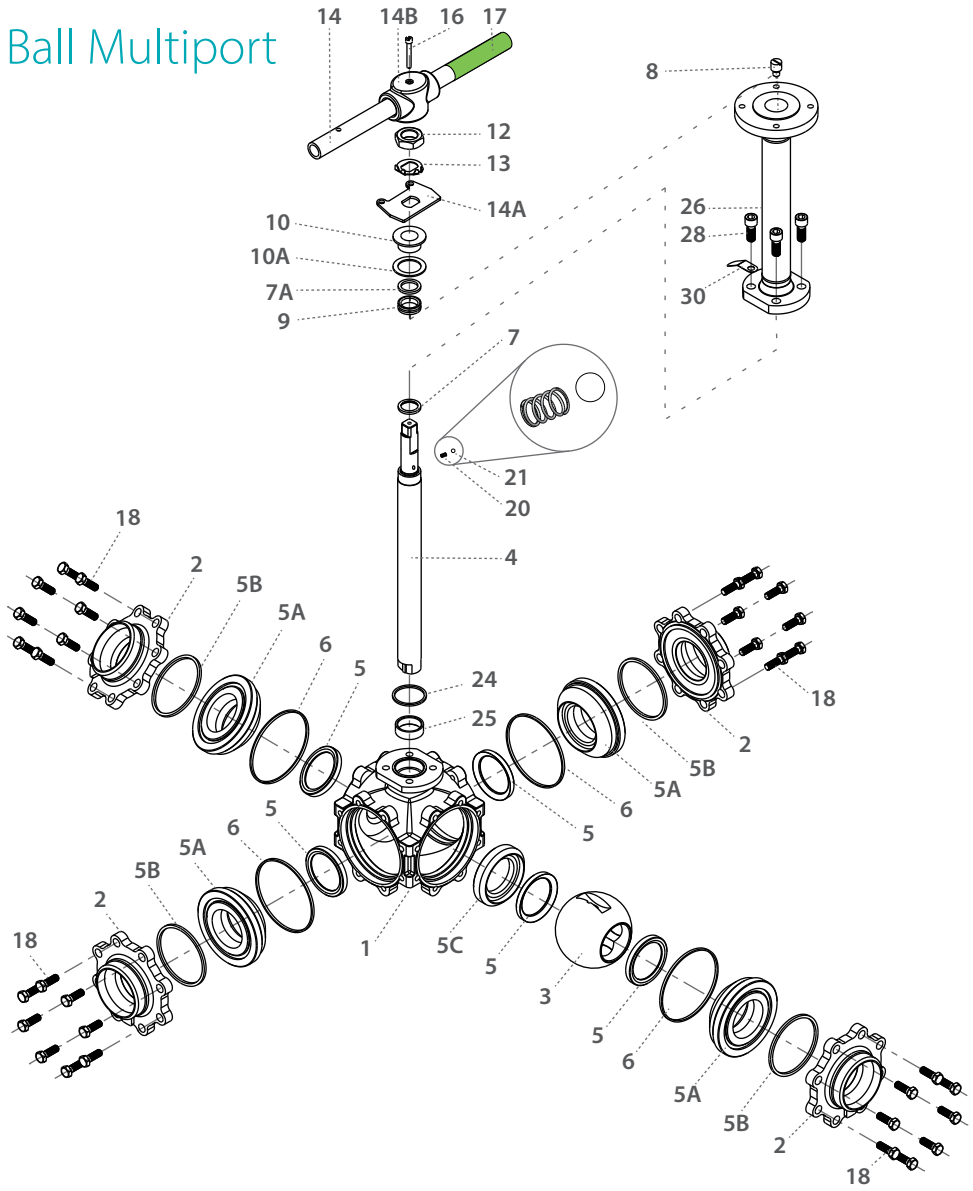


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				E	S	M	M DD	N	P	F		TxL	Weight kg/lb	
						C	D	H	G	C	D	H	G											Std.	6"
DN80	DN65	mm	60.0	249.8	164.0	486.75	555.85	624.65	254.15	244.43	323.25	274.5	152.4	124.9	916.0	28.45	23.75	1-½"-12 UNF-2A	26.2	F12	125.0	M12X15	42.4	41.2
3"	2½"	inch	2.36	9.83	6.46	19.16	21.88	24.59	10.01	9.62	12.73	10.8	6.0	4.91	36.0	1.12	0.94		1.03		4.92		93.45	90.8
DN100	DN80	mm	76.0	309.8	205.0	519.5	588.6	624.65	286.9	257.13	356.0	274.5	152.4	154.9	916.0	28.45	23.75	1-½"-12 UNF-2A	26.2	F12	125.0	M12X15	66.4	65.2
4"	3"	inch	2.99	12.2	8.07	20.45	23.17	24.59	11.3	10.12	14.02	10.8	6.0	11.1	36.0	1.12	0.94		1.03		4.92		146.35	143.7

Cryogenic Floating Ball Multiport

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Seat Housing	S. Steel	3
5B*	Seat Seal	PTFE, Graphite	3
5C	Seat Support	A479 316/316L, B574 N06022, Bronze RG5	1
6*	Body Seal	PTFE, Graphite	3
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2

Item	Description	Material specifications	Qty.
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14**	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	32
18A	Spring Washer	S. Steel	32
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Seal	PTFE, Graphite	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

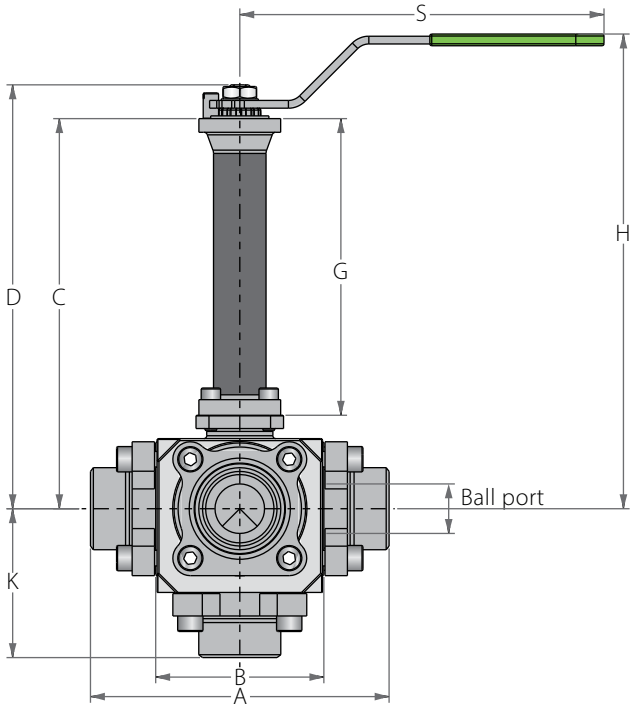
* Maintenance kit components

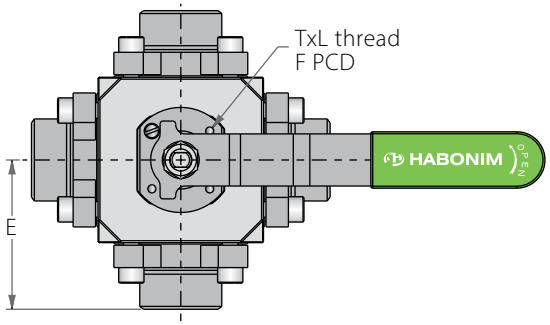
** Gear operator should be used for size 3" DN80 and above (handle components are not included)

DC62 ¾"-1½" | DN20-DN40 | CLASS 600

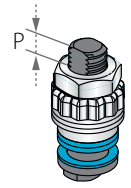
Cryogenic Multiport Floating Ball

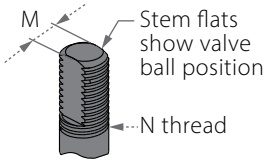
Valve Dimensions





Preparation for actuation



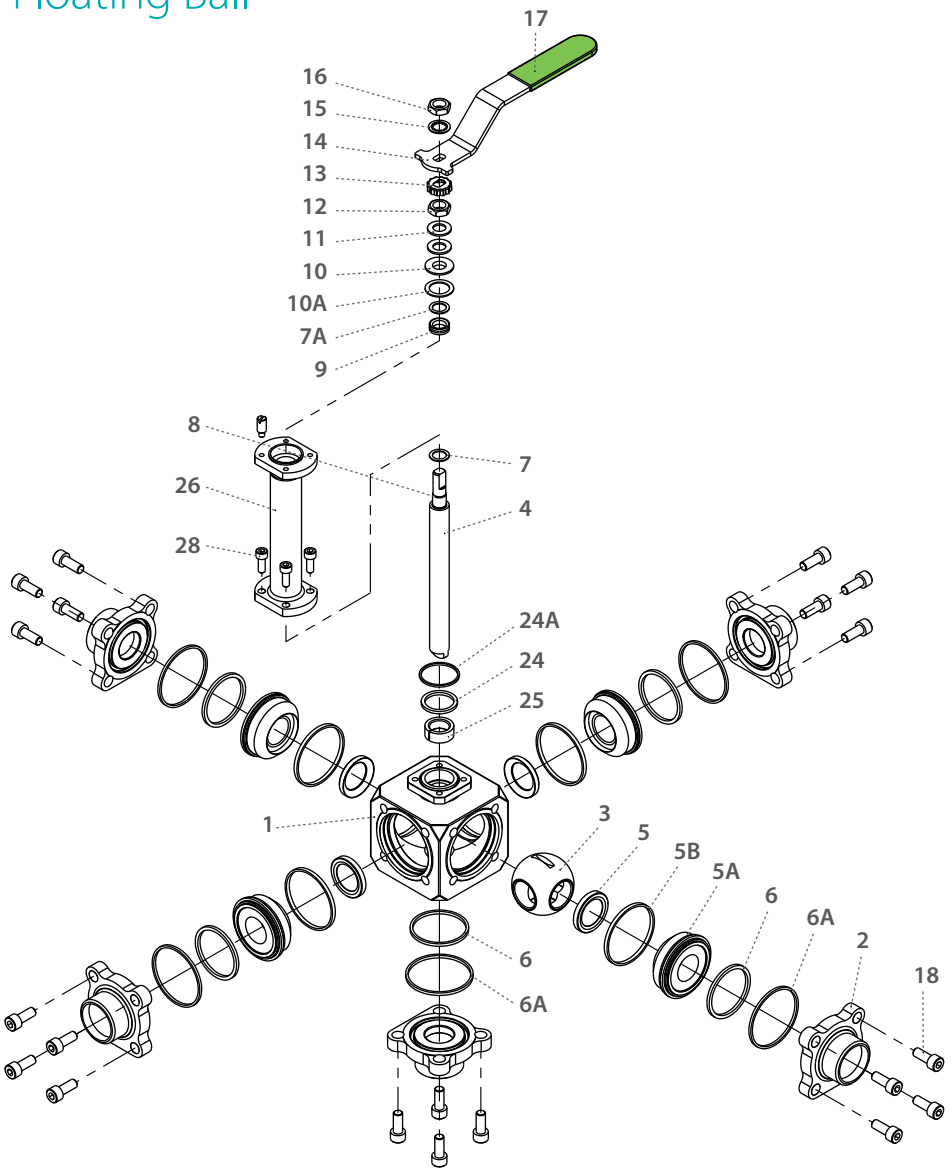


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				E	K	S	M	N	P	TxL	F	PCD	Weight kg/lb	
						C	D	H	G	C	D	H	G											Std.	6"
DN20	DN15	mm	14.3	113.0	67.0	342.1	359.6	384.0	304.0	190.5	208.0	232.0	152.0	A/2	52.7	187	7.54	7/16" UNF	5.8	M5X8	F04	42.0	3.8	3.3
¾"	½"	inch	0.56	4.45	2.64	13.47	14.16	15.12	11.97	7.50	8.19	9.15	6.0		2.07	7.36	0.30		0.23			1.65	8.36	7.26
DN25	DN20	mm	20.6	143.6	81.6	347.0	364.5	389	304	195.4	212.9	237.0	152		66.2	187	7.54	7/16" UNF	5.8	M5X8	F04	42.0	5.3	4.8
1"	¾"	inch	0.81	5.65	3.21	13.66	14.35	15.31	11.97	7.69	8.38	9.34	6.0		2.61	7.36	0.30		0.23			1.65	11.66	10.56
DN32	DN25	mm	25.4	153.4	86.4	352.0	369.5	394.0	304.0	200.4	217.9	242.0	152		76.5	187	7.54	7/16" UNF	5.8	M5X8	F04	42.0	7.0	6.5
1¼"	1"	inch	1.0	6.04	3.40	13.86	14.55	15.51	11.97	7.89	8.58	9.54	6.0		3.01	7.36	0.30		0.23			1.65	15.4	14.3
DN40	DN32	mm	31.8	164	97.0	353.4	382.9	407.0	304.0	201.8	231.3	255.0	152		79.5	237.0	8.71	9/16" UNF	7.8	M6X9	F05	50.0	9.0	8.5
1½"	1¼"	inch	1.25	6.46	3.82	13.91	15.07	16.02	11.97	7.94	9.11	10.06	6.0		3.13	9.33	0.34		0.31			1.97	19.8	18.7

Cryogenic Multiport Floating Ball

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner seal	Acc. Ordering Code	5
6A*	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1

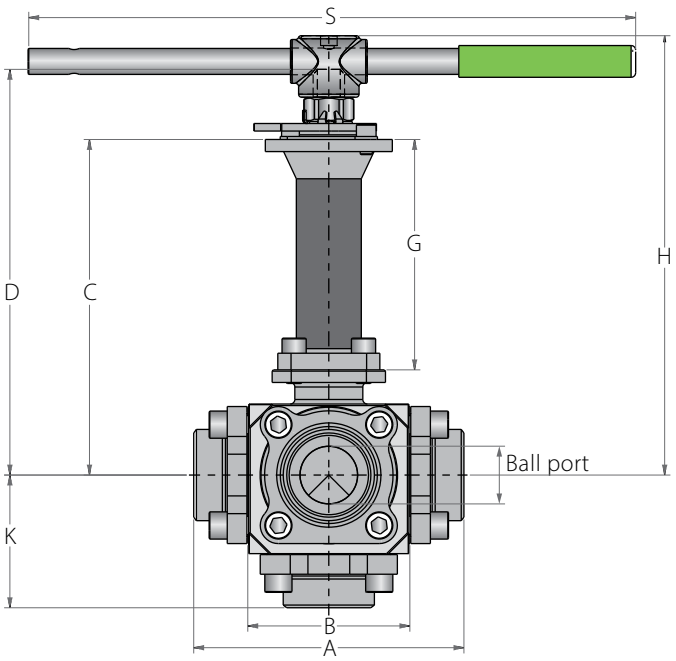
Item	Description	Material specifications	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	20
24*	Bonnet Inner Seal	Acc. Ordering Code	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4

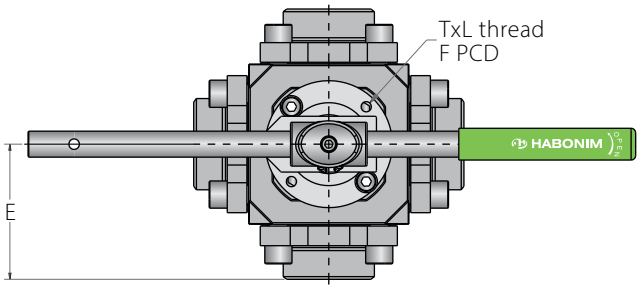
* Maintenance kit components

DC62 2"-2½" | DN50-DN65 | CLASS 300

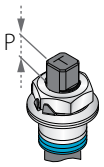
Cryogenic Floating Ball Multiport

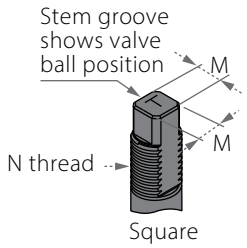
Valve Dimensions





Preparation for actuation



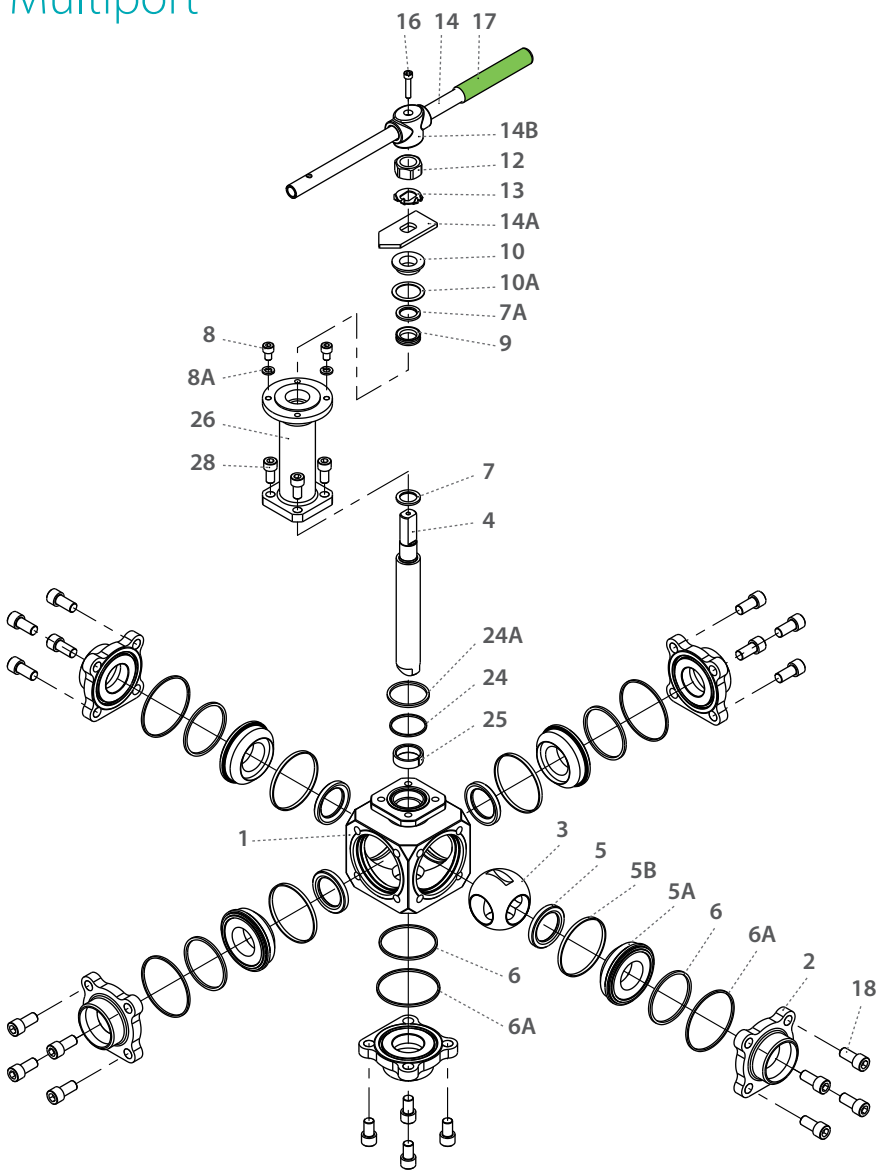


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	Standard design				6" bonnet				E	K	S	M	N	P	TxL	F	PCD	Weight kg/lb	
						C	D	H	G	C	D	H	G											Std.	6"
DN50	DN40	mm	38.1	177.2	107.2	396.7	438.3	465.0	327.0	187.4	187.4	256.0	152.0	A/2	87.0	400.0	13.9	M20x2.5	13.5	M8X10	F07	70.0	16.0	14.5
2"	1½"	inch	1.50	6.98	4.22	15.62	17.26	18.32	12.87	7.38	7.38	10.08	6.0		3.43	15.75	0.55		0.53			2.76	35.2	31.9
DN65	DN50	mm	48.0	210.4	125	406.1	447.7	475.0	327.0	195.1	195.1	264.0	152.0		100.7	400.0	13.9	M20x2.5	13.5	M8X10	F07	70.0	22.5	21.0
2½"	2"	inch	1.89	8.28	4.92	15.99	17.63	18.69	12.87	7.68	7.68	10.38	6.0		3.96	15.75	0.55		0.53			2.76	49.5	46.2

Cryogenic Floating Ball Multiport

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner Seal	Acc. Ordering Code	5
6A*	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	2
8A	Spring Washer	S. Steel	2
9	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2

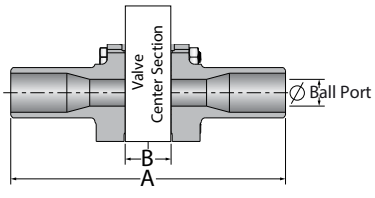
Item	Description	Material specifications	Qty.
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	20
18A	Spring Washer	S. Steel	20
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	Acc. Ordering Code	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4

C61 C62 DC61 DC62

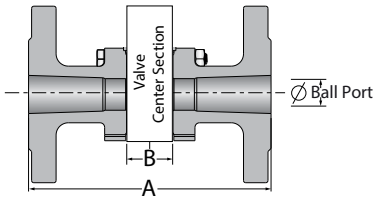
Face To Face Sizes

Valve Size	B		A-XBW / ETI / ETD / GR		A-ETO	A-Flanged CLASS 150+300		A-Flanged CLASS 600		A-Flanged DIN		A-TC
	Std. port	Full port	Std. port	Full port	Std. port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Full port
DN15		67.0		189.4			182.4		194.4		172.4	
½"		2.64		7.46			7.18		7.65		6.79	
DN20	67.0	81.6	189.4	218.6	189.4	194.4	202.2	194.4	215.0	192.4	200.0	144.0
¾"	2.64	3.21	7.46	8.61	7.46	7.65	7.96	7.65	8.46	7.57	7.87	5.67
DN25	81.6	86.4	218.6	224.4	213.9	214.8	210.2	265.8	223.1	209.8	205.2	164.2
1"	3.21	3.40	8.61	8.83	8.42	8.46	8.28	10.46	8.78	8.26	8.08	6.46
DN32	86.4	97.0	224.4	238.0	224.4	223.1	226.6	223.1	226.6	225.2	228.6	86.4
1¼"	3.40	3.82	8.83	9.37	8.83	8.78	8.92	8.78	8.92	8.87	9.0	3.40
DN40	97.0	107.2	238.0	251.2	232.6	238.6	241.4	290.0	267.0	248.6	251.0	188.4
1½"	3.82	4.22	9.37	9.89	9.16	9.39	9.50	11.42	10.51	9.79	9.88	7.42
DN50	107.2	125.0	251.2	285.0	244.4	266.9	268.2			280.8	282.4	209.8
2"	4.22	4.92	9.89	11.22	9.62	10.51	10.56			11.06	11.12	8.26
DN65	125.0	164.0	285.0	364.0	285.0	293.4	362.6			284.7	350.6	265.4
2½"	4.92	6.46	11.22	14.33	11.22	11.55	14.28			11.21	13.80	10.45
DN80	164.0	205	364.0	445.0	364.0	362.7	378.4			360.6	406.2	164.0
3"	6.46	8.07	14.33	17.52	14.33	14.28	14.90			14.20	15.99	6.46
DN100	205.0		445.0		445.0	401.0				446.2		205.0
4"	8.07		17.52		17.52	15.79				17.57		8.07

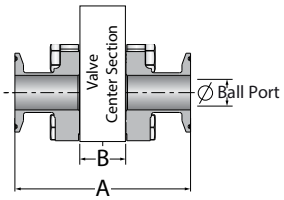
XBW / ETO / ETI / ETD / GR

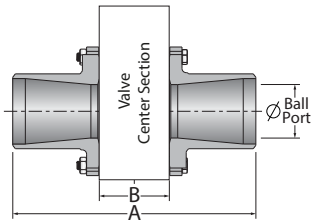


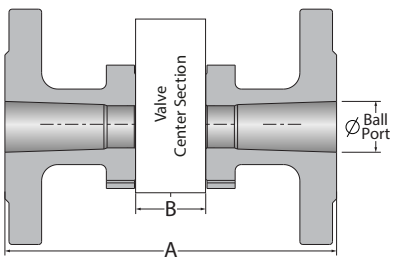
Flanged

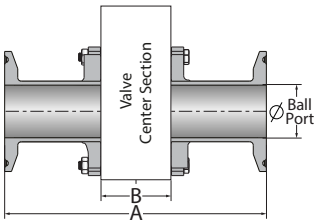


TC









C61 C62 DC61 DC62

Cryogenic Floating Ball Multiport - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	...30
2	0		F	D	C	6	1	W	-	6	6	6	M	A	A		/	B	W			-	#	0	0	1	-	
Size		Features				Series(1)		Design		Body material	Ends material	Ball material	Stem material	Seat material	Body/seat seal			End connection					Flow pattern					Special Features

Size (1-2)

Code	inch	mm
05 *	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30**	3"	80
40**	4"	100

* Full port only
** Available in C61, C62 only

Features (3-6)

C	Cryogenic design
D	Diverter bottom entry
F	Fire safe
B	Full port

Series (7-8)

61	3 way Multiport Floating ball
62	4 way Multiport Floating ball

Design (9)

W *	Total HermetiX Integrity Package
X**	HermetiX stem seal

* Up to 2½"/2" full bore
** 3" to 4"

Body material (11)

6	S. Steel

End material (12)

6	S. Steel

Ball material (13)

6	S. St.

Stem material (14)

M	High Strength S. Steel
Z	Inconel

Seat material (15)

A	TFM
C	PCTFE
P	CF PTFE

Inner Seal Material (16)

A	TFM
G	Expanded graphite

Outer Seal Material (17)

A	TFM
G	Expanded graphite

Flow pattern code (23-26)

#001-#028	3 way side entry
#029-#031	3 way bottom entry
#032-#063	4 way side entry
#064-#073	4 way bottom entry
#074-#085	5 way bottom entry

Special Features (24-30)

6.0	Short bonnet

End connections

Welded

BW10	Buttweld schd. 10
BW	Buttweld schd. 40
XBW10	Extended buttweld schd. 10
XBW	Extended buttweld schd. 40
BW5	Buttweld schd. 5
BW80	Buttweld schd. 80
BWO *	Buttweld tube OD
BWD	Buttweld DIN 11860
BWI1.6	buttweld ISO 1127 1.6mm
BWI2.0	buttweld ISO 1127 2.0mm
BWI2.3	buttweld ISO 1127 2.3mm
SW	Socket weld
SWO *	Socket weld tube OD
XBW80	Extended buttweld 80
XSW	Extended socket weld
ETO *	Extended tube OD
ETI1.6	Extended buttweld ISO 1127 1.6mm
ETI2.0	Extended buttweld ISO 1127 2.0mm
ETI2.3	Extended buttweld ISO 1127 2.3mm
ETD	Extended buttweld DIN 11850

* Std. port only

Threaded

NPT	ASME B1.20.1 - National Pipe Taper thread
MNPT	Male NPT
BSPT	EN 10226 - Pipe Taper thread
MBSPT	Male BSPT
BSPP	ISO228-1, DIN3852 - Pipe parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	SAE internal straight thread

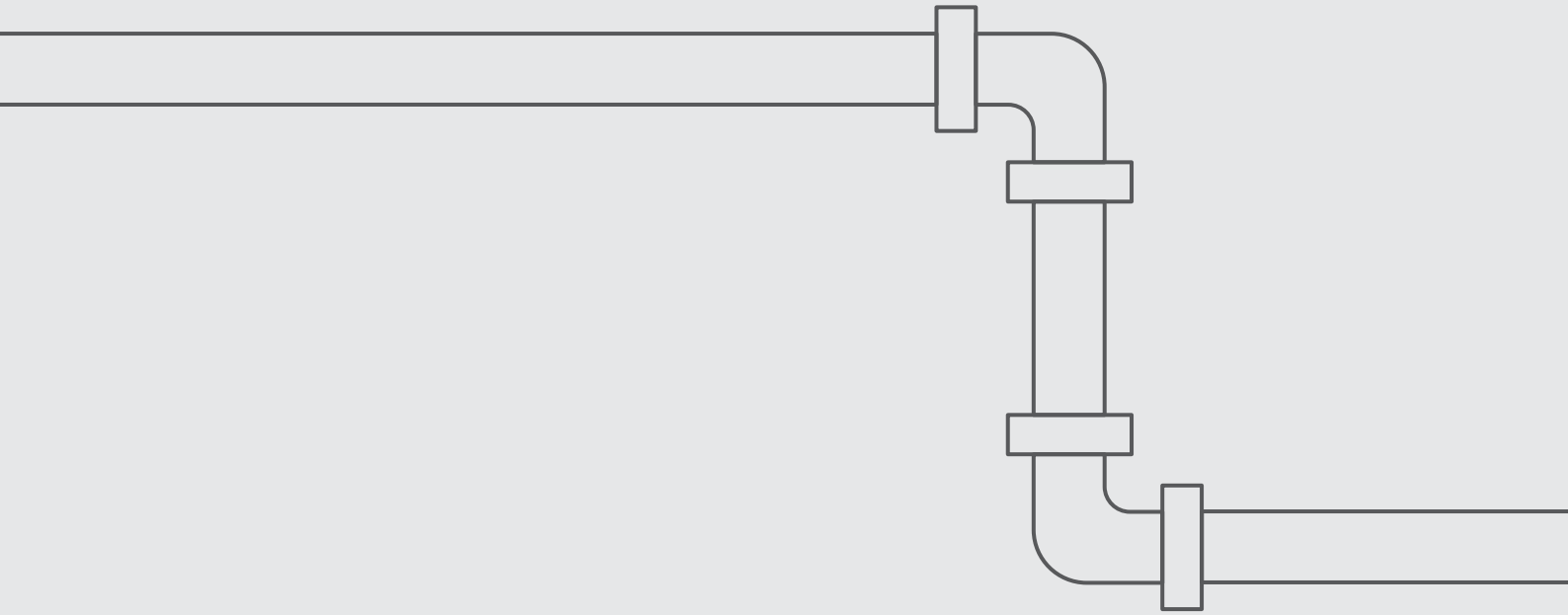
Flanged

150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF

Clamp

LL *	Compression fitting (Imperial) - **No** nuts & Ferrules
LM *	Compression fitting (metric) - **No** nuts & Ferrules
LL-NF *	Compression fitting (Imperial) - **with** nuts & Ferrules
LM-NF *	Compression fitting (metric) - **with** nuts & Ferrules
TC *	Tri-Clamp
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

* Std. port only
** Not available for 1¼" (DN32) Valves



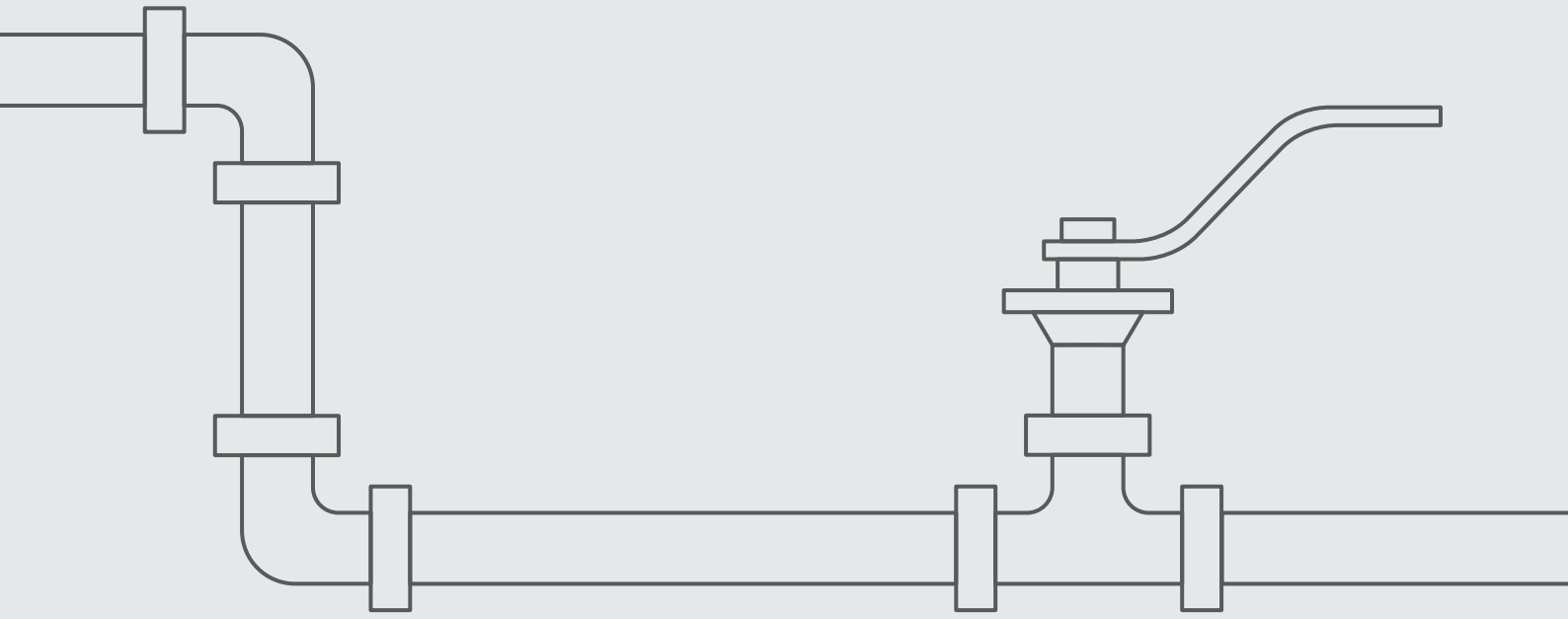
C31 C32 C73 C74 C77 C78

C31-BD C32-BD C73-BD C74-BD C77-BD

Cryogenic Valves

FLOATING BALL

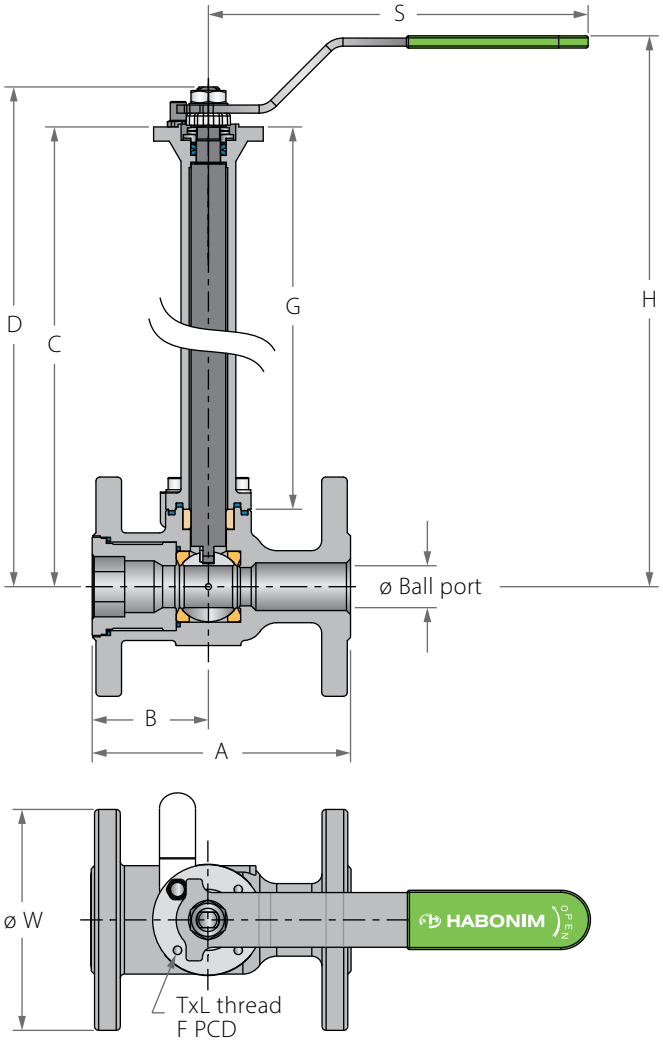
FLANGED



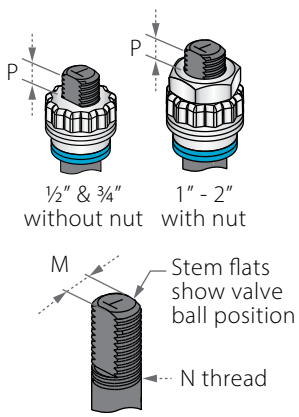
C31 C32 ½"-2" | DN15-DN50 | CLASS 150/300

Cryogenic Flanged Reduced Port Floating Ball

Valve Dimensions



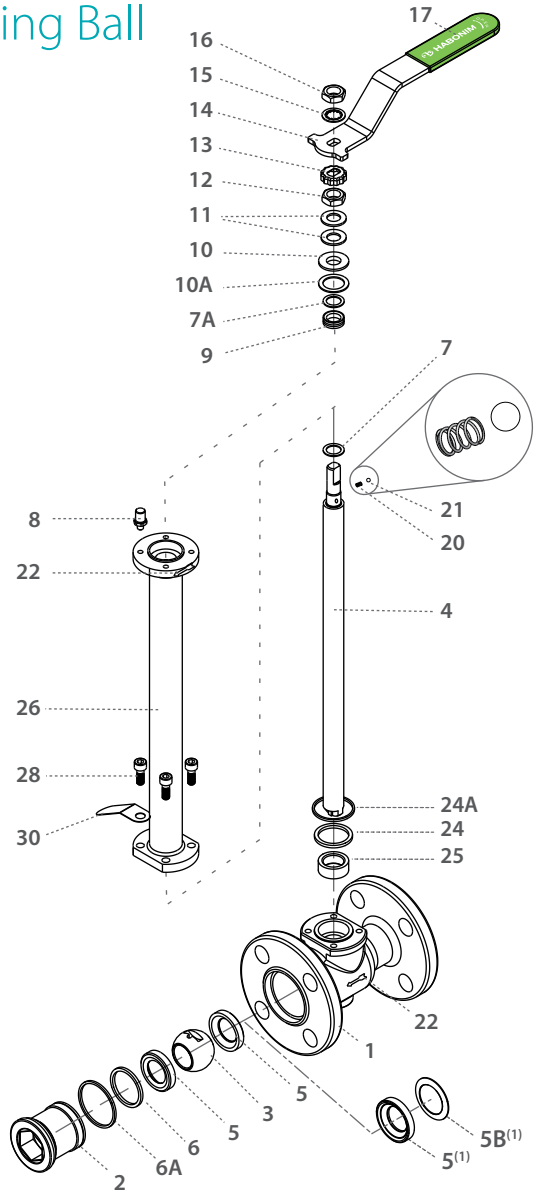
Preparation for actuation



Std. port	Unit	Ball port	A_31	A_32	B	Standard design				6" bonnet				S	W	M	N	P	F		TxL	Weight kg/lb		Kv
						C	D	G	H	C	D	G	H									Std.	6"	Cv
DN15	mm	11.15	108.0	140.0	46.0	333.0	341.9	304.0	367.0	181.4	190.3	152.4	215.4	150.0	89.0	5.5	⅜" UNF	7.2	F03	36.0	M5X7	2.4	2.1	7
½"	inch	0.44	4.25	5.51	1.81	13.11	13.46	11.97	14.45	7.14	7.49	6.0	8.48	5.91	3.5	0.22		0.28		1.42		5.3	4.6	8
DN20	mm	14.30	117.0	152.4	49.35	335.4	344.3	304.0	369.4	183.8	192.7	152.4	217.8	150.0	98.0	5.5	⅜" UNF	7.2	F03	36.0	M5X7	3	2.7	10
¾"	inch	0.56	4.61	6.0	1.94	13.2	13.56	11.97	14.54	7.24	7.59	6.0	8.57	5.91	3.86	0.22		0.28		1.42		6.6	5.9	12
DN25	mm	20.60	127.0	165.0	57.0	342.15	359.65	304.0	387.0	190.55	208.05	152.4	235.4	187.0	108.0	7.54	7⁄16" UNF	7.2	F04	42.0	M5X7	4.2	3.85	27
1"	inch	0.81	5.0	6.5	2.24	13.47	14.16	11.97	15.24	7.5	8.19	6.0	9.27	7.36	4.25	0.3		0.28		1.65		9.3	8.5	32
DN40	mm	31.80	165.0	190.5	62.4	347.55	377.05	304.0	404.0	195.95	225.45	152.4	252.4	237.0	127.0	8.71	9⁄16" UNF	8.0	F05	50.0	M6X8	7	6.43	70
1½"	inch	1.25	6.5	7.5	2.46	13.68	14.84	11.97	15.91	7.71	8.88	6.0	9.94	9.33	5.0	0.34		0.31		1.97		15.4	14.2	82
DN50	mm	38.10	178.0	216.0	68.0	352.25	381.75	304.0	406.0	200.65	230.15	152.4	254.4	237.0	152.0	8.71	9⁄16" UNF	8.5	F05	50.0	M6X8	9.1	8.53	103
2"	inch	1.50	7.01	8.5	2.68	13.87	15.03	11.97	15.98	7.9	9.06	6.0	10.02	9.33	5.98	0.34		0.33		1.97		20.1	18.8	120

Cryogenic Flanged Reduced Port Floating Ball

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1

Item	Description	Material specifications	Qty.
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

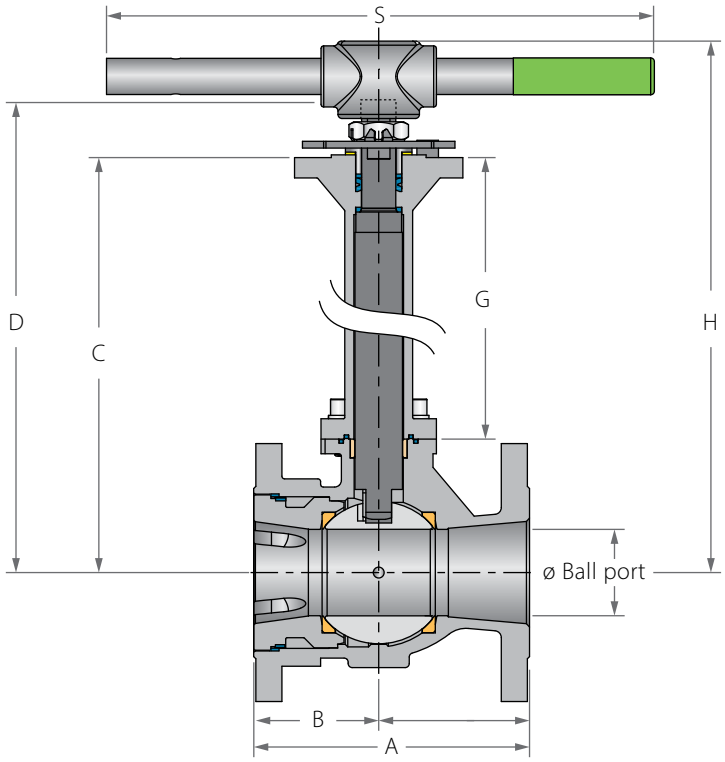
* Maintenance kit components

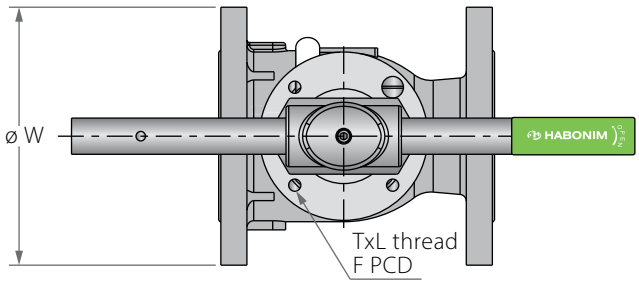
(1) Optional Dynemic seat design

C31 C32 3"-8" | DN80-DN200 | CLASS 150/300

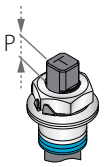
Cryogenic Flanged Reduced Port Floating Ball

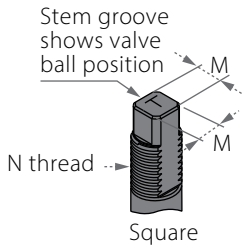
Valve Dimensions





Preparation for actuation

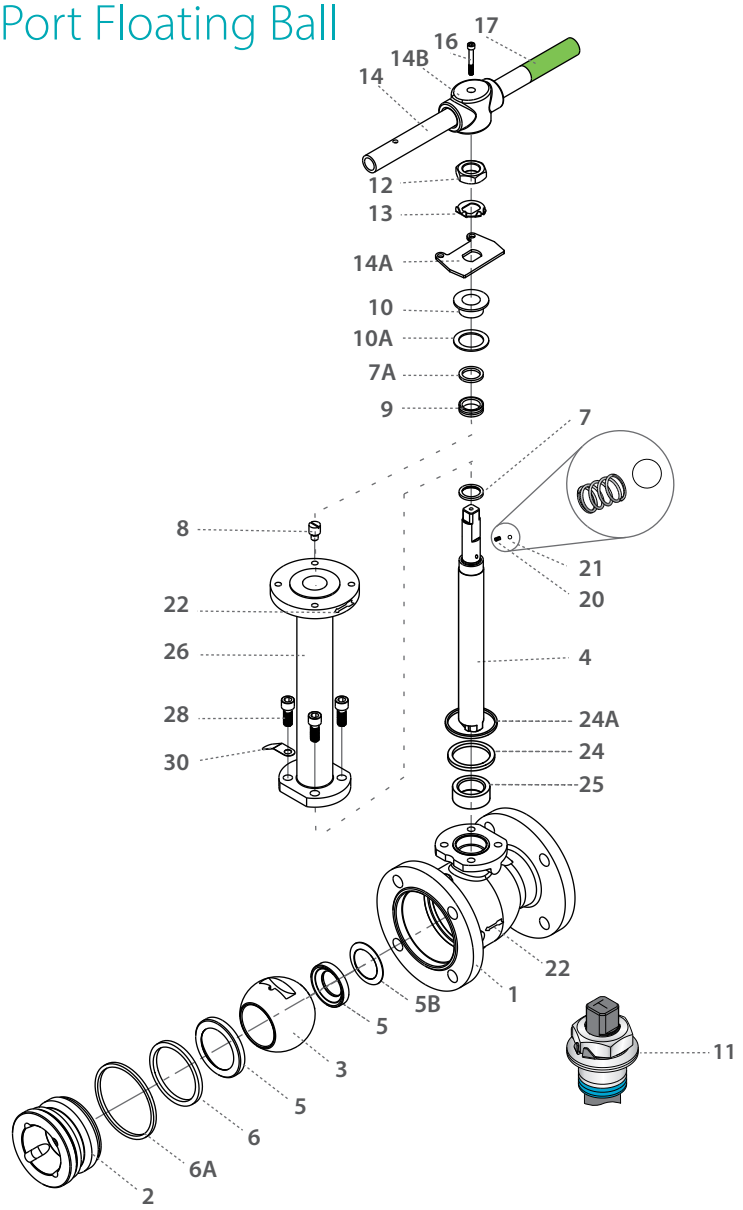




Std. port	Unit	Ball port	A_31	A_32	B	Standard design				6" bonnet				S	W	M	M DD	N	P	F		TxL	Weight kg/lb		Kv
						C	D	G	H	C	D	G	H										Std.	6"	Cv
DN80	mm	63.8	203.2	282	92.1	463.3	509.9	343.5	550.5	272.2	318.8	152.4	359.4	610.0	210.0	18.92	15.9	1"-14 UNS-2A	16.7	F10	102.0	M10X15	29	27.8	385
3"	inch	2.51	8.0	11.1	3.63	18.24	20.07	13.52	21.67	10.72	12.55	6.0	14.15	24.02	8.27	0.74	0.63		0.66		4.02		63.9	61.3	450
DN100	mm	82.8	228.6	304.8	101.6	457.6	504.2	343.5	543.4	266.5	313.1	152.4	352.3	610.0	254	18.92	15.9	1"-14 UNS-2A	16.7	F10	102.0	M10X15	44.6	43.4	615
4"	inch	3.26	9.0	12.0	4.0	18.02	19.85	13.52	21.39	10.49	12.33	6.0	13.87	24.02	10.0	0.74	0.63		0.66		4.02		98.3	95.7	720
DN150	mm	111.3	266.8	403.2	107.8	561.0	630.5	385.0	-	328.4	397.9	152.4	-	-	318.0	28.45	23.75	1½"-12 UNS-2A	26.2	F12	125.0	M12X15	92	89	872
6"	inch	4.38	10.5	15.87	4.24	22.09	24.82	15.16	-	12.93	15.67	6.0	-	-	12.52	1.12	0.94		1.03		4.92		202.4	195.8	1020
DN200	mm	144.4	292.1	419.1	142.25	570.1	639.6	385.0	-	337.5	407	152.4	-	-	381.0	28.45	23.75	1½"-12 UNS-2A	26.2	F12	125.0	M12X15	118.6	114.5	1607
8"	inch	5.69	11.5	16.5	5.6	22.44	25.18	15.16	-	13.29	16.02	6.0	-	-	15.0	1.12	0.94		1.03		4.92		261.4	252.4	1880

Cryogenic Flanged Reduced Port Floating Ball

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	A351 CF8M, B574 N06022, Bronze RG5	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1

Item	Description	Material specifications	Qty.
14**	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Seal	PTFE, Graphite	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

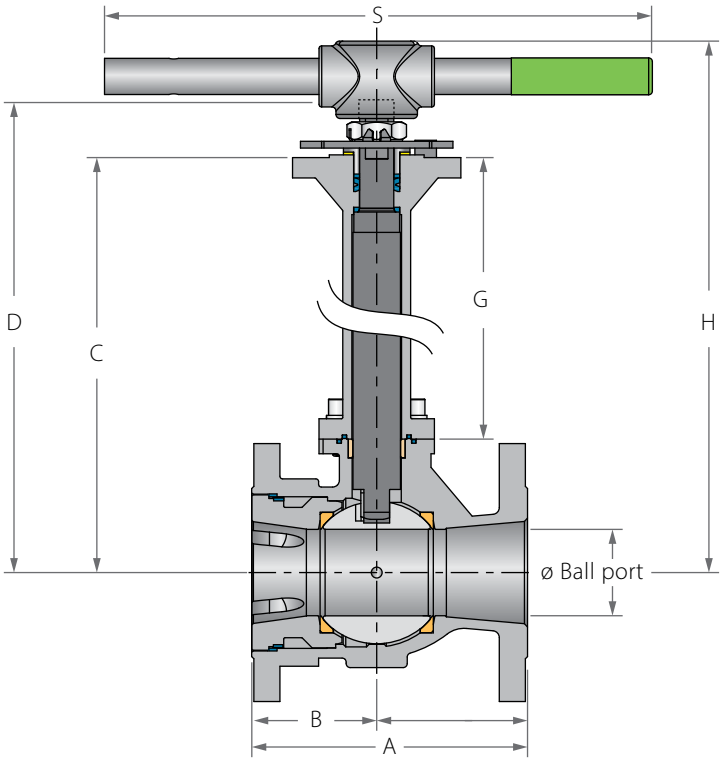
* Maintenance kit components

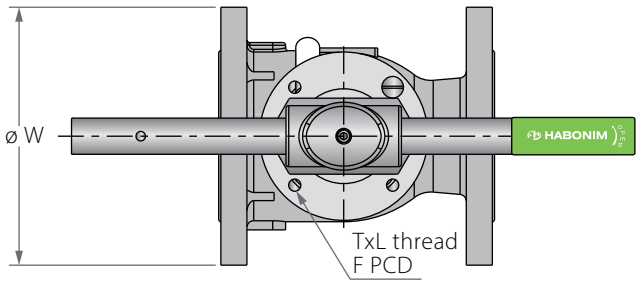
** Gear operator should be used for size 6" DN150 and above (handle components are not included)

C31-BD C32-BD 3"-8" | DN80-DN200 | CLASS 150/300

Cryogenic Flanged Reduced Port Floating Ball; BD - Bidirectional

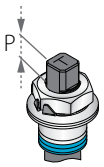
Valve Dimensions

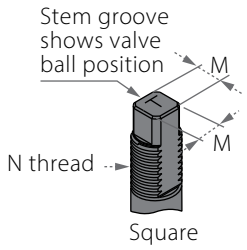




PATENTED
US 12044333

Preparation for actuation





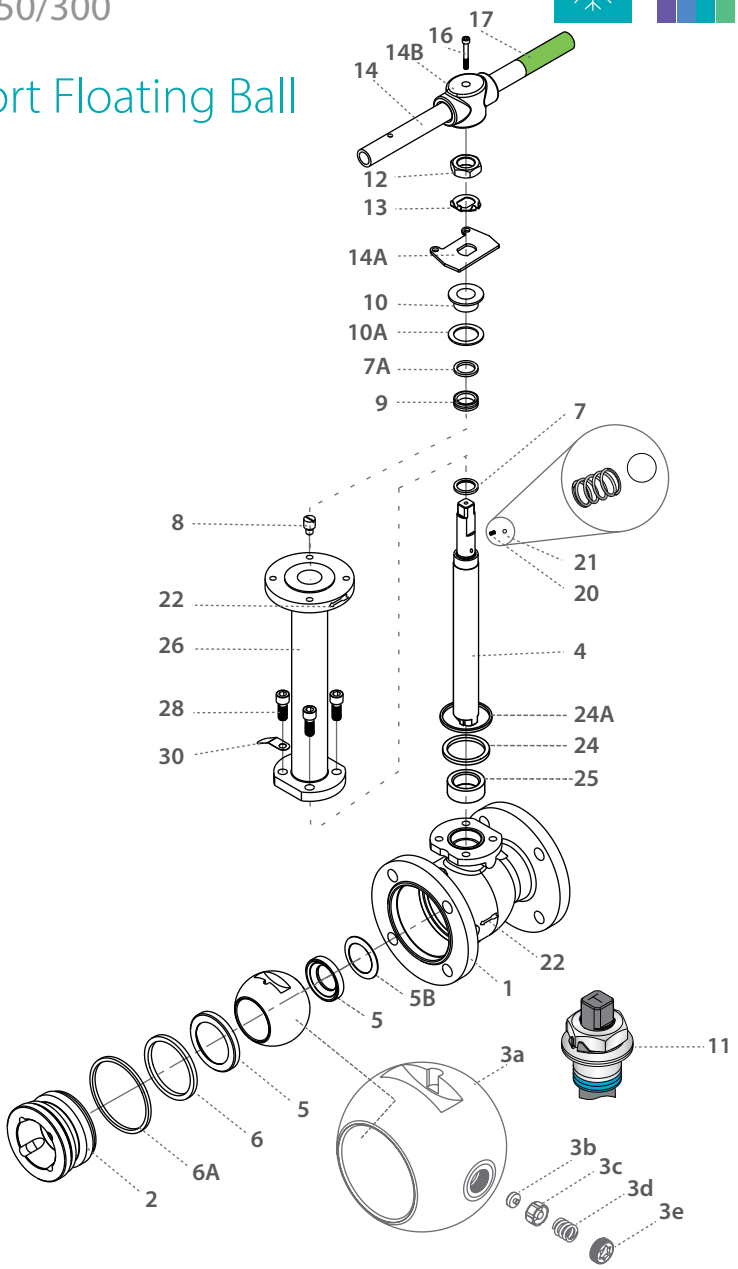
Std. port	Unit	Ball port	A_31	A_32	B	Standard design				6" bonnet				S	W	M	M DD	N	P	F		TxL	Weight kg/lb		Kv
						C	D	G	H	C	D	G	H										Std.	6"	Cv
DN80	mm	63.8	203.2	282	92.1	463.3	509.9	343.5	550.5	272.2	318.8	152.4	359.4	610.0	210.0	18.92	15.9	1"-14 UNS-2A	16.7	F10	102.0	M10X15	29	27.8	385
3"	inch	2.51	8.0	11.1	3.63	18.24	20.07	13.52	21.67	10.72	12.55	6.0	14.15	24.02	8.27	0.74	0.63		0.66		4.02		63.9	61.3	450
DN100	mm	82.8	228.6	304.8	101.6	457.6	504.2	343.5	543.4	266.5	313.1	152.4	352.3	610.0	254	18.92	15.9	1"-14 UNS-2A	16.7	F10	102.0	M10X15	44.6	43.4	615
4"	inch	3.26	9.0	12.0	4.0	18.02	19.85	13.52	21.39	10.49	12.33	6.0	13.87	24.02	10.0	0.74	0.63		0.66		4.02		98.3	95.7	720
DN150	mm	111.3	266.8	403.2	107.8	561.0	630.5	385.0	-	328.4	397.9	152.4	-	-	318.0	28.45	23.75	1½"-12 UNS-2A	26.2	F12	125.0	M12X15	92	89	872
6"	inch	4.38	10.5	15.87	4.24	22.09	24.82	15.16	-	12.93	15.67	6.0	-	-	12.52	1.12	0.94		1.03		4.92		202.4	195.8	1020
DN200	mm	144.4	292.1	419.1	142.25	570.1	639.6	385.0	-	337.5	407	152.4	-	-	381.0	28.45	23.75	1½"-12 UNS-2A	26.2	F12	125.0	M12X15	118.6	114.5	1607
8"	inch	5.69	11.5	16.5	5.6	22.44	25.18	15.16	-	13.29	16.02	6.0	-	-	15.0	1.12	0.94		1.03		4.92		261.4	252.4	1880

C31-BD **C32-BD** 3"-8" | DN80-DN200
CLASS 150/300

Cryogenic Flanged Reduced Port Floating Ball

Components & Materials

PATENTED
US 12044333



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3a	Ball With Integrated PRV	S.Steel	1
3b	Insert	MOD PTFE, CF PTFE, PCTFE	1
3c	Piston	S.Steel	1
3d	Spring	INCONEL® X-750	1
3e	Nut	S.Steel	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2

Item	Description	Material specifications	Qty.
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14**	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Seal	PTFE, Graphite	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

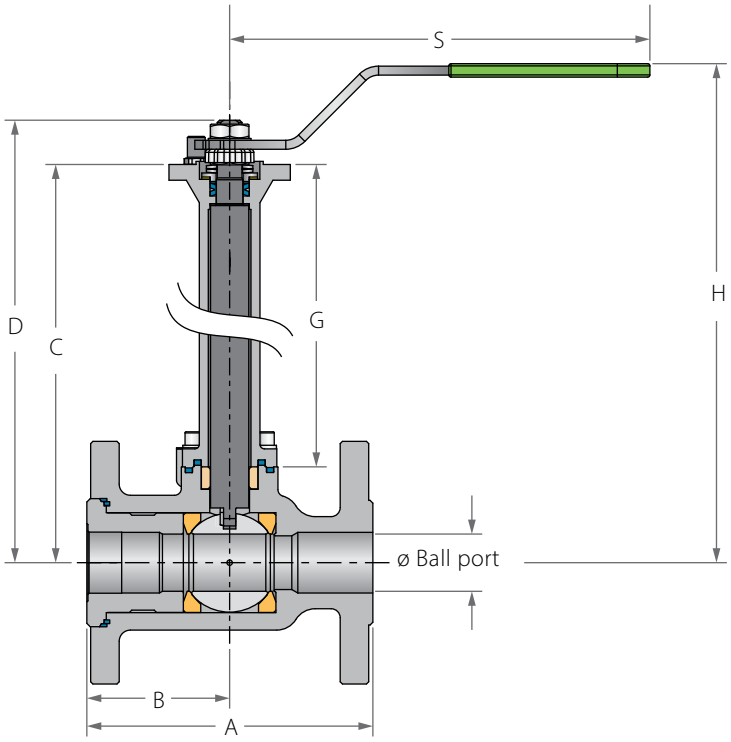
* Maintenance kit components

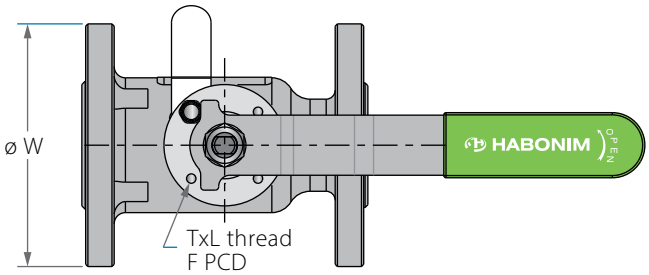
** Gear operator should be used for size 6" DN150 and above (handle components are not included)

C73 C74 C78 ½"-1" | DN15-DN25
CLASS 150/300/PN 40

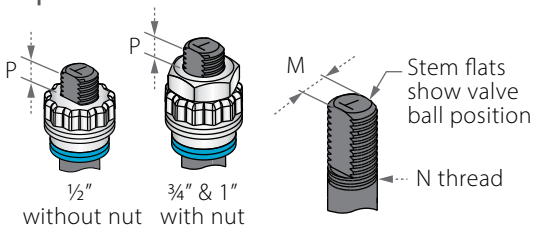
Cryogenic Flanged Full Port Floating Ball

Valve Dimensions





Preparation for actuation



C73 C74

Full Port	Unit	Ball port	A		B	Standard design				6" bonnet				S	W		M	N	P	TxL	F	PCD	Weight (Kg /lb)				Kv
			C73	C74		C	D	G	H	C	D	G	H		C73	C74							C73 Std.	C73 6"	C74 Std.	C74 6"	Cv
DN15	mm	14.3	108.0	140.0	48.5	334.7	343.6	304.0	368.0	183.1	192.0	152.0	216.0	150.0	89.0	95.0	5.5	⅜"	6.0	M5X7	F03	36.0	2.8	2.4	3.3	2.9	26.0
½"	inch	0.56	4.25	5.51	1.91	13.18	13.53	11.97	14.47	7.21	7.56	6.0	8.50	5.91	3.50	3.74	0.22	UNF	0.24			1.42	6.16	5.28	7.26	6.38	30.0
DN20	mm	20.6	117.0	152.0	59.0	342.2	359.65	304.0	387.0	190.6	208.1	152.0	235.0	187.0	98.0	117.0	7.5	7/16"	6.0	M5X7	F04	42.0	3.9	3.1	4.7	3.9	43.0
¾"	inch	0.81	4.61	5.98	2.32	13.47	14.16	11.97	15.22	7.50	8.19	6.0	9.25	7.36	3.86	4.61	0.3	UNF	0.24			1.65	8.58	6.82	10.34	8.58	50.0
DN25	mm	25.4	127.0	165.0	63.5	353.7	371.15	304.0	398.0	202.1	219.6	152.0	247.0	187.0	108.0	125.0	7.5	7/16"	6.0	M5X7	F04	42.0	4.9	4.1	6.3	5.5	82.0
1"	inch	1.0	5.0	6.50	2.50	13.92	14.61	11.97	15.68	7.95	8.64	6.0	9.71	7.36	4.25	4.92	0.3	UNF	0.24			1.65	10.78	9.02	13.86	12.1	95.0

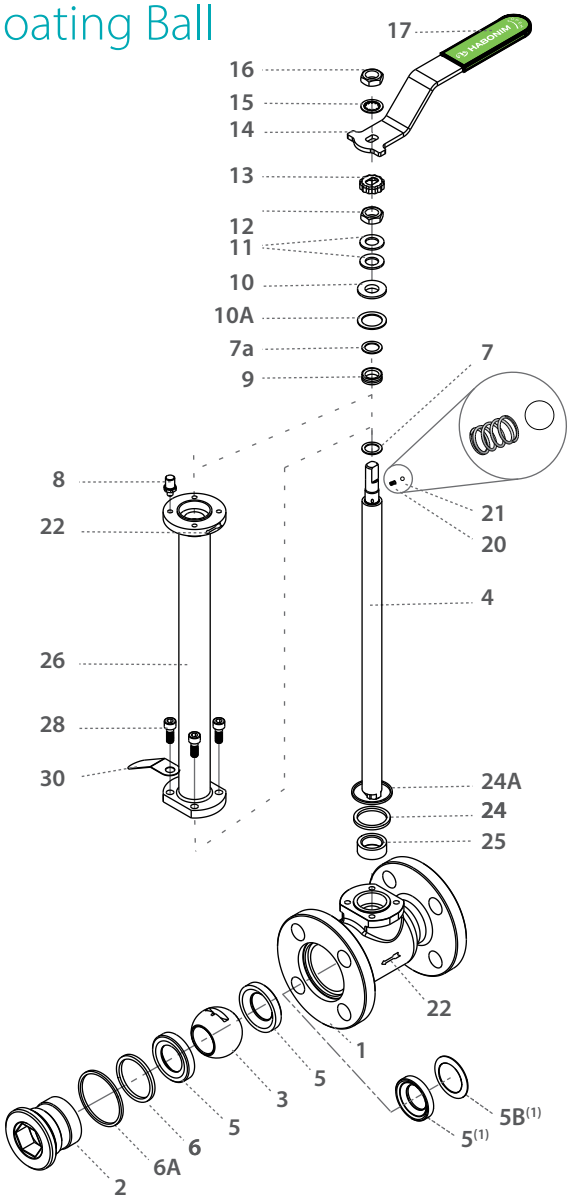
C78

Full Port	Unit	Ball port	A		B	Standard design				6" bonnet				S	W		M	N	P	TxL	F	PCD	Weight (Kg /lb)				Kv
			F1	F4		C	D	G	H	C	D	G	H		F1	F4							F1 Std.	F1 6"	F4 Std.	F4 6"	Cv
DN15	mm	14.3	130.0	115.0	48.5	334.7	343.6	304.0	368.0	183.1	192.0	152.0	216.0	150.0	95.0	95.0	5.5	⅜"	6.0	M5X7	F03	36	3.2	2.8	3.1	2.7	26.0
½"	inch	0.56	5.12	4.53	1.91	13.18	13.53	11.97	14.47	7.21	7.56	6.0	8.50	5.91	3.74	3.74	0.22	UNF	0.24			1.42	7.04	6.16	6.82	5.94	30.0
DN20	mm	20.6	150.0	120.0	59.0	342.2	359.65	304.0	387	190.6	208.1	152.0	235.0	187.0	105.0	105.0	7.5	7/16"	6.0	M5X7	F04	42	4.9	4.1	4.7	3.9	43.0
¾"	inch	0.81	5.91	4.72	2.32	13.47	14.16	11.97	15.22	7.50	8.19	6.00	9.25	7.36	4.13	4.13	0.30	UNF	0.24			1.65	10.78	9.02	10.34	8.58	50.0
DN25	mm	25.4	160.0	125.0	63.5	353.7	371.15	304.0	398.0	202.1	219.6	152.0	247.0	187.0	115.0	115.0	7.5	7/16"	6.0	M5X7	F04	42	5.9	5.1	5.7	4.9	82.0
1"	inch	1.0	6.30	4.92	2.50	13.92	14.61	11.97	15.68	7.95	8.64	6.0	9.71	7.36	4.53	4.53	0.30	UNF	0.24			1.65	12.98	11.22	12.54	10.78	95.0

C73 C74 C78 ½"-1" | DN15-DN25
CLASS 150/300/PN 40

Cryogenic Flanged Full Port Floating Ball

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PCTFE	1
7a*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1

Item	Description	Material specifications	Qty.
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

* Maintenance kit components

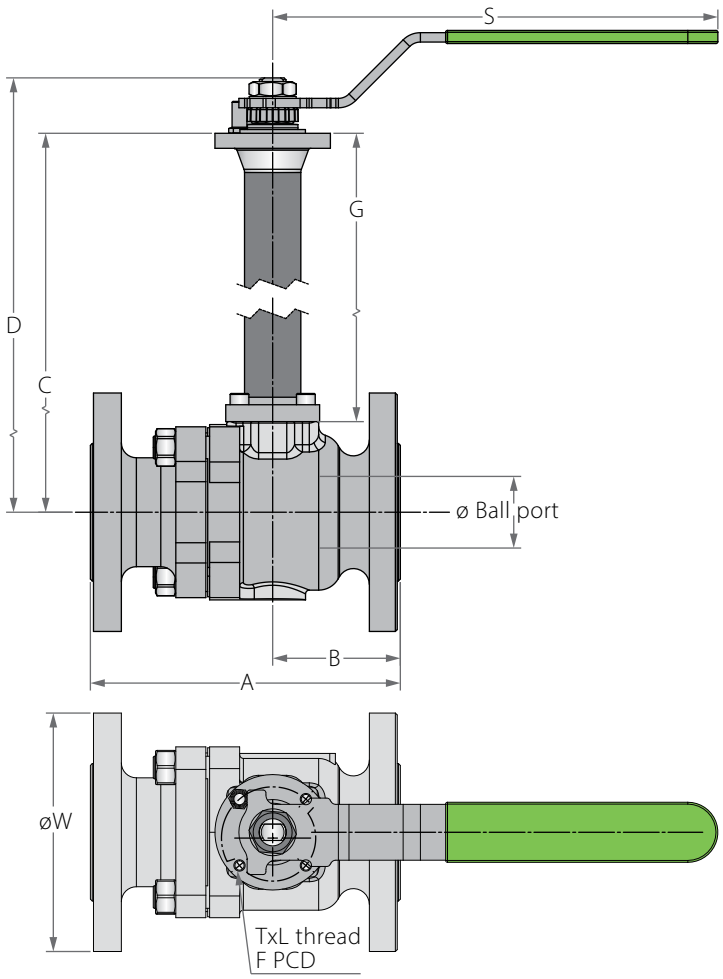
(1) Optional Dynemic seat design

C73 C74 C78

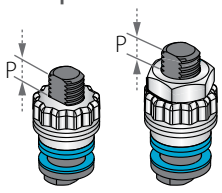
1¼"-1½" | DN32-DN40
CLASS 150/300/PN 40

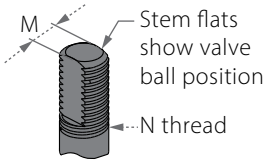
Cryogenic Flanged Full Port Floating Ball

Valve Dimensions



Preparation for actuation





C73 C74

Full Port	Unit	Ball port	A		B		Standard design				6" bonnet				S	W		M	N	P	TxL	F	PCD	Weight (Kg /lb)				Kv
			C73	C74	C73	C74	C	D	G	H	C	D	G	H		C73	C74							C73 Std.	C73 6"	C74 Std.	C74 6"	Cv
DN40	mm	31.8	140.0	-	59.0	-	353.3	382.8	304.0	407.0	201.7	231.2	152.0	255.0	237.0	115.0	-	8.6	9/16" UNF	8.0	M6X8	F05	50.0	-	-	8.15	7.35	216.0
1½"	inch	1.25	5.51	-	2.32	-	13.91	15.07	11.97	16.02	7.94	9.10	6.0	10.05	9.33	4.53	-	0.34		0.31			1.97	-	-	17.93	16.17	250.0
DN50	mm	38.1	165.0	190.5	68	80.5	352.3	381.75	304.0	406.0	200.7	230.2	152.0	254.0	237.0	127.0	156.0	8.6	9/16" UNF	8.0	M6X8	F05	50.0	11.0	10.2	10.3	9.5	216.0
2"	inch	1.50	6.50	7.50	2.68	3.17	13.87	15.03	11.97	15.97	7.90	9.06	6.0	10.01	9.33	5.0	6.14	0.34		0.31			1.97	24.2	22.44	22.66	20.9	250.0

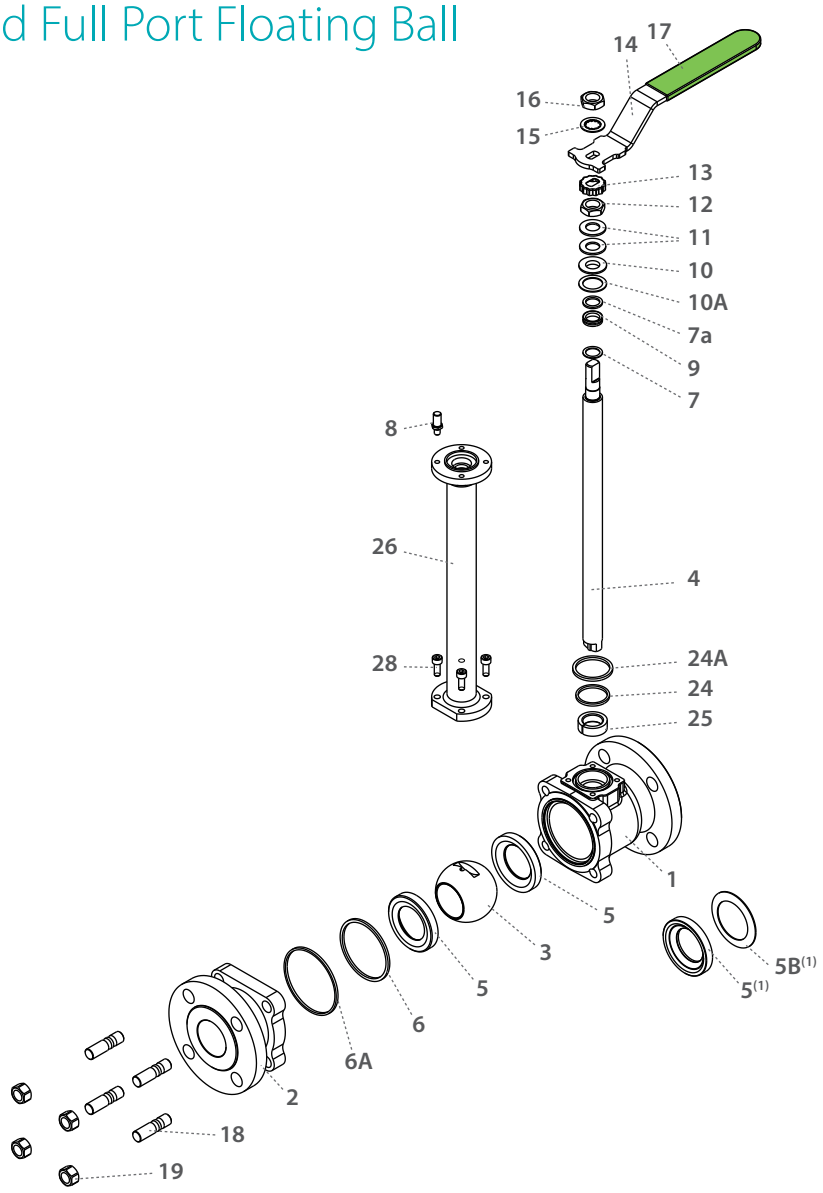
C78

Full Port	Unit	Ball port	A		B		Standard design				6" bonnet				S	W		M	N	P	TxL	F	PCD	Weight (Kg /lb)				Kv
			F1	F4	F1	F4	C	D	G	H	C	D	G	H		F1	F4							F1 Std.	F1 6"	F4 Std.	F4 6"	Cv
DN32	mm	31.8	140.0	-	59.0	-	353.3	382.8	304.0	407.0	201.7	231.2	152.0	255.0	237.0	115.0	-	8.6	9/16" UNF	8.0	M6X8	F05	50.0	-	-	8.15	7.35	216.0
1¼"	inch	1.25	5.51	-	2.32	-	13.91	15.07	11.97	16.02	7.94	9.10	6.0	10.05	9.33	4.53	-	0.34		0.31			1.97	-	-	17.93	16.17	250.0
DN40	mm	38.1	165.0	190.5	68.0	80.5	352.3	381.75	304.0	406.0	200.7	230.2	152.0	254.0	237.0	127.0	156.0	8.6	9/16" UNF	8.0	M6X8	F05	50.0	11.0	10.2	10.3	9.5	216.0
1½"	inch	1.50	6.50	7.50	2.68	3.17	13.87	15.03	11.97	15.97	7.90	9.06	6.0	10.01	9.33	5.0	6.14	0.34		0.31			1.97	24.2	22.44	22.66	20.9	250.0

C73 C74 C78 1¼"-1½" | DN32-DN40
CLASS 150/300/PN 40

Cryogenic Flanged Full Port Floating Ball

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

Item	Description	Material specifications	Qty.
11	Disc Spring	S. Steel	1
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Studs	S. Steel	4
19	Body Nuts	S. Steel	4
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4

* Maintenance kit components

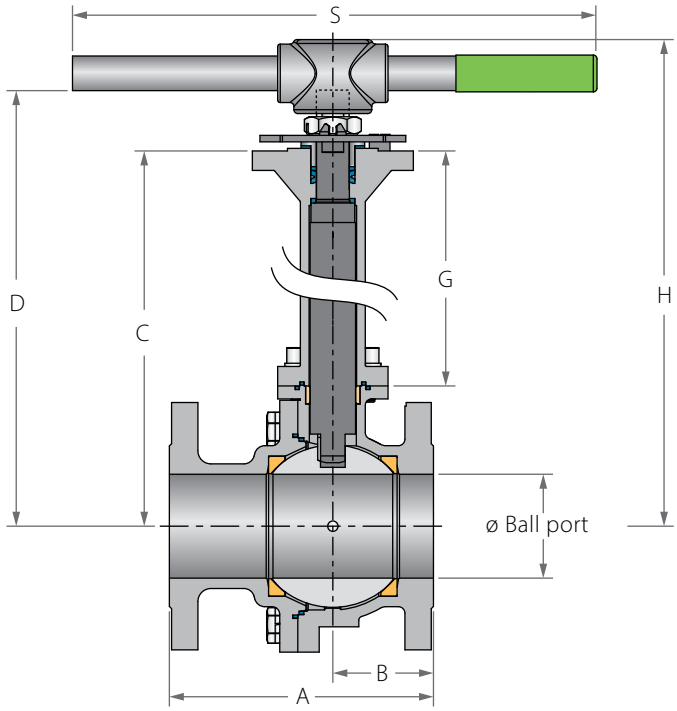
(1) Optional Dynemic seat design

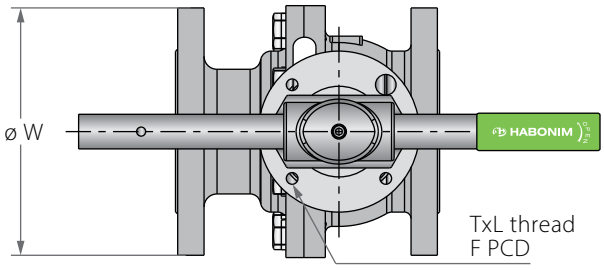
C73 C74 C77

2"-8"[(1)] | DN50-DN200
CLASS 150/300/PN 16

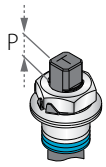
Cryogenic Flanged Full Port Floating Ball

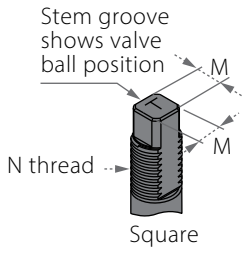
Valve Dimensions





Preparation for actuation





C73 C74

Full Port	Unit	Ball port	A		B		Standard Bonnet				6" bonnet				S	W		M	N	P	TxL	F	PCD	Weight (Kg /lb)				Kv
			C73	C74	C73	C74	C	D	G	H	C	D	G	H		C73	C74							C73		C74		
																								Std.	6" [1]	Std.	6"	Cv
DN50	mm	50.8	178	216.0	69.0	75.2	397.5	439.1	328.0	466.0	222.4	264.0	152.0	291.0	400.0	152.0	165.0	13.9	M20	13.5	M8X8	F07	70.0	16.2	14.5	18.9	17.2	415
2"	inch	2.0	7.01	8.50	2.72	2.96	15.65	17.29	12.89	18.35	8.76	10.39	6.0	11.46	15.75	5.98	6.50	0.55		0.53			2.76	35.64	31.9	41.58	37.84	480
DN65	mm	63.5	190.0	-	83.0	-	463.3	509.8	344.0	550.0	272.2	318.7	152.0	359.0	610.0	180.0	-	18.9	1"-14	16.5	M10X15	F10	102.0	30.25	27.25	-	-	735
2½"	inch	2.50	7.48	-	3.27	-	18.24	20.07	13.52	21.66	10.72	12.55	6.0	14.14	24.02	7.09	-	0.74	UNS-2A	0.65			4.02	66.55	59.95	-	-	850
DN80	mm	80.0	203.0	282.0	77.5	96.4	451.5	498.0	344.0	538.0	260.4	306.9	152.0	347.0	610.0	190.5	210.0	18.9	1"-14	16.5	M10X15	F10	102.0	31.0	28.0	37.2	34.2	1125
3"	inch	3.15	7.99	11.10	3.05	3.80	17.78	19.61	13.52	21.20	10.25	12.08	6.0	13.67	24.02	7.50	8.27	0.74	UNS-2A	0.65			4.02	68.2	61.6	81.84	75.24	1300
DN100	mm	100.0	229.0	305.0	84.5	104.5	467.5	514.0	344.0	554.0	276.4	322.9	152.0	363.0	610.0	230.0	24.0	18.9	1"-14	16.5	M10X15	F10	102.0	48.0	45.0	53.5	50.5	2076
4"	inch	3.94	9.02	12.01	3.33	4.11	18.41	20.24	13.52	21.83	10.88	12.71	6.0	14.30	24.02	9.06	0.94	0.74	UNS-2A	0.65			4.02	105.6	99.0	117.7	111.1	2400
DN150	mm	150.0	394.0	403.5	163.5	174.5	564.0	633.5	385.0	-	331.4	400.9	152.0	-	-	280.0	318.0	28.5	1½"-12	26.0	M12X15	F12	125.0	98.0	92.0	116.0	110.0	4671
6"	inch	5.91	15.51	15.89	6.44	6.87	22.20	24.94	15.16	-	13.05	15.78	6.0	-	-	11.02	12.52	1.12	UNF-2A	1.02			4.92	215.6	202.4	255.2	242.0	5400
DN200	mm	200.0	457.0	502.0	242.5	241.0	626.0	738.5	385.0	-	393.4	505.9	152.0	-	-	343.0	381.0	35.9	2"	40.0	M16X20	F14	140.0	218.0	208.0	253.0	243.0	8045
8"	inch	7.87	17.99	19.76	9.55	9.49	24.65	29.07	15.16	-	15.49	19.92	6.0	-	-	13.50	15.0	1.41	UN-2A	1.57			5.51	479.6	457.6	556.6	534.6	9300

[1] 6" Bonnet

C77 C78

Full Port	Unit	Ball port	A		B		Standard Bonnet				6" bonnet				S	W		M	N	P	TxL	F	PCD	Weight (Kg /lb)				Kv
			C78	C77	C78	C77	C	D	G	H	C	D	G	H		C78	C77							C78		C77		
																								Std.	6" [1]	Std.	6"	Cv
DN50	mm	50.8	150*/230**	-	60.5	-	397.5	439.1	327.5	466.0	222.4	264.0	152.0	291.0	400.0	165.0	-	13.9	M20	13.5	M8X8	F07	70.0	16.2*/17.4**	14.5*/15.7**	-	-	415
2"	inch	2.0	5.91/9.06	-	2.38	-	15.65	17.29	12.89	18.35	8.76	10.39	6.0	11.46	15.75	6.50	-	0.55		0.53			2.76	35.6/38.3	31.9/34.5	-	-	480
DN65	mm	63.5	170.0	-	83	-	463.3	509.8	344	550	272.2	318.7	152	359	610	185.0	-	18.9	1"-14	16.5	M10X15	F10	102.0	29.0	26.0	-	-	735
2-½"	inch	2.50	6.69	-	3.27	-	18.24	20.07	13.52	21.66	10.72	12.55	6.0	14.14	24.02	7.28	-	0.74	UNS-2A	0.65			4.02	63.8	57.2	-	-	850
DN80	mm	80.0	-	180.0	-	77.5	451.5	498.0	344.0	538.0	260.4	306.9	152.0	347.0	610.0	-	200.0	18.9	1"-14	16.5	M10X15	F10	102.0	-	-	35.0	32.0	1125
3"	inch	3.15	-	7.09	-	3.05	17.78	19.61	13.52	21.20	10.25	12.08	6.0	13.67	24.02	-	7.87	0.74	UNS-2A	0.65			4.02	-	-	77.0	70.4	1300
DN100	mm	100.0	-	190.0	-	84.5	467.5	514.0	344.0	554.0	276.4	322.9	152.0	363.0	610.0	-	220.0	18.9	1"-14	16.5	M10X15	F10	102.0	-	-	48.0	45.0	2076
4"	inch	3.94	-	7.48	-	3.33	18.41	20.24	13.52	21.83	10.88	12.71	6.0	14.30	24.02	-	8.66	0.74	UNS-2A	0.65			4.02	-	-	105.6	99.0	2400
DN150	mm	150.0	-	350.0	-	163.5	564.0	633.5	385.0	-	331.4	400.9	152.0	-	-	-	285	28.5	1½"-12	26	M12X15	F12	125.0	-	-	104.0	98.0	4671
6"	inch	5.91	-	13.78	-	6.44	22.20	24.94	15.16	-	13.05	15.78	6.0	-	-	-	11.2	1.12	UNF-2A	1.02			4.92	-	-	228.8	215.6	5400

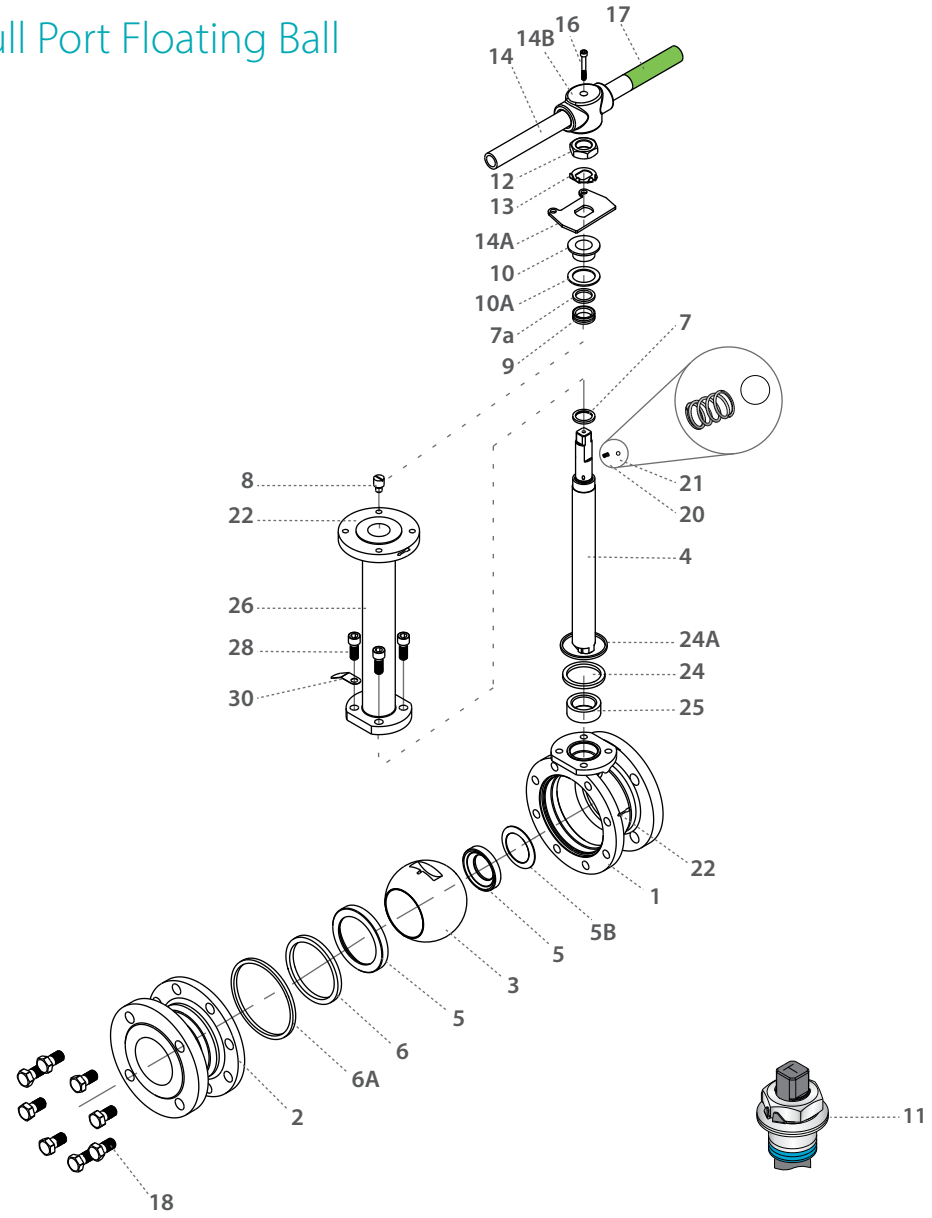
[1] 6" Bonnet

C73 C74 C77

2"-8"[1] | DN50-DN200
CLASS 150/300/PN 16

Cryogenic Flanged Full Port Floating Ball

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PCTFE	1
7a*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14**	Handle	S. Steel	1

Item	Description	Material specifications	Qty.
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	8-10
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

* Maintenance kit components

** Gear operator should be used for size 6" DN150 and above (handle components are not included)

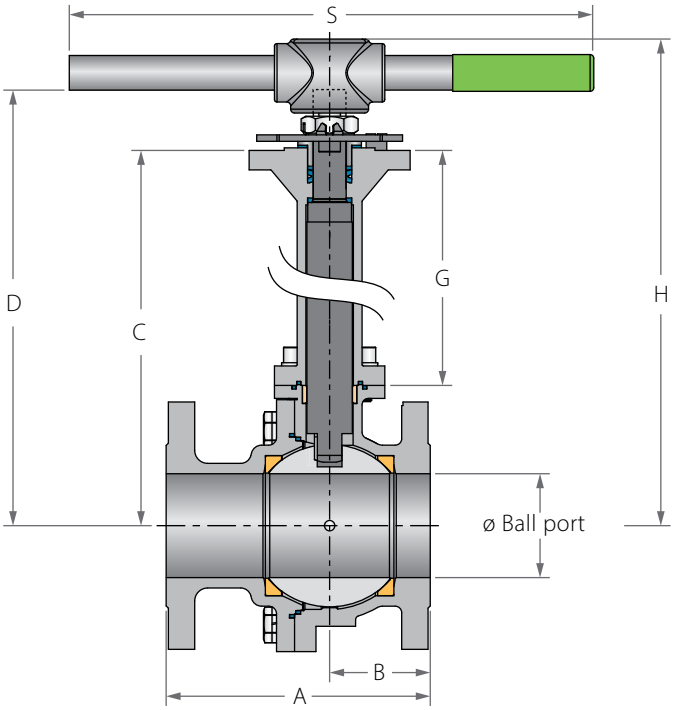
[1] C77 up to 6"

C73-BD C74-BD C77-BD

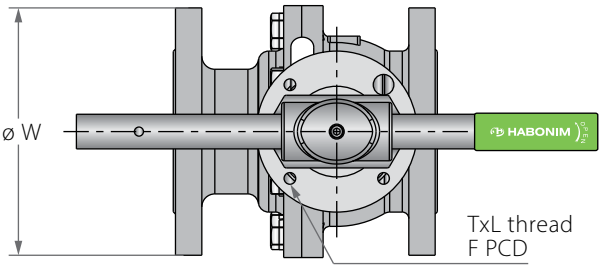
2"-8"(1) | DN50-DN200
CLASS 150/300/PN 16

Cryogenic Flanged Full Port Floating Ball; BD - Bidirectional

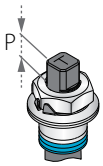
Valve Dimensions

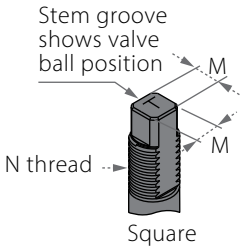


PATENTED
US 12044333



Preparation for actuation





C73 C74

Full Port	Unit	Ball port	A		B		Standard Bonnet				6" bonnet				S	W		M	N	P	TxL	F	PCD	Weight (Kg /lb)				Kv
			C73	C74	C73	C74	C	D	G	H	C	D	G	H		C73	C74							C73		C74		
																								Std.	6" *	Std.	6"	Cv
DN50	mm	50.8	178.0	216.0	68.0	80.5	397.5	439.1	328.0	466.0	222.4	264.0	152.0	291.0	400.0	152.0	165.0	13.9	M20	13.5	M8X8	F07	16.2	14.5	-	-	433	415
2"	inch	2.00	7.01	8.50	2.68	3.17	15.65	17.29	12.89	18.35	8.76	10.39	6.0	11.46	15.75	5.98	6.50	0.55		0.53			35.64	31.9	-	-	500	480
DN65	mm	63.5	190.0	-	83.0	-	463.3	509.8	344.0	550.0	272.2	318.7	152.0	359.0	610.0	180.0	-	18.9	1"-14	16.5	M10X15	F10	30.25	27.25	-	-	735	735
2-½"	inch	2.50	7.48	-	3.27	-	18.24	20.07	13.52	21.66	10.72	12.55	6.0	14.14	24.02	7.09	-	0.74	UNS-2A	0.65			66.55	59.95	-	-	850	850
DN80	mm	80.0	203.0	282.0	77.5	96.4	451.5	498.0	344.0	538.0	260.4	306.9	152.0	347.0	610.0	190.5	210.0	18.9	1"-14	16.5	M10X15	F10	31.0	28.0	37.2	34.2	1125	1125
3"	inch	3.15	7.99	11.10	3.05	3.80	17.78	19.61	13.52	21.20	10.25	12.08	6.0	13.67	24.02	7.50	8.27	0.74	UNS-2A	0.65			68.2	61.6	81.84	75.24	1300	1300
DN100	mm	100.0	229.0	305.0	84.5	104.5	467.5	514.0	344.0	554.0	276.4	322.9	152.0	363.0	610.0	230.0	24.0	18.9	1"-14	16.5	M10X15	F10	48.0	45.0	53.5	50.5	2076	2076
4"	inch	3.94	9.02	12.01	3.33	4.11	18.41	20.24	13.52	21.83	10.88	12.71	6.0	14.30	24.02	9.06	0.94	0.74	UNS-2A	0.65			105.6	99.0	117.7	111.1	2400	2400
DN150	mm	150.0	394.0	403.5	163.5	174.5	564.0	633.5	385.0	-	331.4	400.9	152.0	-	-	280.0	318.0	28.5	1-½"-12	26	M12X15	F12	98.0	92.0	116.0	110.0	4671	4671
6"	inch	5.91	15.51	15.89	6.44	6.87	22.20	24.94	15.16	-	13.05	15.78	6.0	-	-	11.02	12.52	1.12	UNF-2A	1.02			215.6	202.4	255.2	242.0	5400	5400
DN200	mm	200.0	457.0	502.0	242.5	241.0	626.0	738.5	385.0	-	393.4	505.9	152.0	-	-	343.0	381.0	35.9	2"	40	M16X20	F14	218.0	208.0	253.0	243.0	8045	8045
8"	inch	7.87	17.99	19.76	9.55	9.49	24.65	29.07	15.16	-	15.49	19.92	6.0	-	-	13.50	15.0	1.41	UN-2A	1.57			479.6	457.6	556.6	534.6	9300	9300

*6" Bonnet

C77 C78

Full Port	Unit	Ball port	A		B		Standard Bonnet				6" bonnet				S	W		M	N	P	TxL	F	PCD	Weight (Kg /lb)				Kv
			C78	C77	C78	C77	C	D	G	H	C	D	G	H		C78	C77							C78		C77		
																								Std.	6" *	Std.	6"	Cv
DN50	mm	50.8	150.0	-	83.0	-	327.5	369.1	328.0	396.0	152.4	194.0	152.0	221.0	610.0	165.0	-	18.9	1"-14	16.5	M10X15	F10	102.0	16.2	14.5	-	-	433
2"	inch	2.00	5.91	-	3.27	-	12.89	14.53	12.89	15.59	6.0	7.64	6.0	8.70	24.02	6.50	-	0.74	UNS-2A	0.65			4.02	35.64	31.9	-	-	500
DN65	mm	63.5	170.0	-	83.0	-	463.3	509.8	344.0	550.0	272.2	318.7	152.0	359.0	610.0	185.0	-	18.9	1"-14	16.5	M10X15	F10	102.0	29.0	26.0	-	-	735
2-½"	inch	2.50	6.69	-	3.27	-	18.24	20.07	13.52	21.66	10.72	12.55	6.0	14.14	24.02	7.28	-	0.74	UNS-2A	0.65			4.02	63.8	57.2	-	-	850
DN80	mm	80.0	-	180.0	-	77.5	451.5	498.0	344.0	538.0	260.4	306.9	152.0	347.0	610.0	-	200.0	18.9	1"-14	16.5	M10X15	F10	102.0	-	-	35.0	32.0	1125
3"	inch	3.15	-	7.09	-	3.05	17.78	19.61	13.52	21.20	10.25	12.08	6.0	13.67	24.02	-	7.87	0.74	UNS-2A	0.65			4.02	-	-	77.0	70.4	1300
DN100	mm	100.0	-	190.0	-	84.5	467.5	514.0	344.0	554.0	276.4	322.9	152.0	363.0	610.0	-	220.0	18.9	1"-14	16.5	M10X15	F10	102.0	-	-	48.0	45.0	2076
4"	inch	3.94	-	7.48	-	3.33	18.41	20.24	13.52	21.83	10.88	12.71	6.0	14.30	24.02	-	8.66	0.74	UNS-2A	0.65			4.02	-	-	105.6	99.0	2400
DN150	mm	150.0	-	350.0	-	163.5	564.0	633.5	385.0	-	331.4	400.9	152.0	-	-	-	28.05	28.5	1-½"-12	26	M12X15	F12	125.0	-	-	104.0	98.0	4671
6"	inch	5.91	-	13.78	-	6.44	22.20	24.94	15.16	-	13.05	15.78	6.0	-	-	-	11.22	1.12	UNF-2A	1.02			4.92	-	-	228.8	215.6	5400

*6" Bonnet

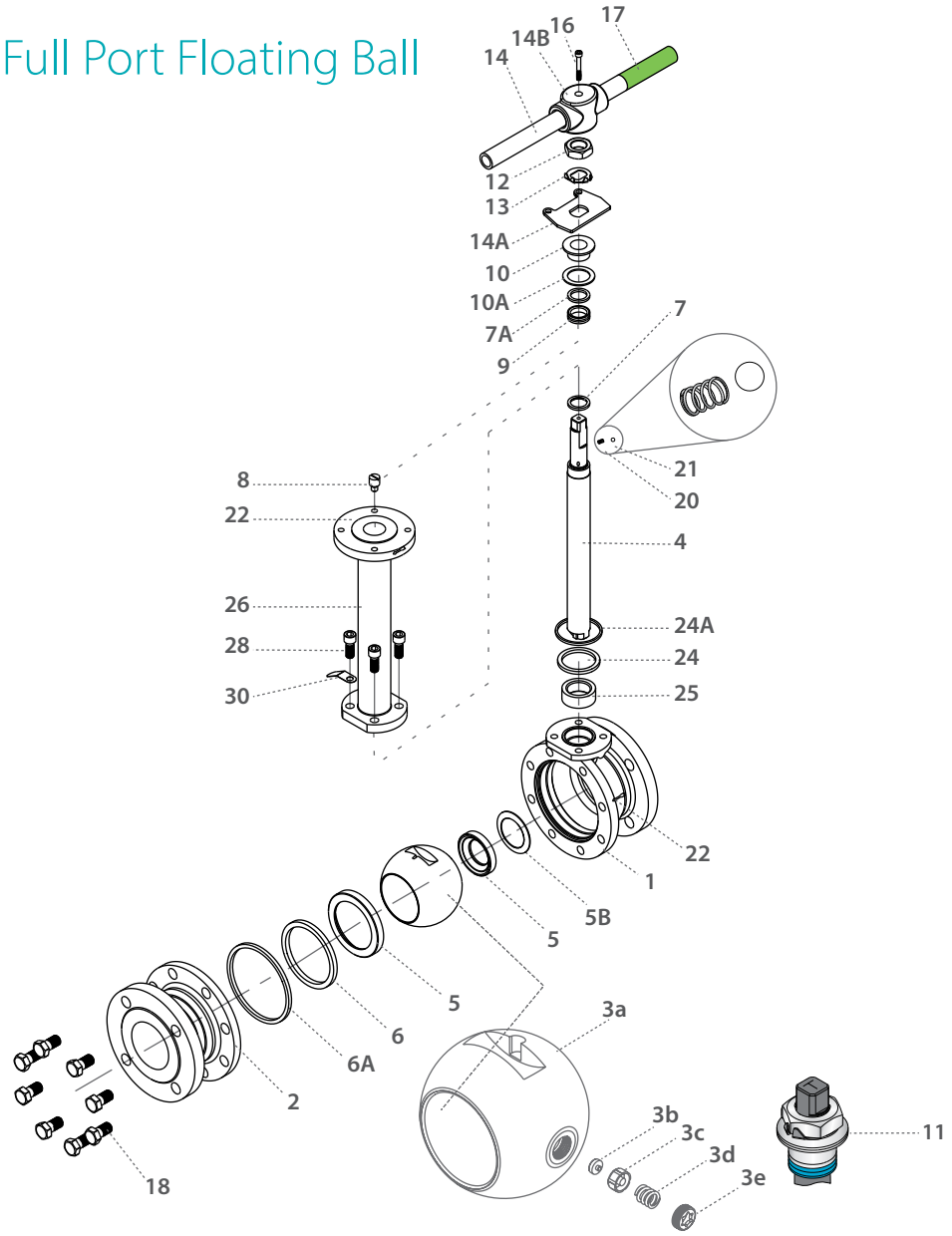
C73-BD C74-BD C77-BD

2"-8"[(1)] | DN50-DN200
CLASS 150/300/PN 16

Cryogenic Flanged Full Port Floating Ball

Components & Materials

PATENTED
US 12044333



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3a	Ball With Integrated PRV	S.Steel	1
3b	Insert	MOD PTFE, CF PTFE, PCTFE	1
3c	Piston	S.Steel	1
3d	Spring	INCONEL® X-750	1
3e	Nut	S.Steel	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5B	Upstream Seat Spring	Inconel 718	1
6*	Inner Seal	TFM	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1

Item	Description	Material specifications	Qty.
14**	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	8-10
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1
24*	Bonnet Inner Seal	TFM	1
24A*	Bonnet Outer Seal	Acc. Ordering Code	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. Steel	1
28	Bolt	S. Steel	4
30	Dog Tag	S. Steel	1

* Maintenance kit components

** Gear operator should be used for size 6" DN150 and above (handle components are not included)

(1) C77 up to 6"

C31 C32 C73 C74 C77 C78

C31-BD C32-BD C73-BD C74-BD C77-BD

Cryogenic Flanged Full Port Floating Ball - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	.	30
4	0			F	C	7	3	W	-	6	6	6	M	A	A	G	/	1	5	0							
Size		Features				Series		Design		Body/ End		Ball material	Seat material	Seat/ Seals				End connection				Special features					

Size (1-2)		
Code	inch	mm
05	½"	15
07	¾"	20
10	1"	25
12*	1¼"	32
15	1½"	40
20	2"	50
25*	2½"	65
30	3"	80
40	4"	100
60	6"	150
80	8"	200

* only for series 73/78

Features (3-6)	
C	Cryogenic
F	Fire safe
N	Control service

Series (7-8)	
31	ANSI #150 std. port
32	ANSI #300 std. port
73	ANSI #150 full port
74	ANSI #300 full port
77	DIN PN 16 full port
78	DIN PN 40 full port

Design (9)	
W	Total HermetiX Integrity package

Body material (11)	
6	CF8M
7	Monel

End material (12)	
6	CF8M
7	Monel

Ball material (13)	
6	S. St.
7	Monel

Stem material (14)	
M	High Strength S. Steel
Z	Inconel

Seat material (15)	
A	TFM
C	PCTFE
P	CF PTFE

Inner Seal Material (16)	
A	TFM
G	Expanded graphite

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
Flanged	
150(2)*	ASME B16.5 #150 RF
300(2)**	ASME B16.5 #300 RF
PN16(2)***	EN1092 PN16 RF
PN40(2)****	EN1092 PN40 RF

* C31, 73 series
** C32, C74 series
*** C77 series
**** C78 series

Special Features (24-30)	
BD	Bidirectional design
6.0	Short bonnet
SPR	Spring loaded seat, valve 2½" Full port and up
SPR*	Spring loaded seat, up to 2½" std. port
B	Body made from rolled bar
FF	Flat face
F1	F1 - DIN 3202-1 RF face-to-face size
F4	F4 - DIN 3202-1 RF face-to-face size
F5	F5 - DIN 3202-1 RF face-to-face size
Vxx	V port (xx = angle)
VBxx	Characterized control ball

* Applicable to Uni-directional valves only.

HIGH PRESSURE VALVES

General 138

Trunnion

3 Piece 141

Floating Ball

3 Piece 149



HIGH PRESSURE VALVES

General

Habonim's High Pressure product line valves are subject to the general Habonim valves design, materials, practices, methodologies and certifications – for more information, see Valves General chapter.

Habonim High Pressure valves are equipped with the Total HermetiX integrity package for superior sealing, safety and environmental care.

High Pressure Valves

Performing within high pressure systems is a significant part of our daily commitment over the last two decades. We design, manufacture and support our high-pressure ball valves and control packages that are specially built for safety, endurance and reliability to cover for gases and fluids control up to Class 2500 pressures rating and beyond.

Our customers trust allows us to offer a comprehensive standard catalogue product line alongside flexible tailor-made product offered to the most demanding applications.

Features

Materials

- Forged or rolled bars, sourced and stocked only from high quality mills.

Robust design

- High Δp (differential pressure)
- Up to 414bar (6,000psi) full Δp class 2500 depend on series and size.
- Series 28:
  - pressure containing parts are in compliance with ASME B16.34, for wall thickness.
  - A one-size-up stem made of high tensile material complies with ASME B16.34 and API 6D for drive train requirements provides sufficient safety factor during operation.

Hybrid seat design

- A special hybrid seat design provides a higher metal seat stiffness and bubble tight shut-off (Rate A) combined with lower operating torque compared to equivalent similar valve solutions.

Pressure tested

- Designs are burst-proof tested for 4 times the maximal working pressure.

Reference standards

- Designed and tested per EN 14432:2014
- Type test certified by DNV-GL (for part of the series)

Quick Selection Table

Total Hermetix™ | **Port:** Standard Port | Full Port | Tube Size | **End Connections:** Threaded | Flanged | Welded

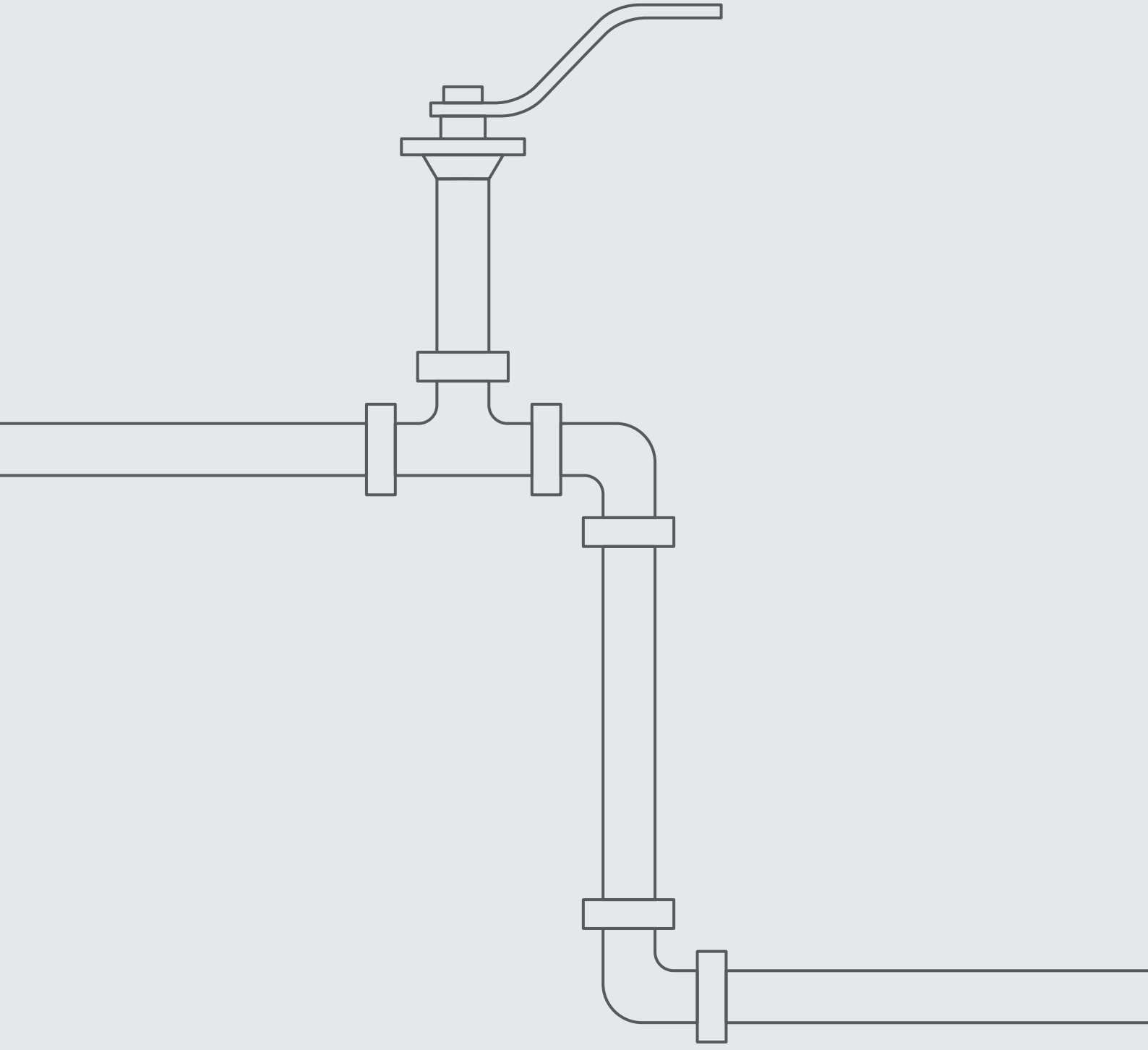
OC Ordering Code

	Ball Valve	Design Type	OC	Series	TH	Port		End Con.			Valve Size (Inches) ¼	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12	MWP (ASME Class / DIN PN)
-60°C - +260°C (-76 °F - +500 °F)	Trunnion Mounted Ball	3 Piece	OC	96	TH														2500						
			OC	95	TH														1500						
	Floating Ball	3 Piece	OC	28	TH						2500							2500 (Δp up to 255bar/3700psi)							
			OC	27	TH						2500							1500							
			OC	24	TH						2500 (Full Δp)														

ASME Class			150	300	600	900	1500	2500	6000
Pressure Bar	-1 *	0	16	20	50	100	150	250	414	1034
Pressure psi	-14 *	0	290	290	725	1450	2175	3600	5800	15000

* Vacuum 10^{-6} Tor



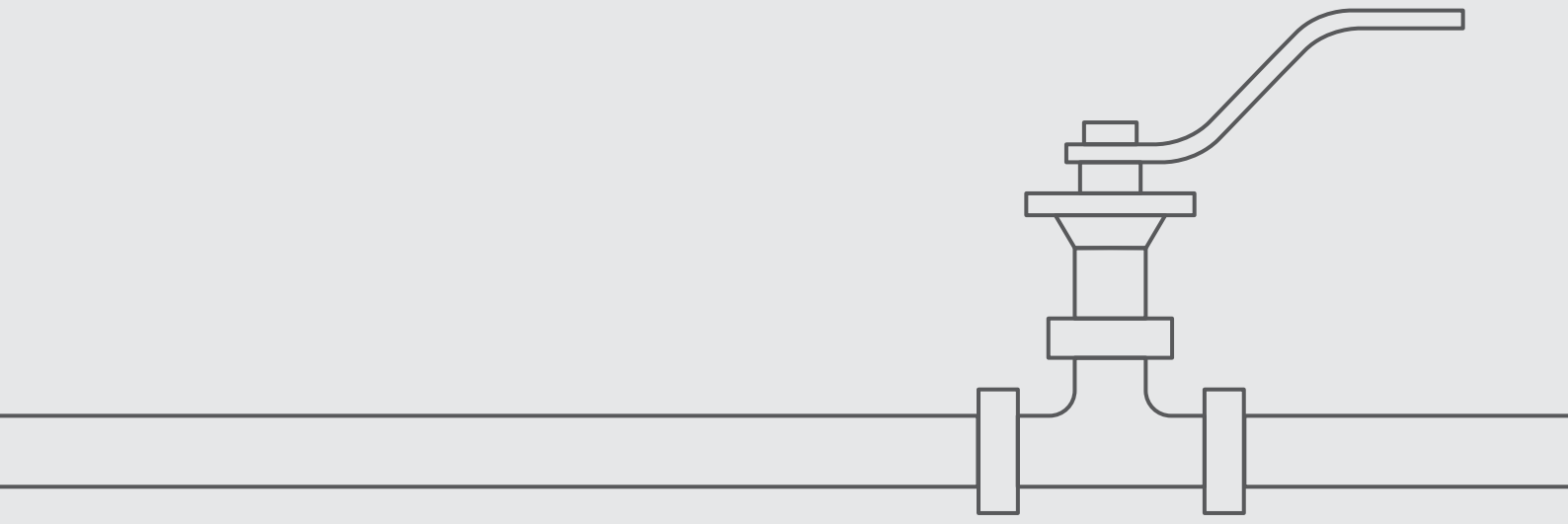


95 96

High Pressure

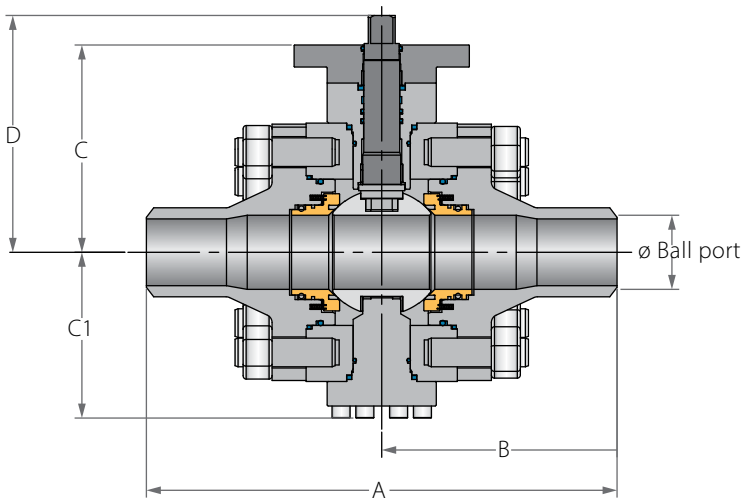
TRUNNION

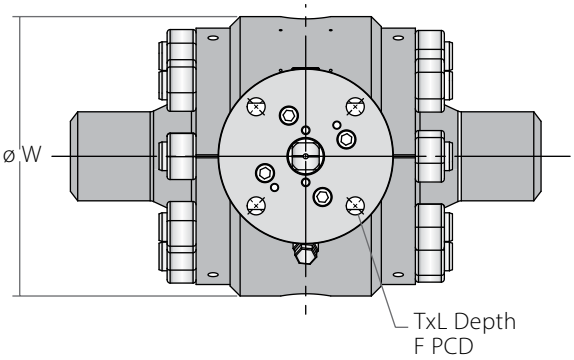
3 PIECE



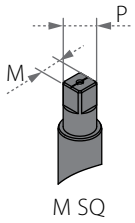
High Pressure Trunnion Mounted Ball 3 Piece

Valve Dimensions





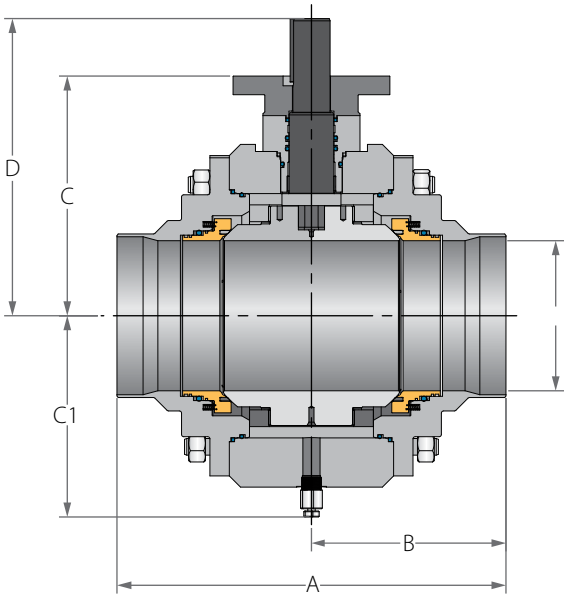
Preparation for actuation

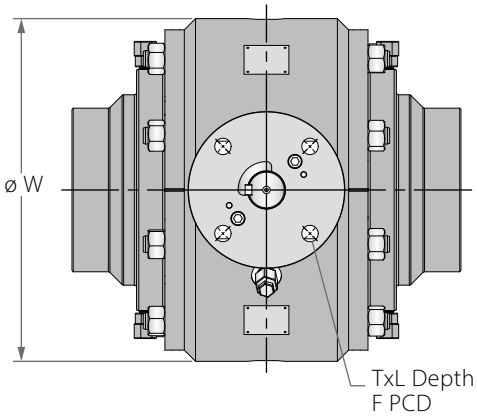


Std. port	Full port	Unit	Ball port		A		B		C	C1	D	W		Msq	Psq	F		TxL	Weight kg/ib		Kv / Cv	
			1500	2500	1500	2500	1500	2500				1500	2500						1500	2500	1500	2500
DN80	DN50	mm	49.0	42.0	368.0	451.0	184.0	225.50	204.50	159.0	339.0	215.0	235.0	22.0	32.0	F14	140.0	18X12 (4 holes)	57	124	281	260
3"	2"	inch	1.93	1.65	14.49	17.76	7.24	8.88	8.05	6.26	13.35	8.46	9.25	0.87	1.26		5.51		126	273	325	300
DN100	DN80	mm	74.0	62.0	470.0	578.0	235.0	289.0	262.0	201.50	342.50	265.0	305.0	27.0	35.0	F14	140.0	18x22 (4 holes)	112	238	735	649
4"	3"	inch	2.91	2.44	18.50	22.76	9.25	11.38	10.31	7.93	13.48	10.43	12.01	1.06	1.38		5.51		247	525	850	750
DN150	DN100	mm	100.0	87.0	546.0	673.0	273.0	336.50	225.0	198.50	299.50	310.0	355.0	36.0	46.20	F16	165.0	22x25 (4 holes)	235	402	1384	1228
6"	4"	inch	3.94	3.43	21.50	26.50	10.75	13.25	8.86	7.81	11.79	12.20	13.98	1.42	1.82		6.50		518	886	1600	1420
DN200	DN150	mm	144.0	131.0	705.0	914.0	352.50	457.0	310.0	272.0	425.0	395.0	485.0	46.0	59.0	F25	254.0	22x30 (8 holes)	445	833	3590	2206
8"	6"	inch	5.67	5.16	27.76	35.98	13.88	17.99	12.20	10.71	16.73	15.55	19.09	1.81	2.32		10.0		981	1836	4150	2550

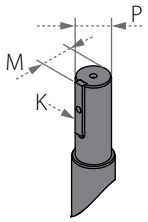
High Pressure Trunnion Mounted Ball 3 Piece

Valve Dimensions





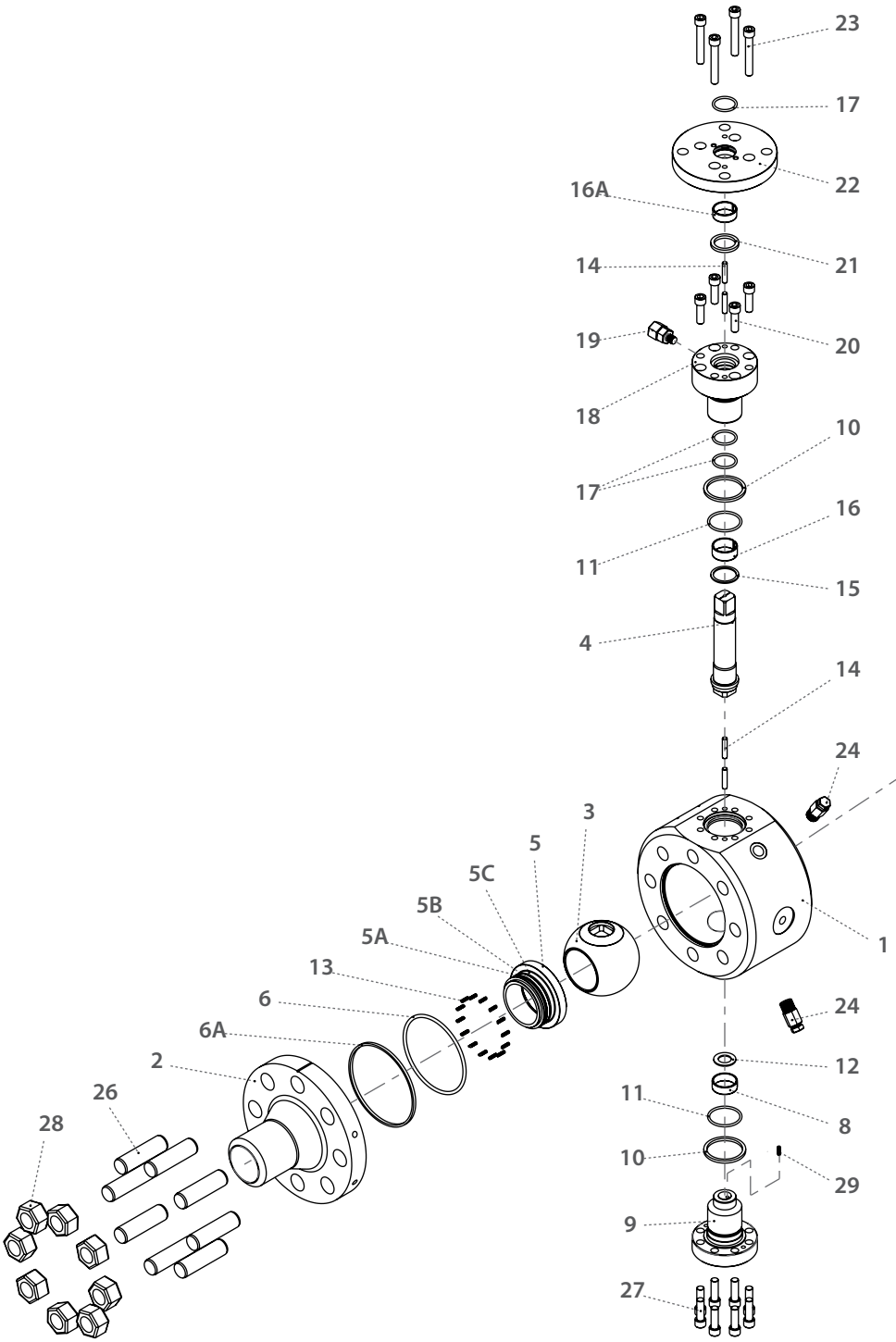
Preparation for actuation



Std. port	Full port	Unit	Ball port		A		B		C	C1	D	W		P	M	K	F		TxL	Weight kg/ib		Kv / Cv	
			1500	2500	1500	2500	1500	2500				1500	2500							1500	2500	1500	2500
DN250	DN200	mm	192.0	179.0	832.0	1022.0	416.0	511.0	425.0	273.0	540.0	485.0	550.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	784	1920	6963	4758
10"	8"	inch	7.56	7.05	32.76	40.24	16.38	20.12	16.73	10.75	21.26	19.09	21.65	2.83	3.01	0.79		10.0		1728	4233	8050	5500
DN300	DN250	mm	239.0	223.0	991.0	1270.0	495.50	635.0	582.0	374.0	712.0	585.0	675.0	80.0	87.0	22.0	F30	298.0	22x30 (8 holes)	1560	3317	11418	7526
12"	10"	inch	9.41	8.78	39.02	50.0	19.51	25.0	22.91	14.72	28.03	23.03	26.57	3.15	3.43	0.87		11.73		3439	7313	13200	8700

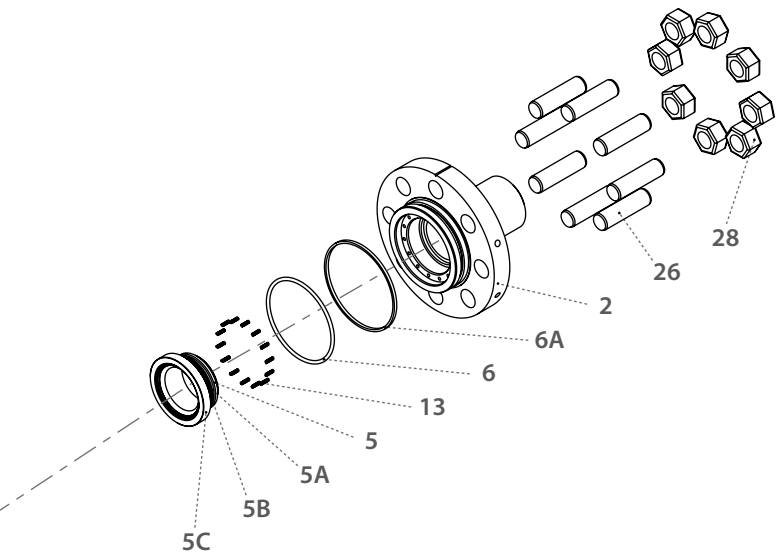
High Pressure Trunnion Mounted Ball 3 Piece

Components & Materials



High Pressure Trunnion Mounted Ball 3 Piece

Components & Materials

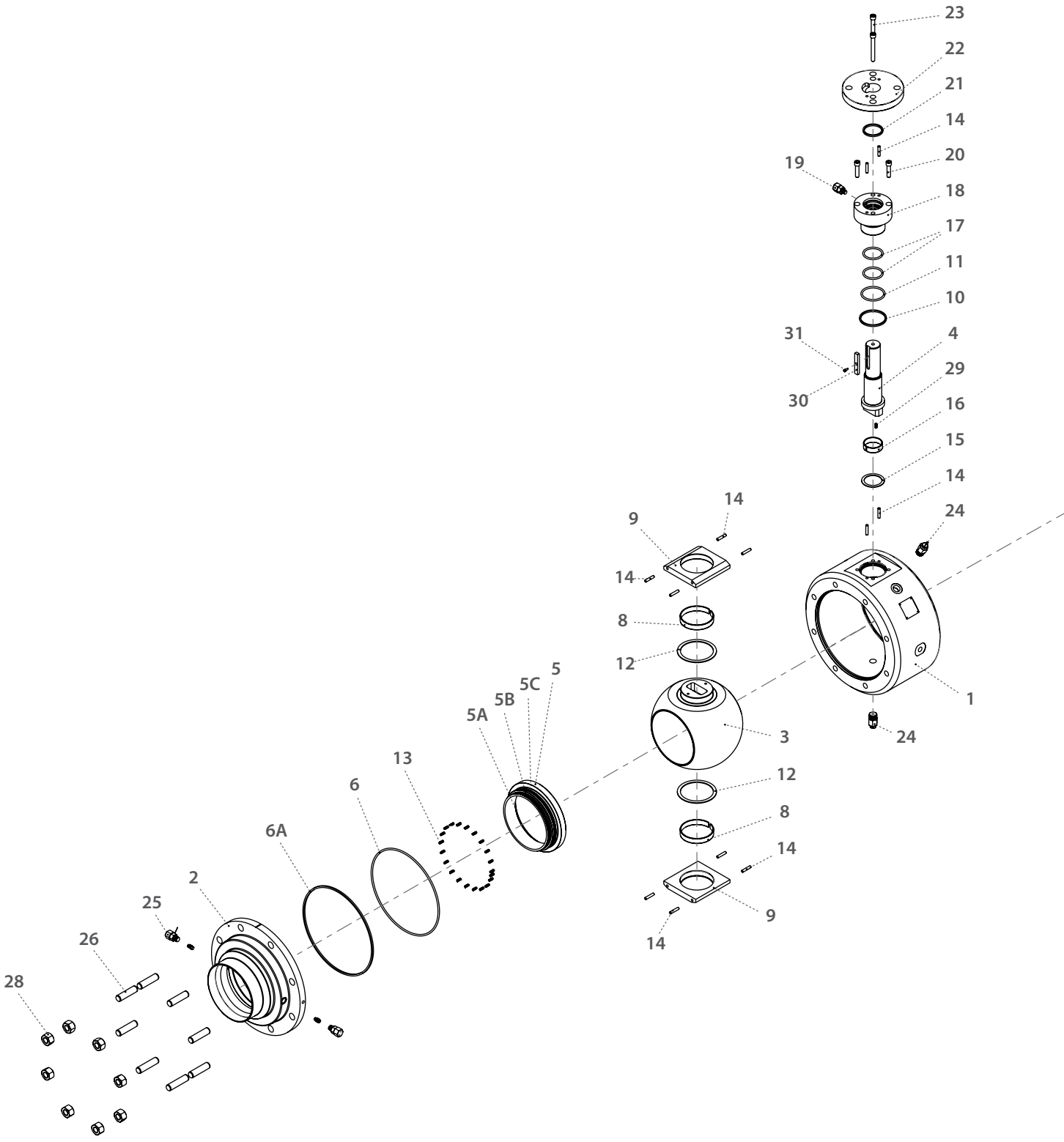


Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5	Seat	Acc. Ordering Code	2
5A	Seat Insert	Acc. Ordering Code	2
5B	Seat Seal	HNBR, VITON	2-4
5C	Seat Fire Safe Seal	Graphite	2
6	Body Inner Seal	HNBR, VITON	2
6A	Body Outer Seal	Graphite	2
8	Ball Bearing	S.Steel 316+PTFE	2
9	Trunnion Plate	S.Steel / C.Steel	2
10	Gland Plate Fire Safe Seal	Graphite	1
11	Gland Plate Seal	HNBR, VITON	1
12	Ball Thrust Washer	S.Steel 316+PTFE	2
13	Seat Spring	Inconel X750	10-24
14	Gland Pin (not shwon)	S.Steel / C.Steel	12

Item	Description	Material specification	Qty.
15	Stem Thrust Washer	S.Steel 316+PTFE	1
16	Stem Bearing	S.Steel 316+PTFE	1
16A	Iso Plate Bearing	S.Steel 316+PTFE	1
17	Stem Seal	HNBR, VITON	2
18	Gland Plate	S.Steel / C.Steel	1
19	Stem Grease Fitting	S. Steel	1
20	Lower Gland Bolts	A193-B8M / A320 L7	2-6
21	Stem Fire Safe Seal	Graphite	1
22	Iso Plate	S. Steel	1
23	Upper Gland Bolts	A193-B8M / A320 L7	2
24	Plug Valve	S. Steel	2
25	Seat Grease Fitting + Check Valve	S. Steel	4
26	Body Studs	A193-B8M / A320 L7	8-40
27	External Trunnion Bolts	A320 L7, A193 B8M	4-12
28	Body Nuts	A193-B8M / A320 L7	8-40
29	Anti-Static Spring	Inconel X750	1

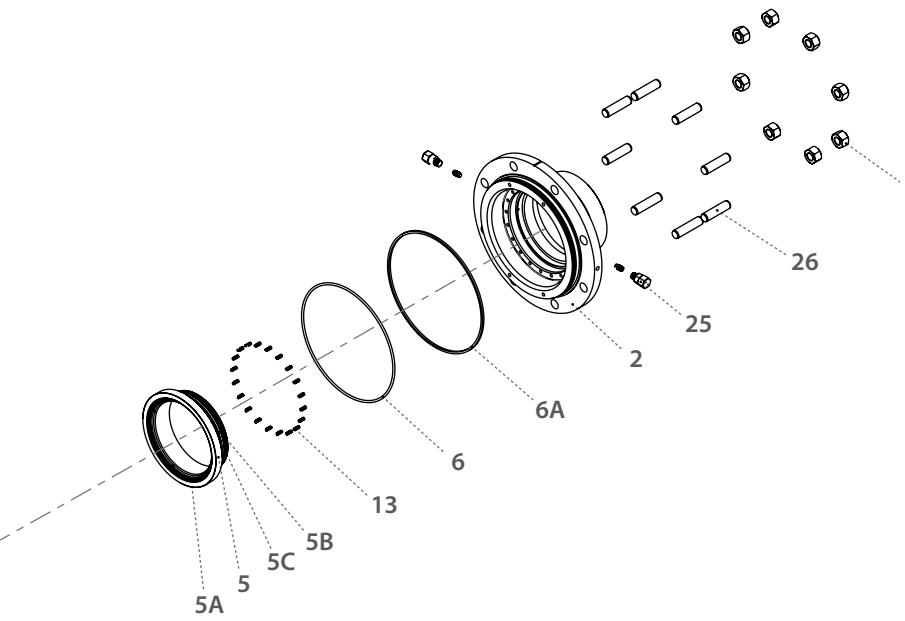
High Pressure Trunnion Mounted Ball 3 Piece

Components & Materials



High Pressure Trunnion Mounted Ball 3 Piece

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5	Seat	Acc. Ordering Code	2
5A	Seat Insert	Acc. Ordering Code	2
5B	Seat Seal	HNBR, VITON	2-4
5C	Seat Fire Safe Seal	Graphite	2
6	Body Inner Seal	HNBR, VITON	2
6A	Body Outer Seal	Graphite	2
8	Ball Bearing	S.Steel 316+PTFE	2
9	Trunnion Plate	S.Steel / C.Steel	2
10	Gland Plate Fire Safe Seal	Graphite	1
11	Gland Plate Seal	HNBR, VITON	1
12	Ball Thrust Washer	S.Steel 316+PTFE	2
13	Seat Spring	Inconel X750	10-24
14	Gland Pin (not shwon)	S.Steel / C.Steel	12

Item	Description	Material specification	Qty.
15	Stem Thrust Washer	S.Steel 316+PTFE	1
16	Stem Bearing	S.Steel 316+PTFE	1
17	Stem Seal	HNBR, VITON	2
18	Gland Plate	S.Steel / C.Steel	1
19	Stem Grease Fitting	S. Steel	1
20	Lower Gland Bolts	A193-B8M / A320 L7	2-6
21	Stem Fire Safe Seal	Graphite	1
22	Iso Plate	S. Steel	1
23	Upper Gland Bolts	A193-B8M / A320 L7	2
24	Plug Valve	S. Steel	2
25	Seat Grease Fitting + Check Valve	S. Steel	4
26	Body Studs	A193-B8M / A320 L7	8-40
27	External Trunnion Bolts	A320 L7, A193 B8M	4-12
28	Body Nuts	A193-B8M / A320 L7	8-40
29	Anti-Static Spring	Inconel X750	1
30	Stem Key	S.Steel / C.Steel	1
31	Stem Key Bolt	S.Steel / C.Steel	1

High Pressure Trunnion Mounted Ball Valve - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0			F	B	9	5		-	4	M	4	D	V	V	G	/	1	5	0	0					
Size		Features				Series		Design		Body & ends	Stem	Ball & seat ring	Seat feature	Seat insert	Inner Seal	Outer Seal		End Connection				Special features				

Size (1-2)		
Code	inch	mm
20	2"	50
30	3"	75
40	4"	100
60	6"	150
80	8"	200
A0	10"	250
A2	12"	300

Features (3-6)	
F	Fire safe
B	Full port
H*	Hydrogen Service

* for material selection - see Hydrogen Service chapter

Series- 3 Piece (7-8)	
95	ASME B16.5 #1500
96	ASME B16.5 #2500

Design (9)	
	Empty (Stands For future designs)

Body & ends (11)	
4	C. Steel A105
6	S. Steel A479 316
F	C. Steel A350 LF2

Stem (12)	
M	17-4PH A564 Gr 630 H1150D
Z	Inconel 718

Ball (13)	
4	C. Steel A105+ENP
6	S. Steel A182 F316
F	C. Steel A350 LF2+ENP
M	17-4PH A564 Gr 630 H1150D

Seat feature (14)	
D	Double Piston Effect (DPE) (API 6D DIB-1)
S	Single Piston Effect (SPE) (API 6D DBB)
C	DPE & SPE combination (API 6D DIB-2)

Seat insert (15)	
V	Devlon
K	CF PEEK

Inner Seal (16)	
V	Viton
H	HNBR

Outer Seal (17)	
G	Graphite

End connections (19-22)	
Welded	
XBW160	Extended buttweld sch 160
XBWXXS	Extended buttweld sch XXS
Flanged	
1500	ASME B16.5 #1500
2500	ASME B16.5 #2500
PN250	DIN EN 1092-1 PN250
PN320	DIN EN 1092-1 PN320
PN400	DIN EN 1092-1 PN400
Flanged RTJ	
1500RTJ	ANSI B16.5 #1500 RTJ
2500RTJ	ANSI B16.5 #2500 RTJ

Special features (23-30)	
L*	Seat greasing point
D*	Drain & Vent
PT**	Basic paint system
Blank	Drain & vent is capped
H*	Drain ball valve & vent
PT1**	Offshore, Temp Ambient up to 93°C (200°F)
PT2	Offshore, up to 537°C (1000°F)

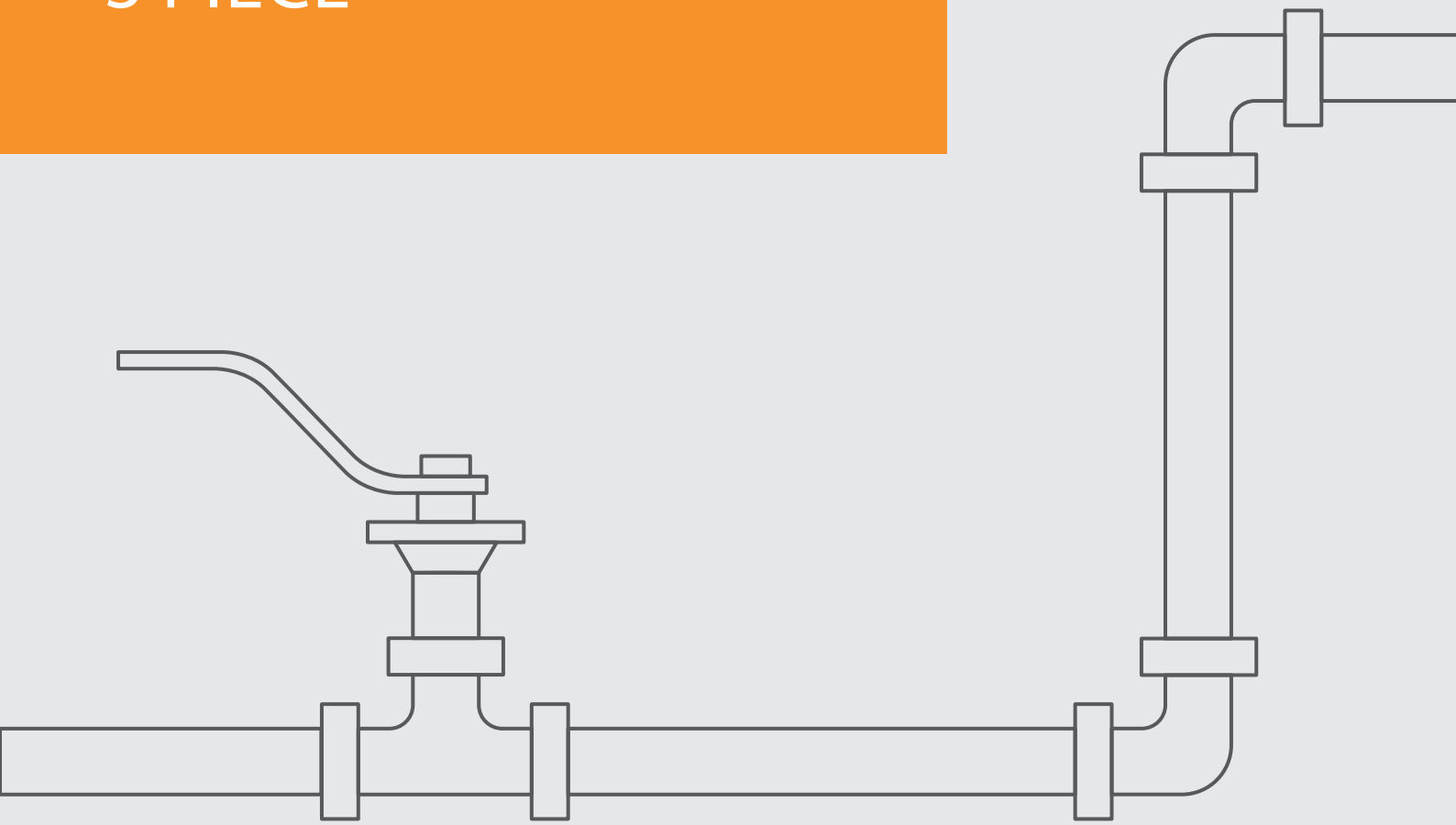
* for 6" up
** color RAL 7036

28 27 24

High Pressure

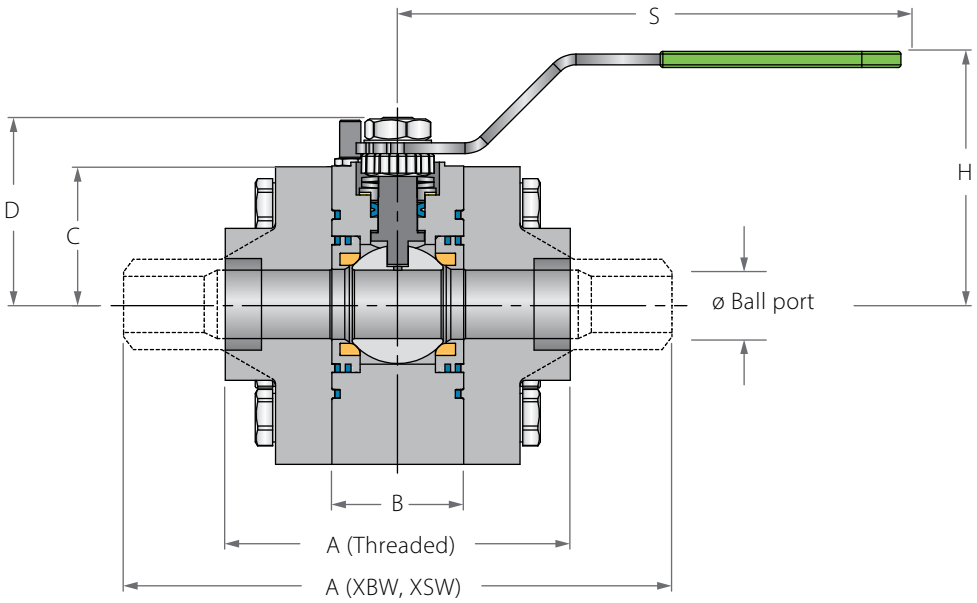
FLOATING BALL

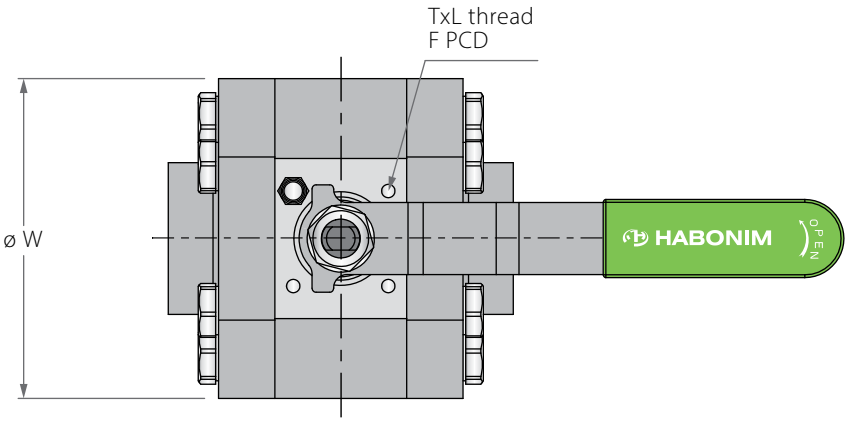
3 PIECE



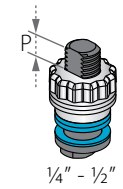
High Pressure Floating Ball 3 Piece

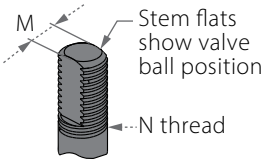
Valve Dimensions





Preparation for actuation



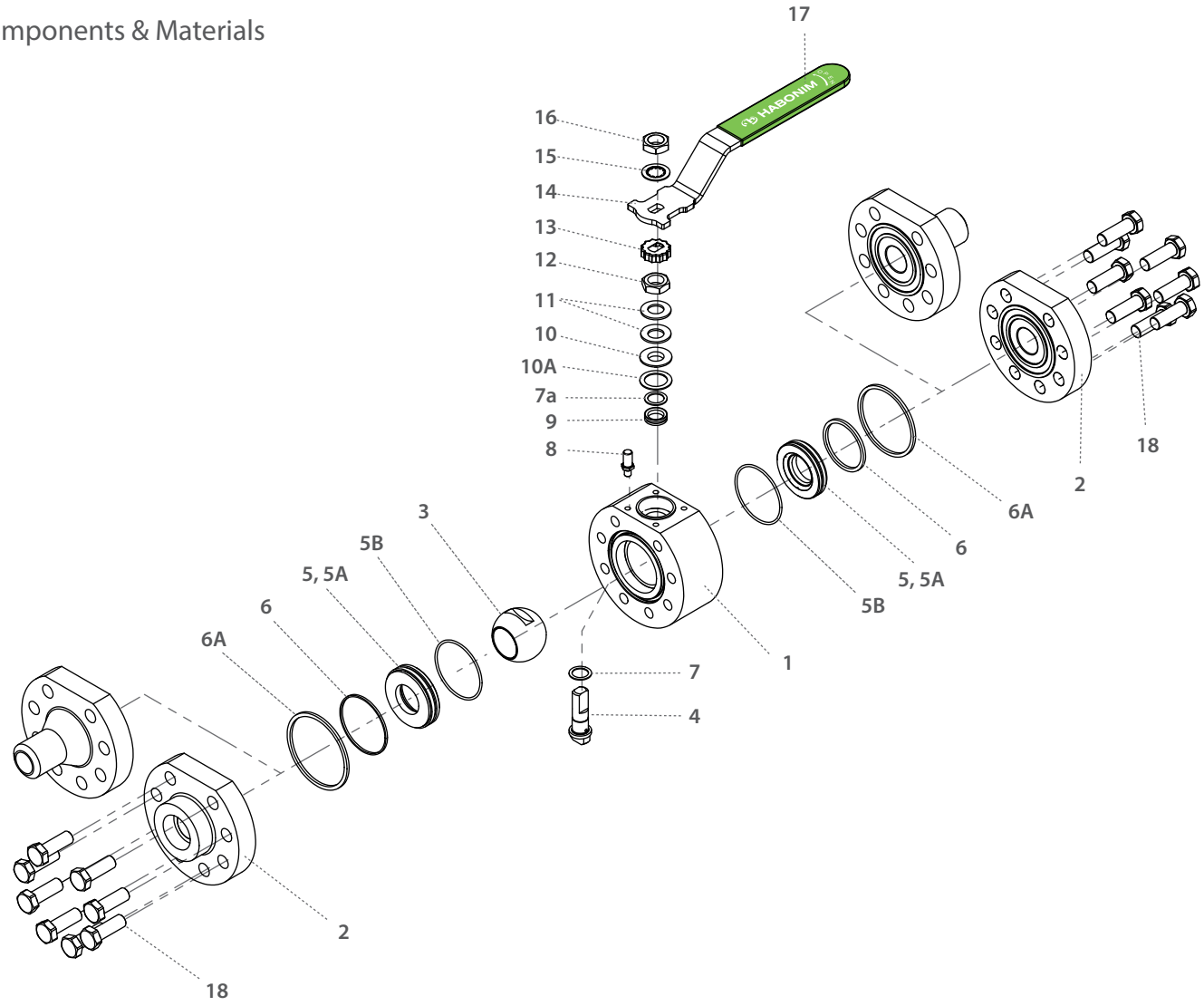


Face To Face of Flanged end connections are per flange standards, for other end connections consult us.

Std. port	Full port	Unit	Ball port	A THD	A XBW/ XSW	B	C	D	H	S	W	M	N	P	F		TxL	Weight		Kv
																		THD	XBW	Cv
DN15	DN8, DN10	mm	11.15	92.2	158.6	35.0	29.0	37.9	63.0	150.0	45.5	5.5	⅜" UNF	6.5	F03	36.0	M5X6	2.8	7	2.6
½"	¼", ⅜"	inch	0.44	3.63	6.24	1.38	1.14	1.49	2.48	5.91	1.79	0.22		0.26		1.42		6.16	8	3.0
DN20	DN15	mm	13.0	100.0	168.6	40.0	34.1	51.0	76.5	187.0	8.09	7.5	7⁄16" UNF	6.5	F04	42.0	M5X8	4.3	10	4.3
¾"	½"	inch	0.51	3.94	6.64	1.57	1.34	2.01	3.01	7.36	3.50	0.30		0.26		1.65		9.46	12	5.0
DN25	DN20	mm	20.6	125.2	189.6	49.0	43.75	65.9	90.0	237.0	104.0	8.7	9⁄16" UNF	6.5	F05	50.0	M6X8	6.8	28	6.9
1"	¾"	inch	0.81	4.93	7.46	1.93	1.72	2.59	3.54	9.33	4.09	0.34		0.26		1.97		14.96	32	8.0
DN32	DN25	mm	25.4	133	192.6	49.0	51.5	69.5	92.5	237.0	69.0	8.7	9⁄16" UNF	6.5	F05	50.0	M6X9	9.5	49	10
1¼"	1"	inch	1. 0	5.24	7.58	1.93	2.03	2.74	3.64	9.33	2.72	0.34		0.26		1.97		20.90	57	12

High Pressure Floating Ball 3 Piece

Components & Materials



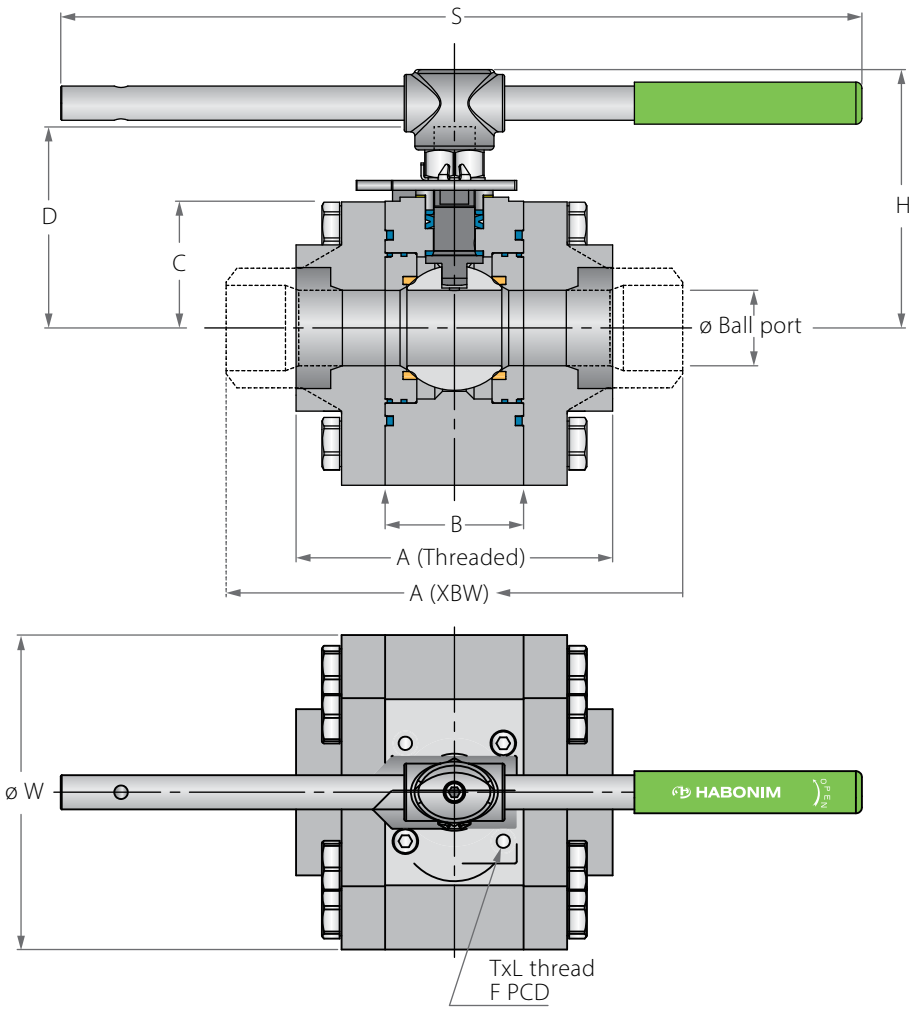
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat Insert	Acc. Ordering Code	2
5A*	Seat Housing	S. Steel	2
5B*	Seat Seal	Acc. Ordering Code	2
6*	Seat Seal	Acc. Ordering Code	2
6A*	Body Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7a**	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1

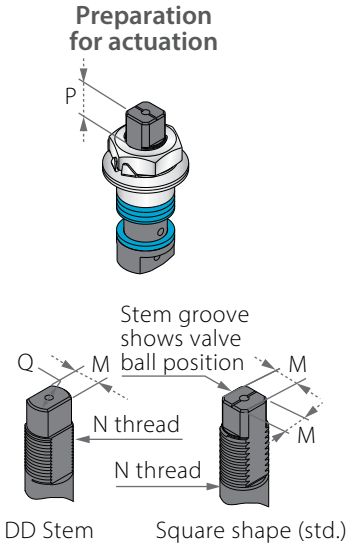
Item	Description	Material specification	Qty.
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	12-16
20	Anti Static Spring	S. Steel	1
21	Anti Static Plunger	S. Steel	1
23	Tag (Not Shown)	S. Steel	1

* Maintenance kit components

High Pressure Floating Ball 3 Piece

Valve Dimensions



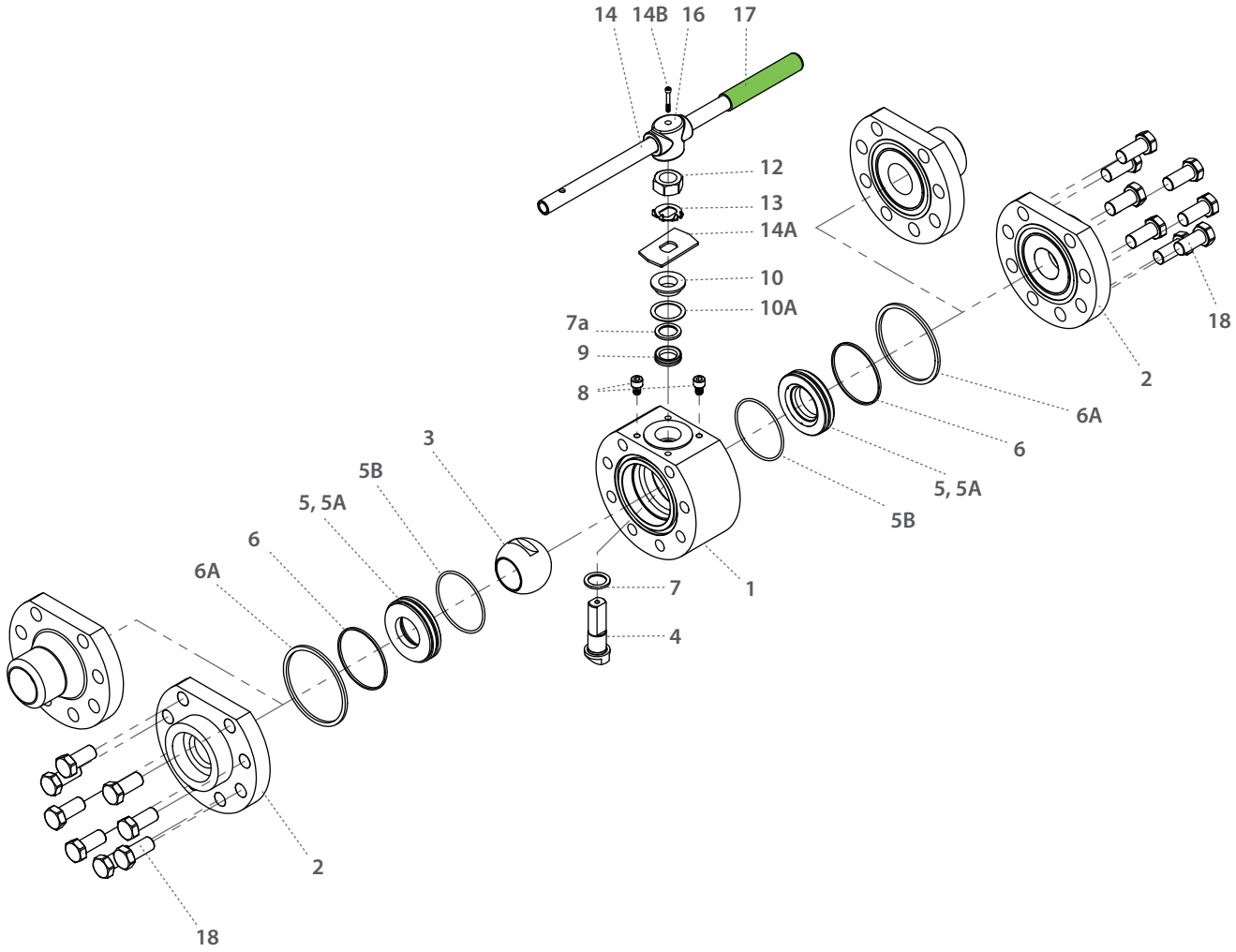


Face To Face of Flanged end connections are per flange standards, for other end connections consult us.

Std. port	Full port	Unit	Ball port	A THD	A XBW/ XSW	B	C	D	H	S	W	M	N	P	F		TxL	Weight (Kg /lb)	Kv / Cv
DN40	DN32	mm	31.8	154.0	237.0	70.0	53.0	94.6	120.0	400.0	79.0	13.9	M20x2.5	13.5	F07	70.0	M8X12	14.5	69
1½"	1¼"	inch	1.25	6.06	9.33	2.76	2.09	3.72	4.72	15.75	3.11	0.55		0.53		2.76		31.90	80
DN50	DN40	mm	38.1	170.0	241.0	70.0	64.1	105.7	124.0	400.0	90.5	13.9	M20x2.5	14.6	F07	70.0	M8X12	22.0	102
2"	1½"	inch	1.50	6.69	9.49	2.76	2.52	4.16	4.88	15.75	3.56	0.55		0.57		2.76		48.40	118
DN65	DN50	mm	50.8	214	302.4	94.0	87.5	134.0	158.5	610.0	108.0	18.9	1"-14 UNS-2A	16.7	F10	102.0	M10X16	36.0	208
2½"	2"	inch	2.0	8.43	11.91	3.70	3.44	5.28	6.24	24.02	4.25	0.74		0.66		4.02		79.20	241
DN80	DN65	mm	63.5	276.6	378.0	115.0	112.0	181.5	227.0	916.0	250.0	28.45	1½"-12 UNF-2A	26.2	F12	125.0	M12X15	76.0	301
3"	2½"	inch	2.50	10.89	14.88	4.53	4.41	7.15	8.94	36.06	9.84	1.12		1.03		4.92		167.20	348
DN100	DN80	mm	82.7	-	410.0	130.0	136.0	205.5	265.0	916.0	298.0	28.45	1½"-12 UNF-2A	26.2	F14	140.0	M16X20	110.0	616
4"	3"	inch	3.26	-	16.14	5.12	5.35	8.09	10.43	36.06	11.73	1.12		1.03		5.51		242.00	713
DN150	DN100	mm	100.0	-	510.0	175.0	177.0	289.6	-	-	390.0	35.9	2"-8 UN-2A	40.0	F16	165.0	M20X25	235.0	746
6"	4"	inch	3.94	-	20.08	6.89	6.97	11.40	-	-	15.35	1.41		1.57		6.50		517.00	863
DN200	DN150	mm	144.4	-	650.0	210.0	215.0	370.0	-	-	470.0	45.9	2¾"-8 UN-2A	50.0		200.0	M24X30	450.0	1555
8"	6"	inch	5.69	-	25.59	8.27	8.46	14.57	-	-	18.50	1.81		1.97		7.87		990.00	1800

High Pressure Floating Ball 3 Piece

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat Insert	Acc. Ordering Code	2
5A*	Seat Housing	S. Steel	2
5B*	Seat Seal	Acc. Ordering Code	2
6*	Seat Seal	Acc. Ordering Code	2
6A*	Body Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7a*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1

Item	Description	Material specification	Qty.
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	12-16
20	Anti Static Spring	S. Steel	1
21	Anti Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

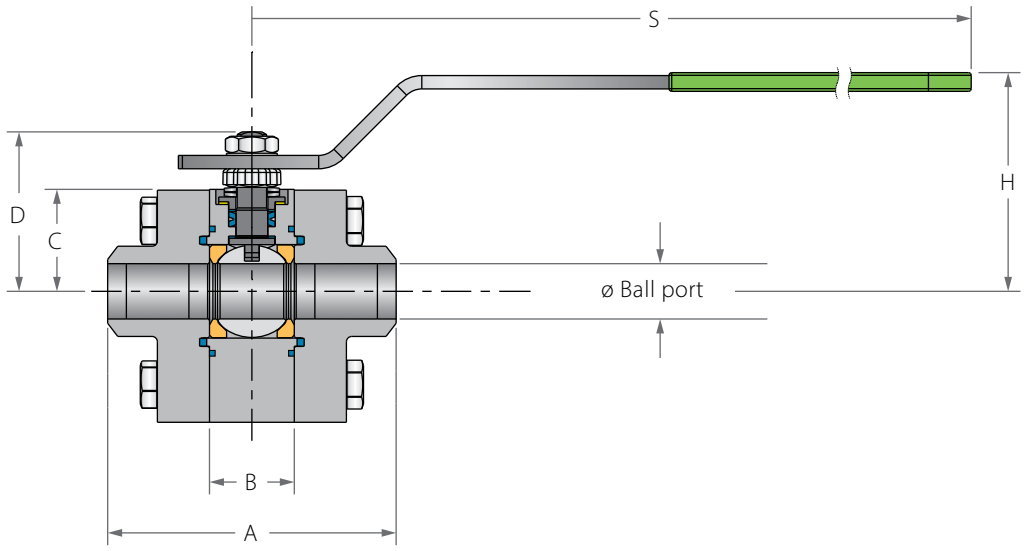
28

Face To Face Sizes

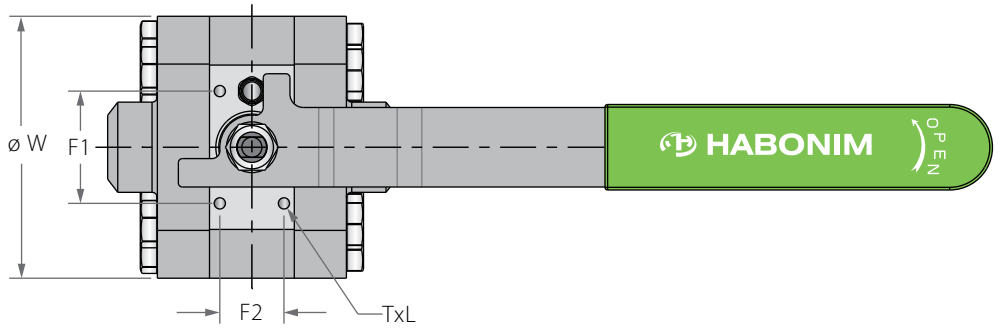
Valve Size	B		A-XBW, XSW, GR		A-Flange #900		A-Flange #900 RTJ		A-Flange #1500		A-Flange #1500RTJ		A-Flange #2500		A-Flange #2500RTJ		PN250-PN400 F3	
	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port
DN8	35.0	-	158.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
¼"	1.38	-	6.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DN10	35.0	-	158.6	-	-	-	-	-	-	-	-	-	-	-	-	-	230.0	-
⅜"	1.38	-	6.24	-	-	-	-	-	-	-	-	-	-	-	-	-	9.06	-
DN15	35.0	40.0	158.6	168.6	216.0	216.0	216.0	216.0	216.0	216.0	216.0	216.0	264.0	264.0	264.0	264.0	230.0	230.0
½"	1.38	1.57	6.24	6.64	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	10.39	10.39	10.39	10.39	9.06	9.06
DN20	40.0	49.0	168.6	189.6	229.0	229.0	229.0	229.0	229.0	229.0	229.0	229.0	273.0	273.0	273.0	273.0	260.0	260.0
¾"	1.57	1.93	6.64	7.46	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02	10.75	10.75	10.75	10.75	10.24	10.24
DN25	49.0	49.0	189.6	192.6	254.0	254.0	254.0	254.0	254.0	254.0	254.0	254.0	308.0	308.0	308.0	308.0	260.0	260.0
1"	1.93	1.93	7.46	7.58	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	12.13	12.13	12.13	12.13	10.24	10.24
DN32	49.0	70.0	192.6	237.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	349.0	349.0	352.0	352.0	300.0	300.0
1¼"	1.93	2.76	7.58	9.33	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	13.74	13.74	13.86	13.86	11.81	11.81
DN40	70.0	70.0	237.0	241.0	305.0	305.0	305.0	305.0	305.0	305	305.0	305.0	384.0	384.0	387.0	387.0	300.0	300.0
1½"	2.76	2.76	9.33	9.49	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	15.12	15.12	15.24	15.24	11.81	11.81
DN50	70.0	94.0	241.0	302.4	368.0	368.0	371.0	371.0	368.0	368.0	371.0	371.0	451.0	451.0	454.0	454.0	350.0	350.0
2"	2.76	3.70	9.49	11.91	14.49	14.49	14.61	14.61	14.49	14.49	14.61	14.61	17.76	17.76	17.87	17.87	13.78	13.78
DN65	94.0	115.0	302.4	378.0	419.0	419.0	422.0	422.0	419.0	419.0	422.0	422.0	508.0	508.0	514.0	514.0	400.0	400.0
2½"	3.70	4.53	11.91	14.88	16.50	16.50	16.61	16.61	16.50	16.50	16.61	16.61	20.0	20.0	20.24	20.24	15.75	15.75
DN80	115.0	130.0	378.0	410.0	381.0	381.0	384.0	384.0	470.0	470.0	473.0	473.0	578.0	578.0	584.0	584.0	450.0	45.00
3"	4.53	5.12	14.88	16.14	15.0	15.0	15.12	15.12	18.50	18.50	18.62	18.62	22.76	22.76	22.99	22.99	17.72	17.72
DN100	130.0	175.0	410.0	510.0	457.0	457.0	460.0	460.0	546.0	546.0	549.0	549.0	673.0	673.0	683.0	683.0	520.0	520.0
4"	5.12	6.89	16.14	20.08	17.99	17.99	18.11	18.11	21.50	21.50	21.61	21.61	26.50	26.50	26.89	26.89	20.47	20.47
DN150	175.0	210.0	510.0	650.0	610.0	610.0	613.0	613.0	705.0	705.0	711.0	711.0	914.0	914.0	927.0	927.0	700.0	700.0
6"	6.89	8.27	20.08	25.59	24.02	24.02	24.13	24.13	27.76	27.76	27.99	27.99	35.98	35.98	36.50	36.50	27.56	27.56
DN200	210.0	-	650.0	-	737.0	-	740.0	-	832.0	-	842.0	-	1022.0	-	1038.0	-	800.0	-
8"	8.27	-	25.59	-	29.02	-	29.13	-	32.76	-	33.15	-	40.24	-	40.87	-	31.50	-

High Pressure Floating Ball 3 Piece

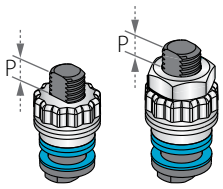
Valve Dimensions

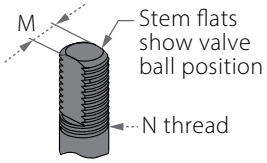


Size 2" | DN20
Differential pressure (Δp)
is up to 200bar (2,900psi)



Preparation for actuation



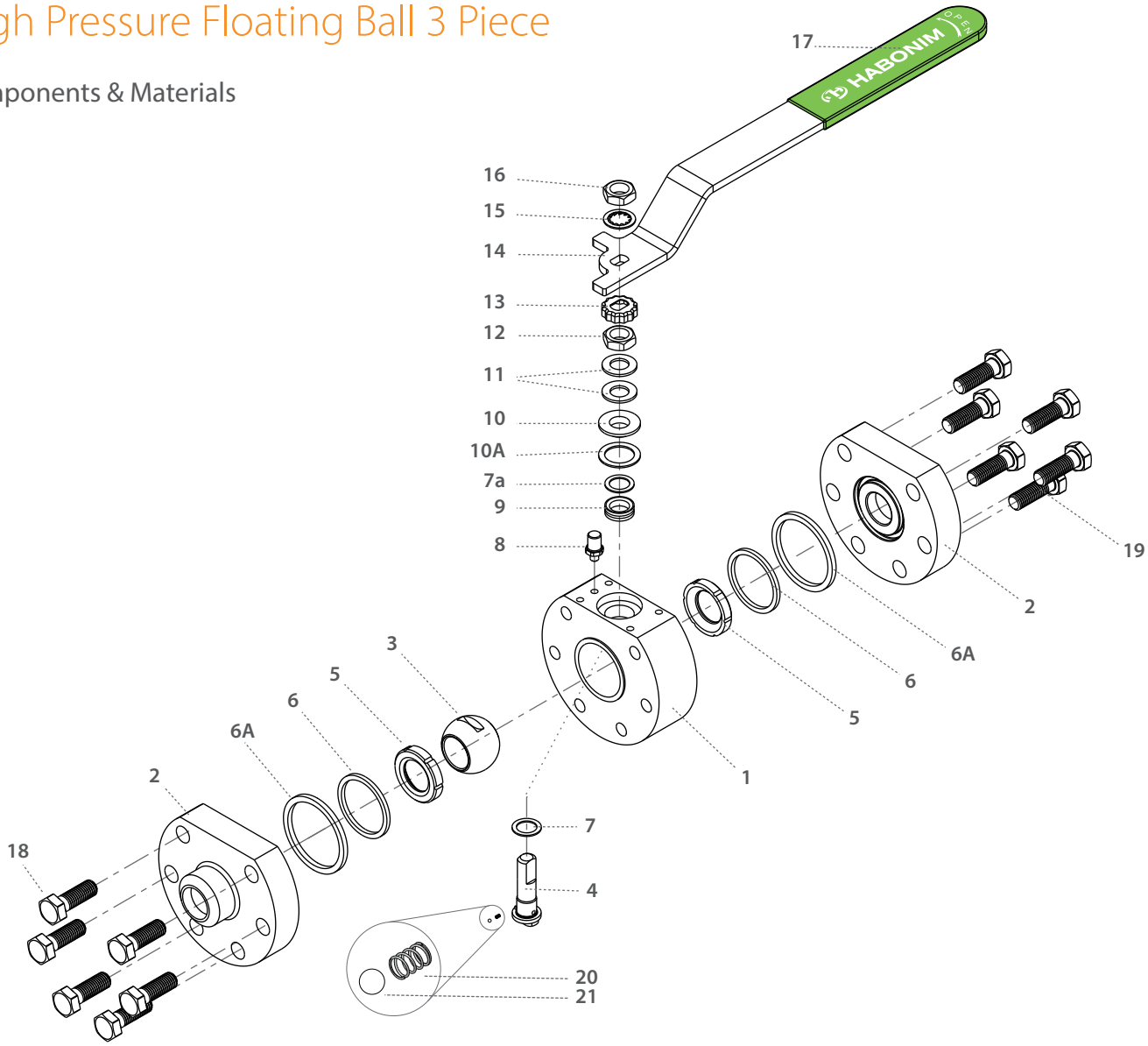


Face To Face of Flanged end connections are per flange standards, for other end connections consult us.

Std. port	Full port	Unit	Ball port	A		B	C	D	ØW	H	M	N	P	S	TxL	F1	F2	weight kg/lb	kv cv
				Weld/Thread	Extended Weld	Std. port													
DN8		mm	11.10	77.8	144.2	20.6	27.0	38.0	69.50	46.0	5.50	⅜" UNF	7.0	179.0	M5x8	34.0	0.0	1.60	2.6
¼"		inch	0.44	3.1	5.7	0.81	1.06	1.50	2.74	1.81	0.22		0.28	7.05		1.34	0.0	3.50	3.0
DN10		mm	11.10	77.8	144.2	20.6	27.0	38.0	69.50	46.0	5.50	⅜" UNF	7.0	179.0	M5x8	34.0	0.0	1.60	4.3
⅜"		inch	0.44	3.1	5.7	0.81	1.06	1.50	2.74	1.81	0.22		0.28	7.05		1.34	0.0	3.50	5.0
DN15	DN8, DN10	mm	11.10	77.8	144.2	20.6	27.0	38.0	69.50	46.0	5.50	⅜" UNF	7.0	179.0	M5x8	34.0	0.0	1.60	6.9
½"	¼", ⅜"	inch	0.44	3.1	5.7	0.81	1.06	1.50	2.74	1.81	0.22		0.28	7.05		1.34	0.0	3.50	8.0
DN20	DN15	mm	14.30	85.0	153.2	24.6	29.40	40.40	79.0	48.0	5.50	⅜" UNF	7.0	179.0	M5x8	34.0	15.0	2.40	10
¾"	½"	inch	0.56	3.3	6.0	0.97	1.16	1.59	3.11	1.89	0.22		0.28	7.05		1.34	0.59	5.30	12
DN25	DN20	mm	20.60	107.9	172.4	31.8	38.20	55.70	98.0	64.0	7.54	7/16" UNF	7.0	300.0	M5x8	42.0	24.0	4.50	28
1"	¾"	inch	0.81	4.2	6.8	1.25	1.50	2.19	3.86	2.52	0.30		0.28	11.81		1.65	0.94	9.90	32
DN32	DN25	mm	25.40	120.7	184.8	41.2	38.20	60.30	109.0	68.70	7.54	7/16" UNF	7.0	300.0	M5x8	42.0	24.0	5.40	49
1¼"	1"	inch	1.0	4.8	7.3	1.62	1.50	2.37	4.29	2.70	0.30		0.28	11.81		1.65	0.94	11.90	57
DN40	DN32	mm	31.80	131.2	215.4	48.4	50.0	72.80	128.0	81.10	8.71	9/16" UNF	10.0	400.0	M6x8	40.0	36.0	9.50	69
1½"	1¼"	inch	1.25	5.2	8.5	1.91	1.97	2.87	5.04	3.19	0.34		0.39	15.75		1.57	1.42	20.90	80
DN50	DN40	mm	38.20	142.9	227.3	56.3	55.0	77.80	145.0	81.10	8.71	9/16" UNF	10.0	400.0	M6x8	58.0	40.0	13.10	102
2"	1½"	inch	1.50	5.6	8.9	2.22	2.17	3.06	5.71	3.19	0.34		0.39	15.75		2.28	1.57	28.90	118

High Pressure Floating Ball 3 Piece

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7a*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

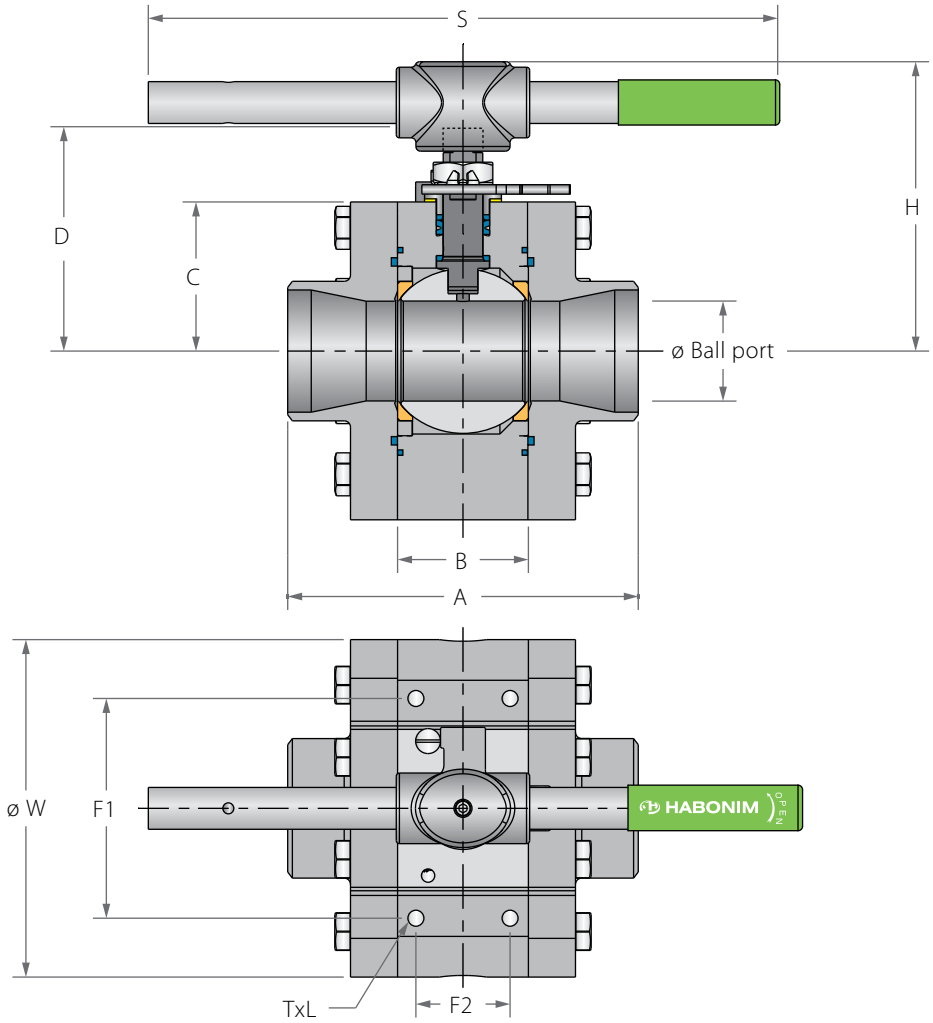
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	12-16
20	Anti Static Spring	S. Steel	1
21	Anti Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

Note: For the 27 series sizes ½" and ¾" 7a does not exist.

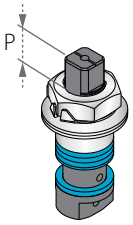
High Pressure Floating Ball 3 Piece

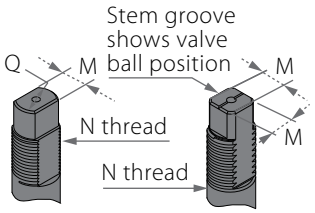
Valve Dimensions



Size 2½"-8" | DN65-DN200
Differential pressure (Δp)
is up to 70bar (1,034psi)

Preparation for actuation





Special shape add WR to description) (when ordering the valve

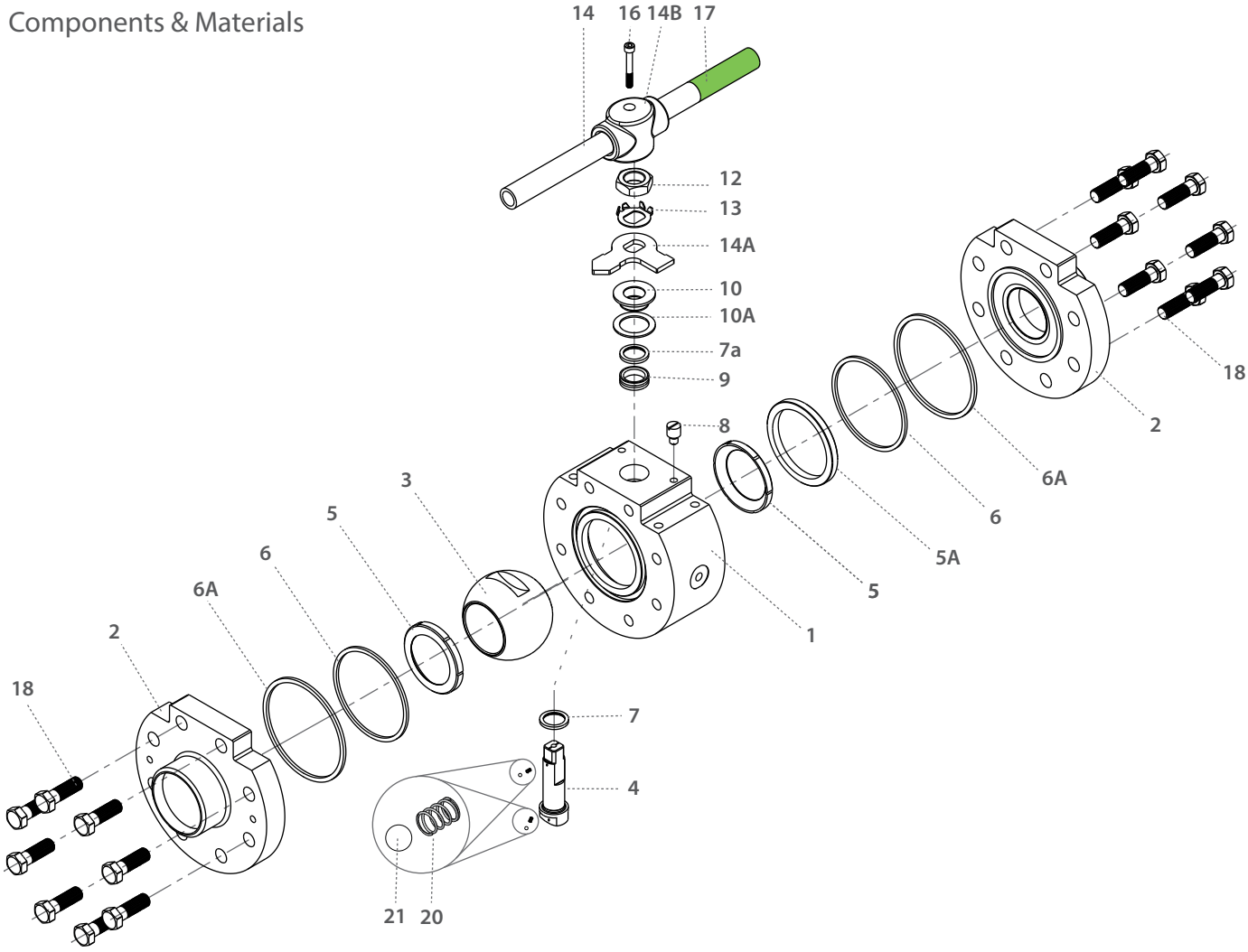
Standard shape

Face To Face of Flanged end connections are per flange standards, for other end connections consult us.

Std. port	Std. port	Unit	Ball port	A	B	C	D	Ø W	H	M	M-DD	N	P	Q	S	TxL	F1	F2	Weight kg/lb	kv
				Weld/Thread	Std. port															cv
DN65	DN50	mm	50.80	172.6	72.6	77.20	115.80	190.0	147.0	13.90	-	M20x2.5	16.50	-	256.0	M12x16	92.0	50.0	25.00	208
2½"	2"	inch	2.0	6.8	2.86	3.04	4.56	7.48	5.79	0.55	-		0.65	-	10.08		3.62	1.97	55.10	241
DN80	DN65	mm	63.75	224.0	83.3	70.0	144.90	215.0	185.0	18.90	15.90	1"-14" UNS	16.60	22.70	402.0	M10x12	140.0	60.0	39.00	300
3"	2½"	inch	2.51	8.8	3.28	2.76	5.70	8.46	7.28	0.74	0.62		0.65	0.89	15.83		5.51	2.36	85.98	348
DN100	DN80	mm	82.70	268.0	108.8	90.0	160.70	250.0	201.0	18.90	15.90	1"-14" UNS	16.60	22.70	610.0	M10x12	150.0	70.0	64.00	615
4"	3"	inch	3.26	10.6	4.28	3.54	6.33	9.84	7.91	0.74	0.62		0.65	0.89	24.02		5.91	2.76	141.10	713
DN150	DN100	mm	114.0	336.0	146.1	120.0	226.30	295.0	280.0	28.50	23.80	1½"-12" UNF	26.20	35.20	916.0	M16x18	140.0	66.0	120.00	872
6"	4"	inch	4.49	13.2	5.75	4.72	8.91	11.61	11.02	1.12	0.94		1.03	1.39	36.06		5.51	2.60	264.55	1012

High Pressure Floating Ball 3 Piece

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A	Support Ring	S. Steel	1
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7a**	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
12	Stem Mut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	16-28
20	Anti Static Spring	S. Steel	2
21	Anti Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

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Face To Face Sizes

Valve Size	B		A-XBW, XSW, GR		A-Flange #900		A-Flange #900 RTJ		A-Flange #1500		A-Flange #1500RTJ		A-Flange #2500		A-Flange #2500RTJ		PN250-PN400 F3	
	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port
DN8	20.6	-	144.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
¼"	0.81	-	5.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DN10	20.6	-	144.2	-	-	-	-	-	-	-	-	-	-	-	-	-	230.0	-
⅜"	0.81	-	5.68	-	-	-	-	-	-	-	-	-	-	-	-	-	9.06	-
DN15	20.6	24.6	144.2	153.2	216.0	216.0	216.0	216.0	216.0	216.0	216.0	216.0	264.0	264.0	264.0	264.0	230.0	230.0
½"	0.81	0.97	5.68	6.03	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	10.39	10.39	10.39	10.39	9.06	9.06
DN20	24.6	31.8	153.2	172.4	229.0	229.0	229.0	229.0	229.0	229.0	229.0	229.0	273.0	273.0	273.0	273.0	260.0	260.0
¾"	0.97	1.25	6.03	6.79	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02	10.75	10.75	10.75	10.75	10.24	10.24
DN25	31.8	41.2	172.4	184.8	254.0	254.0	254.0	254.0	254.0	254.0	254.0	254.0	308.0	308.0	308.0	308.0	260.0	260.0
1"	1.25	1.62	6.79	7.28	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	12.13	12.13	12.13	12.13	10.24	10.24
DN32	41.2	48.4	184.8	215.4	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	349.0	349.0	352.0	352.0	300.0	300.0
1¼"	1.62	1.91	7.28	8.48	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	13.74	13.74	13.86	13.86	11.81	11.81
DN40	48.4	56.3	215.4	227.3	305.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	384.0	384.0	38.07	387.0	300.0	300.0
1½"	1.91	2.22	8.48	8.95	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	15.12	15.12	15.24	15.24	11.81	11.81
DN50	56.3	72.6	227.3	281.0	368.0	368.0	371.0	371.0	368.0	368.0	371.0	371.0	451.0	451.0	454.0	454.0	350.0	350.0
2"	2.22	2.86	8.95	11.06	14.49	14.49	14.61	14.61	14.49	14.49	14.61	14.61	17.76	17.76	17.87	17.87	13.78	13.78
DN65	72.6	83.3	281.0	346.3	419.0	419.0	422.0	422.0	419.0	419.0	422.0	422.0	508.0	508.0	514.0	514.0	400.0	400.0
2½"	2.86	3.28	11.06	13.63	16.50	16.50	16.61	16.61	16.50	16.50	16.61	16.61	20.0	20.0	20.24	20.24	15.75	15.75
DN80	83.3	108.8	346.3	388.8	381.0	381.0	384.0	384.0	470.0	470.0	473.0	473.0	578.0	578.0	584.0	584.0	450.0	450.0
3"	3.28	4.28	13.63	15.31	15.0	15.0	15.12	15.12	18.50	18.50	18.62	18.62	22.76	22.76	22.99	22.99	17.72	17.72
DN100	108.8	146.1	388.8	481.1	457.0	457.0	460.0	460.0	546.0	546.0	549.0	549.0	673.0	673.0	683.0	683.0	520.0	520.0
4"	4.28	5.75	15.31	18.94	17.99	17.99	18.11	18.11	21.50	21.50	21.61	21.61	26.50	26.50	26.89	26.89	20.47	20.47
DN150	146.1	-	481.1	-	610.0	-	457.0	-	705.0	-	711.0	-	914.0	-	927.0	-	700.0	-
6"	5.75	-	18.94	-	24.02	-	17.99	-	27.76	-	27.99	-	35.98	-	36.50	-	27.56	-

High Pressure Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
2	0				F	**2**	**8**	**W**	-	6	6	6	M	**F**	T	G	/	X	S	W		-	W	1	1	5		
Size	Features					Series		Design		Body/Ends material		Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End Connection					Special features					

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
F	Fire safe
B	Full port
O	Clean assembly for O2 service
H*	Hydrogen Service

* for material selection - see Hydrogen Service chapter

Series (7-8)	
28	HP Float 3 piece

Design (9)	
W	Total HermetiX Integrity package

Body/Ends material (11-12)	
6	S. Steel 316L
F	C. steel LF2
4	C. steel A105
Z	Inconel 718
7	Monel
A	Alloy-20
W	Alloy-C22
D	Duplex
K	Super Duplex
S	254SMO

Ball material (13) Sizes up to ¾" std. port	
M	High Strength S. Steel

Ball material (13) Sizes ¾" full bore and up	
6	S. Steel 316L
M	High Strength S. Steel
Z	Inconel 718
7	Monel
A	Alloy-20
W	Alloy-C22
D	Duplex A479
K	Super Duplex A479
S	254SMO A479

Stem material (14)	
M	High Strength S. Steel
Z	Inconel 718
7	Monel
W	Alloy-C22
D	Duplex A479
K	Super Duplex A479

Seat material (15)	
F	Hybrid Seat (info in special features)

Inner Seal Material (16)	
T	PTFE
G	Expanded graphite
V	Viton
B	NBR

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
Welded Ends	
XBW160*	Extended buttweld ends (sch160)
XSW	Extended socket weld ends
BW80	buttweld ends (sch80)
BW160*	buttweld ends (sch160)
SW	Socket weld ends
XBW80	Extended buttweld ends (sch80)
XBWXXS*	Extended buttweld ends (sch XXS)
Threaded Ends	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	AS 5202 on-face gasket sealing threaded connection
Flanged RF	
1500	ANSI B16.5 #1500 RF
2500	ANSI B16.5 #2500 RF
PN160-F3	EN1092 PN160, FTF F3**
PN250-F3	EN1092 PN250, FTF F3**
PN320-F3	EN1092 PN320, FTF F3**
PN400-F3	EN1092 PN400, FTF F3**

** Not applicable for size ¾" and 1¼"

Flanged RTJ	
1500RTJ	ANSI B16.5 #1500 RTJ
2500RTJ	ANSI B16.5 #2500 RTJ
Flanged SAE J518 / ISO 6162 Threaded	
SAE3000	Code 61/ISO 6162-1 Flat face
SAE6000	Code 62/ISO 6162-2 Flat face

* St. Port only

Special Features (24-30)	
P250	Ball with upstream pressure relief hole
LDN	Lockable handle
EXT	Extended Bonnet
Valve Special Stem Seals	
HC	High Cycle service

Hybrid Seats (24-27)

24		25-26		27	
Insert material		Seat Configuration		Seal Type	
W	PVDF	00	Unidirectional Spring-Loaded Hybrid Seats	5	L+PTFE+Graphite
		11	Bidirectional Hybrid Seats	1	U+NBR
L	Virgin PEEK			0	U+Viton
Y	Delrin			6	L+PTFE
				4	L+ Graphite

High Pressure Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
2	0				F	2	7	W	-	6	6	6	M	W	T	G	/	S	W			-						
Size		Features				Series		Design		Body/Ends material		Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End Connection					Special features					

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
F	Fire safe
B	Full port
O	Clean assembly for O2 service
H*	Hydrogen Service

* for material selection - see Hydrogen Service chapter

Series (7-8)	
27	HP Float 3 piece

Design (9)	
W	Total HermetiX Integrity package

Body/Ends material (11-12)	
6	S. Steel 316L
F	C. steel LF2
4	C. steel A105
Z	Inconel 718
7	Monel
A	Alloy-20
W	Alloy-C22
D	Duplex
K	Super Duplex
S	254SMO

Ball material (13) ¼"-¾"	
M	High Strength S. Steel

Ball material (13) 1" and up	
6	S. Steel 316L
M	High Strength S. Steel
Z	Inconel 718
7	Monel
A	Alloy-20
W	Alloy-C22
D	Duplex A479
K	Super Duplex A479
S	254SMO A479

Stem material (14)	
M	High Strength S. Steel
Z	Inconel 718
7	Monel
W	Alloy-C22
D	Duplex A479
K	Super Duplex A479

Seat material (15)	
W	PVDF
K	CF PEEK
Y	Delrin
L	Virgin PEEK
C	PCTFE
F	Hybrid seat

Inner Seal Material (16)	
B	NBR
T	PTFE
V	Viton
G	Expanded graphite

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
Welded Ends	
SW	Socket weld ends
BW80	buttweld ends (sch80)
BW160*	buttweld ends (sch160)
XBW80	Extended buttweld ends (sch80)
XBW160*	Extended buttweld ends (sch160)
XBWXXS*	Extended buttweld ends (sch XXS)
XSW	Extended socket weld ends
Threaded Ends	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	AS 5202 on-face gasket sealing threaded connection
Flanged RF	
1500	ANSI B16.5 #1500 RF
2500	ANSI B16.5 #2500 RF
PN160-F3	EN1092 PN160, FTF F3**
PN250-F3	EN1092 PN250, FTF F3**
PN320-F3	EN1092 PN320, FTF F3**
PN400-F3	EN1092 PN400, FTF F3**

** Not applicable for size ¾" and 1¼"

Flanged RTJ	
1500RTJ	ANSI B16.5 #1500 RTJ
2500RTJ	ANSI B16.5 #2500 RTJ
Flanged SAE J518 / ISO 6162 Threaded	
SAE3000	Code 61/ISO 6162-1 Flat face
SAE6000	Code 62/ISO 6162-2 Flat face

* St. Port only

Special Features (24-30)	
P250	Ball with upstream pressure relief hole
LDN	Lockable handle
Valve Special Stem Seals	
HC	High Cycle service

Clamp	
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

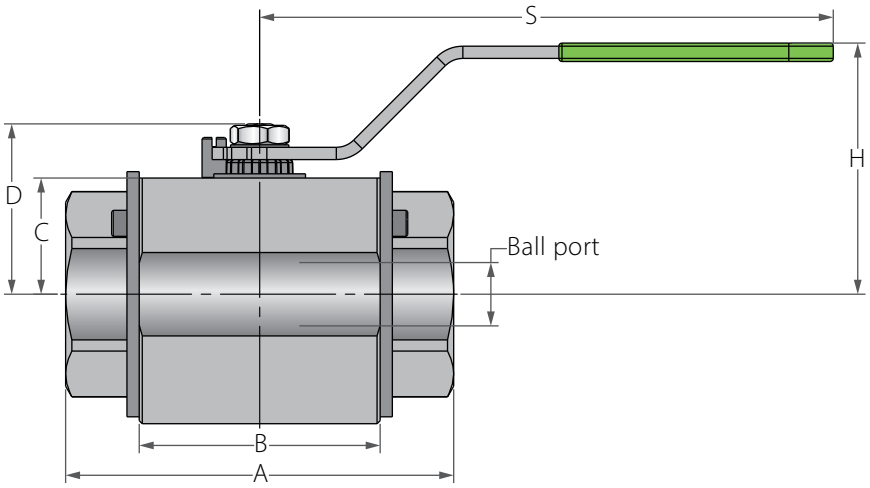
** Not available for 1¼" (DN32) Valves

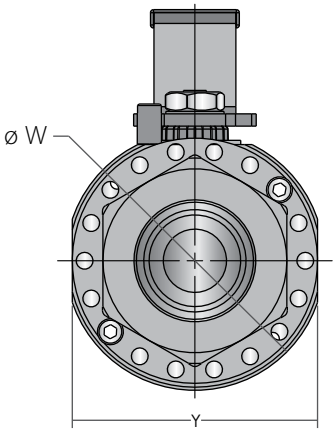
Hybrid Seats (24-27)

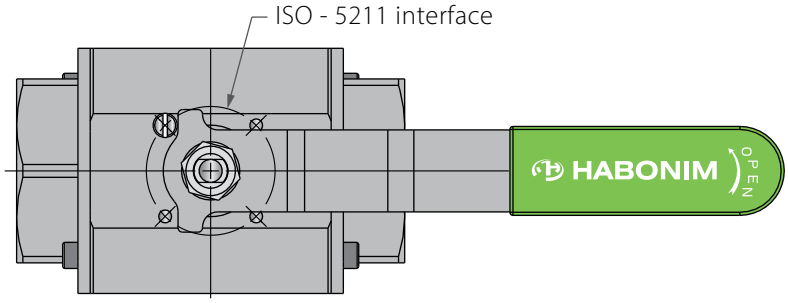
24		25-26		27	
Insert material		Seat Configuration		Seal Type	
K	CF PEEK	00	Unidirectional Spring-Loaded Hybrid Seats	8	U+NBR+Graphite
W	PVDF			7	U+Viton+Graphite
C	PCTFE	11	Bidirectional Hybrid Seats	1	U+NBR
L	Virgin PEEK			0	U+Viton
Y	Delrin			4	L+ Graphite

High Pressure Floating Ball 3 Piece Threaded-Body

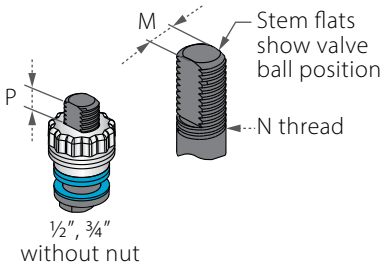
Valve Dimensions







Preparation for actuation

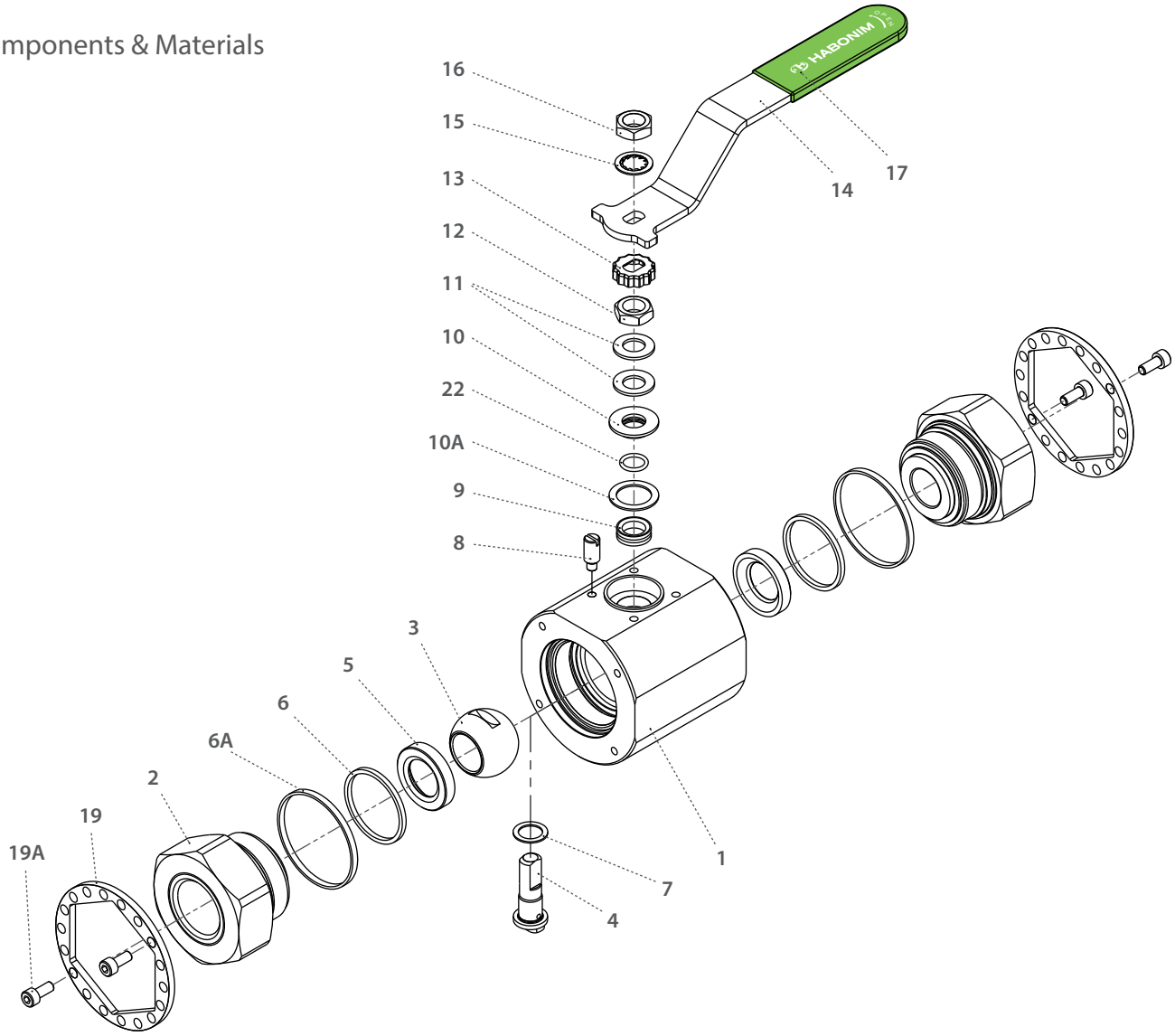


Std. port	Full port	Unit	Ball port	A	B	C	D	H	M	N	P	W	S	ISO PCD	F	Y	weight kg/lb	kv / cv
	DN8	mm	11.15	91.0	45.5	21.50	37.90	42.1	5.54	⅜" UNF	11.1	54.0	179.0	-	-	45.0	0.8	4.3
	¼"	inch	0.44	3.58	1.79	0.84	1.49	1.66	0.22		0.43	2.12	7.05	-	-	1.77	1.76	5.00
DN15	DN10	mm	11.15	91.0	45.5	24.50	37.90	42.1	5.54	⅜" UNF	11.1	54.0	179.0	F03	36.0	45.0	0.8	6.9
½"	⅜"	inch	0.44	3.58	1.79	0.84	1.49	1.66	0.22		0.43	2.12	7.05	F03	36.0	1.77	1.76	8.00
DN20	DN15	mm	14.3	104.25	52.12	23.90	40.30	45.0	5.54	⅜" UNF	11.1	62.0	179.0	F03	36.0	60.0	1.27	10
¾"	½"	inch	0.56	4.10	2.05	0.94	1.59	1.77	0.22		0.43	2.44	7.05	F03	36.0	2.36	2.79	12.00
DN25	DN20	mm	20.6	126.6	63.3	37.90	55.60	60.3	7.54	7/16" UNF	15.4	84.5	193.0	F04	42.0	77.0	2.1	28
1"	¾"	inch	0.81	4.98	2.49	1.49	2.19	2.37	0.29		0.60	3.32	7.60	F04	42.0	3.03	4.63	32.00
DN32	DN25	mm	25.4	137.25	68.62	42.50	60.2	68.7	7.54	7/16" UNF	15.4	93.0	193.0	F04	42.0	85.0	2.9	49
1¼"	1"	inch	1.0	5.40	2.70	1.67	2.37	2.70	0.29		0.90	3.66	7.60	F04	42.0	3.34	6.39	57.00
DN40	DN32	mm	31.8	161.94	80.97	43.55	73.0	81.1	8.7	9/16" UNF	19.6	99.0	287.0	F05	50.0	95.0	4.8	69
1½"	1¼"	inch	1.25	6.37	3.18	1.71	2.87	3.19	3.19		0.77	3.89	11.30	F05	50.0	3.74	10.58	80.00

* std. port only

High Pressure Floating Ball 3 Piece Threaded-Body

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7a*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
8A	Dowel Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
20	Anti Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

High Pressure Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
0	5				F	**2**	**4**	**W**	-	6	6	6	M	K	T	G	/	N	P	T		-						
Size		Features				Series		Design		Body/Ends material		Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End Connection					Special features					

Size (1-2)		
Code	**inch**	**mm**
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40

Features (3-6)	
F	Fire safe
B	Full port
O	Clean assembly for O2 service
H*	Hydrogen Service

* for material selection - see Hydrogen Service chapter

Series (7-8)	
24	HP Float 3 piece

Design (9)	
W	Total HermetiX Integrity package

Body/Ends material (11-12)	
6	S. Steel 316L
4	C. steel A105
F	C. steel LF2

Ball material (13)	
6	S. Steel316L
M	High Strength S. Steel

Stem material (14)	
M	High Strength S. Steel
Z	Inconel 718

Seat material (15)	
W	PVDF
K	CF PEEK
Y	Delrin
L	Virgin PEEK
C	PCTFE

Inner Seal Material (16)	
T	PTFE
G	Expanded graphite
V	Viton
B	NBR

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
Threaded Ends	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPP	ISO228-1 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
BSPT EN	10226 - Pipe Taper thread
AS5202	AS 5202 on-face gasket sealing threaded connection
MNPT	Male NPT
SAE J1926	SAE J1926
Clamp	
LL*	Compression fitting (Imperial) - **No** nuts & Ferrules
LM*	Compression fitting (metric) - **No** nuts & Ferrules
LL-NF*	Compression fitting (Imperial) - **with** nuts & Ferrules
LM-NF*	Compression fitting (metric) - **with** nuts & Ferrules
Welded	
XBW80	Extended buttweld ends (sch80)

Special Features (24-30)	
P250	Ball with upstream pressure relief hole
Valve Special Stem Seals	
HC	High Cycle service
LAX	FDA Compliant, Stem seal, Virgin Peek thrust and TFM, X shape, gasket

* Std. port Only

HIGH TEMP. VALVES

General 168

Trunnion

3 Piece 173

2 Piece 191

Floating Ball

3 Piece 205

High Pressure | 3 Piece 223

HIGH TEMP. VALVES

General

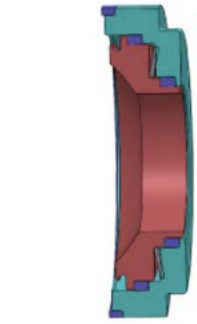
Habonim's High Temp. product line valves are subject to the general Habonim valves design, materials, practices, methodologies and certifications – for more information, see Valves General chapter.

Habonim Control valves are equipped (in some series) with the Total HermetiX integrity package for superior sealing, safety and environmental care.

High Temperature - Metal Seated Ball Valve

Habonim's extended line of High Temperature - metal seated valves perform and excels in the harshest industrial environments, where valve durability is critical to ensure safety, minimize failures and promote efficiency. These meticulously engineered metal seated ball valves are designed to withstand the harshest applications and process conditions, including extreme high temperature, high pressure and abrasive medium.

Careful metallurgical selection of all valve parts, special surface treatments including hard coatings, thorough analyses of mechanical strength and thermal expansion and vast experience of successful installations ensure that Habonim High temperature – metal seated valve line is the best choice for industry's toughest applications.



Bidirectional Flow Direction

Seat Design

Description	Bi-directional shutoff, encapsulated spring loaded seat	**Shutoff class**	BS-EN 12266-1 Rate C, FCI 70-2 Class VI (Factory tested)
Temperature	-60°C +650°C (-76°F + 1200°F)	**Service**	Pulp & paper, slurries, catalyst

Metal Selection and Surface Treatments

HVOF (High Velocity Oxygen Fuel):

Various HVOF spray solutions based on chromium and tungsten carbides. Is used for applications up to 650°C (1200°F).

ASME B16.34 listed forged bar materials:

Even for the higher temperature range up to 650°C (1200°F) Habonim uses ASME B16.34 listed forged bar material for the construction of the valve pressure-containing elements.

Stellite welding:

For severe abrasive conditions such as pulp and paper processing, Habonim uses a minimum of 1.5 mm thick, hard stellite coating. These coatings are specifically engineered to meet the customer's application to provide outstanding resistance to abrasion and corrosion for a lifetime of effective operation in harsh applications.

Lapping:

Each ball and seat sub-assembly is accurately machined, ground and then mate-lapped for a perfect match. The complete valve assembly demonstrates high repeatability in terms of sealing (Rate B - factory tested), low torque and smooth operation at various temperatures and pressures.

Quick Selection Table

Total Hermetix™ | **Port:** Standard Port | Full Port | Tube Size | **End Connections:** Threaded | Flanged | Welded

Ordering Code

Ball Valve Style	Design Type	Ordering Code	Series	Temperature range -60°C (-76°F) up to: 260°C (500°F)	450°C (752°F)	650°C (1200°F)	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12
				W	Z	Q				MWP (ANSI Class / DIN PN)														
Trunnion Mounted Ball	3 Piece	OC	Z91	W	Z	Q													150					
		OC	Z92																300					
		OC	Z93																600					
		OC	Z94																900					
		OC	Z95																1500					
		OC	Z96																2500					
	2 Piece	OC	Z81		Z	Q													150					
		OC	Z82																300					
		OC	Z83																600					
Floating Ball	3 Pcs.	OC	Z47	W	Z	Q	TH			600														
		OC	Z28	W	Z	Q	TH			2500														
		OC	Z47			Q				600														
		OC	Z28			Q				2500														

ASME Class			150	300	600	900	1500	2500	6000
Pressure Bar	0	16	20	50	100	150	250	400	1034
Pressure psi	0	290	290	725	1450	2175	3600	5800	15000

High Temperature – Metal Seated Designs:

Design Code	Working Temperature range	Remarks
W	-60°C to 260°C (-76°F to 500°F)	Trunnion valves only -46°C to 200°C (-50°F to 400°F)
Z	-60°C to 450°C (-76°F to 842°F)	Trunnion valves only -46°C to 327°C (-50°F to 620°F)
Q	-60°C to 650°C (-76°F to 1200°F)	Trunnion valves only -60°C to 538°C (-76°F to 1000°F)

Maximal Working Pressure Per Class / Temperature

Temperature vs Pressure (bar) - Standard class rating

ASME B16.34	Material	Temperature (°C)										
		-29 to 38	50	100	200	300	400	450	500	538	600	650
Class 150	316/316L	19.0	18.3	16.1	13.6	10.2	6.6	4.6	2.8	1.4		
	CF8M/CF3M	19.0	18.4	16.2	13.7	10.2	6.5	4.6	2.8	1.4		
	WCB/A105/LF2	19.6	19.2	17.7	13.8	10.2	6.5	4.6	2.8	1.4		
	F22	19.8	19.5	17.7	13.8	10.2	6.5	4.6	2.8	1.4	1.4	1.4
	321/321H	19.0	18.6	17.0	13.8	10.2	6.5	4.6	2.8	1.4	1.4	1.4
Class 300	316/316L	49.7	48.1	42.3	35.8	31.6	29.3	29.0	28.2	25.2		
	CF8M/CF3M	49.6	48.1	42.2	35.7	31.6	29.4	28.8	28.2	25.2		
	WCB/A105/LF2	51.1	50.1	46.6	43.8	39.8	34.7	23.0	11.8	5.9		
	F22	51.7	51.7	51.5	48.6	42.9	36.5	33.7	28.2	18.4	6.9	2.8
	321/321H	49.6	48.6	44.2	38.3	34.1	31.6	30.8	28.2	25.2	20.3	12.6
Class 600	316/316L	99.3	96.3	84.5	71.2	63.1	59.0	57.7	56.5	50.0		
	CF8M/CF3M	99.3	96.2	84.4	71.3	63.2	58.9	57.7	56.5	50.0		
	WCB/A105/LF2	102.1	100.2	93.2	87.6	79.6	69.4	46.0	23.5	11.8		
	F22	103.4	103.4	103.0	97.2	85.7	73.3	67.7	56.5	36.9	13.8	5.7
	321/321H	99.3	97.1	88.5	76.6	68.3	63.2	61.7	56.5	50.0	40.5	25.3
Class 900	316/316L	149.0	144.4	126.8	106.9	95.0	88.3	86.7	84.7	75.2		
	A105/LF2	153.2	150.4	139.8	131.4	119.5	104.2	69.0	35.3	17.7		
	F22	155.1	155.1	154.6	145.8	128.6	109.8	101.4	84.7	55.3	20.7	8.5
	321/321H	148.9	145.7	132.7	114.9	102.4	94.8	92.5	84.7	75.2	60.8	37.9
Class 1500	316/316L	248.3	240.7	211.0	178.5	158.1	147.2	144.3	140.9	125.5		
	A105/LF2	255.3	250.6	223.0	219.0	199.1	173.6	115.0	58.8	29.5		
	F22	258.6	258.6	257.6	243.4	214.4	183.1	169.0	140.9	92.2	34.4	14.2
	321/321H	248.2	242.8	221.2	191.5	170.7	157.9	154.2	140.9	125.5	101.3	63.2
Class 2500	316/316L	413.8	401.0	351.7	297.2	263.6	245.5	240.4	235.0	208.9		
	A105/LF2	425.5	417.7	388.3	365.0	331.8	289.3	191.7	97.9	49.2		
	F22	430.9	430.9	429.4	405.4	357.1	304.9	281.8	235.0	153.7	57.4	23.6
	321/321H	413.7	404.6	368.7	319.1	284.6	263.2	256.9	235.0	208.9	168.9	105.4

Temperature vs Pressure (Psi) - Standard class rating

ASME B16.34	Material	Temperature (°F)										
		-20 to 100	122	212	392	572	752	842	932	1000	1112	1200
Class 150	316/316L	275	266	233	197	148	95	67	41	20		
	CF8M/CF3M	276	267	235	199	148	94	67	41	20		
	WCB/A105/LF2	284	278	257	200	148	94	67	41	20		
	F22	287	283	257	200	148	94	67	41	20	20	20
	321/321H	276	270	247	200	148	94	67	41	20	20	20
Class 300	316/316L	720	698	613	519	458	425	420	409	365		
	CF8M/CF3M	719	697	612	518	458	426	418	409	365		
	WCB/A105/LF2	741	726	676	635	577	503	334	171	86		
	F22	750	750	747	705	622	529	489	409	267	100	41
	321/321H	719	705	641	555	494	458	447	409	365	294	183
Class 600	316/316L	1440	1396	1225	1032	915	855	837	819	725		
	CF8M/CF3M	1440	1395	1224	1034	916	854	837	819	725		
	WCB/A105/LF2	1480	1453	1351	1270	1154	1006	667	341	171		
	F22	1499	1499	1494	1409	1243	1063	982	819	535	200	83
	321/321H	1440	1408	1283	1111	990	916	895	819	725	587	367
Class 900	316/316L	2160	2094	1838	1550	1377	1280	1257	1228	1090		
	A105/LF2	2221	2181	2027	1905	1733	1511	1001	512	257		
	F22	2249	2249	2242	2114	1865	1592	1470	1228	802	300	123
	321/321H	2159	2113	1924	1666	1485	1375	1341	1228	1090	882	550
Class 1500	316/316L	3600	3490	3059	2588	2293	2135	2093	2043	1820		
	A105/LF2	3702	3634	3234	3176	2887	2517	1668	853	428		
	F22	3750	3750	3735	3529	3109	2655	2451	2043	1337	499	206
	321/321H	3599	3521	3207	2777	2475	2290	2236	2043	1820	1469	916
Class 2500	316/316L	6000	5815	5100	4310	3822	3560	3486	3408	3029		
	A105/LF2	6170	6057	5630	5293	4811	4195	2780	1420	713		
	F22	6248	6248	6226	5878	5178	4421	4086	3408	2229	832	342
	321/321H	5999	5867	5346	4627	4127	3816	3725	3408	3029	2449	1528

* It is totaly forbidden to use a material when pressure rating is missing
* F22 316L material is not recommended for prolonged use above 595 °C/1100 °F
* A105, WCB and LF2 materials are not recommended for prolonged use above 425 °C/800 °F
* 316L and CF3M materials are not to be used above 455 °C/850 °F

HIGH TEMP. VALVES

Coatings

Surface coating applies on outer layer of the ball and seats. The following types of surface coating methods are available in the Habonim metal seated series: chromium carbide with nickel chrome binder (Cr3C2), tungsten carbide with cobalt binder (WC-Co), and stellite welding.

Cr_3C_2 (Chromium Carbide)

Chromium carbide with a nickel chrome binder is applied by a High Velocity Oxygen Fuel (HVOF) creating a 0.3mm hard outer layer. The Cr3C2 coating that is applied to high strength steels, results in a micro-hardness of up to 68HRC. This coating resists cryogenic temperatures down to -196 ˚C / -320 ˚F and high temperatures up to 815 ˚C / 1500 ˚F. This multipurpose wear resistance coating is used extensively in power generation, refining and hot catalyst handling services. Its corrosive limitations are in wet sulfur or chloride environments, where sulfuric acid can form and attack the coating.

WC-Co (Tungsten Carbide)

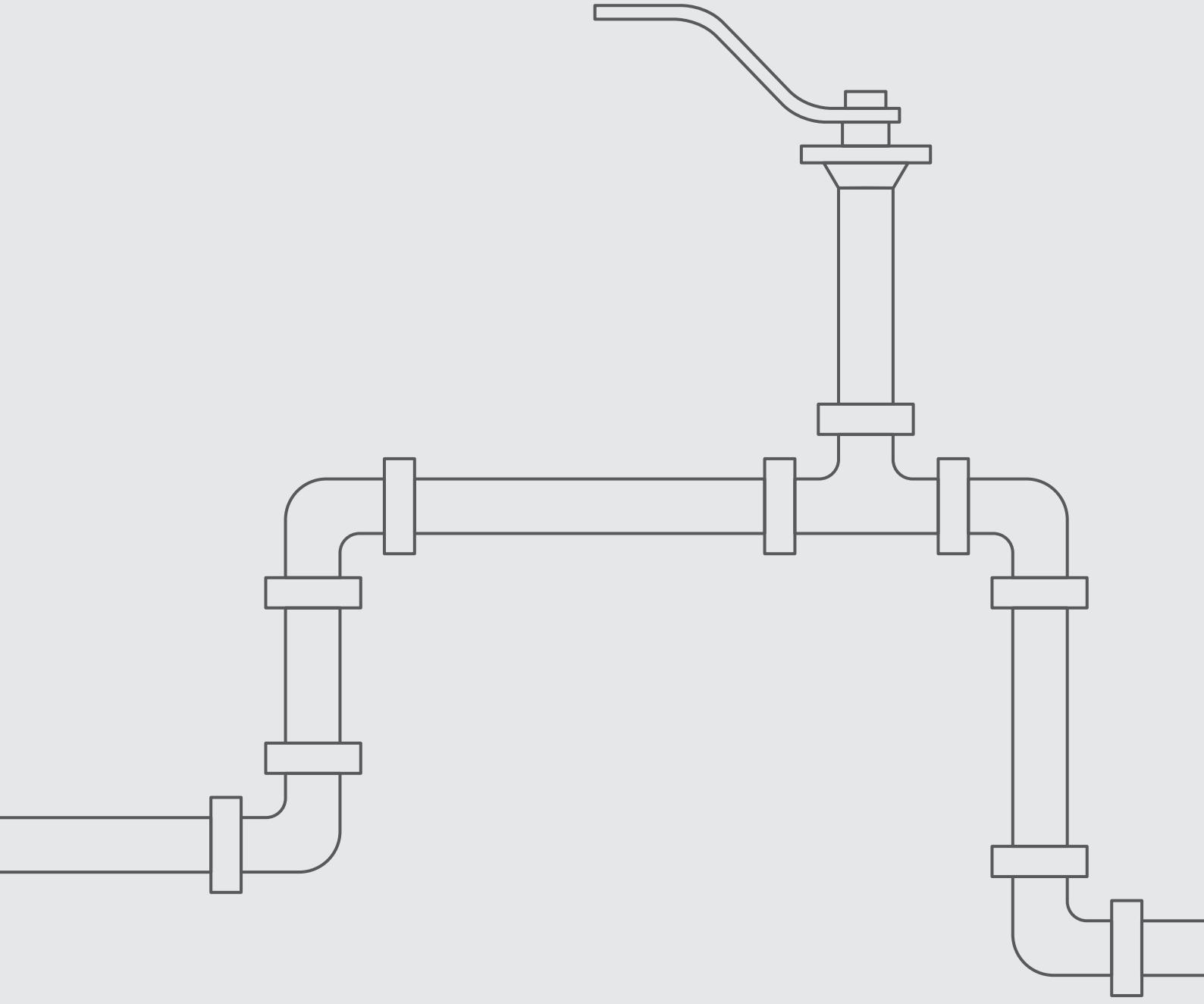
Tungsten Carbide with a cobalt binder coating is applied by HVOF techniques similar to Cr3C2. The WC-Co coating is applied mainly to 400 series martensitic stainless steel to provide micro-hardness that reaches 72HRC. This coating resists cryogenic temperatures down to -196 ˚C / -320 ˚F and high temperatures up to 538 ˚C / 1000 ˚F. WC-Co is a coating that consists of a hard metal alloy based on a Tungsten Carbide + Cobalt composition.

Stellite

A cobalt-based stellite coating provides excellent mechanical wear resistance, with good corrosion resistance at temperatures up to 538 ˚C / 1000 ˚F. The stellite is applied by a Plasma Thermal Arc (PTA) method. Most stellite alloys are cobalt based with elements of chromium (Cr), carbon (C), tungsten (W) and nickel (Ni). Stellite 6 is broadly used in the pulp and paper industry, as well as in refining applications, such as catalyst handling and hydrocracker processes.

Surface Treatments/ Coatings	Process Method	Process Material	Coating Thickness	Min. Hardness	Max Temp*	Corrosion Resistance
CR_3C_2	HVOF spray	Chromium, Carbon Nickel	0.3 mm	68HRC	815 °C / 1500 ˚F	Good
DN WC-Co 40	HVOF spray	Tungsten, Carbon Cobalt	0.3 mm	72HRC	538 °C / 1000 ˚F	Excellent

*All temperatures above 650 °C/1200 °F refer to the coating performance only and not to the valve design

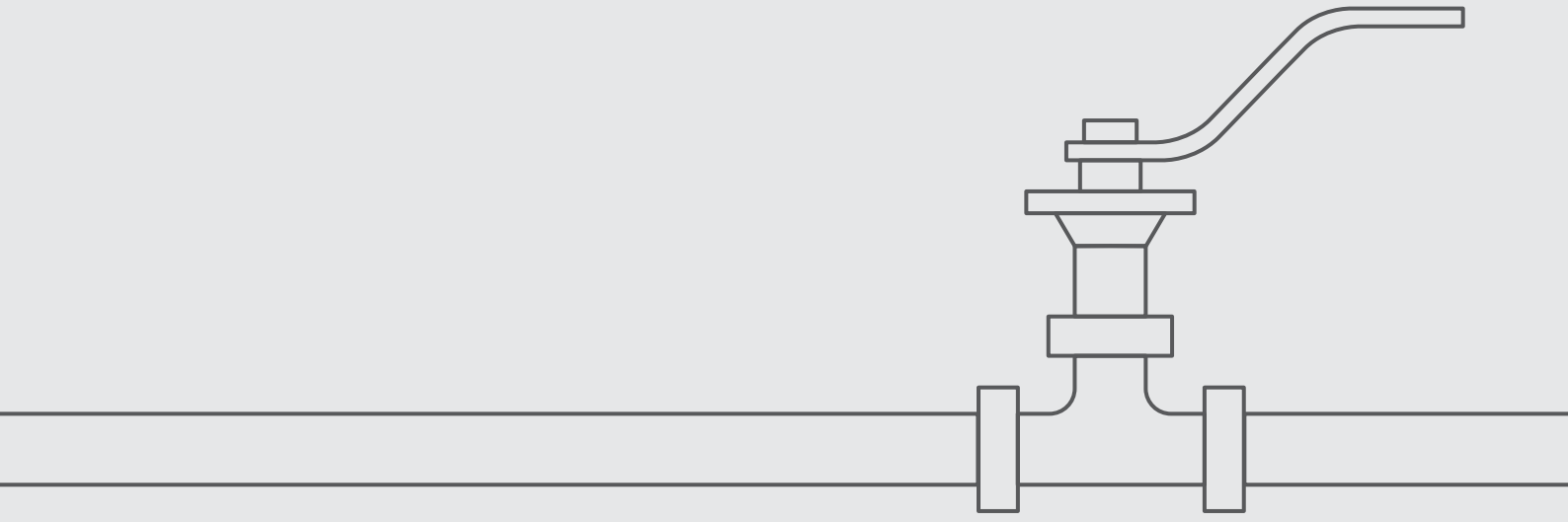


Z91 Z92 Z93 Z94 Z95 Z96

High Temp. Valves

TRUNNION

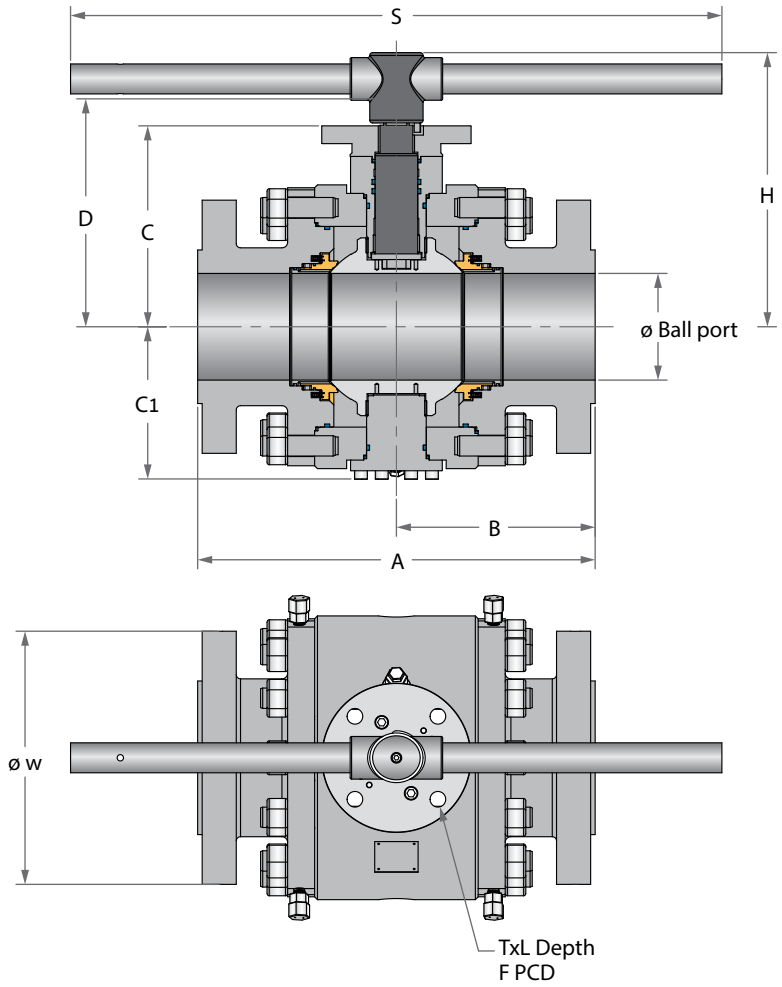
3 PIECE

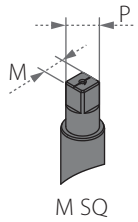


Z91W Z92W Z91Z Z92Z 2"-6" | DN50-DN150 CLASS 150/300

High Temperature Trunnion Ball 3 Piece Up to
W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions



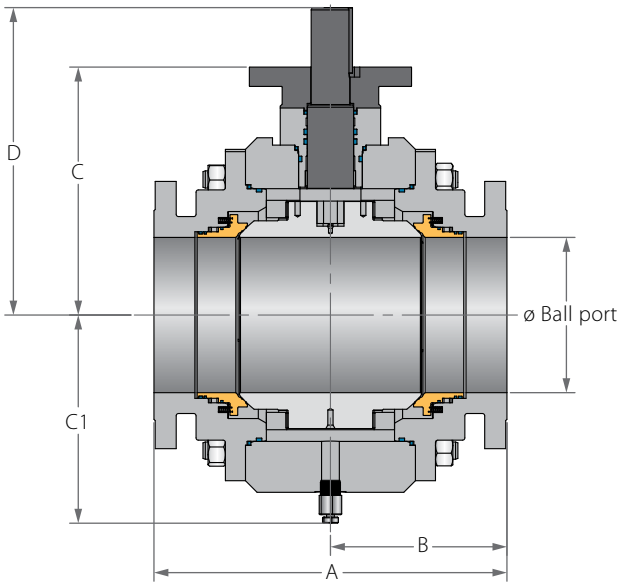


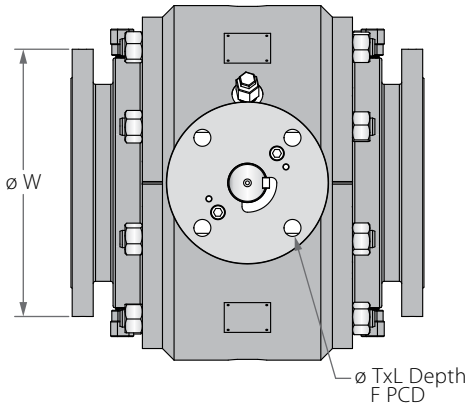
Std. port	Full port	Unit	Ball port	A		B		C	C1	D	W		M SQ	P SQ	H	S	F		TxL	Weight kg/ib		Kv/Cv	
				150	300	150	300				150	300								150	300	150	300
DN50		mm	49.0	178.0	216.0	89.0	108.0	127.0	91.50	144.50	150.0	165.0	17.0	22.0	196.0	401.0	F10	102.0	11X15 (4 holes)	27	31	400	363
2"		inch	1.93	7.01	8.50	3.50	4.25	5.0	3.60	5.69	5.91	6.50	0.67	0.87	7.72	15.79		4.02		60	68	463	420
DN80	DN50	mm	74.0	203.0	283.0	101.50	128.0	148.0	117.0	172.0	190.0	210.0	22.0	32.0	223.0	610.0	F12	125.0	13X15 (4 holes)	44	61	1125	952
3"	2"	inch	2.91	7.99	11.14	4.0	5.04	5.83	4.61	6.77	7.48	8.27	0.87	1.26	8.78	24.02		4.92		97	134	1300	1100
DN100	DN80	mm	100.0	229.0	305.0	114.50	140.50	171.0	139.0	198.50	230.0	255.0	27.0	35.0	247.50	610.0	F14	140.0	18X15 (4 holes)	66	100	2154	1860
4"	3"	inch	3.94	9.02	12.0	4.51	5.53	6.73	5.47	7.81	9.06	10.04	1.06	1.38	9.74	24.02		5.51		146	220	2490	2150
DN150	DN100	mm	150.0	394.0	403.0	185.0	230.40	254.0	191.0	290.50	280.0	320.0	36.0	46.20	356.50	916.0	F16	165.0	22X25 (4 holes)	180	216	4723	4628
6"	4"	inch	5.91	15.51	15.87	7.28	9.07	10.0	7.52	11.44	11.02	12.60	1.42	1.82	14.04	36.06		6.50		397	476	5460	5350

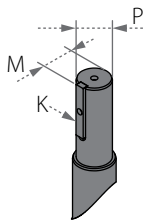
Z91W Z92W Z91Z Z92Z 8"-12" | DN200-DN300
CLASS 150/300

High Temperature Trunnion Ball 3 Piece Up to
W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions







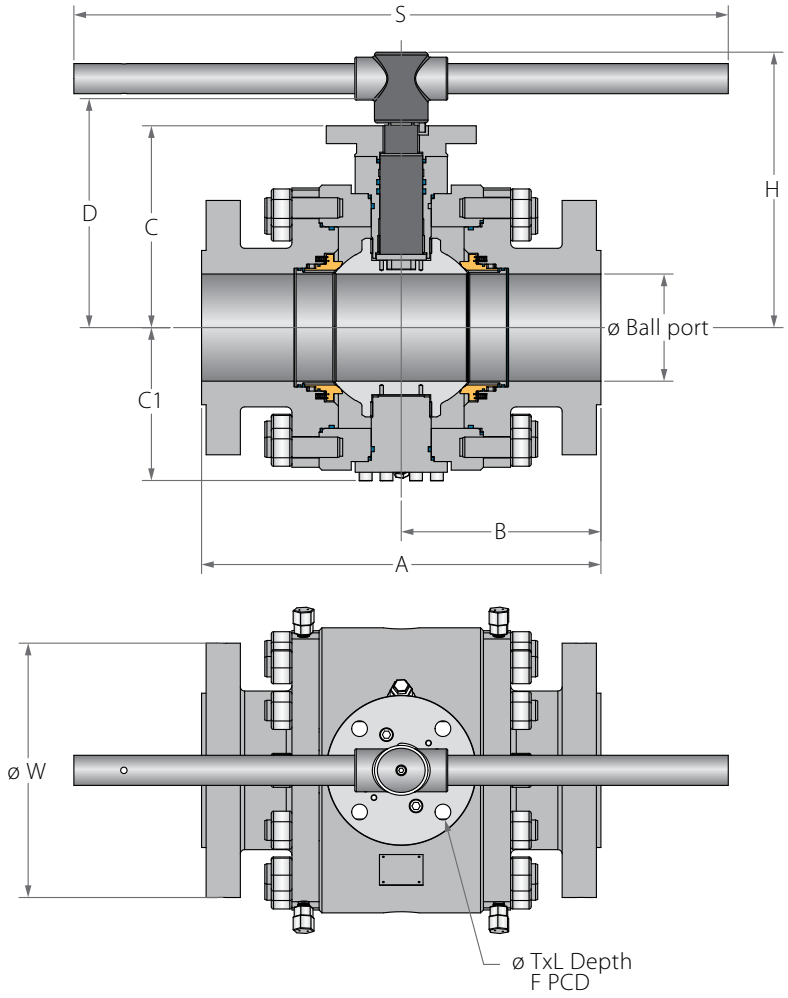
Std. port	Full port	Unit	Ball port	A		B		C	C1	D	W	P	M	K	F		TxL	Weight kg/ib		Kv/Cv	
				150	300	150	300											150	300	150	300
DN200	DN150	mm	201.0	457.0	502.0	228.50	251.0	325.0	305.0	247.0	232.0	405.50	379.50	345.0	F16	165.0	22x25 (4 holes)	346	378	9273	8737
8"	6"	inch	7.91	17.99	19.76	9.0	9.88	12.80	12.01	9.72	9.13	15.96	14.94	13.58		6.50		763	833	10720	10100
DN250	DN200	mm	252.0	533.0	568.0	270.0	287.50	353.0	359.0	297.0	299.0	430.0	454.0	405.0	F25	254.0	18x25 (8 holes)	473	594	15224	14792
10"	8"	inch	9.92	20.98	22.36	10.63	11.32	13.90	14.13	11.69	11.77	16.93	17.87	15.94		10.0		1043	1310	17600	17100
DN300	DN250	mm	303.0	610.0	648.0	298.0	313.0	388.0	368.0	324.0	305.0	468.50	464.0	485.0	F25	254.0	18x25 (8 holes)	723	833	23096	22404
12"	10"	inch	11.93	24.02	25.51	11.73	12.32	15.28	14.49	12.76	12.01	18.44	18.27	19.09		10.0		1594	1836	26700	25900

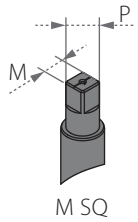
Z93W Z94W Z93Z Z94Z

2"-6" | DN50-DN150
CLASS 600/900

High Temperature Trunnion Ball 3 Piece Up to
W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions





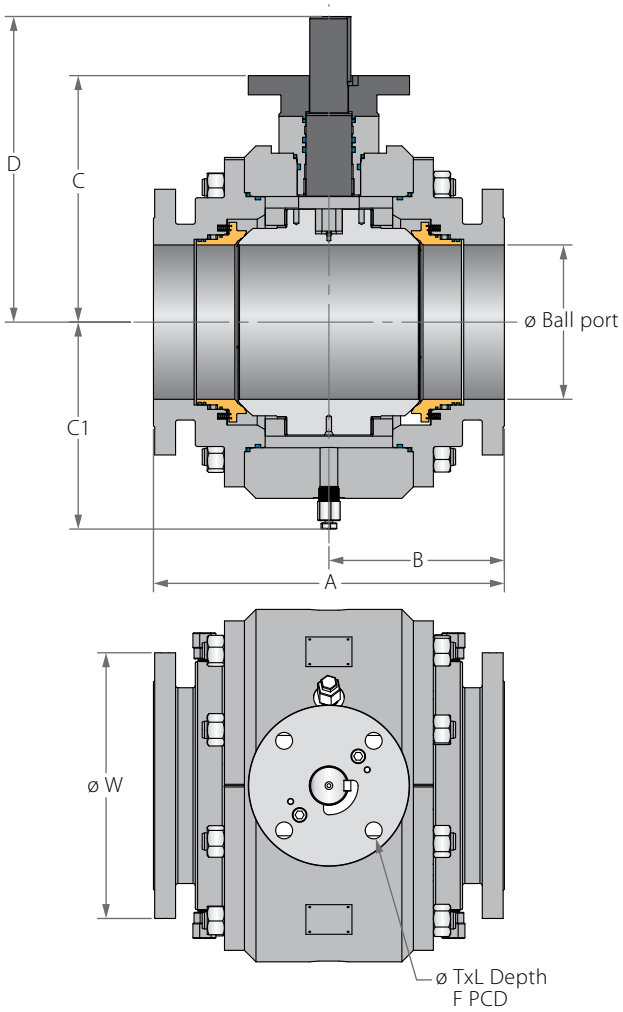
Std. port	Full port	Unit	Ball port	A		B		C		C1		D		W		M SQ	P SQ	H	S	F		TxL	Weight kg/ib		Kv/Cv	
				600	900	600	900	600	900	600	900	600	900	600	900								600	900	600	900
DN50		mm	49.0	292.0	368.0	131.0	184.0	144.0	148.50	119.0	263.0	168.50	182.50	165.0	215.0	22.0	28.0	219.50	401.0	F12	125.0	13X15 (4 holes)	49	67	329	294
2"		inch	1.93	11.50	14.49	5.16	7.24	5.67	5.85	4.69	10.35	6.63	7.19	6.50	8.46	0.87	1.10	8.64	15.79		4.92		108	148	380	340
DN80	DN50	mm	74.0	356.0	381.0	161.0	190.50	191.0	214.0	160.0	152.70	215.0	237.50	210.0	240.0	22.0	28.0	266.0	610.0	F14	140.0	18X24 (4 holes)	103	114	874	822
3"	2"	inch	2.91	14.02	15.0	6.34	7.50	7.52	8.43	6.30	6.01	8.46	9.35	8.27	9.45	0.87	1.10	10.47	24.02		5.51		227	251	1010	950
DN100	DN80	mm	100.0	432.0	457.0	216.0	228.50	217.0	193.0	184.0	184.0	246.50	259.0	275.0	290.0	27.0	36.0	316.50	916.0	F16	165.0	22X25 (4 holes)	166	186	1557	1471
4"	3"	inch	3.94	17.01	17.99	8.50	9.0	8.54	7.60	7.24	7.24	9.70	10.20	10.83	11.42	1.06	1.42	12.46	36.06		6.50		366	410	1800	1700
DN150	DN100	mm	150.0	559.0	610.0	278.0	305.0	282.50	368.0	214.50	224.0	320.50	463.0	355.0	380.0	36.0	48.20	385.0	916.0	F16	165.0	22X25 (4 holes)	342	418	3893	3823
6"	4"	inch	5.91	22.01	24.02	10.94	12.01	11.12	14.49	8.44	8.82	12.62	18.23	13.98	14.96	1.42	1.90	15.16	36.06		6.50		754	922	4500	4420

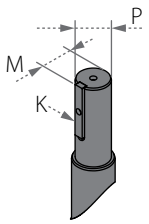
Z93W Z94W Z93Z Z94Z 8"-12" | DN200-DN300 CLASS 600/900

High Temperature Trunnion Ball 3 Piece Up to

W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions





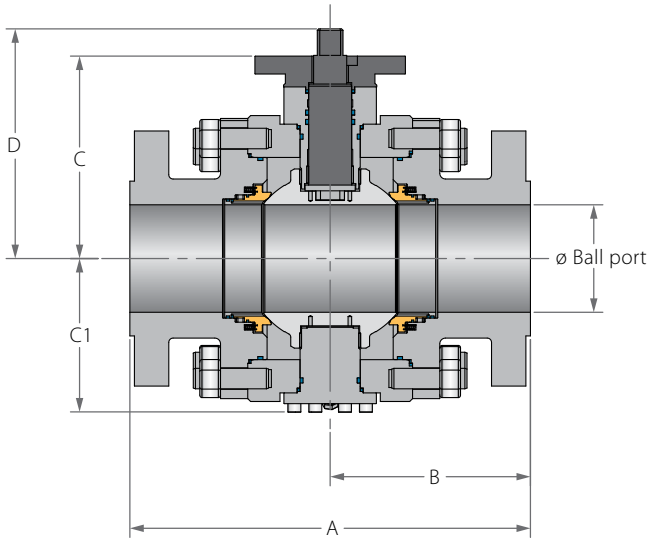
Std. port	Full port	Unit	Ball port	A		B		C		C1		D		W		P	M	K	F		TxL	Weight kg/ib		Kv/Cv	
				600	900	600	900	600	900	600	900	600	900	600	900							600	900	600	900
DN200	DN150	mm	201.0	660.0	737.0	330.0	368.50	312.0	307.0	263.0	263.0	409.0	403.0	420.0	470.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	577	836	7742	7344
8"	6"	inch	7.91	25.98	29.02	12.99	14.51	12.28	12.09	10.35	10.35	16.10	15.87	16.54	18.50	2.83	3.01	0.79		10.0		1272	1843	8950	8490
DN250	DN200	mm	252.0	787.0	838.0	400.0	419.0	374.0	393.0	310.0	347.0	471.0	490.0	510.0	545.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	931	1301	12543	12110
10"	8"	inch	9.92	30.98	32.99	15.75	16.50	14.72	15.47	12.20	13.66	18.54	19.29	20.08	21.46	2.83	3.01	0.79		10.0		2052	2868	14500	14000
DN300	DN250	mm	303.0	838.0	965.0	419.0	482.50	402.0	419.0	344.0	361.0	499.0	544.0	560.0	610.0	72.0	76.50	20.0	F25	254.0	18x35 (8 holes)	1126	1576	19809	18598
12"	10"	inch	11.93	32.99	37.99	16.50	19.0	15.83	16.50	13.54	14.21	19.65	21.42	22.05	24.02	2.83	3.01	0.79		10.0		2482	3474	22900	21500

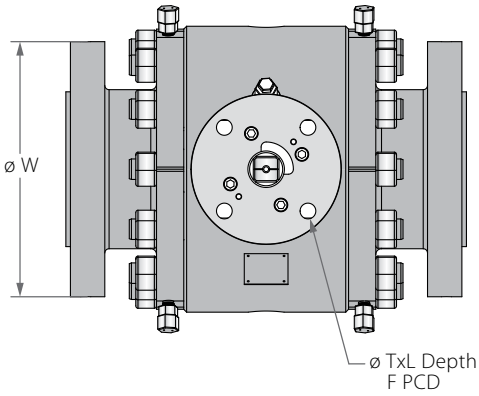
Z95W Z96W Z95Z Z96Z

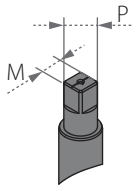
2"-6" | DN50-DN150
CLASS 1500/2500

High Temperature Trunnion Ball 3 Piece Up to
W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions







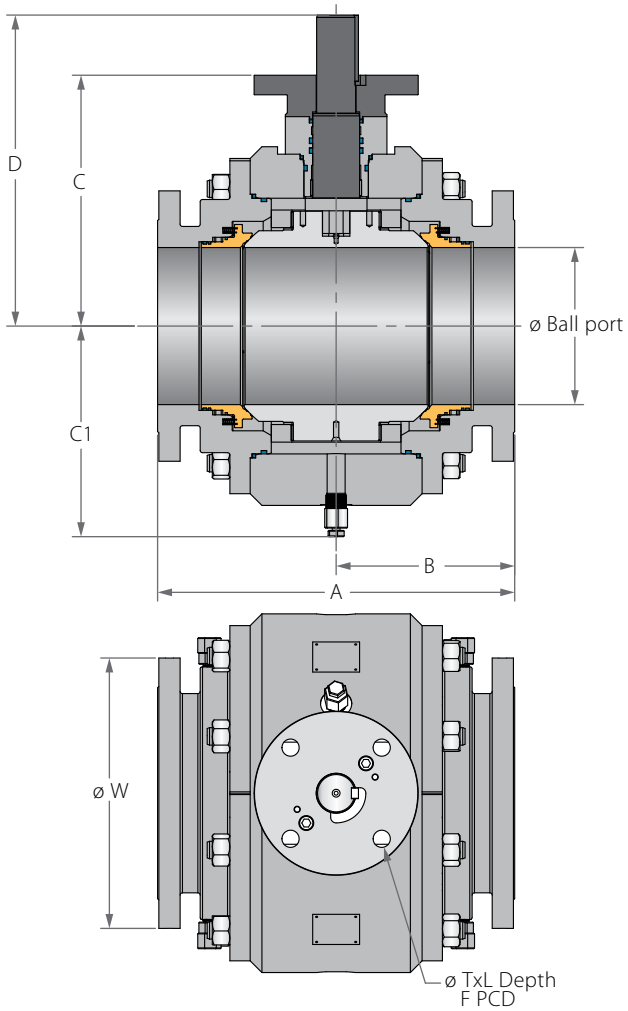
Std. port	Full port	Unit	Ball port	A		B		C	C1	D	W		M SQ	P SQ	F		TxL	Weight kg/ib		Kv/Cv	
				1500	2500	1500	2500				1500	2500						1500	2500	1500	2500
DN50		mm	49.0	368.0	451.0	184.0	225.50	204.50	159.0	339.0	215.0	235.0	22.0	32.0	F14	140.0	18X12 (4 holes)	90	179	281	260
2"		inch	1.93	14.49	17.76	7.24	8.88	8.05	6.26	13.35	8.46	9.25	0.87	1.26		5.51		198	395	325	300
DN80	DN50	mm	74.0	470.0	578.0	235.0	289.0	262.0	201.50	342.50	265.0	305.0	27.0	35.0	F14	140.0	18x22 (4 holes)	175	340	735	649
3"	2"	inch	2.91	18.50	22.76	9.25	11.38	10.31	7.93	13.48	10.43	12.01	1.06	1.38		5.51		386	750	850	750
DN100	DN80	mm	100.0	546.0	673.0	273.0	336.50	225.0	198.50	299.50	310.0	355.0	36.0	46.20	F16	165.0	22x25 (4 holes)	330	646	1384	1228
4"	3"	inch	3.94	21.50	26.50	10.75	13.25	8.86	7.81	11.79	12.20	13.98	1.42	1.82		6.50		728	1424	1600	1420
DN150	DN100	mm	150.0	705.0	914.0	352.50	457.0	310.0	272.0	425.0	395.0	485.0	46.0	59.0	F25	254.0	22x30 (8 holes)	627	1227	3590	2206
6"	4"	inch	5.91	27.76	35.98	13.88	17.99	12.20	10.71	16.73	15.55	19.09	1.81	2.32		10.0		1382	2705	4150	2550

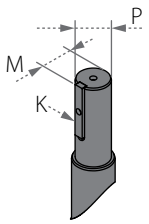
Z95W Z96W Z95Z Z96Z 8"-12" | DN200-DN300 CLASS 1500/2500

High Temperature Trunnion Ball 3 Piece Up to

W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions





Std. port	Full port	Unit	Ball port	A		B		C	C1	D	W		P	M	K	F		TxL	Weight kg/ib		Kv/Cv	
				1500	2500	1500	2500				1500	2500							1500	2500	1500	2500
DN200	DN150	mm	201.0	832.0	1022.0	416.0	511.0	425.0	273.0	540.0	485.0	550.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	1000	2330	6963	4758
8"	6"	inch	7.91	32.76	40.24	16.38	20.12	16.73	10.75	21.26	19.09	21.65	2.83	3.01	0.79		10.0		2205	5137	8050	5500
DN250	DN200	mm	252.0	991.0	1270.0	495.50	635.0	582.0	374.0	712.0	585.0	675.0	80.0	87.0	22.0	F30	298.0	22x30 (8 holes)	1900	4427	11418	7526
10"	8"	inch	9.92	39.02	50.0	19.51	25.0	22.91	14.72	28.03	23.03	26.57	3.15	3.43	0.87		11.73		4189	9760	13200	8700
DN300	DN250	mm	303.0	1130.0	1422.0	565.0	711.0	797.0	512.0	927.0	675.0	760.0	80.0	87.0	22.0	F30	298.0	22x30 (8 holes)	3610	8000	16868	10726
12"	10"	inch	11.93	44.49	55.98	22.24	27.99	31.38	20.16	36.50	26.57	29.92	3.15	3.43	0.87		11.73		7959	17637	19500	12400

Z91W Z92W Z93W Z94W Z95W Z96W

Z91Z Z92Z Z93Z Z94Z Z95Z Z96Z

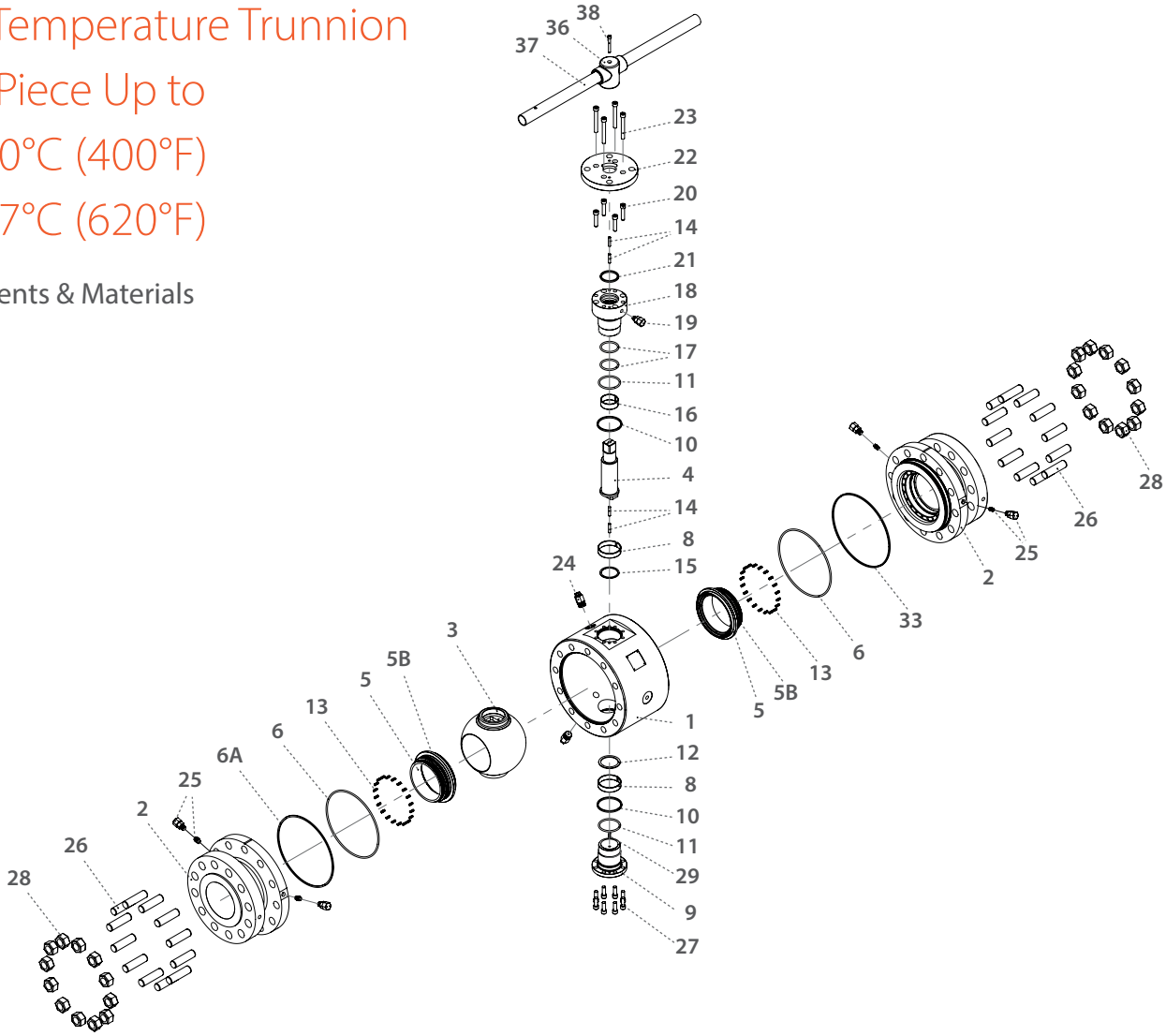
2"-6"
DN50-DN150

High Temperature Trunnion Ball 3 Piece Up to

W 200°C (400°F)

Z 327°C (620°F)

Components & Materials



Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering code	1
2	Ends	Acc. Ordering code	2
3	Ball	Acc. Ordering code	1
4	Stem	Acc. Ordering code	1
5*	Seat	Acc. Ordering code	2
5B*	Seat Seal	Viton / HNBR	2-4
6*	Body Inner Seal	Viton / HNBR	2
6A*	Body Outer Seal	Graphite	2
8*	Ball Bearing	S.steel 316 + PTFE	2
9	External Trunnion	S.steel / C.steel	1
10*	Gland Plate & External Trunnion Fire Safe Seal	Graphite	2
11*	Gland Plate & External Trunnion Seal	Viton / HNBR	2
12*	Lower Thrust Washer	S.steel 316 + PTFE	1
13	Seat Spring	Inconel X750	28-40
14	Gland Pin	S.steel / C.steel	4
15*	Stem Thrust Washer	S.steel 316 + PTFE	1
16*	Gland Plate Bearing	S.steel 316 + PTFE	1

Item	Description	Material Spec. ASTM	Qty.
17*	Stem Seal	Viton / HNBR	2
18	Gland Plate	S.steel / C.steel	1
19	Stem Grease Fitting	S.steel	1
20	Lower Gland Bolts	A193-B8M / A320 L7	4
21*	Stem Fire Safe Seal	Graphite	1
22	Iso Plate	S.steel / C.steel	1
23	Upper Gland Bolts	A193-B8M / A320 L7	4
24	Plug Valve	S.steel	2
25**	Seat Grease Fitting + Check Valve	S.steel	4
26	Body Studs	A193-B8M / A320 L7	16-24
27	External Trunnion Bolts	A193-B8M / A320 L7	4
28	Body Nuts	A194-8M / A194 L7	16-24
29	Antistatic Spring	Inconel X750	1
30	Wrench Head	S.steel / C.steel	1
31	Wrench Bolt	S.steel / C.steel	1
32	Pipe Handle	S.steel / C.steel Zink plate	1

* Maintenance kit components

** Available from 6" size only

Z91W Z92W Z93W Z94W Z95W Z96W

Z91Z Z92Z Z93Z Z94Z Z95Z Z96Z

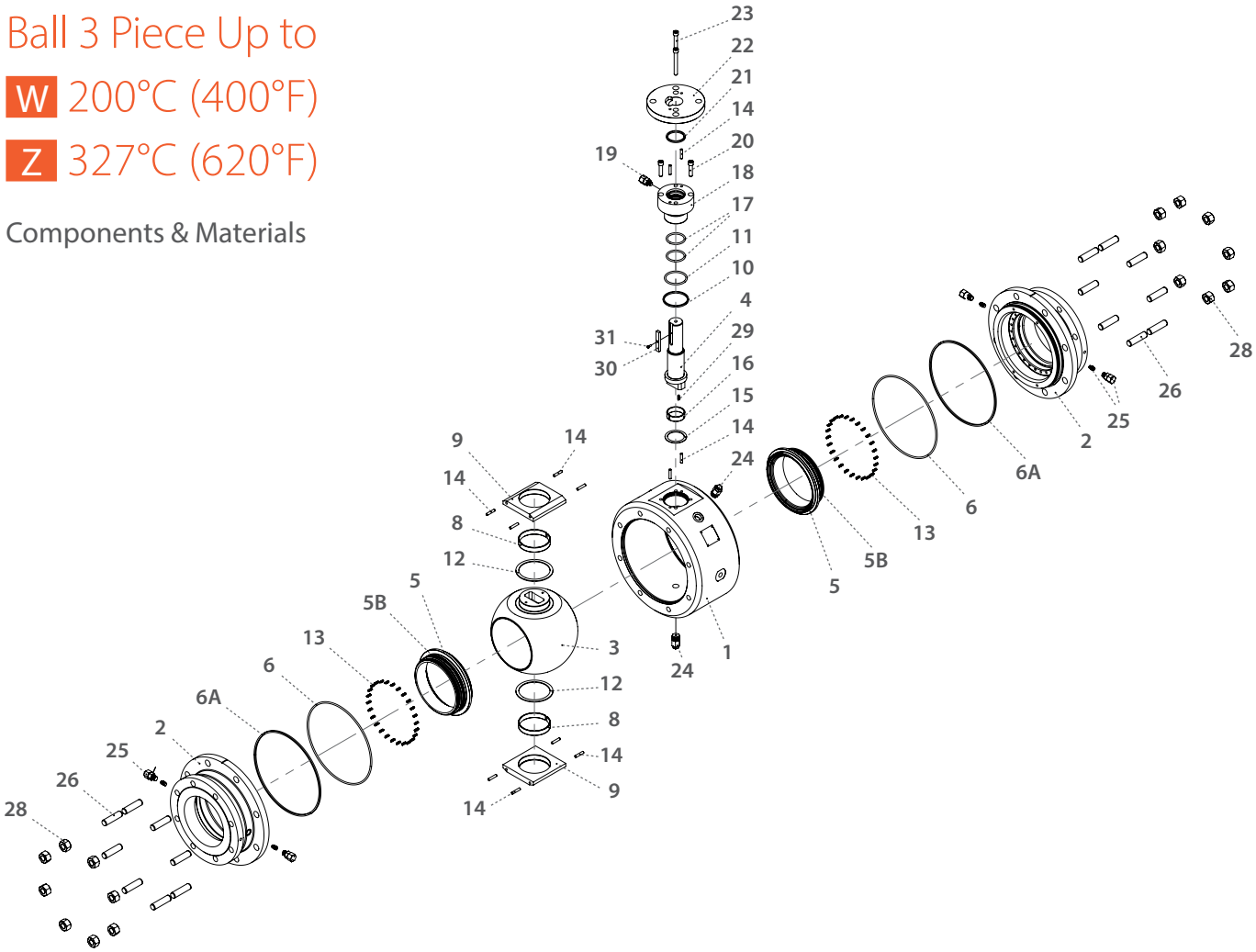
8"-12"
DN200-DN300

High Temperature Trunnion Ball 3 Piece Up to

W 200°C (400°F)

Z 327°C (620°F)

Components & Materials



Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering code	1
2	Ends	Acc. Ordering code	2
3	Ball	Acc. Ordering code	1
4	Stem	Acc. Ordering code	1
5*	Seat	Acc. Ordering code	2
5B*	Seat Seal	Viton, HNBR	2-4
6*	Body Inner Seal	Viton, HNBR	2
6A*	Body Outer Seal	Graphite	2
8*	Ball Bearing	S.steel 316 + PTFE	2
9	Trunnion Plate	S.steel / C.steel	2
10*	Gland Plate & External Trunnion Fire Safe Seal	Graphite	1
11*	Gland Plate & External Trunnion Seal	Viton, HNBR	1
12*	Ball Thrust Washer	S.steel 316 + PTFE	2
13	Seat Spring	Inconel X750	52-60
14	Gland Pin	S.steel / C.steel	12
15*	Stem Thrust Washer	S.steel 316 + PTFE	1
16*	Stem Bearing	S.steel 316 + PTFE	1

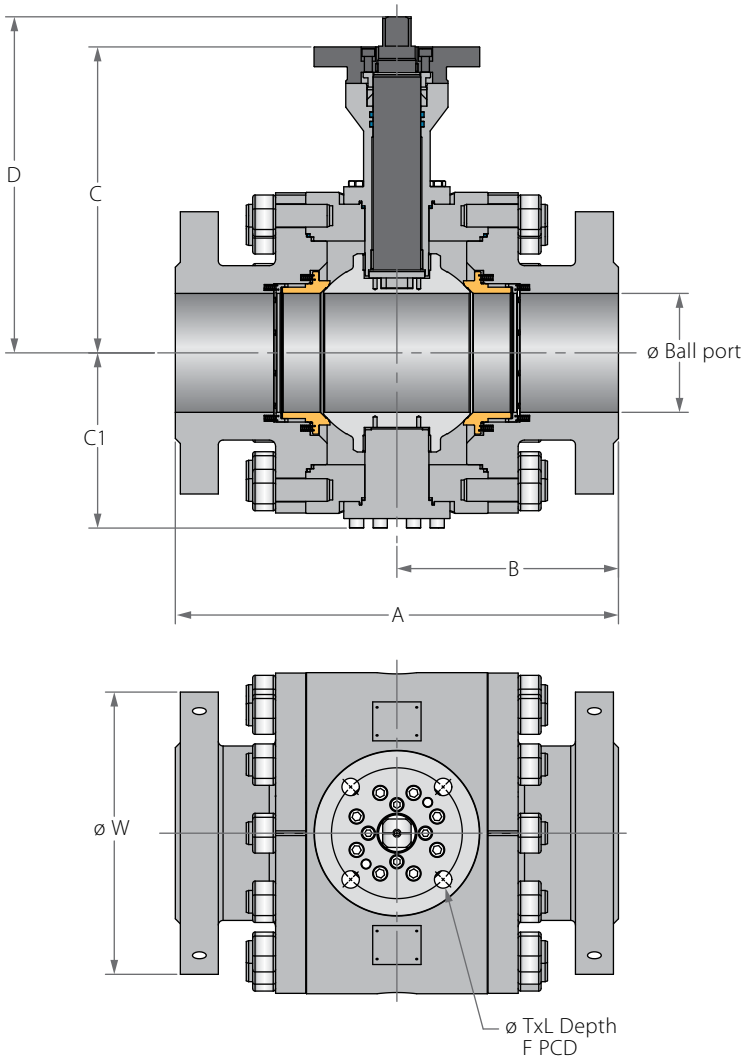
Item	Description	Material Spec. ASTM	Qty.
17*	Stem Seal	Viton, HNBR	2
18	Gland Plate	S.steel / C.steel	1
19	Stem Grease Fitting	S.steel	1
20	Lower Gland Bolts	A193-B8M / A320 L7	2-6
21*	Stem Fire Safe Seal	Graphite	1
22	Iso Plate	S.steel / C.steel	1
23	Upper Gland Bolts	A193-B8M / A320 L7	2-6
24	Plug Valve	S.steel	2
25**	Seat Grease Fitting + Check Valve	S.steel	4
26	Body Studs	A193-B8M / A320 L7	16-32
28	Body Nuts	A194-8M / A194 L7	16-32
29	Antistatic Spring	Inconel X750	1
30	Stem Key	S.steel / C.steel	1
31	Stem Key Bolt	S.steel / C.steel	1

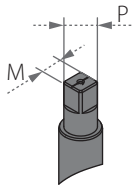
* Maintenance kit components

Z91Q Z92Q 2"-6" | DN50-DN150 | CLASS 150/300

High Temperature Trunnion Ball 3 Piece Up to 538°C (1000°F)

Valve Dimensions

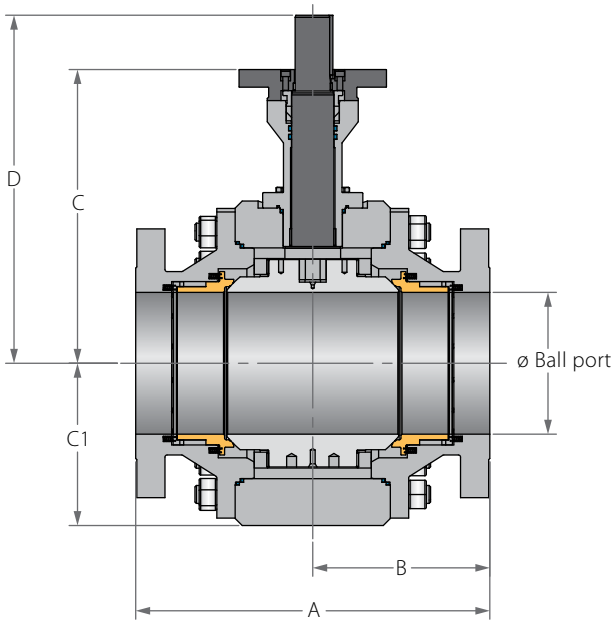


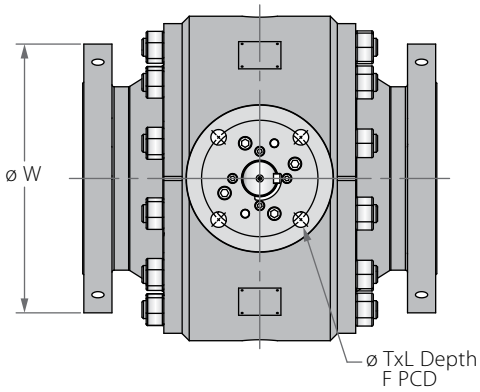


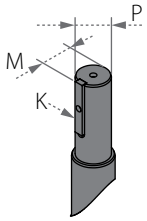
Std. port	Full port	Unit	Ball port	A		B		C	C1	D		M SQ	P SQ	F		TxL	Weight kg/ib		Kv/Cv	
				150	300	150	300			150	300						150	300	150	300
DN50		mm	49.0	178.0	216.0	89.0	108.0	250.0	94.0	269.0	150.0	165.0	16.90	F10	102.0	M10X15 (4 holes)	27	31	400	363
2"		inch	1.93	7.01	8.50	3.50	4.25	9.84	3.70	10.59	5.91	6.50	0.67		4.02		60	68	463	420
DN80	DN50	mm	74.0	203.0	283.0	101.50	141.50	277.0	117.0	301.0	190.0	210.0	21.90	F12	125.0	M12X15 (4 holes)	49	63	1125	952
3"	2"	inch	2.91	7.99	11.14	4.0	5.57	10.91	4.61	11.85	7.48	8.27	0.86		4.92		108	139	1300	1100
DN100	DN80	mm	100.0	229.0	305.0	114.50	152.50	293.0	139.0	322.0	230.0	255.0	26.90	F14	140.0	M16X15 (4 holes)	72	96	2154	1860
4"	3"	inch	3.94	9.02	12.0	4.51	6.0	11.54	5.47	12.68	9.06	10.04	1.06		5.51		159	212	2490	2150
DN150	DN100	mm	150.0	394.0	403.0	197.0	201.50	362.0	191.0	400.0	280.0	320.0	35.90	F16	165.0	M22X25 (4 holes)	166	184	4723	4628
6"	4"	inch	5.91	15.51	15.87	7.76	7.93	14.25	7.52	15.75	11.02	12.60	1.41		6.50		366	406	5460	5350

High Temperature Trunnion Ball 3 Piece Up to 538°C (1000°F)

Valve Dimensions





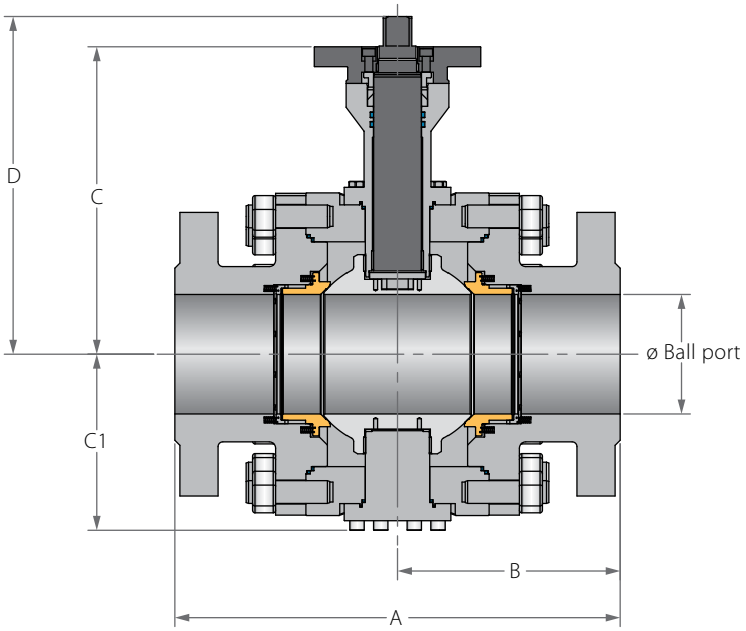


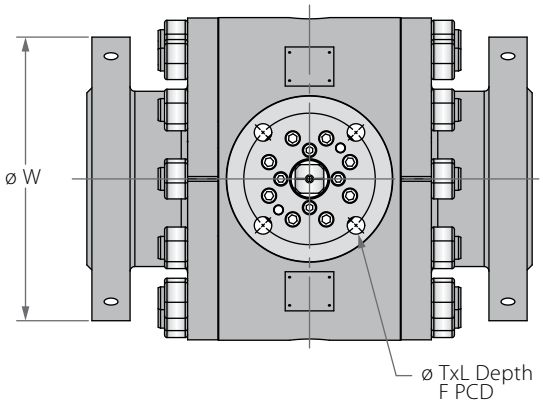
Std. port	Full port	Unit	Ball port	A		B		C	C1	D	M	K	F		TxL	Weight kg/ib		Kv/Cv	
				150	300	150	300									150	300	150	300
DN200	DN150	mm	201.0	457.0	502.0	228.50	251.0	416.0	215.0	493.0	345.0	380.0	50.0	54.0	14.0	346	378	9273	8737
8"	6"	inch	7.91	17.99	19.76	9.0	9.88	16.38	8.46	19.41	13.58	14.96		1.97		763	833	10720	10100
DN250	DN200	mm	252.0	533.0	568.0	266.50	284.0	504.0	260.0	581.0	405.0	445.0	50.0	54.0	14.0	518	639	15224	14792
10"	8"	inch	9.92	20.98	22.36	10.49	11.18	19.84	10.24	22.87	15.94	17.52		1.97		1142	1408	17600	17100
DN300	DN250	mm	303.0	610.0	648.0	305.0	324.0	590.0	300.0	671.0	485.0	520.0	60.0	63.50	18.0	723	833	23096	22404
12"	10"	inch	11.93	24.02	25.51	12.01	12.76	23.23	11.81	26.42	19.09	20.47		2.36		1594	1837	26700	25900

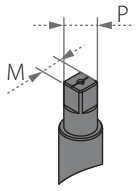
Z93Q Z94Q 2"-6" | DN50-DN150 | CLASS 600/900

High Temperature Trunnion Ball 3 Piece Up to 538°C (1000°F)

Valve Dimensions



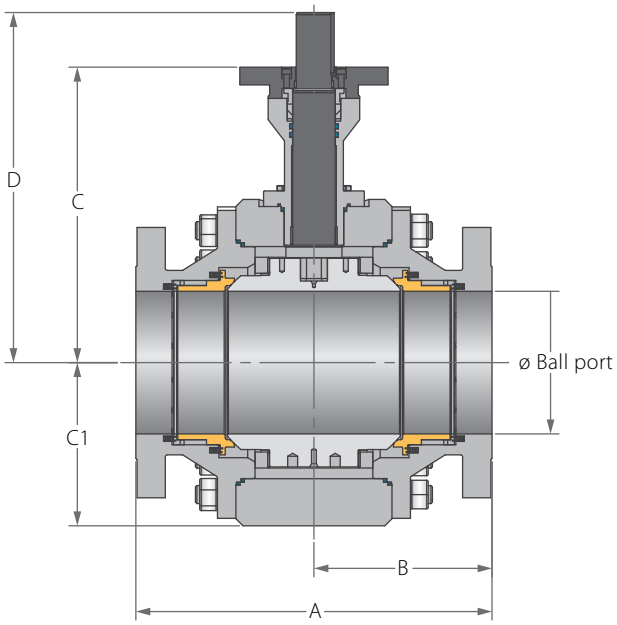


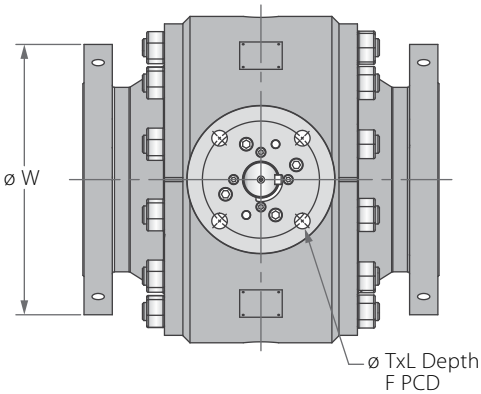


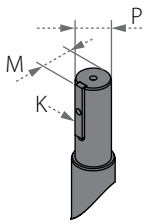
Std. port	Full port	Unit	Ball port	A		B		C		C1		D		W		M SQ	P SQ	F		TxL	Weight kg/ib		Kv/Cv	
				600	900	600	900	600	900	600	900	600	900	600	900						600	900	600	900
DN50		mm	49.0	292.0	368.0	146.0	184.0	272.0	272.0	119.0	119.0	291.0	291.0	165.0	215.0	16.90	21.30	F12	125.0	M12X15 (4 holes)	49	67	329	294
2"		inch	1.93	11.50	14.49	5.75	7.24	10.71	10.71	4.69	4.69	11.46	11.46	6.50	8.46	0.67	0.84		4.92		108	148	380	340
DN80	DN50	mm	74.0	356.0	381.0	178.0	190.50	306.0	306.0	160.0	160.0	330.0	330.0	210.0	240.0	21.90	26.90	F12	125.0	M12X15 (4 holes)	95	114	874	822
3"	2"	inch	2.91	14.02	15.0	7.01	7.50	12.05	12.05	6.30	6.30	12.99	12.99	8.27	9.45	0.86	1.06		4.92		209	251	1010	950
DN100	DN80	mm	100.0	432.0	457.0	216.0	228.50	334.0	334.0	184.0	184.0	364.0	364.0	275.0	290.0	26.90	34.90	F16	165.0	M22X25 (4 holes)	165	186	1557	1471
4"	3"	inch	3.94	17.01	17.99	8.50	9.0	13.15	13.15	7.24	7.24	14.33	14.33	10.83	11.42	1.06	1.37		6.50		364	410	1800	1700
DN150	DN100	mm	150.0	559.0	610.0	279.50	305.0	386.0	404.0	220.0	220.0	424.0	442.0	355.0	380.0	35.90	46.20	F16	165.0	M22X25 (4 holes)	340	418	3893	3823
6"	4"	inch	5.91	22.01	24.02	11.0	12.01	15.20	15.91	8.66	8.66	16.69	17.40	13.98	14.96	1.41	1.82		6.50		750	922	4500	4420

High Temperature Trunnion Ball 3 Piece Up to 538°C (1000°F)

Valve Dimensions





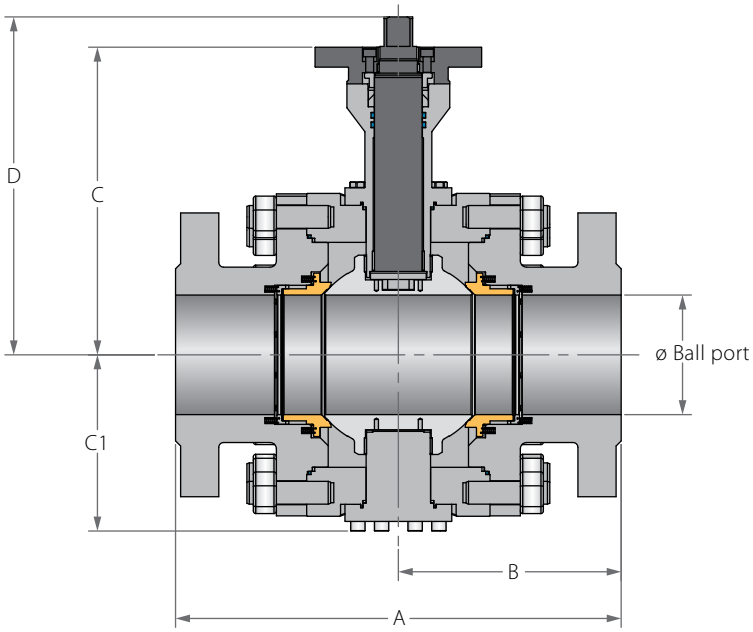


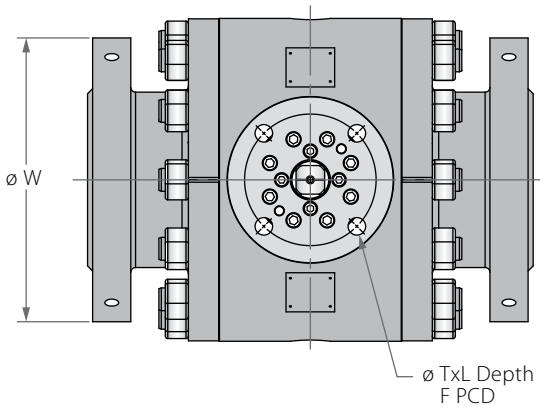
Std. port	Full port	Unit	Ball port	A		B		C		C1		D		W		P	M	K	F		TxL	Weight kg/ib		Kv/Cv	
				600	900	600	900	600	900	600	900	600	900	600	900							600	900	600	900
DN200	DN150	mm	201.0	660.0	737.0	330.0	368.50	418.0	418.0	263.0	263.0	515.0	515.0	420.0	470.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	548	789	7742	7344
8"	6"	inch	7.91	25.98	29.02	12.99	14.51	16.46	16.46	10.35	10.35	20.28	20.28	16.54	18.50	2.83	3.01	0.79		10.0		1208	1739	8950	8490
DN250	DN200	mm	252.0	787.0	838.0	393.50	419.0	519.0	537.0	310.0	326.0	616.0	634.0	510.0	545.0	72.0	76.50	20.0	F30	298.0	22x30 (8 holes)	895	1274	12543	12110
10"	8"	inch	9.92	30.98	32.99	15.49	16.50	20.43	21.14	12.20	12.83	24.25	24.96	20.08	21.46	2.83	3.01	0.79		11.73		1973	2809	14500	14000
DN300	DN250	mm	303.0	838.0	965.0	419.0	482.50	598.0	605.0	344.0	361.0	695.0	702.0	560.0	610.0	72.0	76.50	20.0	F30	298.0	22x30 (8 holes)	1096	1546	19809	18598
12"	10"	inch	11.93	32.99	37.99	16.50	19.0	23.54	23.82	13.54	14.21	27.36	27.64	22.05	24.02	2.83	3.01	0.79		11.73		2416	3408	22900	21500

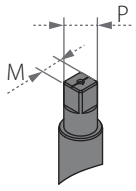
Z95Q Z96Q 2"-6" | DN50-DN150 | CLASS 1500/2500

High Temperature Trunnion Ball 3 Piece Up to 538°C (1000°F)

Valve Dimensions



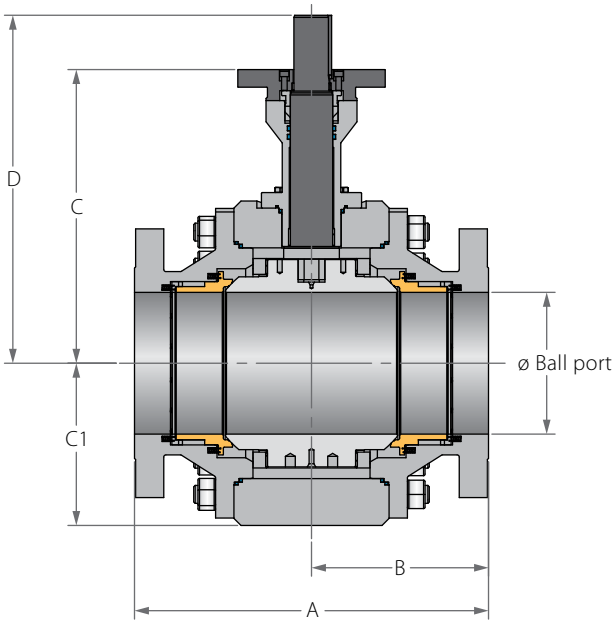


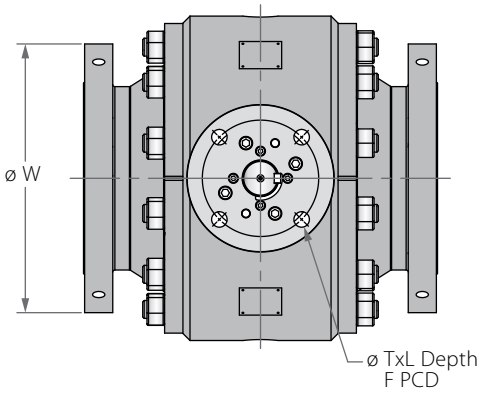


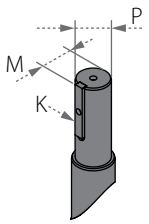
Std. port	Full port	Unit	Ball port		A		B		C	C1	D	W		M SQ	P SQ	F		TxL	Weight kg/ib		Kv/Cv	
			1500	2500	1500	2500	1500	2500				1500	2500						1500	2500	1500	2500
DN50		mm	49.0	42.0	368.0	451.0	184.0	225.50	325.0	127.0	330.0	215.0	235.0	22.0	32.0	F14	140.0	18X12 (4 holes)	90	179	281	260
2"		inch	1.93	1.65	14.49	17.76	7.24	8.88	12.80	5.0	12.99	8.46	9.25	0.87	1.26		5.51		198	395	325	300
DN80	DN50	mm	74.0	62.0	470.0	578.0	235.0	289.0	379.0	201.50	408.0	265.0	305.0	27.0	35.0	F14	140.0	18x22 (4 holes)	175	340	735	649
3"	2"	inch	2.91	2.44	18.50	22.76	9.25	11.38	14.92	7.93	16.06	10.43	12.01	1.06	1.38		5.51		386	750	850	750
DN100	DN80	mm	100.0	87.0	546.0	673.0	273.0	336.50	408.0	198.50	446.0	310.0	355.0	36.0	46.20	F16	165.0	22x25 (4 holes)	330	646	1384	1228
4"	3"	inch	3.94	3.43	21.50	26.50	10.75	13.25	16.06	7.81	17.56	12.20	13.98	1.42	1.82		6.50		728	1424	1600	1420
DN150	DN100	mm	144.0	131.0	705.0	914.0	352.50	457.0	538.0	272.0	586.0	395.0	485.0	46.0	59.0	F25	254.0	22x30 (8 holes)	627	1227	3590	2206
6"	4"	inch	5.67	5.16	27.76	35.98	13.88	17.99	21.18	10.71	23.07	15.55	19.09	1.81	2.32		10.0		1382	2705	4150	2550

High Temperature Trunnion Ball 3 Piece Up to 538°C (1000°F)

Valve Dimensions





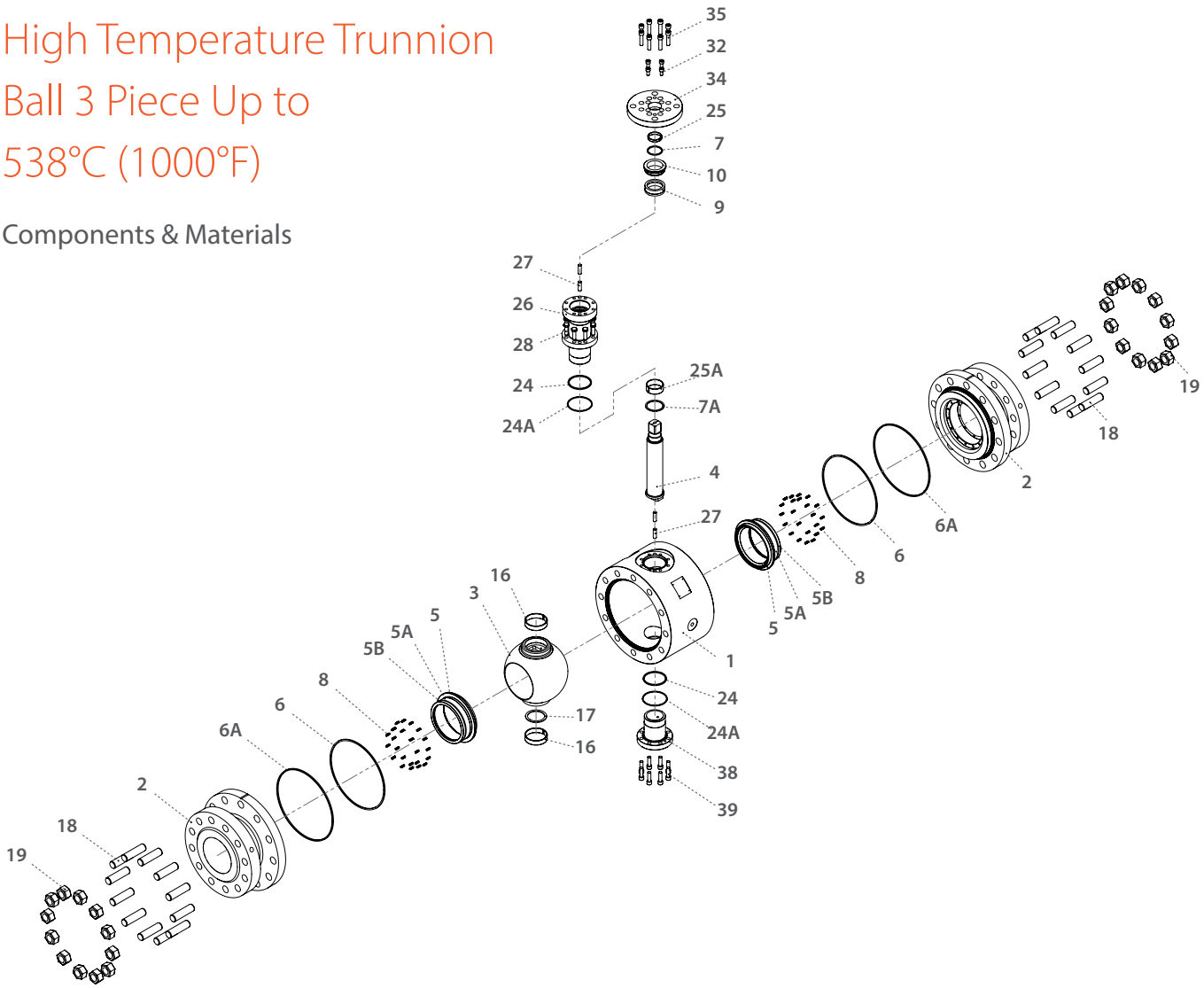


Std. port	Full port	Unit	Ball port		A		B		C	C1	D	W		P	M	K	F		TxL	Weight kg/ib		Kv/Cv	
			1500	2500	1500	2500	1500	2500				1500	2500							1500	2500	1500	2500
DN200	DN150	mm	192.0	179.0	832.0	1022.0	416.0	511.0	498.0	273.0	628.0	485.0	550.0	98.0	104.40	28.0	F30	298.0	22x30 (8 holes)	1000	2330	6963	4758
8"	6"	inch	7.56	7.05	32.76	40.24	16.38	20.12	19.61	10.75	24.72	19.09	21.65	3.86	4.11	1.10		11.73		2205	5137	8050	5500
DN250	DN200	mm	239.0	223.0	991.0	1270.0	495.50	635.0	609.0	374.0	740.0	585.0	675.0	98.0	104.40	28.0	F35	356.0	32x45 (8 holes)	1900	3623	11418	7389
10"	8"	inch	9.41	8.78	39.02	50.0	19.51	25.0	23.98	14.72	29.13	23.03	26.57	3.86	4.11	1.10		14.02		4189	7987	13200	8542
DN300	DN250	mm	287.0	265.0	1130.0	1422.0	565.0	711.0	558.0	512.0	688.0	675.0	760.0	120.0	127.40	32.0	F40	406.0	38x55 (8 holes)	2705	4875	16868	10508
12"	10"	inch	11.30	10.43	44.49	55.98	22.24	27.99	21.97	20.16	27.09	26.57	29.92	4.72	5.02	1.26		15.98		5963	10747	19500	12148

Z91Q Z92Q Z93Q
Z94Q Z95Q Z96Q 2"-6" | DN50-DN150

High Temperature Trunnion Ball 3 Piece Up to 538°C (1000°F)

Components & Materials



Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A*	Seat Seal	Graphite	2
5B*	Seat Ring	Acc. Ordering Code	2
6*	Body Inner Seal	Graphite	2
6A*	Body Outer Seal	Graphite	2
7	Upper Thrust Seal	S.steel 316 / Inconel 625	1
7A	Lower Thrust Seal	S.steel 316 / Inconel 625	1
8	Seat Spring	Inconel X750	16-48
9*	Stem Seal	Graphite	1
10	Follower	S.steel	1
16	Ball Bearing	Inconel 625	2
17	Ball Thrust Seal	Inconel 625	1

Item	Description	Material Spec. ASTM	Qty.
18	Body Stud	A193-B8M / A320 L7	8-24
19	Body Nuts	A194 8M / A194 L7	8-24
24*	Bonnet Inner Seal	Graphite	2
24A*	Bonnet Outer Seal	Graphite	2
25	Upper Stem Bearing	Inconel 625	1
25A	Lower Stem Bearing	Inconel 625	1
26	Bonnet	S. steel / C. steel	1
27	Bonnet Pin	S. steel / C. steel	4
28	Bonnet Bolts	A193-B8M / A320 L7	4-8
32	Follower Drive Bolts	A193-B8M / A320 L7	4-8
34	Iso Plate	S. steel / C. steel	1
35	Iso Plate Bolts	A193-B8M / A320 L7	4-8
38	External Trunnion	S. steel / C. steel	1
39	External Trunnion Bolts	A193-B8M / A320 L7	4-8

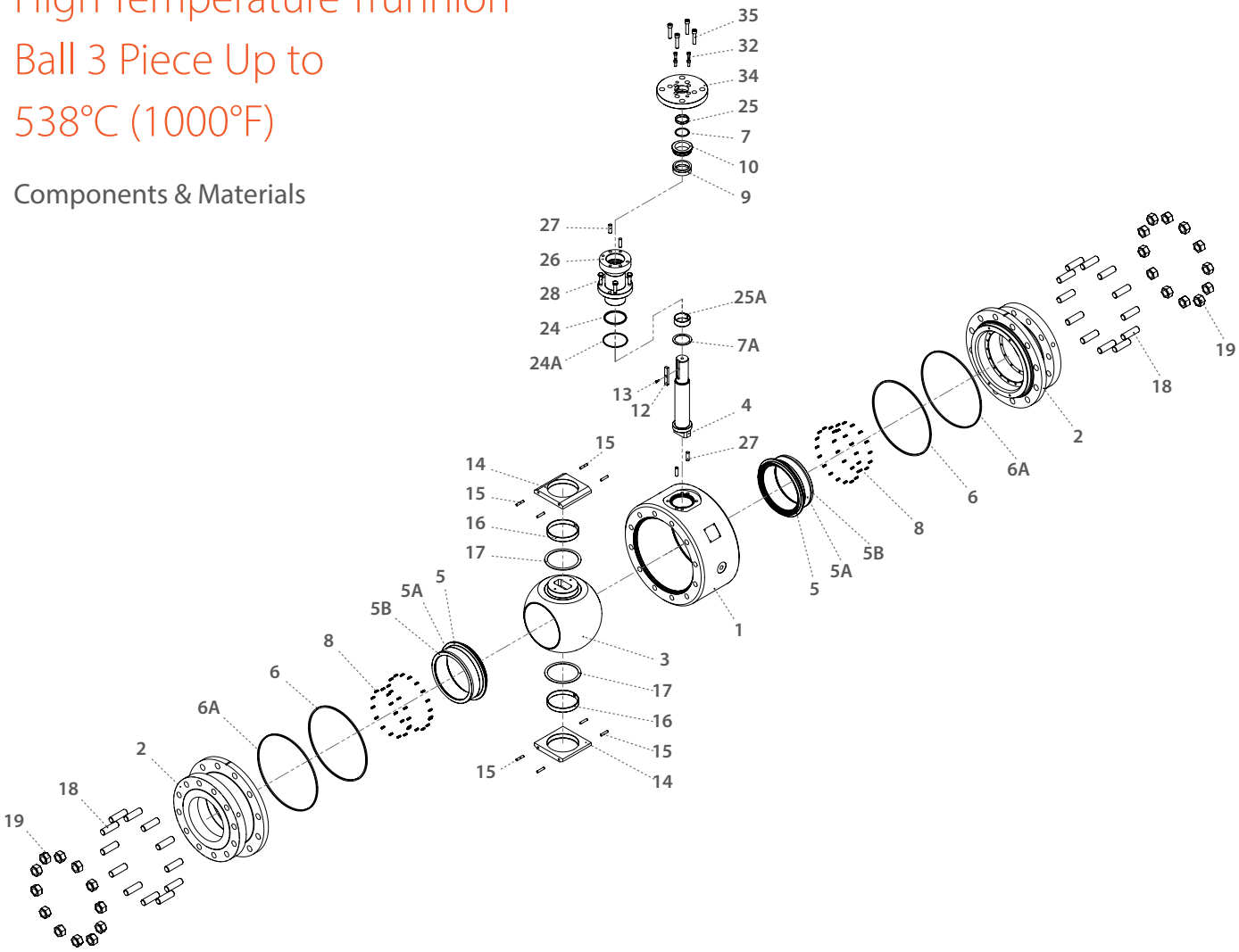
* Maintenance kit components

Z91Q Z92Q Z93Q

Z94Q Z95Q Z96Q 8"-12" | DN200-DN300

High Temperature Trunnion Ball 3 Piece Up to 538°C (1000°F)

Components & Materials



Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering code	1
2	End	Acc. Ordering code	2
3	Ball	Acc. Ordering code	1
4	Stem	Acc. Ordering code	1
5*	Seat	Acc. Ordering code	2
5A*	Seat Seal	Graphite	2
5B*	Seat Ring	Acc. Ordering code	2
6*	Body Inner Seal	Graphite	2
6A*	Body Outer Seal	Graphite	2
7	Upper Thrust Seal	Inconel 625	1
7A	Lower Thrust Seal	Inconel 625	1
8	Seat Spring	Inconel X750	68-76
9*	Stem Seal	Graphite	1
10	Follower	S.steel	1
12	Stem Key	S.steel / C.steel	1
13	Stem Key Bolt	S.steel / C.steel	1
14	Trunnion Plate	S.steel / C.steel	2

Item	Description	Material Spec. ASTM	Qty.
15	Trunnion Plate Pin	S.steel / C.steel	8
16	Ball Bearing	Inconel 625	2
17	Ball Thrust Washer	Inconel 625	2
18	Body Stud	A193-B8M / A320 L7	16-40
19	Body Nuts	A194 8M / A194 L7	16-40
24*	Bonnet Inner Seal	Graphite	1
24A*	Bonnet Outer Seal	Graphite	1
25	Upper Stem Bearing	Inconel 625	1
25A	Lower Stem Bearing	Inconel 625	1
26	Bonnet	S.steel / C.steel	1
27	Bonnet Pin	S.steel / C.steel	4
28	Bonnet Bolts	ASTM A320-B8M	4-8
32	Follower Drive Bolts	ASTM A320-B8M	4-8
34	Iso Plate	S.steel / C.steel	1
35	Iso Plate Bolts	A193-B8M / A320 L7	4-8

* Maintenance kit components

Z91 Z92 Z93 Z94 Z95 Z96

High Temperature Trunnion Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0				Z	9	4	P	-	6	M	6	D	I	V	G	/	9	0	0						
Size		Features				Series		Design		Body & ends material		Stem material		Ball/Seat material		Seat feature		Hardening		Inner Seal		Outer Seal		End Connection				Special features				

Size (1-2)		
Code	inch	mm
20*	2"	50
30	3"	80
40	4"	100
60	6"	150
80	8"	200
A0	10"	250
A2**	12"	300

* Full port only
** Z91-Z94 Only

Features (3-6)	
Z	Metal seats
B	Full port

Series - 3 Piece (7-8)	
91	ASME B16.5 #150
92	ASME B16.5 #300
93	ASME B16.5 #600
94	ASME B16.5 #900
95	ASME B16.5 #1500
96	ASME B16.5 #2500

Design (9)	
W	-46°C to 200°C (-50°F to 400°F)
Z	-46°C to 327°C (-50°F to 620°F)
Q	-60°C to 538°C (-76°F to 1000°F)

Body & ends (11)	
4*	C. Steel A105
6	S. Steel A479 316
J**	F22

* -29°C to 425°C (-20°F to 800°F)
** For Q design only

Stem (12)	
M	High Strength S. Steel
Z	Inconel 718

Ball / Seat material (13)	
6	S. Steel A182 316
N*	ASTM A182 F6A (S.Steel 410)

* For O hardening only

Seat feature (14)	
D	Double Piston Effect (DPE) (API 6D DIB-1)
S	Single Piston Effect (SPE) (API 6D DBB)

Hardening (15)	
I	Cr3C2- Chromium Carbide with Nickel Chrome binder - HVOF technique
O*	WC-Co- Tungsten Carbide with Cobalt binder HVO technique

Inner Seal material (16)	
V	Viton (-20°c to 200°c [-4°F to 400°F])
H	HNBR (-46°c to 150°c [-50°F to 300°F])
K	Kalrez (-20°c to 327°c [-4°F to 620°F])
G	Graphite

* Up to 538°C

Outer Seal material (17)	
G	Graphite

End connections (19-22)	
Welded	
XBW	Extended buttweld sch 40
XBW80	Extended buttweld sch 80
XBW160	Extended buttweld sch 160
XBWXXS	Extended buttweld sch XXS
Flanged	
150	ASME B16.5 #150
300	ASME B16.5 #300
600	ASME B16.5 #600
900	ASME B16.5 #900
1500	ASME B16.5 #1500
2500	ASME B16.5 #2500
PN16	DIN EN 1092-1 PN16
PN40	DIN EN 1092-1 PN40
PN63	DIN EN 1092-1 PN63
PN100	DIN EN 1092-1 PN100
PN160	DIN EN 1092-1 PN160
PN250	DIN EN 1092-1 PN250
PN320	DIN EN 1092-1 PN320
PN400	DIN EN 1092-1 PN400
Flanged RTJ	
600RTJ	ASME B16.5 #600 RTJ
900RTJ	ASME B16.5 #900 RTJ
1500RTJ	ASME B16.5 #1500 RTJ
2500RTJ	ASME B16.5 #2500 RTJ

Special features (23-30)	
L*	Seat greasing point
D**	Drain & Vent
Blank	Drain & vent is capped
H**	Drain ball valve & vent
PT***	Basic paint system
PT1	Offshore, Temp Ambient up to 93°C (200°F)
PT2	Offshore, up to 537°C (998°F)

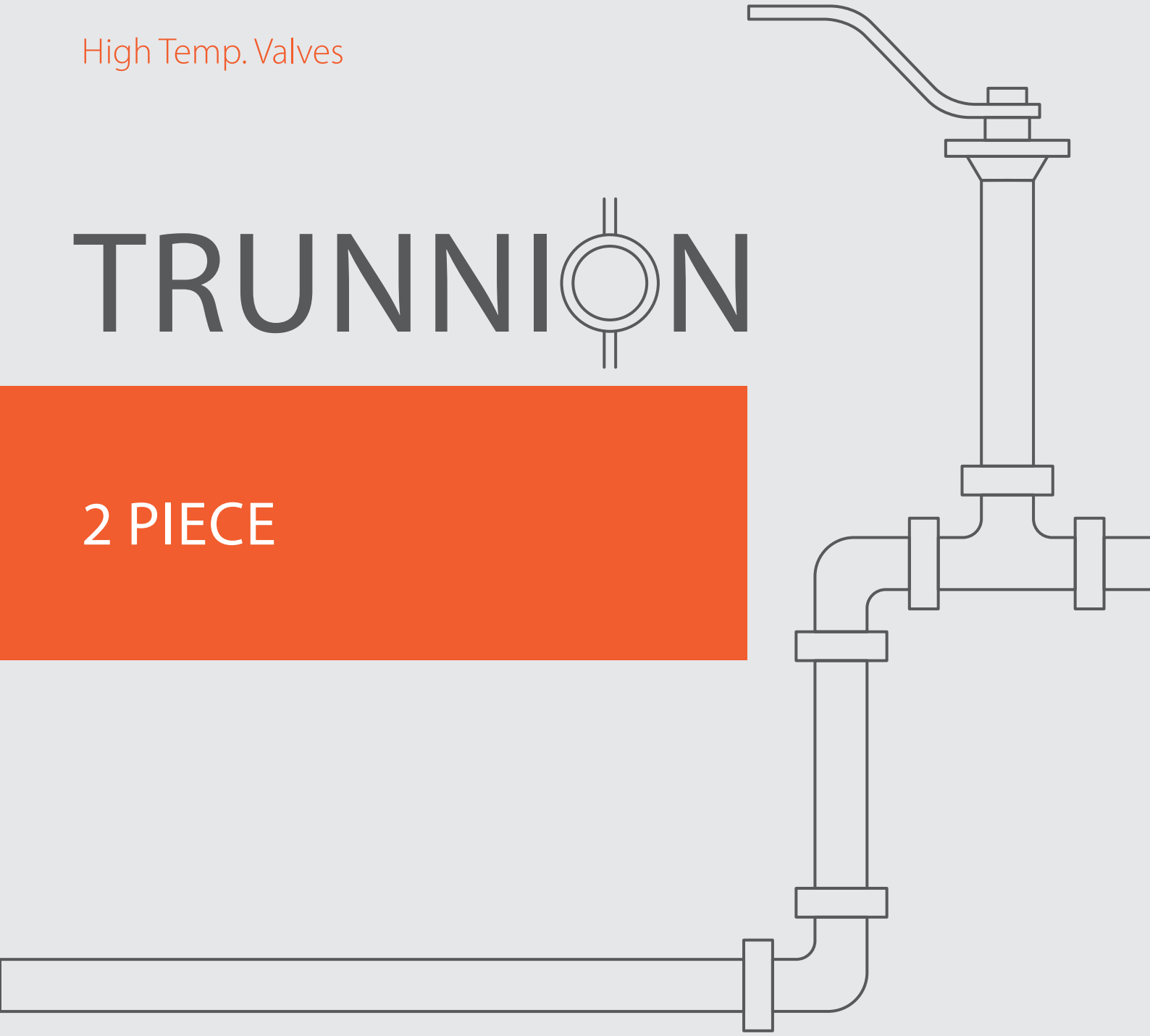
* for 6" Full Bore and up, not for Q-design
** not for Q-design
*** colors RAL 1018 or 7036 (other colors upon request)

Z81 Z82 Z83

High Temp. Valves

TRUNNION

2 PIECE



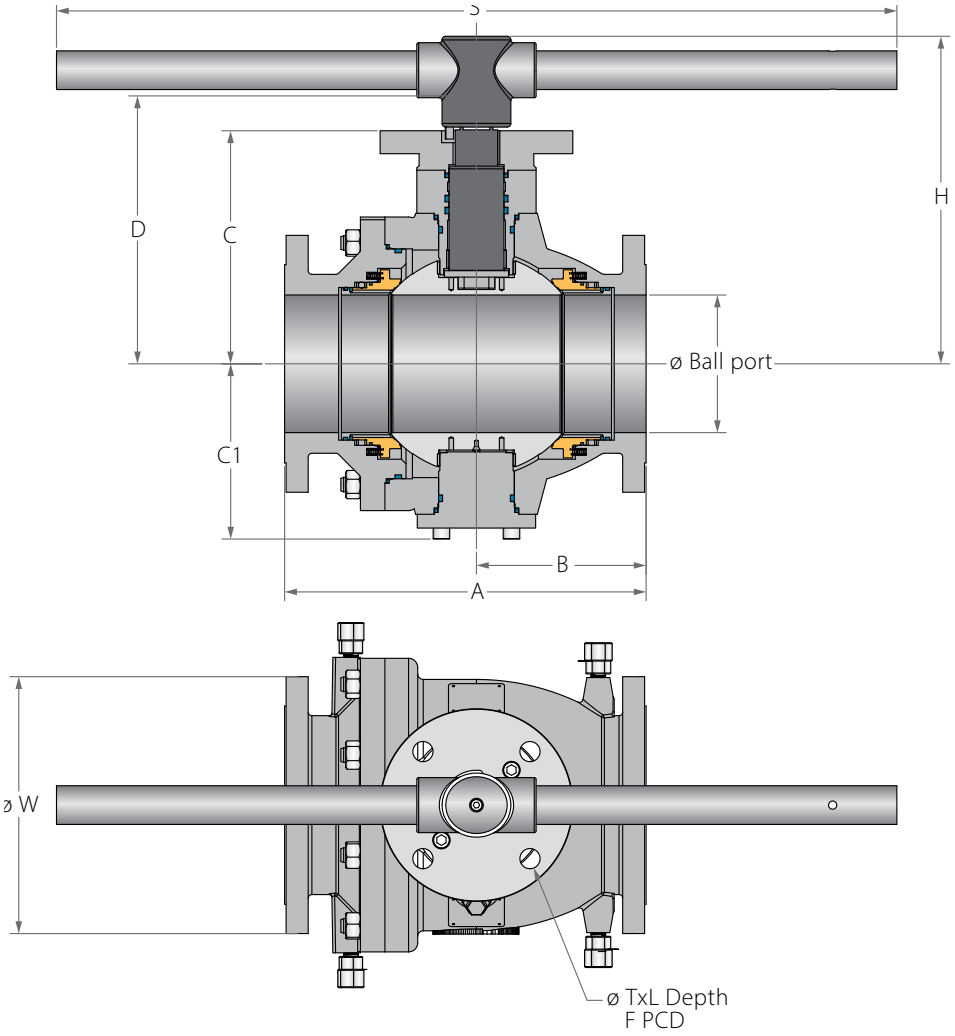
Z81Z Z81W Z82Z Z82W

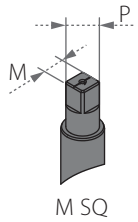
2"-6" | DN50-DN150
CLASS 150/300

High Temperature Trunnion Ball 2 Piece Up to 327°C (620°F)

W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions



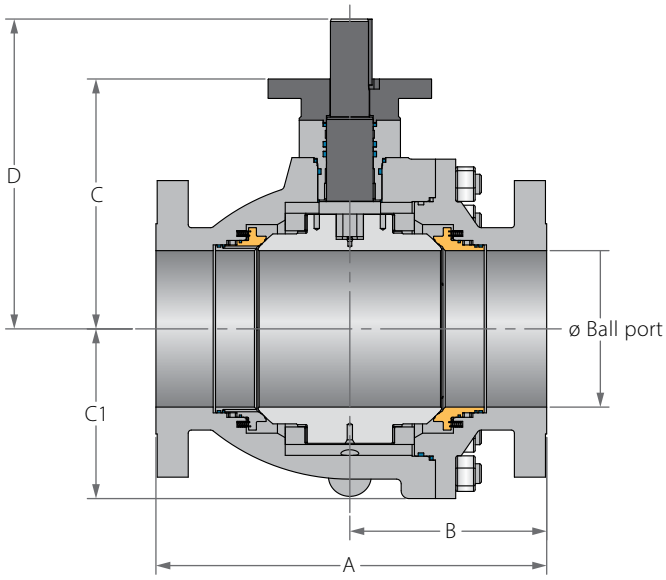


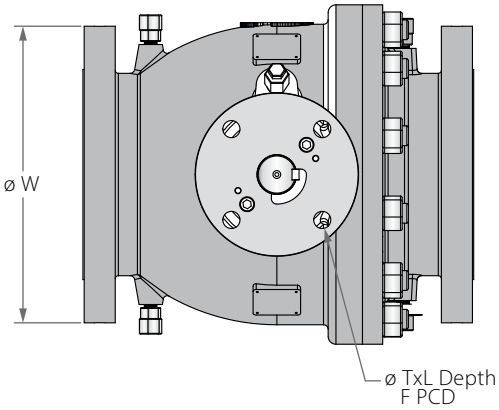
Full port	Unit	Ball port	A		B		C	C1	D	W		M SQ	P SQ	H	S	F		TxL	Weight kg/ib		Kv/Cv	
			150	300	150	300				150	300								150	300	150	300
DN50	mm	49.0	178.0	216.0	89.0	108.0	127.0	91.50	144.50	150.0	165.0	17.0	22.0	196.0	401.0	F10	102.0	11X15	19	23	400	363
2"	inch	1.93	7.01	8.50	3.50	4.25	5.0	3.60	5.69	5.91	6.50	0.67	0.87	7.72	15.79		4.02	(4 holes)	42	51	463	420
DN80	mm	74.0	203.0	283.0	101.50	128.0	148.0	117.0	172.0	190.0	210.0	22.0	32.0	223.0	610.0	F12	125.0	13X15	33	44	1125	952
3"	inch	2.91	7.99	11.14	4.0	5.04	5.83	4.61	6.77	7.48	8.27	0.87	1.26	8.78	24.02		4.92	(4 holes)	73	97	1300	1100
DN100	mm	100.0	229.0	305.0	114.50	140.50	171.0	139.0	198.50	230.0	255.0	27.0	35.0	247.50	610.0	F14	140.0	18X15	49	69	2154	1860
4"	inch	3.94	9.02	12.0	4.51	5.53	6.73	5.47	7.81	9.06	10.04	1.06	1.38	9.74	24.02		5.51	(4 holes)	108	152	2490	2150
DN150	mm	150.0	394.0	403.0	185.0	230.40	254.0	191.0	290.50	280.0	320.0	36.0	46.20	356.50	916.0	F16	165.0	22X25	133	166	4723	4628
6"	inch	5.91	15.51	15.87	7.28	9.07	10.0	7.52	11.44	11.02	12.60	1.42	1.82	14.04	36.06		6.50	(4 holes)	293	366	5460	5350

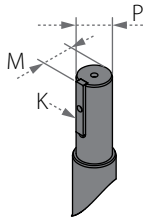
High Temperature Trunnion Ball 2 Piece Up to 327°C (620°F)

W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions







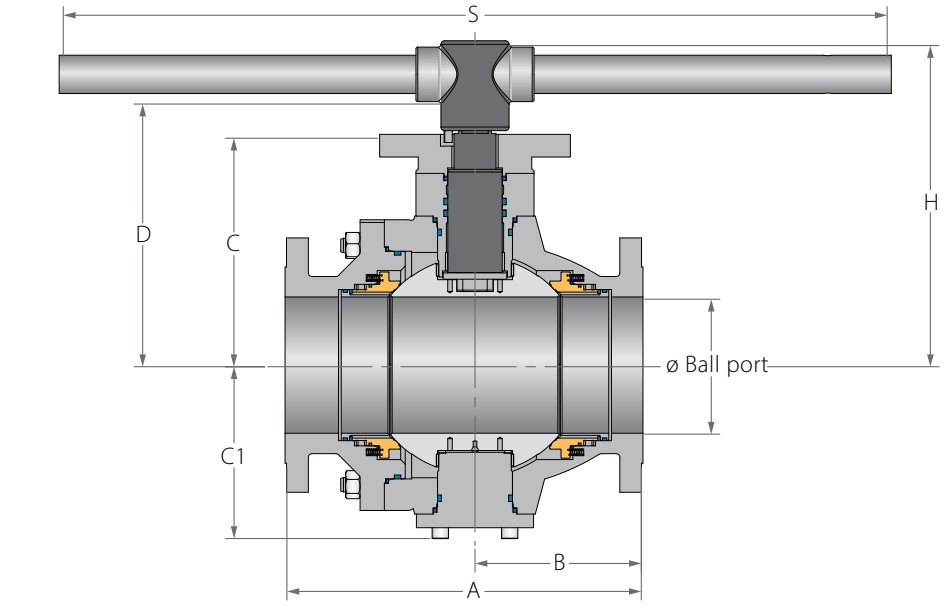
Full port	Unit	Ball port	A		B		C	C1	D	W		P	M	K	F		TxL	Weight kg/ib		Kv/Cv	
			150	300	150	300				150	300							150	300	150	300
DN200	mm	201.0	457.0	502.0	228.50	253.0	325.0	247.0	405.50	345.0	380.0	50.0	54.0	14.0	F16	165.0	22x25 (4 holes)	222	262	9273	8737
8"	inch	7.91	17.99	19.76	9.0	9.96	12.80	9.72	15.96	13.58	14.96	1.97	2.13	0.55		6.50		489	578	10720	10100
DN250	mm	252.0	533.0	568.0	270.0	287.50	353.0	297.0	430.0	405.0	445.0	50.0	54.0	14.0	F25	254.0	18x25 (8 holes)	358	424	15224	14792
10"	inch	9.92	20.98	22.36	10.63	11.32	13.90	11.69	16.93	15.94	17.52	1.97	2.13	0.55		10.0		789	935	17600	17100
DN300	mm	303.0	610.0	648.0	298.0	313.0	388.0	324.0	468.50	485.0	520.0	60.0	63.50	18.0	F25	254.0	18x25 (8 holes)	527	613	23096	22404
12"	inch	11.93	24.02	25.51	11.73	12.32	15.28	12.76	18.44	19.09	20.47	2.36	2.50	0.71		10.0		1162	1351	26700	25900

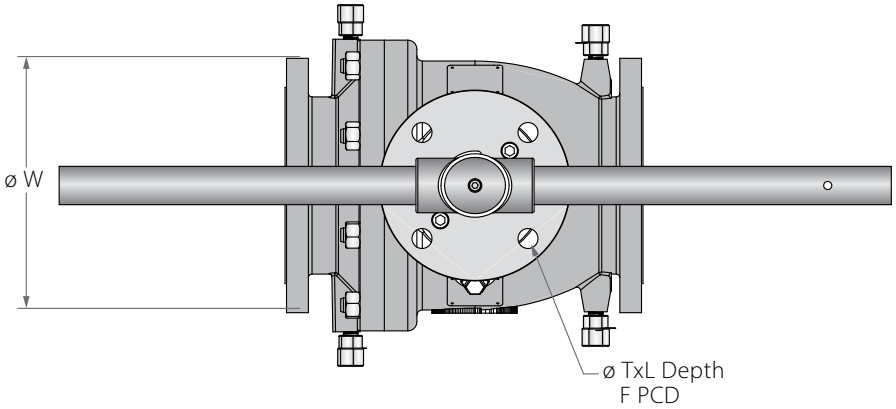
Z83Z Z83W 2"-6" | DN50-DN150 | CLASS 600

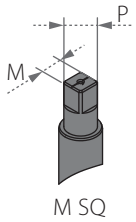
High Temperature Trunnion Ball 2 Piece Up to 327°C (620°F)

W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions





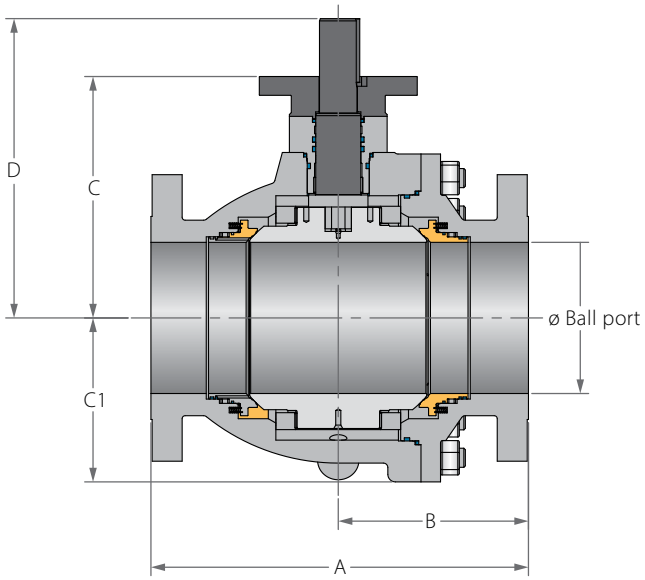


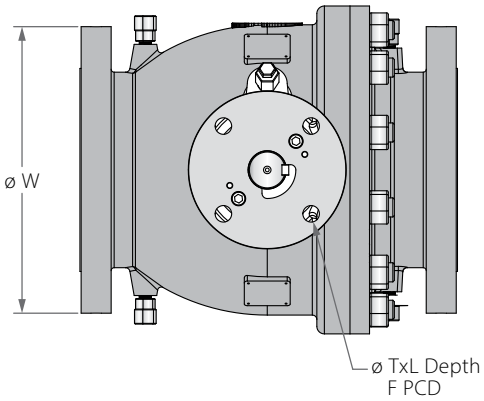
Full port	Unit	Ball port	A	B	C	C1	D	W	M SQ	P SQ	H	S	F		TxL	Weight kg/ib	Kv/Cv
DN50	mm	49.0	292.0	131.0	144.0	119.0	168.50	165.0	22.0	28.0	219.50	401.0	F12	125.0	13X15 (4 holes)	35	329
2"	inch	1.93	11.50	5.16	5.67	4.69	6.63	6.50	0.87	1.10	8.64	15.79		4.92		77	380
DN80	mm	74.0	356.0	161.0	191.0	160.0	215.0	210.0	22.0	28.0	266.0	610.0	F12	140.0	18X24 (4 holes)	71	874
3"	inch	2.91	14.02	6.34	7.52	6.30	8.46	8.27	0.87	1.10	10.47	24.02		5.51		157	1010
DN100	mm	100.0	432.0	216.0	217.0	184.0	246.50	275.0	27.0	36.0	316.50	916.0	F16	165.0	22X25 (4 holes)	123	1557
4"	inch	3.94	17.01	8.50	8.54	7.24	9.70	10.83	1.06	1.42	12.46	36.06		6.50		271	1800
DN150	mm	150.0	559.0	278.0	282.50	214.50	320.50	355.0	36.0	48.20	385.0	916.0	F16	165.0	22X25 (4 holes)	244	3893
6"	inch	5.91	22.01	10.94	11.12	8.44	12.62	13.98	1.42	1.90	15.16	36.06		6.50		538	4500

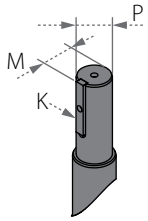
High Temperature Trunnion Ball 2 Piece Up to 327°C (620°F)

W 200°C (400°F) | Z 327°C (620°F)

Valve Dimensions







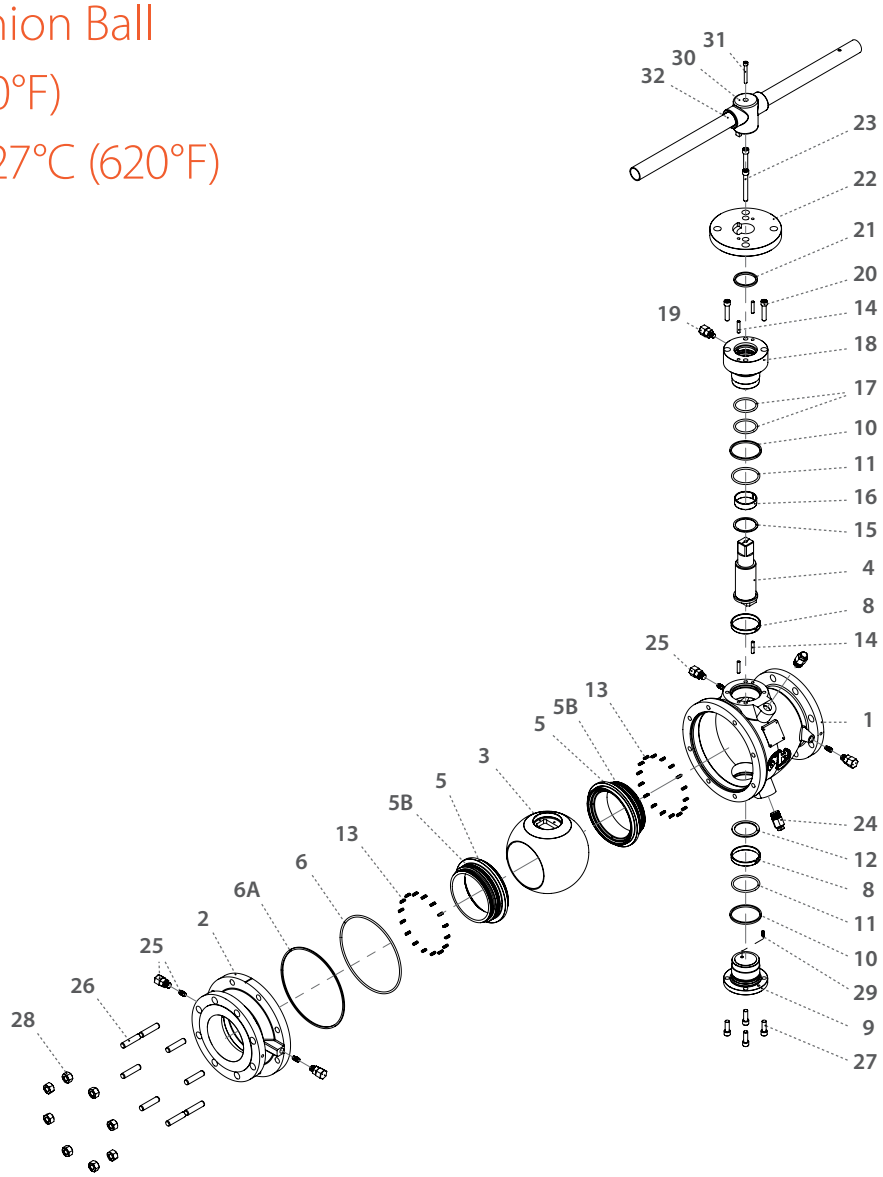
Full port	Unit	Ball port	A	B	C	C1	D	W	P	M	K	F		TxL	Weight kg/ib	Kv/Cv
DN200	mm	201.0	660.0	330.0	312.0	263.0	409.0	420.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	412	7742
8"	inch	7.91	25.98	12.99	12.28	10.35	16.10	16.54	2.83	3.01	0.79		10.0		908	8950
DN250	mm	252.0	787.0	400.0	374.0	310.0	471.0	510.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	665	12543
10"	inch	9.92	30.98	15.75	14.72	12.20	18.54	20.08	2.83	3.01	0.79		10.0		1466	14500
DN300	mm	303.0	838.0	419.0	402.0	344.0	499.0	560.0	72.0	76.50	20.0	F25	254.0	18x35 (8 holes)	804	19809
12"	inch	11.93	32.99	16.50	15.83	13.54	19.65	22.05	2.83	3.01	0.79		10.0		1772	22900

Z81Z Z81W Z82Z Z82W Z83Z Z83W

2"-6" | DN50-DN150 | CLASS 150/300

High Temperature Trunnion Ball
2 Piece Up to 327°C (620°F)
W 200°C (400°F) | Z 327°C (620°F)

Components & Materials



Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering code	1
2	Ends	Acc. Ordering code	1
3	Ball	Acc. Ordering code	1
4	Stem	Acc. Ordering code	1
5*	Seat	Acc. Ordering code	2
5B*	Seat Seal	Viton / HNBR	2-4
6*	Body Inner Seal	Viton / HNBR	1
6A*	Body Outer Seal	Graphite	1
8*	Ball Bearing	S.steel 316 + PTFE	2
9	External Trunnion	S.steel / C.steel	1
10*	Gland Plate & External Trunnion Fire Safe Seal	Graphite	2
11*	Gland Plate & External Trunnion Seal	Viton / HNBR	2
12*	Lower Thrust Washer	S.steel 316 + PTFE	1
13	Seat Spring	Inconel X750	28-40
14	Gland Pin	S.steel / C.steel	4
15*	Stem Thrust Washer	S.steel 316 + PTFE	1
16*	Gland Plate Bearing	S.steel 316 + PTFE	1

Item	Description	Material Spec. ASTM	Qty.
17*	Stem Seal	Viton / HNBR	2
18	Gland Plate	S.steel / C.steel	1
19	Stem Grease Fitting	S.steel	1
20	Lower Gland Bolts	A193-B8M / A320 L7	4
21*	Stem Fire Safe Seal	Graphite	1
22	Iso Plate	S.steel / C.steel	1
23	Upper Gland Bolts	A193-B8M / A320 L7	4
24	Plug Valve	S.steel	2
25**	Seat Grease Fitting + Check Valve	S.steel	4
26	Body Studs	A193-B8M / A320 L7	8-12
27	External Trunnion Bolts	A193-B8M / A320 L7	4
28	Body Nuts	A194-8M / A194 L7	8-12
29	Antistatic Spring	Inconel X750	1
30	Wrench Head	S.steel / C.steel	1
31	Wrench Bolt	S.steel / C.steel	1
32	Pipe Handle	S.steel / C.steel Zink plate	1

* Maintenance kit components

** Available from 6" size only

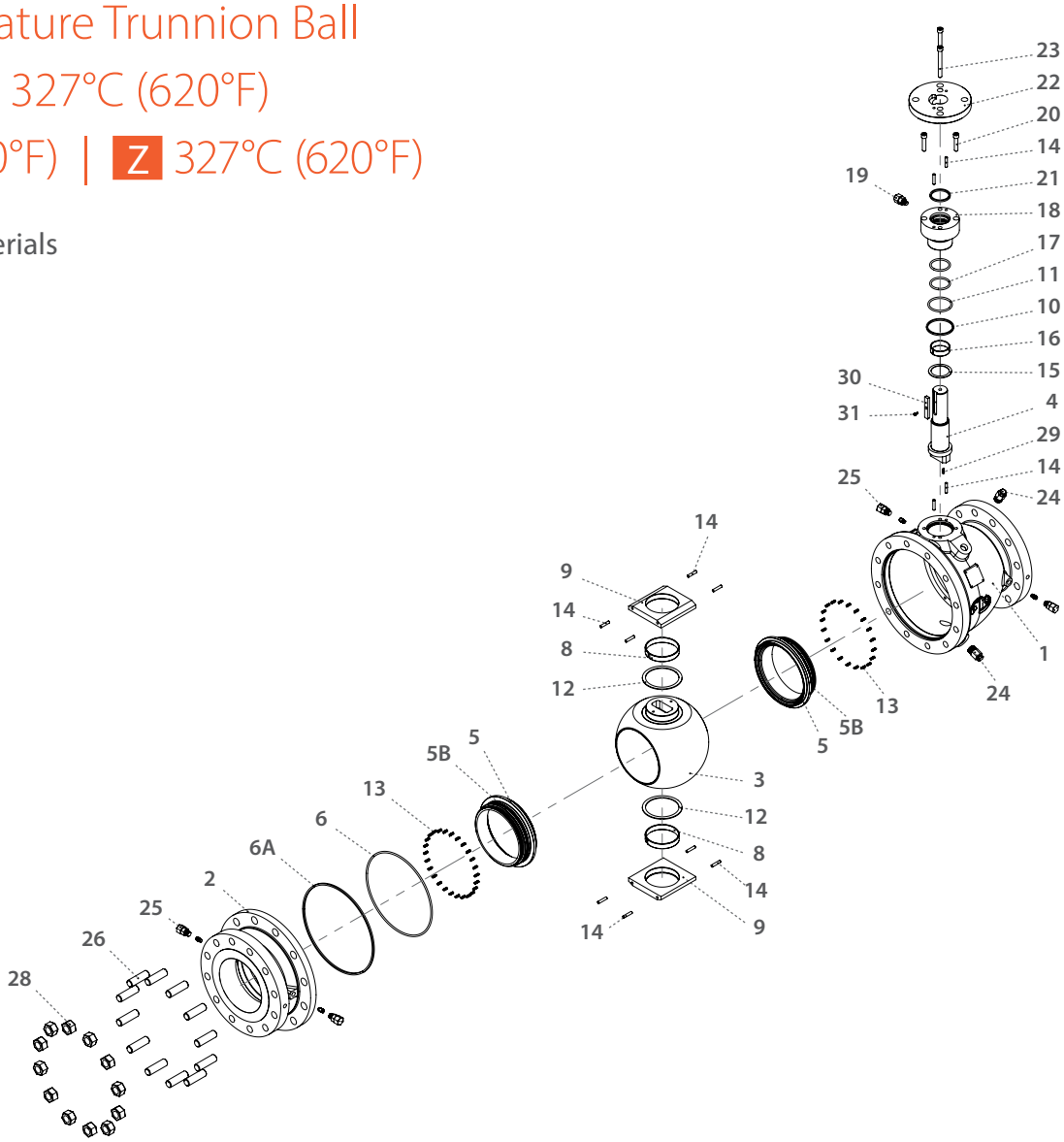
Z81Z Z81W Z82Z Z82W Z83Z Z83W

8"-12" | DN200-DN300 | CLASS 150/300

High Temperature Trunnion Ball
2 Piece Up to 327°C (620°F)

W 200°C (400°F) | **Z** 327°C (620°F)

Components & Materials



Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering code	1
2	Ends	Acc. Ordering code	1
3	Ball	Acc. Ordering code	1
4	Stem	Acc. Ordering code	1
5*	Seat	Acc. Ordering code	2
5B*	Seat Seal	Viton / HNBR	2
6*	Body Inner Seal	Viton / HNBR	2
6A*	Body Outer Seal	Graphite	2
8*	Ball Bearing	S.steel 316 + PTFE	2
9	Trunnion Plate	S.steel / C.steel	2
10*	Gland Plate & External Trunnion Fire Safe Seal	Graphite	1
11*	Gland Plate & External Trunnion Seal	Viton / HNBR	1
12*	Ball Thrust Washer	S.steel 316 + PTFE	2
13	Seat Spring	Inconel X750	52-60
14	Gland Pin	S.steel / C.steel	12
15*	Stem Thrust Washer	S.steel 316 + PTFE	1

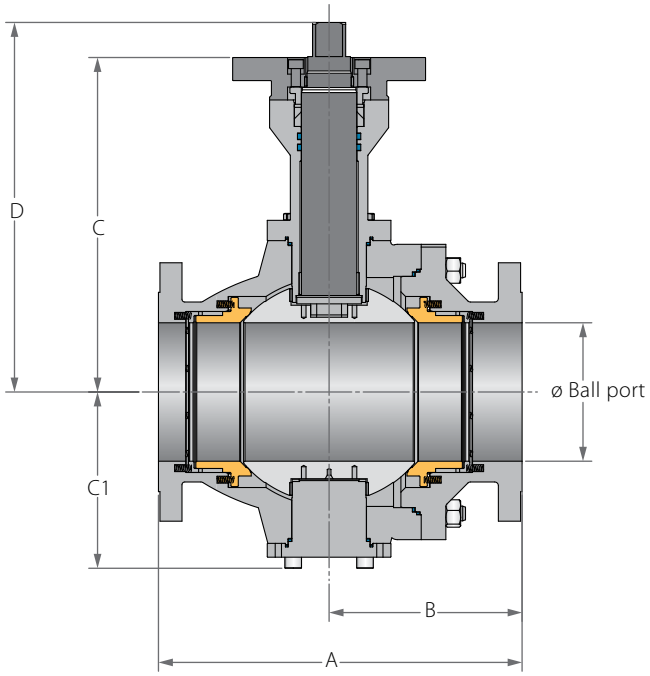
Item	Description	Material Spec. ASTM	Qty.
16*	Stem Bearing	S.steel 316 + PTFE	1
17*	Stem Seal	Viton / HNBR	2
18	Gland Plate	S.steel / C.steel	1
19	Stem Grease Fitting	S.steel	1
20	Lower Gland Bolts	A193-B8M / A320 L7	6
21*	Stem Fire Safe Seal	Graphite	1
22	Iso Plate	S.steel / C.steel	1
23	Upper Gland Bolts	A193-B8M / A320 L7	6
24	Plug Valve	S.steel	2
25	Seat Grease Fitting + Check Valve"	S.steel	4
26	Body Studs	A193-B8M / A320 L7	8-16
28	Body Nuts	A194-8M / A194 L7	8-16
29	Antistatic Spring	Inconel X750	1
30	Stem Key	S.steel / C.steel	1
31	Stem Key Bolt	S.steel / C.steel	1

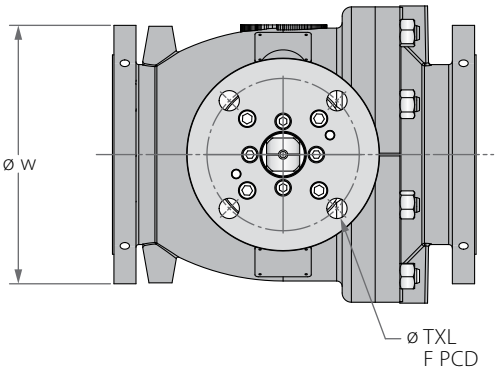
* Maintenance kit components

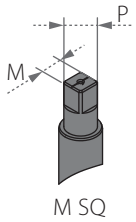
Z81Q Z82Q 2"-6" | DN50-DN150 | CLASS 150/300

High Temperature Trunnion Ball 2 Piece Up to 538°C (1000°F)

Valve Dimensions



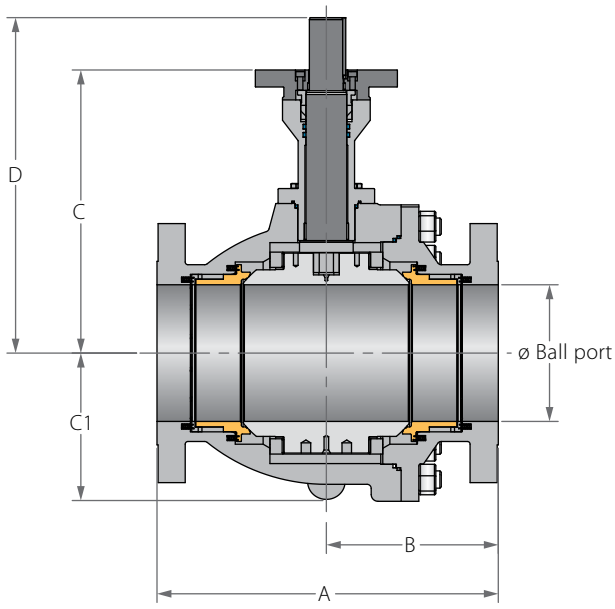


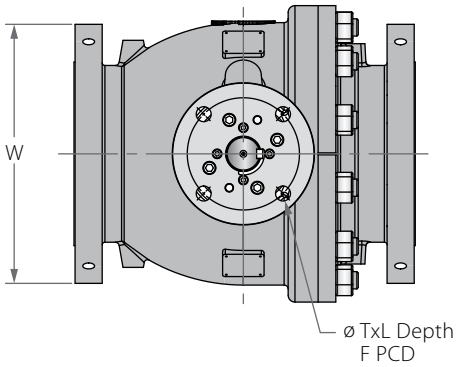


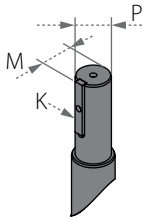
Full port	Unit	Ball port	A		B		C	C1	D	W		M SQ	P SQ	F		TxL	Weight kg/ib		Kv/Cv	
			150	300	150	300				150	300						150	300	150	300
DN50	mm	49.0	178.0	216.0	89.0	113.50	250.0	94.0	269.0	150.0	165.0	16.90	21.30	F10	102.0	M10X15 (4 holes)	22	25	400	363
2"	inch	1.93	7.01	8.50	3.50	4.47	9.84	3.70	10.59	5.91	6.50	0.67	0.84		4.02		49	55	463	420
DN80	mm	74.0	203.0	283.0	101.50	154.0	277.0	117.0	301.0	190.0	210.0	21.90	26.90	F12	125.0	M12X15 (4 holes)	40	51	1125	952
3"	inch	2.91	7.99	11.14	4.0	6.06	10.91	4.61	11.85	7.48	8.27	0.86	1.06		4.92		88	112	1300	1100
DN100	mm	100.0	229.0	305.0	114.50	164.50	293.0	139.0	322.0	230.0	255.0	26.90	34.90	F14	140.0	M16X15 (4 holes)	61	73	2154	1860
4"	inch	3.94	9.02	12.0	4.51	6.48	11.54	5.47	12.68	9.06	10.04	1.06	1.37		5.51		134	161	2490	2150
DN150	mm	150.0	394.0	403.0	209.10	207.60	362.0	191.0	400.0	280.0	320.0	35.90	46.20	F16	165.0	M22X25 (4 holes)	133	145	4723	4628
6"	inch	5.91	15.51	15.87	8.23	8.17	14.25	7.52	15.75	11.02	12.60	1.41	1.82		6.50		293	320	5460	5350

High Temperature Trunnion Ball 2 Piece Up to 538°C (1000°F)

Valve Dimensions





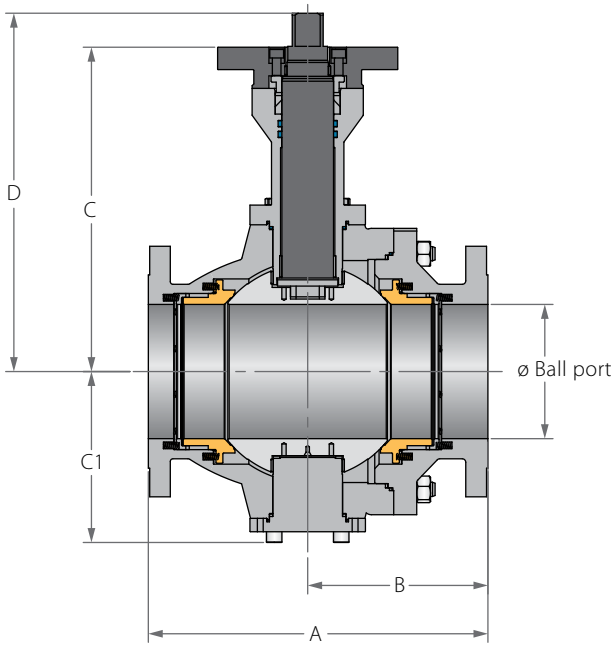


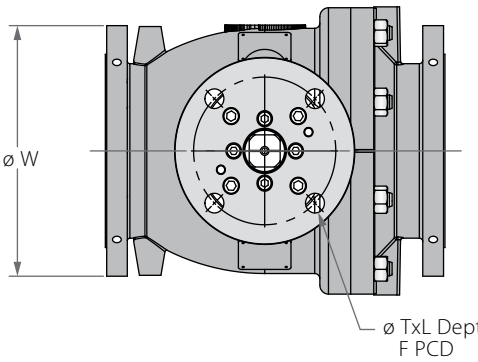
Full port	Unit	Ball port	A		B		C	C1	D	W		P	M	K	F		TxL	Weight kg/ib		Kv/Cv	
			150	300	150	300				150	300							150	300	150	300
DN200	mm	201.0	457.0	502.0	228.50	253.0	416.0	215.0	493.0	345.0	380.0	50.0	54.0	14.0	F16	165.0	22x25 (4 holes)	250	288	9273	8737
8"	inch	7.91	17.99	19.76	9.0	9.96	16.38	8.46	19.41	13.58	14.96	1.97	2.13	0.55		6.50		551	635	10720	10100
DN250	mm	252.0	533.0	568.0	270.0	287.50	504.0	260.0	581.0	405.0	445.0	50.0	54.0	14.0	F25	254.0	18x25 (8 holes)	405	475	15224	14792
10"	inch	9.92	20.98	22.36	10.63	11.32	19.84	10.24	22.87	15.94	17.52	1.97	2.13	0.55		10.0		893	1047	17600	17100
DN300	mm	303.0	610.0	648.0	298.0	313.0	590.0	300.0	671.0	485.0	520.0	60.0	63.50	18.0	F25	254.0	18x25 (8 holes)	595	672	23096	22404
12"	inch	11.93	24.02	25.51	11.73	12.32	23.23	11.81	26.42	19.09	20.47	2.36	2.50	0.71		10.0		1312	1481	26700	25900

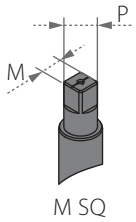
Z83Q 2"-6" | DN50-DN150 | CLASS 600

High Temperature Trunnion Ball 2 Piece Up to 538°C (1000°F)

Valve Dimensions



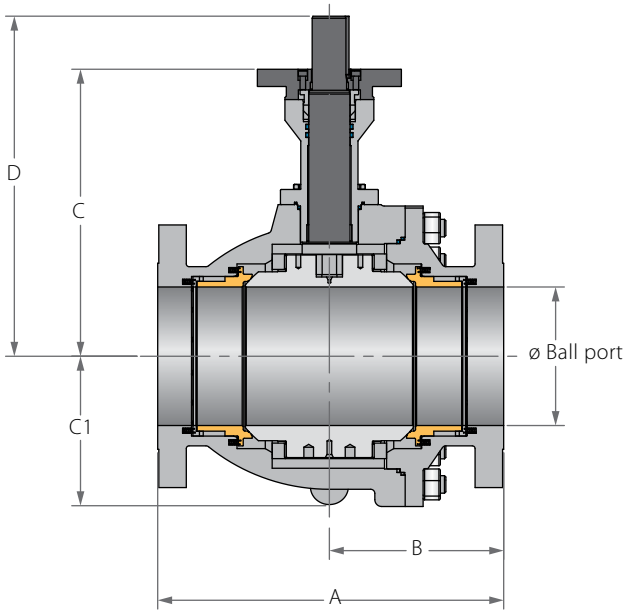


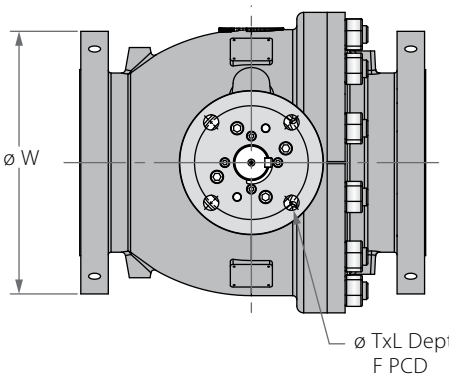


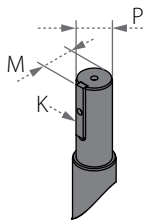
Full port	Unit	Ball port	A	B	C	C1	D	W	M SQ	P SQ	F		TxL	Weight kg/ib	Kv/Cv
DN50	mm	49.0	292.0	131.0	272.0	119.0	291.0	165.0	16.90	21.30	F12	125.0	M12X15 (4 holes)	41	329
2"	inch	1.93	11.50	5.16	10.71	4.69	11.46	6.50	0.67	0.84		4.92		90	380
DN80	mm	74.0	356.0	161.0	306.0	160.0	330.0	210.0	21.90	26.90	F12	125.0	M12X15 (4 holes)	76	874
3"	inch	2.91	14.02	6.34	12.05	6.30	12.99	8.27	0.86	1.06		4.92		168	1010
DN100	mm	100.0	432.0	216.0	334.0	184.0	364.0	275.0	26.90	34.90	F16	165.0	M22X25 (4 holes)	132	1557
4"	inch	3.94	17.01	8.50	13.15	7.24	14.33	10.83	1.06	1.37		6.50		291	1800
DN150	mm	150.0	559.0	278.0	386.0	220.0	424.0	355.0	35.90	46.20	F16	165.0	M22X25 (4 holes)	340	3893
6"	inch	5.91	22.01	10.94	15.20	8.66	16.69	13.98	1.41	1.82		6.50		750	4500

High Temperature Trunnion Ball 2 Piece Up to 538°C (1000°F)

Valve Dimensions





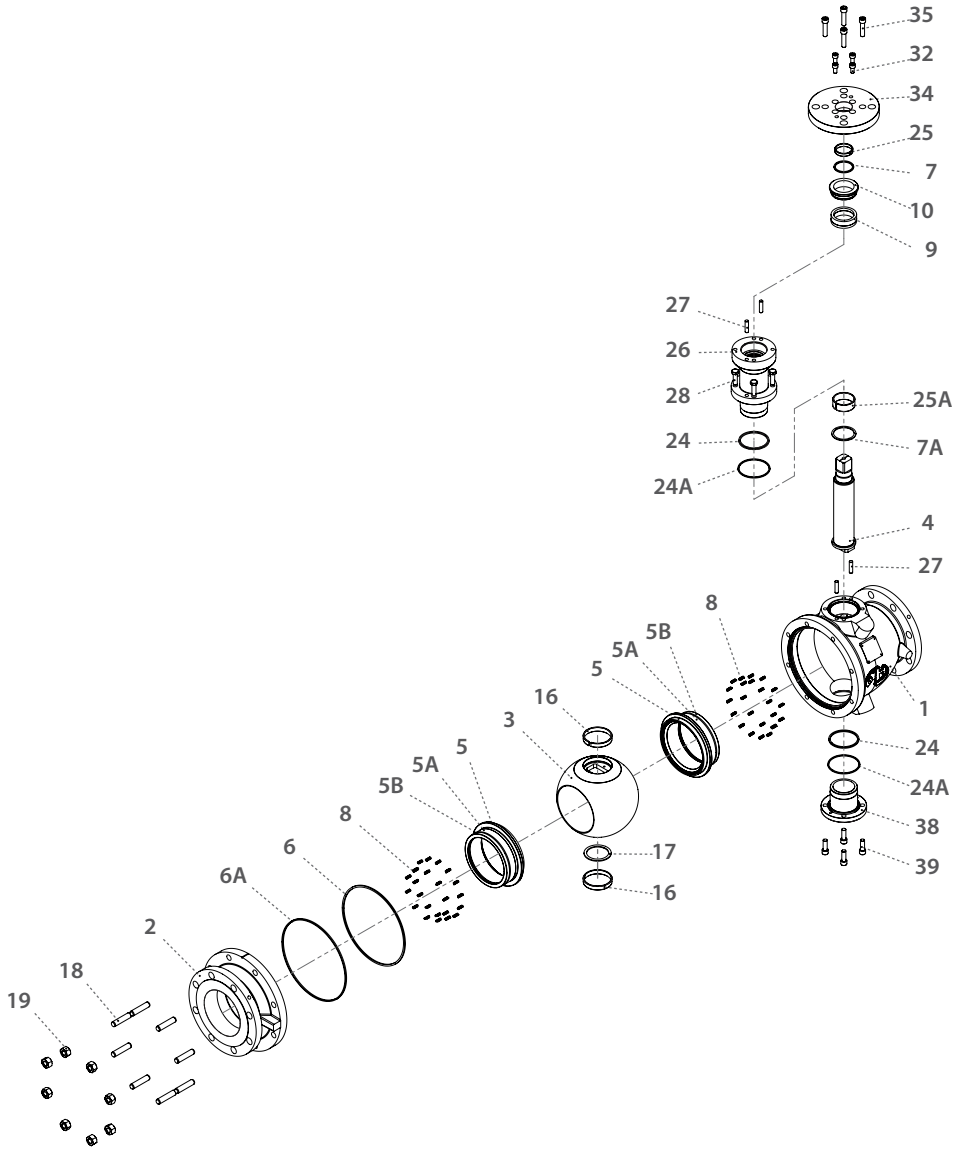


Full port	Unit	Ball port	A	B	C	C1	D	W	P	M	K	F		TxL	Weight kg/ib	Kv/Cv
DN200	mm	201.0	660.0	330.0	418.0	263.0	515.0	420.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	460	7742
8"	inch	7.91	25.98	12.99	16.46	10.35	20.28	16.54	2.83	3.01	0.79		10.0		1014	8950
DN250	mm	252.0	787.0	400.0	519.0	310.0	616.0	510.0	72.0	76.50	20.0	F30	298.0	22x30 (8 holes)	704	12543
10"	inch	9.92	30.98	15.75	20.43	12.20	24.25	20.08	2.83	3.01	0.79		11.73		1552	14500
DN300	mm	303.0	838.0	419.0	598.0	344.0	695.0	560.0	72.0	76.50	20.0	F30	298.0	22x30 (8 holes)	890	19809
12"	inch	11.93	32.99	16.50	23.54	13.54	27.36	22.05	2.83	3.01	0.79		11.73		1962	22900

Z81Q Z82Q 2"-6" | DN50-DN150 | CLASS 150/300

High Temperature Trunnion Ball 2 Piece Up to 538°C (1000°F)

Components & Materials



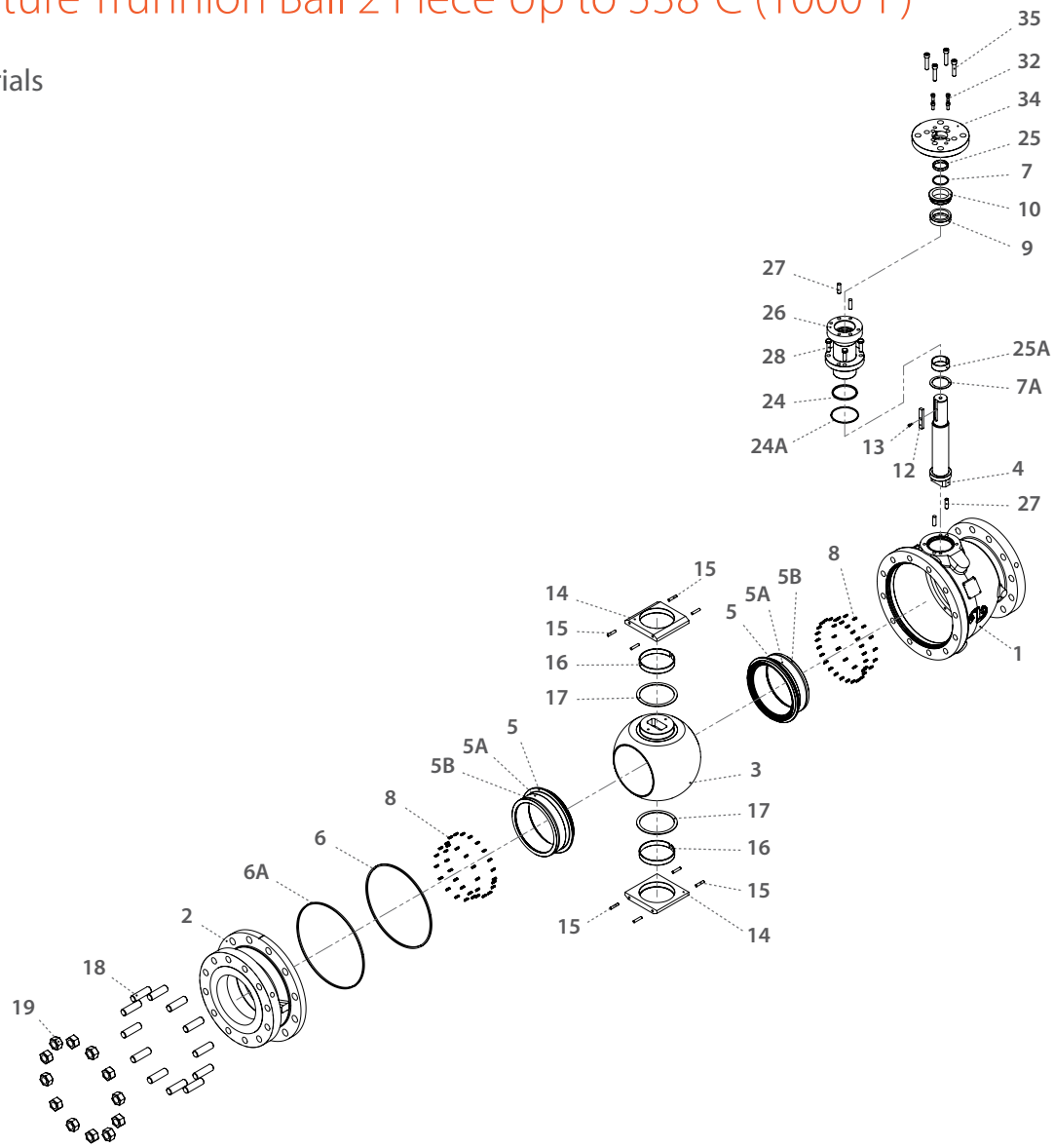
Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A*	Seat Seal	Graphite	2
5B*	Seat Ring	Acc. Ordering Code	2
6*	Body Inner Seal	Graphite	1
6A*	00-91-60-239	Graphite	1
7	Upper Thrust Seal	S.steel 316 / Inconel 625	1
7A	Lower Thrust Seal	S.steel 316 / Inconel 625	1
8	Seat Spring	Inconel X750	16-48
9*	Stem Seal	Graphite	1
10	Follower	S.steel	1
16	Ball Bearing	Inconel 625	2
17	Ball Thrust Seal	Inconel 625	1

Item	Description	Material Spec. ASTM	Qty.
18	Body Stud	A193-B8M / A320 L7	4-12
19	Body Nuts	A194 8M / A194 L7	4-12
24*	Bonnet Inner Seal	Graphite	2
24A*	48G-20-139	Graphite	2
25	Upper Stem Bearing	Inconel 625	1
25A	Lower Stem Bearing	Inconel 625	1
26	Bonnet	S. steel / C. steel	1
27	Bonnet Pin	S. steel / C. steel	4
28	Bonnet Bolts	A193-B8M / A320 L7	4-8
32	Follower Drive Bolts	A193-B8M / A320 L7	4-8
34	Iso Plate	S. steel / C. steel	1
35	Iso Plate Bolts	A193-B8M / A320 L7	4-8
38	External Trunnion	S. steel / C. steel	1
39	External Trunnion Bolts	A193-B8M / A320 L7	4-8

* Maintenance kit components

High Temperature Trunnion Ball 2 Piece Up to 538°C (1000°F)

Components & Materials



Item	Description	Material Spec. ASTM	Qty.
1	Body	Acc. Ordering code	1
2	End	Acc. Ordering code	1
3	Ball	Acc. Ordering code	1
4	Stem	Acc. Ordering code	1
5*	Seat	Acc. Ordering code	2
5A*	Seat Seal	Graphite	2
5B*	Seat Ring	Acc. Ordering code	2
6*	Body Inner Seal	Graphite	1
6A*	Body Outer Seal	Graphite	1
7	Upper Thrust Seal	S.steel / Inconel 625	1
7A	Lower Thrust Seal	S.steel / Inconel 625	1
8	Seat Spring	Inconel X750	68-76
9*	Stem Seal	Graphite	1
10	Follower	S.steel	1
12	Stem Key	S.steel / C.steel	1
13	Stem Key Bolt	S.steel / C.steel	1
14	Trunnion Plate	S.steel / C.steel	2

Item	Description	Material Spec. ASTM	Qty.
15	Trunnion Plate Pin	S.steel / C.steel	8
16	Ball Bearing	Inconel 625	2
17	Ball Thrust Washer	Inconel 625	2
18	Body Stud	A193-B8M / A320 L7	8-20
19	Body Nuts	A194 8M / A194 L7	8-20
24*	Bonnet Inner Seal	Graphite	1
24A*	Bonnet Outer Seal	Graphite	1
25	Upper Stem Bearing	Inconel 625	1
25A	Lower Stem Bearing	Inconel 625	1
26	Bonnet	S.steel / C.steel	1
27	Bonnet Pin	S.steel / C.steel	4
28	Bonnet Bolts	A193-B8M / A320 L7	4-8
32	Follower Drive Bolts	A193-B8M / A320 L7	4-8
34	Iso Plate	S.steel / C.steel	1
35	Iso Plate Bolts	A193-B8M / A320 L7	4-8

* Maintenance Seals kit components

Z81 Z82 Z83

High Temperature Trunnion Ball 2 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
4	0			Z	B	8	1	P	-	6	M	6	D	I	V	G	/	1	5	0						
Size		Features				Series		Design		Body & ends material	Stem material	Ball/Seat material	Seat feature	Hardening	Inner Seal	Outer Seal		End Connection				Special features				

Size (1-2)		
Code	inch	mm
20	2"	50
30	3"	80
40	4"	100
60	6"	150
80	8"	200
A0	10"	250
A2	12"	300

Features (3-6)	
Z	Metal seats
B	Full port

Series - 2 Piece Cast (7-8)	
81	ASME B16.5 #150 Flanged RF
82	ASME B16.5 #300 Flanged RF
83	ASME B16.5 #600 Flanged RF

Design (9)	
W	-46°C to 200°C (-50°F to 400°F)
Z	-46°C to 327°C (-50°F to 620°F)
Q	-60°C to 538°C (-76°F to 1000°F)

Body & ends material (11)	
4*	C. Steel A216 WCB
6	S. Steel A351 CF8M

* Up to 425°C (800°F)

Stem (12)	
M	High Strength S. Steel
Z	Inconel 718

Ball / Seat material (13)	
6	S. Steel A182 316
N*	ASTM A182 F6A (S.Steel 410)

* For O hardening only

Seat feature (14)	
D	Double Piston Effect (DPE) (API 6D DIB-1)
S	Single Piston Effect (SPE) (API 6D DBB)
C	DPE & SPE combination (API 6D DIB-2)

Hardening (15)	
I	Cr3C2- Chromium Carbide with Nickel Chrome binder - HVOF technique
O*	WC-Co- Tungsten Carbide with Cobalt binder HVO technique

* Only with N ball material

Inner Seal (16)	
V	Viton (-20°C to 200°C [-4°F to 400°F])
H	HNBR (-46°C to 150°C [-50°F to 300°F])
K	Kalrez (-20°C to 327°C [-4°F to 620°F])
G	Graphite

Outer Seal (17)	
G	Graphite

End connections (19-22)	
Flanged	
150	ASME B16.5 #150
300	ASME B16.5 #300
600	ASME B16.5 #600

Special features (23-30)	
L*	Seat greasing point
D**	Drain & Vent
Blank	Drain & vent is capped
H**	Drain ball valve & vent
PT***	Basic paint system
PT1	Offshore, Temp Ambient up to 93°C (200°F)
PT2	Offshore, up to 537°C (998°F)

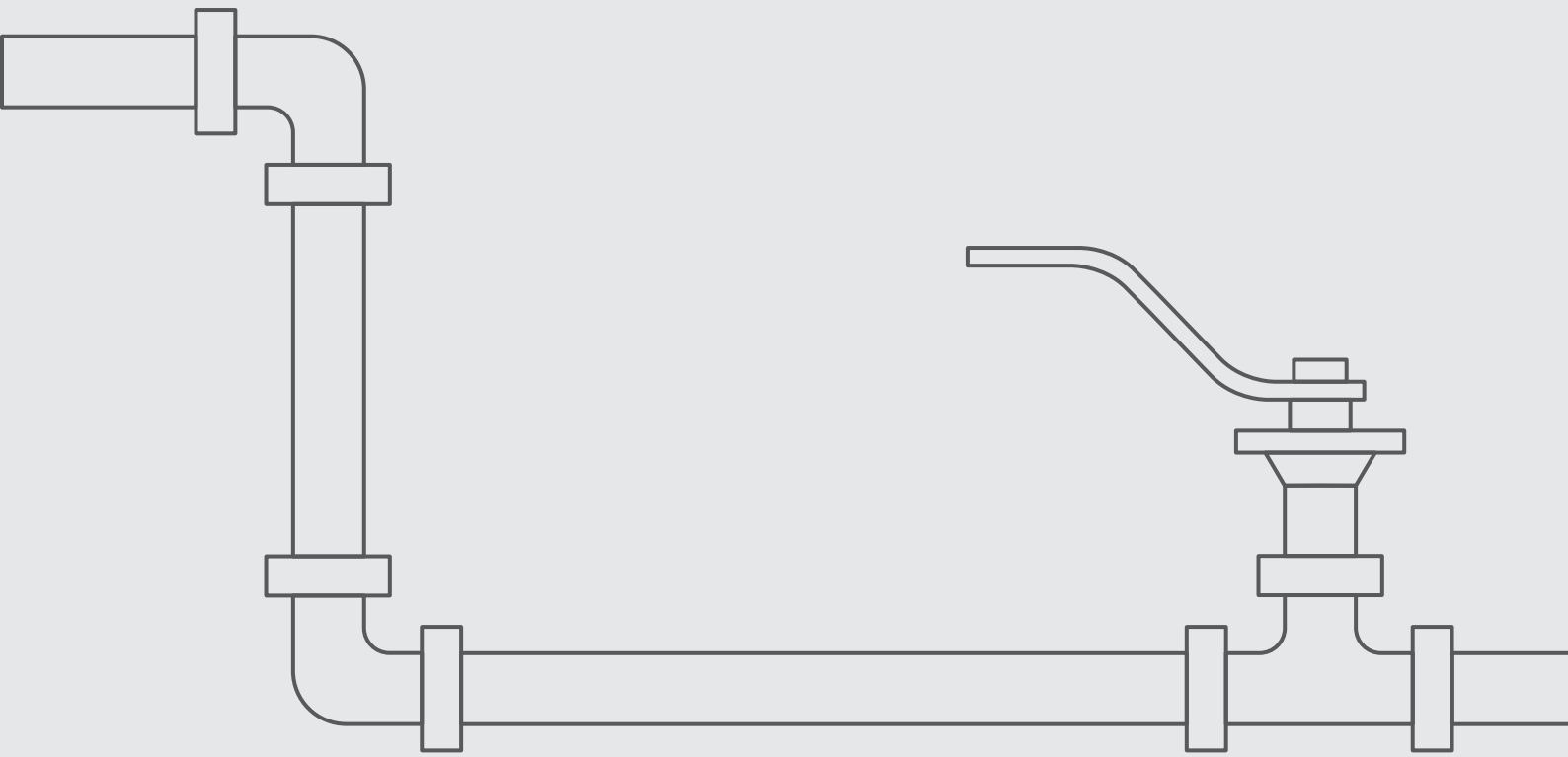
* for 6" and up, not for Q-design
** not for Q-design
*** colors RAL 1018 or 7036 (other colors upon request)

Z47

High Temp. Valves

FLOATING BALL

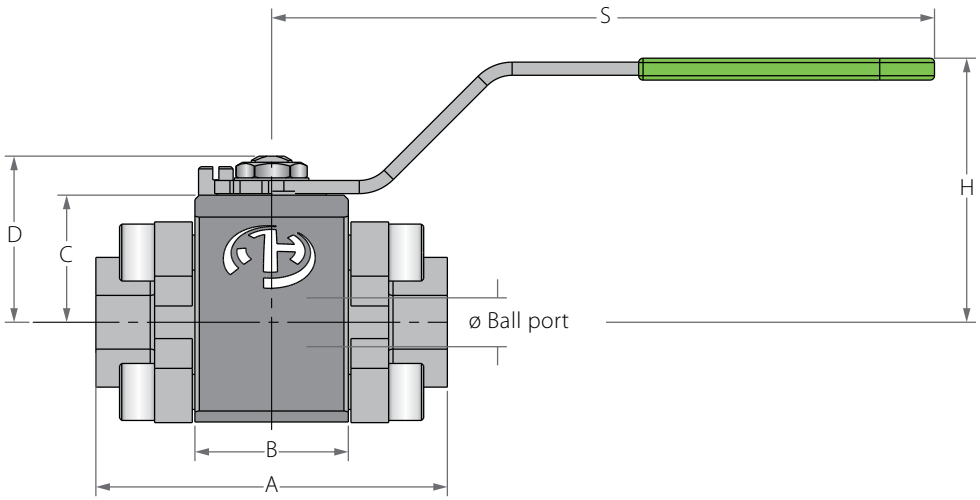
3 PIECE

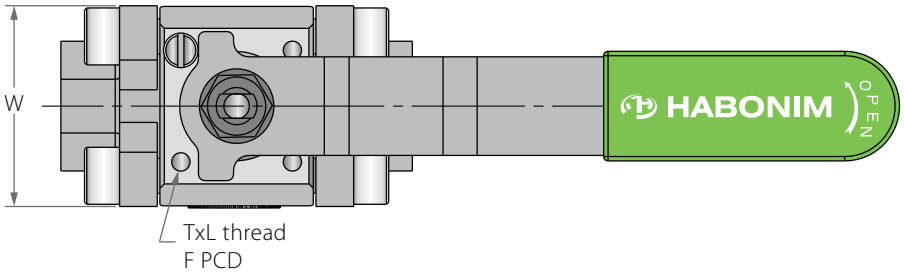


Z47W Z47Z ½"-1¼" | DN15-DN32 | CLASS 600

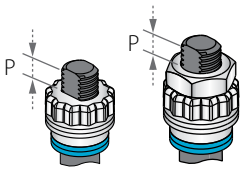
Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

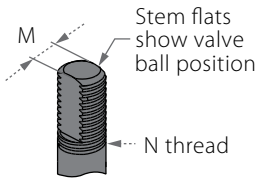
Valve Dimensions





Preparation for actuation





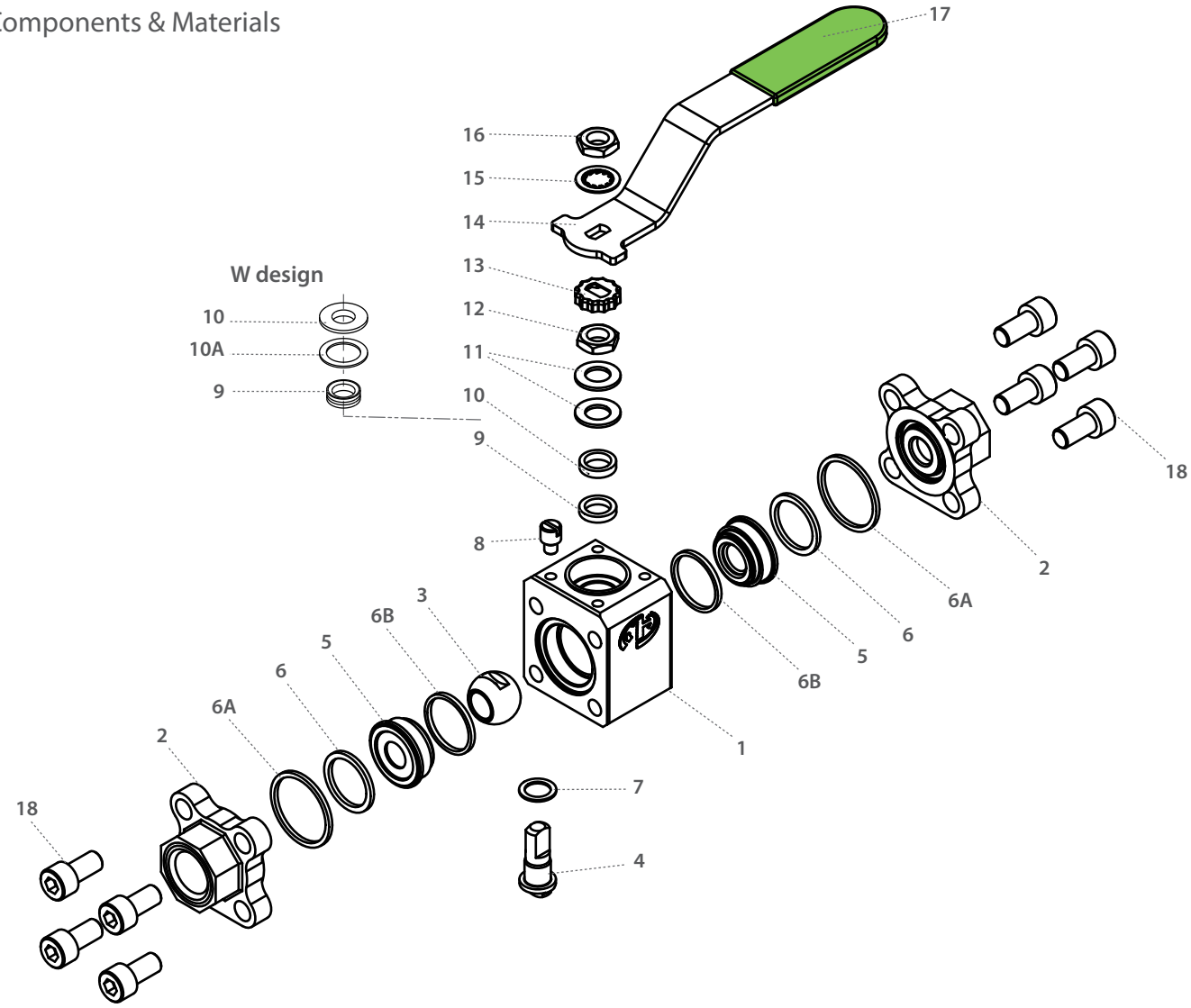
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN15	DN8, DN10	mm	11.15	80.2	35.0	29.0	37.9	63.0	150.0	45.5	5.5	⅜" UNF	6.65	F03	36.0	M5x6	1.0	7
½"	¼", ⅜"	inch	0.44	3.16	1.38	1.14	1.49	2.48	5.91	1.79	0.22		0.26		1.42		2.26	8
DN20	DN15	mm	13.0	86.0	40.0	33.5	51.0	76.5	187.0	52.0	7.5	7⁄16" UNF	6.65	F04	36.0	M5x8	1.5	10
¾"	½"	inch	0.51	3.39	1.57	1.32	2.01	3.01	7.36	2.05	0.30		0.26		1.42		3.27	12
DN25	DN20	mm	20.6	111.0	49.0	36.5	66.0	90.0	237.0	60.5	8.7	9⁄16" UNF	6.65	F05	50.0	M5x8	2.5	28
1"	¾"	inch	0.81	4.37	1.93	1.44	2.60	3.54	9.33	2.38	0.34		0.26		1.97		5.52	32
DN32	DN25	mm	25.4	116.0	49.0	38.0	67.5	92.5	237.0	69.0	8.7	9⁄16" UNF	6.65	F05	50.0	M5x9	3.0	49
1¼"	1"	inch	1.0	4.57	1.93	1.50	2.66	3.64	9.33	2.72	0.34		0.26		1.97		6.69	57

Z47W Z47Z ½"-1¼" | DN15-DN32 | CLASS 600

Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	2
6*	Inner Body Seal	Graphite	2
6A*	Outer Body Seal	Graphite	2
6B*	Outer Body Seal	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	1
7A*	Anti Abrasion Ring	PEEK	1
8	Stop Pin	S. Steel	2
9*	Stem Seal	Graphite ,CF PTFE	1
10	Follower	S. Steel	1

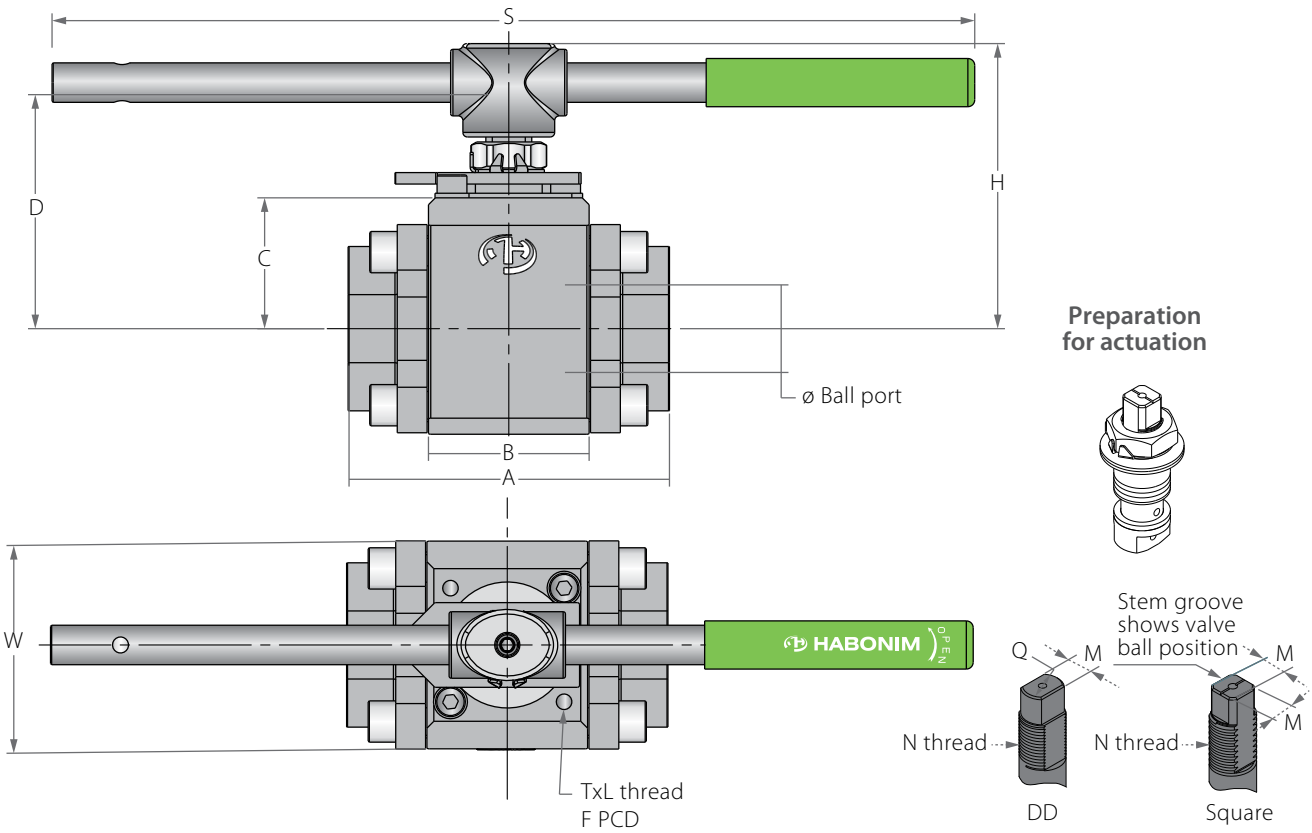
Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	12-16
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Seals kit components
** Ball and seats kit components

Z47W Z47Z 1½"-2½" | DN40-DN65 | CLASS 600

Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

Valve Dimensions



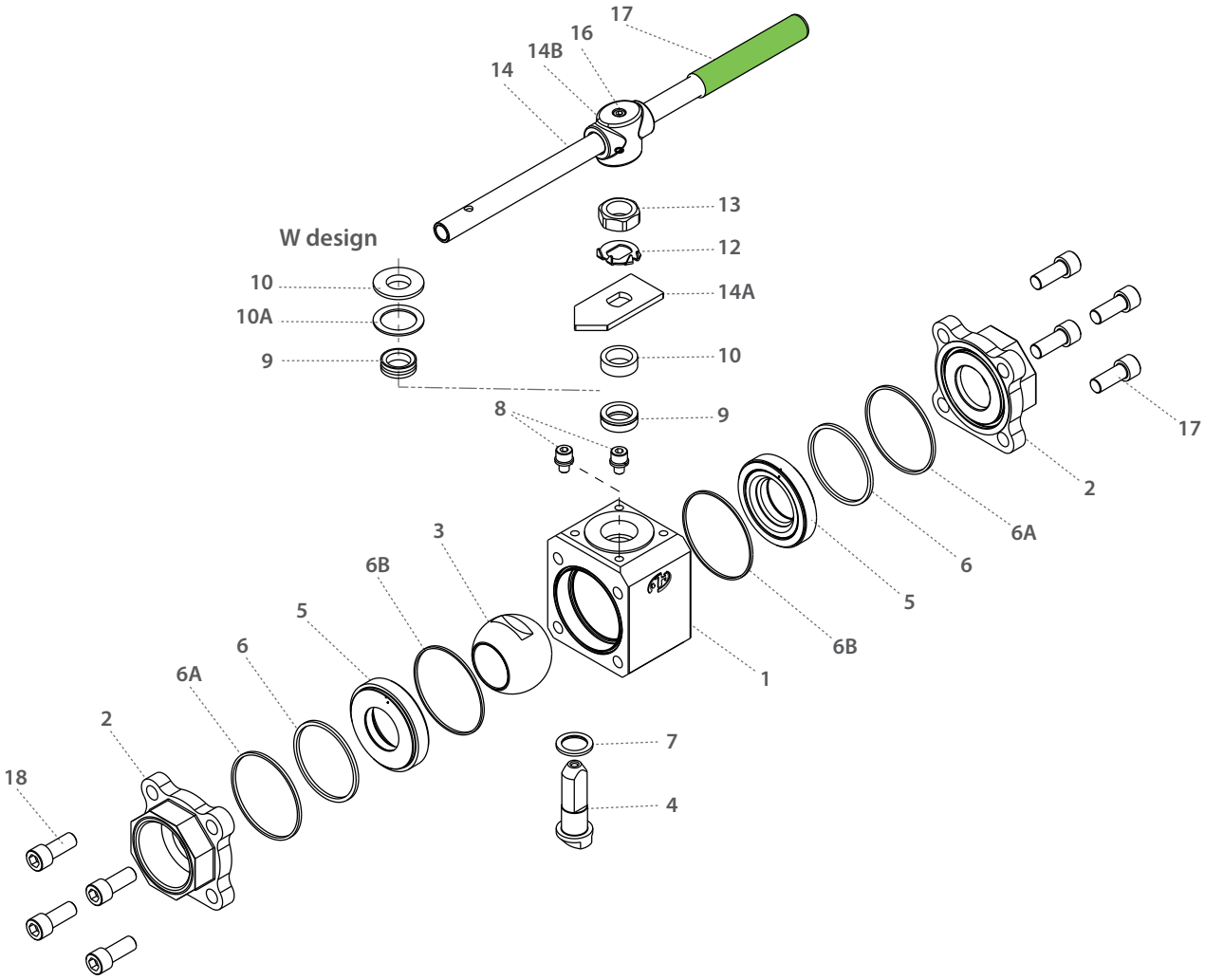
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN40	DN32	mm	31.8	137.0	70.0	53.0	94.6	120.0	400.0	79.0	13.9	M20x2.5	6.65	F07	70.0	M8X12	5.5	69
1½"	1¼"	inch	1.25	5.39	2.76	2.09	3.72	4.72	15.75	3.11	0.55		0.26		2.76		12.19	80
DN50	DN40	mm	38.1	140.0	70.0	57.0	98.6	124.0	400.0	90.5	13.9	M20x2.5	14.6	F07	70.0	M8X12	6.7	102
2"	1½"	inch	1.50	5.51	2.76	2.24	3.88	4.88	15.75	3.56	0.55		0.57		2.76		14.83	118
DN65	DN50	mm	50.8	179.4	94.0	71.7	118.2	158.5	610.0	108.0	18.9	1"-14 UNS-2A	16.7	F10	102.0	M10X16	13.5	208
2½"	2"	inch	2.0	7.06	3.70	2.82	4.65	6.24	24.02	4.25	0.74		0.66		4.02		29.65	241

Z47W Z47Z 1½"-2½" | DN40-DN65 | CLASS 600

Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	2
6*	Inner Body Seal	Graphite	2
6A*	Outer Body Seal	Graphite	2
6B*	Seat Seal	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	1
7A*	Anti Abrasion Ring	PEEK	1
8	Stop Pin	S. Steel	2
9*	Stem Seal	Graphite, CF PTFE	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
12	Stem Nut	S. Steel	1

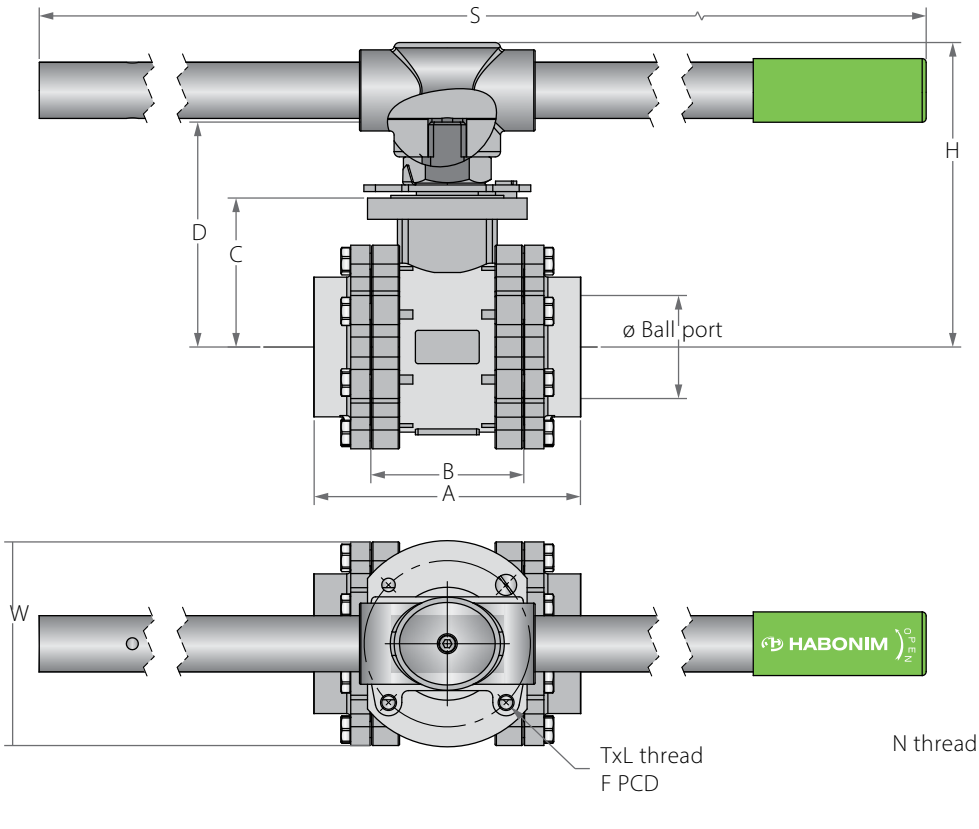
Item	Description	Material specification	Qty.
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	8
23	Tag (not shown)	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	20-32
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Seals kit components
** Ball and seats kit components

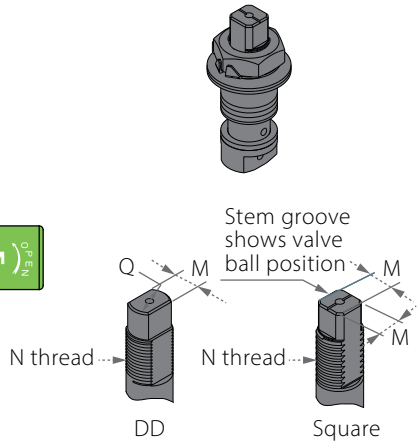
Z47W Z47Z 3"-6" | DN80-DN150 | CLASS 600

Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

Valve Dimensions



Preparation for actuation



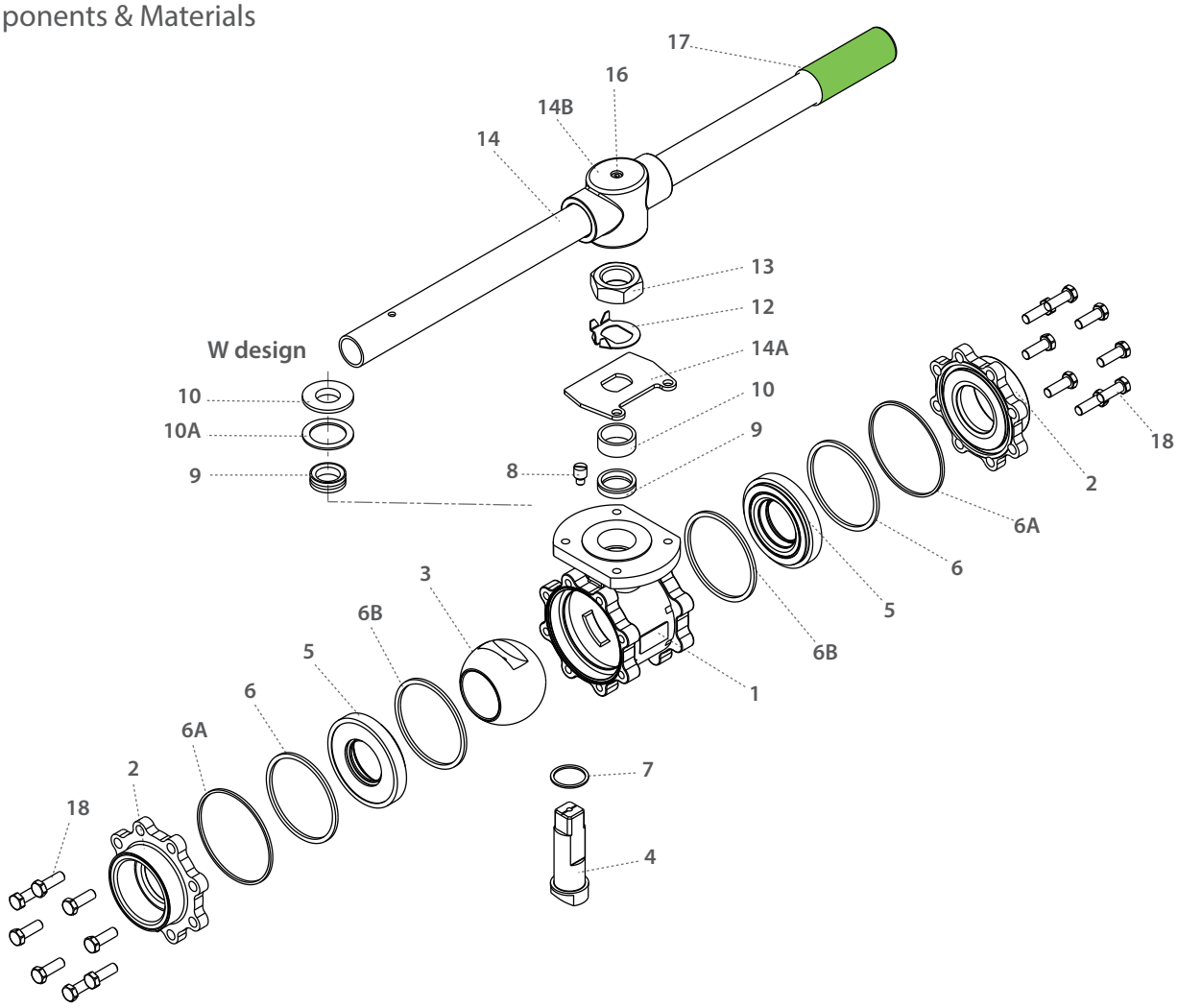
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN80	DN65	mm	63.5	200.8	115.0	98.0	167.5	227.0	916.0	140.0	28.45	1"-14 UNS-2A	26.2	F12	125.0	M12X15	25.0	301
3"	2½"	inch	2.50	7.91	4.53	3.86	6.59	8.94	36.06	5.51	1.12		1.03		4.92		55.00	348
DN100	DN80	mm	82.7	234.8	130.0	136.0	205.5	265.0	916.0	177.0	28.45	1"-14 UNS-2A	26.2	F14	140.0	M16X20	38.0	616
4"	3"	inch	3.26	9.24	5.12	5.35	8.09	10.43	36.06	6.97	1.12		1.03		5.51		83.60	713
DN150	DN100	mm	100.0	375.0	175.0	157.0	269.6	-	-	217.0	35.9	2" UN-2A	40.0	F16	165.0	M20X24	60.0	746
6"	4"	inch	3.94	14.76	6.89	6.18	10.61	-	-	8.54	1.41		1.57		6.50		132.00	863

Z47W Z47Z 3"-6" | DN80-DN150 | CLASS 600

Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	2
6*	Inner Body Seal	Graphite	2
6A*	Outer Body Seal	Graphite	2
6B*	Seat Seal	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	1
7A*	Anti Abrasion Ring	PEEK	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	Graphite, CF PTFEM	1
10	Follower	S. Steel	1

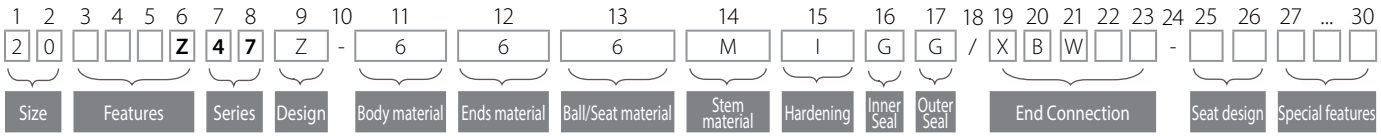
Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16-24
23	Tag (not shown)	S. Steel	1

* Seals kit components
** Ball and seats kit components

Z47

High Temperature - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background



Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
Z	Metal seats
B	Full port
N	Control service

Series (7-8)	
Z47	Floating ball 3 piece

Design (9)	
Z	-60°C to 450°C (-76°F to 842°F)
W	-60°C to 260°C (-76°F to 500°F) HermetiX stem seal

Body material (11)	
6	CF8M (316H)
4*	A216 C.st WCB/ A105
F*	LF2

* Up to 425°C (800°F)

Ends material (12)	
6	CF3M / CF8M
F*	LF2
4*	A216 C.st WCB/ A105

* Up to 425°C (800°F)

Ball / Seat material (13) Sizes up to ¾" std. port	
M*	High Strength S. Steel

* ball - XM19, seat - 316

Ball / Seat material (13) Sizes ¾" full bore and up	
6	316
N*	St. Steel 410

* For O hardening only

Stem material (14)	
M	High Strength S. Steel
Z	Inconel 718

Hardening (15)	
I	Cr3C2- Chromium Carbide with Nickel Chrome binder- HVOF technique
O*	WC-Co- Tungsten Carbide with Coblat binder- HVOF technique

* Only with N ball material

Inner Seal (16)	
G	Expanded graphite
B*	NBR
V**	Viton

* Up to 80°C (175°F)
** Up to 120°C (250°F)

Outer Seal (17)	
G	Expanded graphite

End connections (19-23)	
Welded	
XBW	Extended buttweld schd. 40
XSW	Extended socket weld
Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF

Seat design (25-26)	
Blank	(New type)

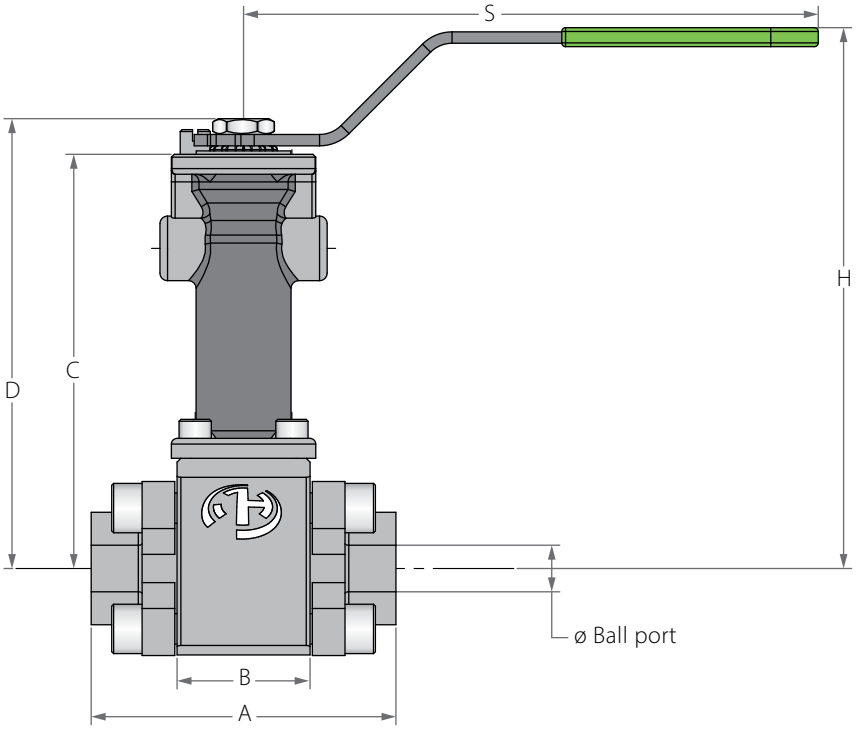
Special Features (27-30)	
B	Body made from rolled bar
Vxx	Characterized control ball xx = angle

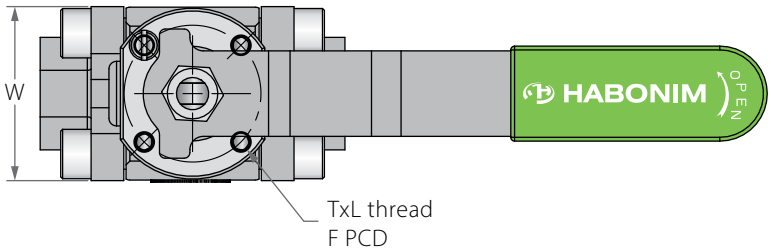


Z47Q ½"-1¼" | DN15-DN32 | CLASS 600

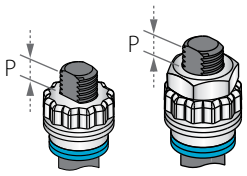
Floating Ball 3 Piece Up to Q 650°C (1200°F)

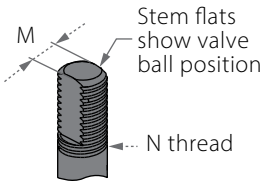
Valve Dimensions





Preparation for actuation



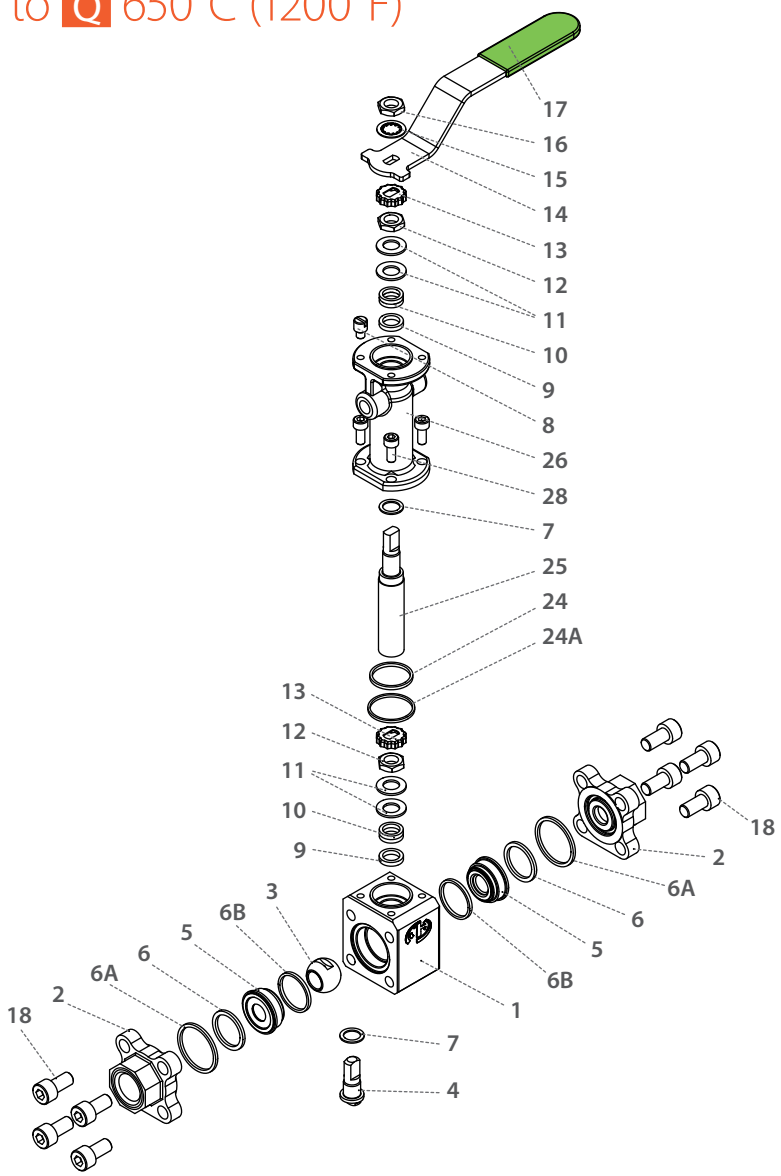


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN15	DN8, DN10	mm	11.15	80.2	35.0	129.0	137.9	163.0	150.0	45.5	5.5	⅜" UNF	6.65	F03	36.0	M5X6	2.5	7
½"	¼", ⅜"	inch	0.44	3.16	1.38	5.08	5.43	6.42	5.91	1.79	0.22		0.26		1.42		5.51	8
DN20	DN15	mm	13.0	86.0	40.0	133.5	151.0	176.5	187.0	52.0	7.5	7⁄16" UNF	6.65	F04	42.0	M5X8	2.5	10
¾"	½"	inch	0.51	3.39	1.57	5.26	5.94	6.95	7.36	2.05	0.30		0.26		1.65		5.51	12
DN25	DN20	mm	20.6	111.0	49.0	136.5	166.0	190.0	237.0	60.5	8.7	9⁄16" UNF	6.65	F05	50.0	M6X8	4.5	28
1"	¾"	inch	0.81	4.37	1.93	5.37	6.54	7.48	9.33	2.38	0.34		0.26		1.97		9.92	32
DN32	DN25	mm	25.4	116.0	49.0	138.0	167.5	192.5	237.0	69.0	8.7	9⁄16" UNF	6.65	F05	50.0	M6X9	5.0	49
1¼"	1"	inch	1.0	4.57	1.93	5.43	6.59	7.58	9.33	2.72	0.34		0.26		1.97		11.09	57

Floating Ball 3 Piece Up to Q 650°C (1200°F)

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	2
6*	Inner Body Seal	Graphite	2
6A*	Outer Body Seal	Graphite	2
6B*	Seat Seal	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	2
7A*	Anti Abrasion Ring	PEEK	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	Graphite, CF PTFE	2
10	Follower	S. Steel	2
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	4
12	Stem Nut	S. Steel	2

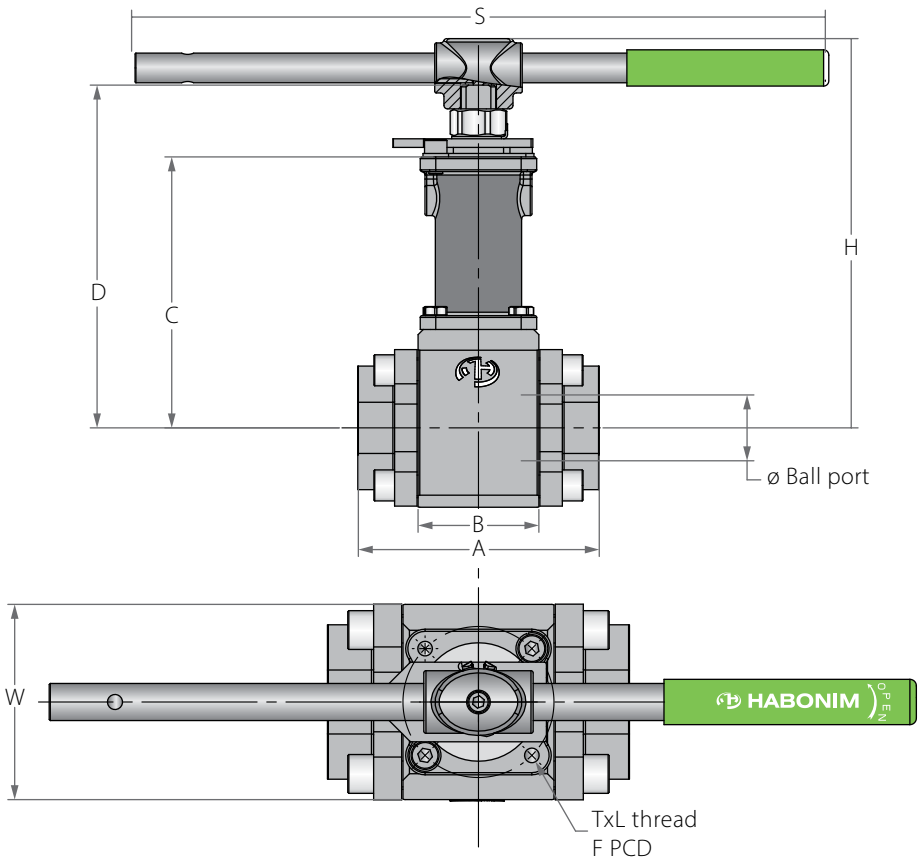
Item	Description	Material specification	Qty.
13	Locking Clip	S. Steel	2
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	8
23	Tag (not shown)	S. Steel	1
24*	Inner Bonnet Seal	Graphite	1
24A*	Outer Bonnet Seal	Graphite	1
25	Bonnet Stem High Temp	S. Steel	1
26	Bonnet High Temp	S. Steel	1
28	Bonnet Bolts	S. Steel	4

* Seals kit components
** Ball and seats kit components

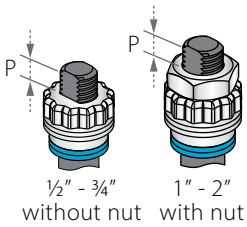
Z47Q 1½"-2½" | DN40-DN65 | CLASS 600

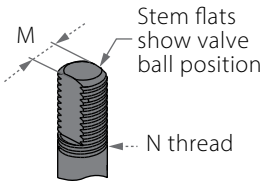
Floating Ball 3 Piece Up to Q 650°C (1200°F)

Valve Dimensions



Preparation for actuation



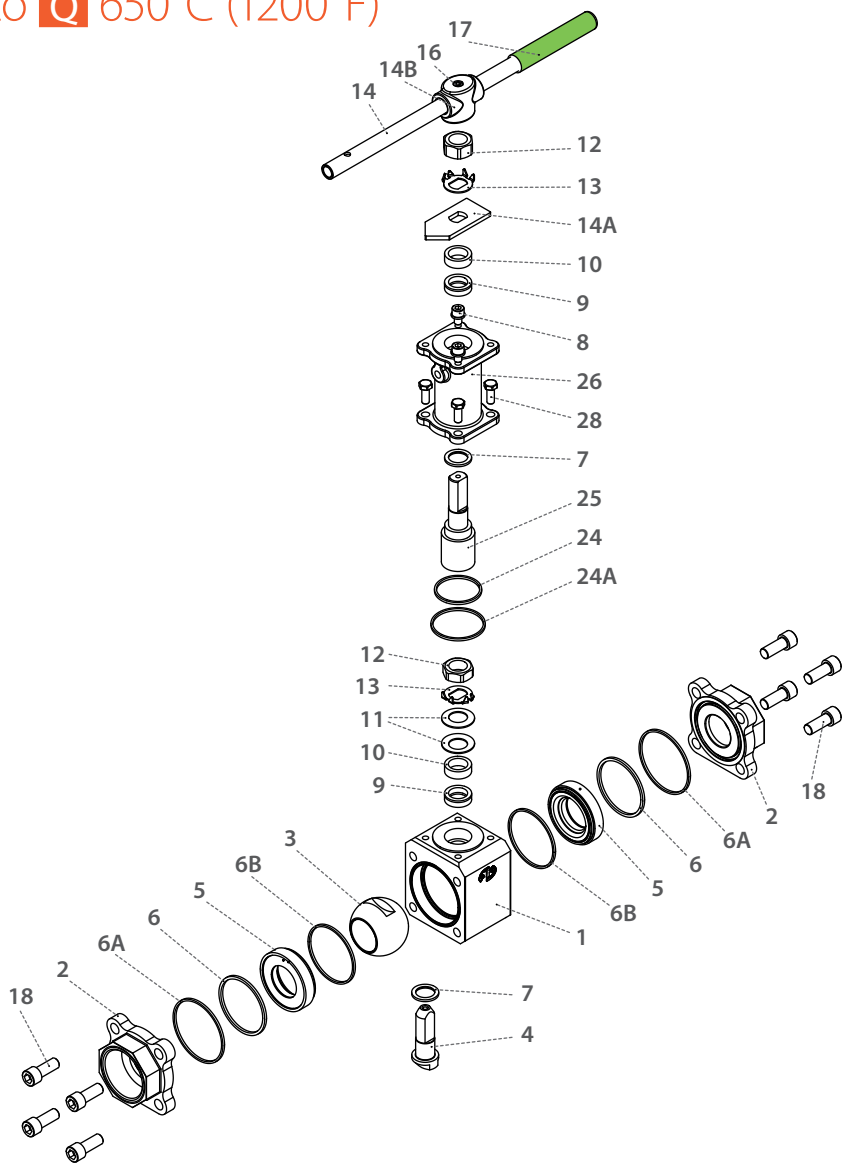


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN40	DN32	mm	31.8	137.0	70.0	153.0	194.6	220.0	400.0	79.0	13.9	M20x2.5	6.65	F07	70.0	M8X12	8.0	69
1½"	1¼"	inch	1.25	5.39	2.76	6.02	7.66	8.66	15.75	3.11	0.55		0.26		2.76		17.69	80
DN50	DN40	mm	38.1	140.0	70.0	157.0	198.6	224.0	400.0	90.5	13.9	M20x2.5	14.6	F07	70.0	M8X12	9.2	102
2"	1½"	inch	1.50	5.51	2.76	6.18	7.82	8.82	15.75	3.56	0.55		0.57		2.76		20.33	118
DN65	DN50	mm	50.8	179.4	94.0	171.7	218.2	258.5	610.0	108.0	18.9	1"-14 UNS-2A	16.7	F10	102.0	M10X16	16.5	208
2½"	2"	inch	2.0	7.06	3.70	6.76	8.59	10.18	24.02	4.25	0.74		0.66		4.02		36.25	241

Floating Ball 3 Piece Up to Q 650°C (1200°F)

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	2
6*	Inner Body Seal	Graphite	2
6A*	Outer Body Seal	Graphite	2
6B*	Seat Sea	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	2
7A*	Anti Abrasion Ring	PEEK	4
8	Stop Pin	S. Steel	1
9*	Stem Seal	Graphite, CF PTFE	2
10	Follower	S. Steel	2
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	4
12	Stem Nut	S. Steel	2

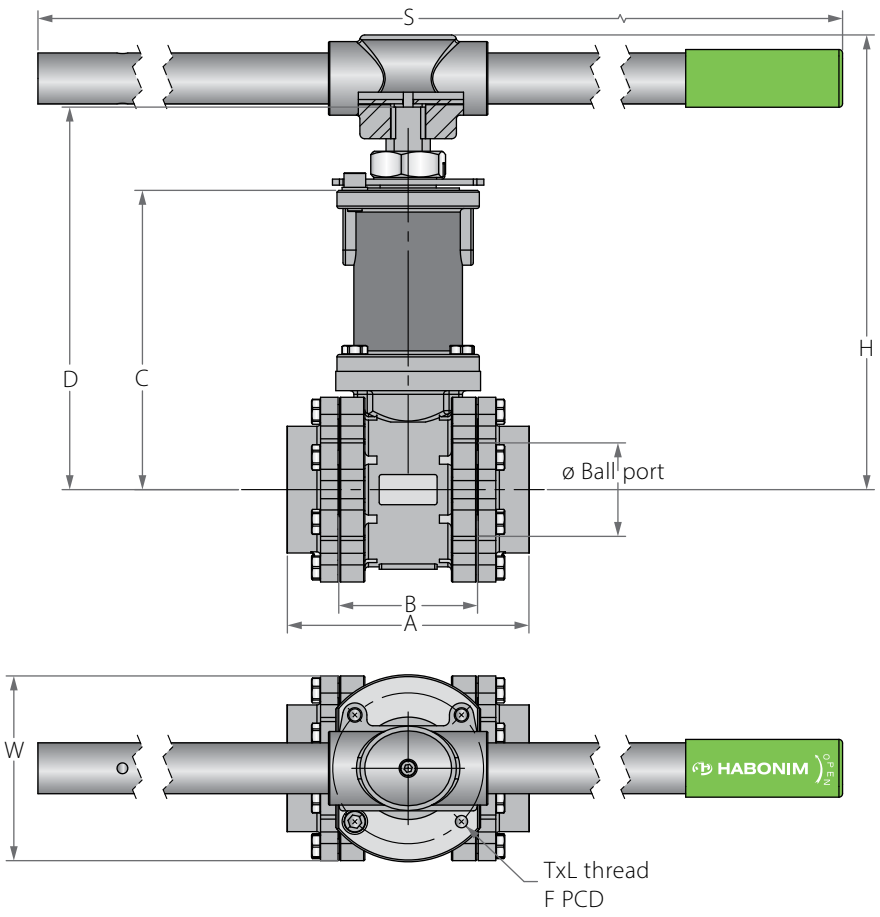
Item	Description	Material specification	Qty.
13	Locking Clip	S. Steel	2
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	8
23	Tag (not shown)	S. Steel	1
24*	Inner Bonnet Seal	Graphite	1
24A*	Outer Bonnet Seal	Graphite	1
25	Bonnet Stem High Temp	S. Steel	1
26	Bonnet High Temp	S. Steel	1
28	Bonnet Bolts	S. Steel	4
28	Bonnet Bolts	S. Steel	4

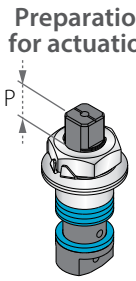
* Seals kit components
** Ball and seats kit components

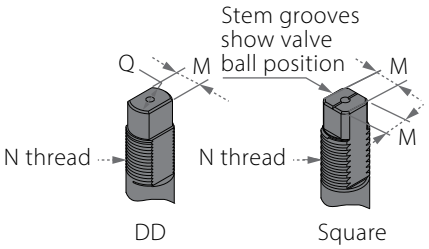
Z47Q 3"-6" | DN80-DN150 | CLASS 600

Floating Ball 3 Piece Up to Q 650°C (1200°F)

Valve Dimensions





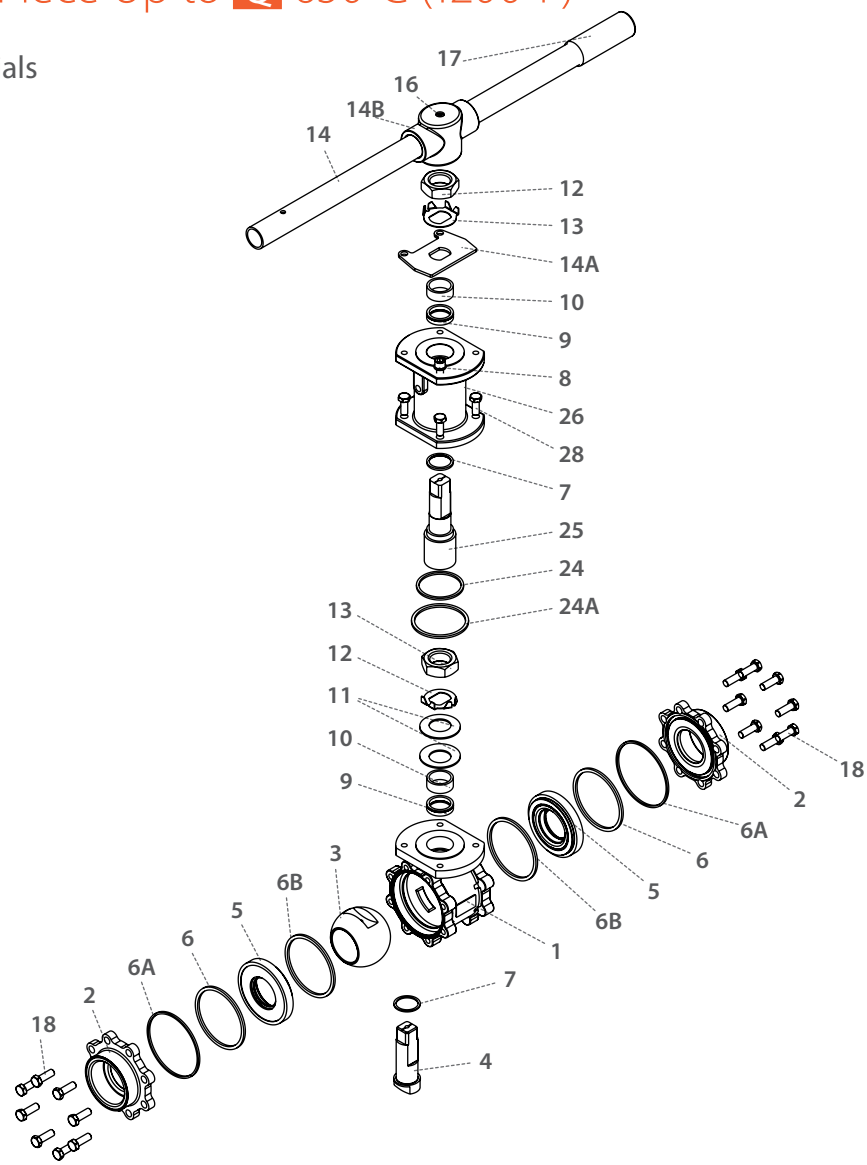


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN80	DN65	mm	63.5	200.8	115.0	248.0	317.5	377.0	916.0	140.0	28.45	1½"-12 UNF-2A	26.2	F12	125.0	M12X15	32.0	301
3"	2½"	inch	2.50	7.91	4.53	9.76	12.50	14.84	36.06	5.51	1.12		1.03		4.92		70.40	348
DN100	DN80	mm	82.7	234.8	130.0	286.0	355.5	415.0	916.0	177.0	28.45	1½"-12 UNF-2A	26.2	F12	125.0	M12X15	46.0	616
4"	3"	inch	3.26	9.24	5.12	11.26	14.0	16.34	36.06	6.97	1.12		1.03		4.92		101.20	713
DN150	DN100	mm	100.0	375.0	175.0	307.0	419.6	-	-	217.0	35.9	2"-8 UN-2A	40.0	F14	140.0	M16X20	75.0	746
6"	4"	inch	3.94	14.76	6.89	12.09	16.52	-	-	8.54	1.41		1.57		5.51		165.00	863

Floating Ball 3 Piece Up to Q 650°C (1200°F)

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	2
6*	Inner Body Seal	Graphite	2
6A*	Outer Body Seal	Graphite	2
6B*	Seat Seal	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	2
7A*	Anti Abrasion Ring	PEEK	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	Graphite, CF PTFE	2
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	2
13	Tab Lock Washer	S. Steel	2

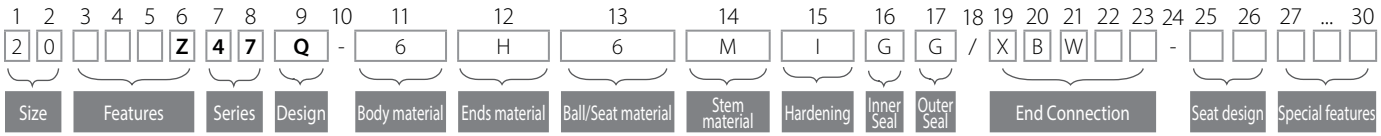
Item	Description	Material specification	Qty.
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16-24
22	Arrow Flow	S. Steel	1
23	Tag (Not Shown)	S. Steel	1
24*	Inner Bonnet Seal	Graphite	1
24A*	Outer Bonnet Seal	Graphite	1
25	Bonnet Stem High Temp	S. Steel	1
26	Bonnet High Temp	S. Steel	1
28	Bonnet Bolts	S. Steel	4

* Seals kit components
** Ball and seats kit components

Z47Q

High Temperature - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background



Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
Z	Metal seats
B	Full port
N	Control service

Series (7-8)	
Z47	Floating ball 3 piece

Design (9)	
Q	-60°C to 650°C (-76°F to 1200°F)

Body material (11)	
6	CF8M (316H)
J*	F22

Ends material (12)	
H	321H
J*	F22

* Up to 583°C (1000°F)

Ball / Seat material (13) Sizes up to ¾" std. port	
M*	High Strength S. Steel

* ball - XM19, seat - 316

Ball / Seat material (13) Sizes ¾" full bore and up	
6	316

Stem material (14)	
M	High Strength S. Steel
Z	Inconel 718

Hardening (15)	
I	Cr3C2- Chromium Carbide with Nickel Chrome binder- HVOF technique

Inner Seal (16)	
G	Expanded graphite

Outer Seal (17)	
G	Expanded graphite

End connections (19-23)	
Welded	
XBW	Extended buttweld schd. 40
XSW	Extended socket weld
Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
Flanged*	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF

* Up to 538°C (1,000°F)

Seat design (25-26)	
Blank	(New type)

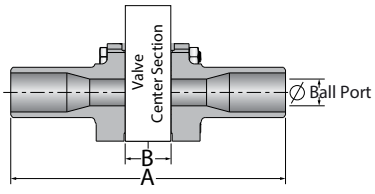
Special Features (27-30)	
B	Body made from rolled bar
Vxx	Characterized control ball xx = angle

Face To Face Sizes

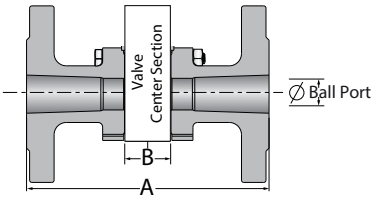
Valve Size	B		A-XBW, XSW , ETI, ETD		A-ETO	A-TC	A-Flange Class 150+ 300		A-Flange Class 600		A-Flanged DIN*	
	Std. Port	Full Port	Std. Port	Full Port	Std. Port	Std. Port	Std. Port	Full Port	Std. Port	Full Port	Std. Port	Full Port
DN8	35.0	-	155.0	-	119.0	-	-	-	-	-	-	-
¼"	1.38	-	6.10	-	4.69	-	-	-	-	-	-	-
DN10	35.0	-	155.0	-	151.4	-	-	-	-	-	130.0	-
⅜"	1.38	-	6.10	-	5.96	-	-	-	-	-	5.12	-
DN15	35.0	40.0	155.0	162.4	151.4	103.2	140.0	140.0	165.0	165.0	130.0	130.0
½"	1.38	1.57	6.10	6.39	5.96	4.06	5.51	5.51	6.50	6.50	5.12	5.12
DN20	40.0	49.0	162.4	186.0	162.4	117.0	152.0	152.0	190.0	190.0	150.0	150.0
¾"	1.57	1.93	6.39	7.32	6.39	4.61	5.98	5.98	7.48	7.48	5.91	5.91
DN25	49.0	49.0	186.0	187.0	181.3	131.6	165.0	165.0	216.0	216.0	160.0	160.0
1"	1.93	1.93	7.32	7.36	7.14	5.18	6.50	6.50	8.50	8.50	6.30	6.30
DN32	49.0	70.0	187.0	211.0	187.0	-	178.0	178.0	229.0	229.0	180.0	180.0
1¼"	1.93	2.76	7.36	8.31	7.36	-	7.01	7.01	9.02	9.02	7.09	7.09
DN40	70.0	70.0	211.0	214.0	205.6	161.4	190.0	190.0	241.0	241.0	200.0	200.0
1½"	2.76	2.76	8.31	8.43	8.09	6.35	7.48	7.48	9.49	9.49	7.87	7.87
DN50	70.0	94.0	214.0	254.0	207.2	172.6	216.0	216.0	292.0	292.0	230.0	230.0
2"	2.76	3.70	8.43	10.0	8.16	6.80	8.50	8.50	11.50	11.50	9.06	9.06
DN65	94.0	115.0	254.0	315.0	254.0	234.4	241.0	241.0	330.0	330.0	290.0	290.0
2½"	3.70	4.53	10.0	12.40	10.0	9.23	9.49	9.49	12.99	12.99	11.42	11.42
DN80	115.0	130.0	315.0	370.0	315.0	-	282.0	282.0	356.0	356.0	310.0	310.0
3"	4.53	5.12	12.40	14.57	12.40	-	11.10	11.10	14.02	14.02	12.20	12.20
DN100	130.0	175.0	370.0	442.0	370.0	-	305.0	305.0	432.0	432.0	350.0	350.0
4"	5.12	6.89	14.57	17.40	14.57	-	12.01	12.01	17.01	17.01	13.78	13.78
DN150	175.0	-	473.0	-	473.0	-	403.0	-	559.0	-	480.0	-
6"	6.89	-	18.62	-	18.62	-	15.87	-	22.01	-	18.90	-

* PN16-PN100

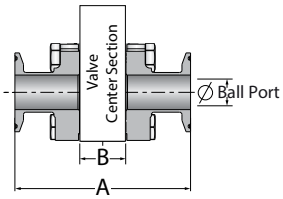
XBW / ETO / ETI / ETD

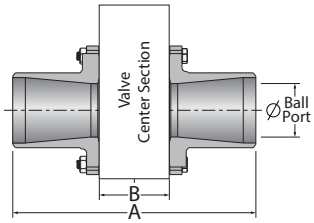


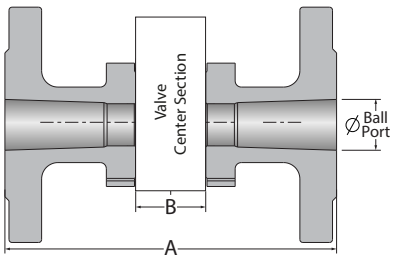
Flanged

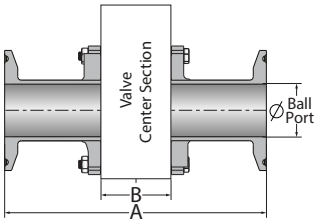


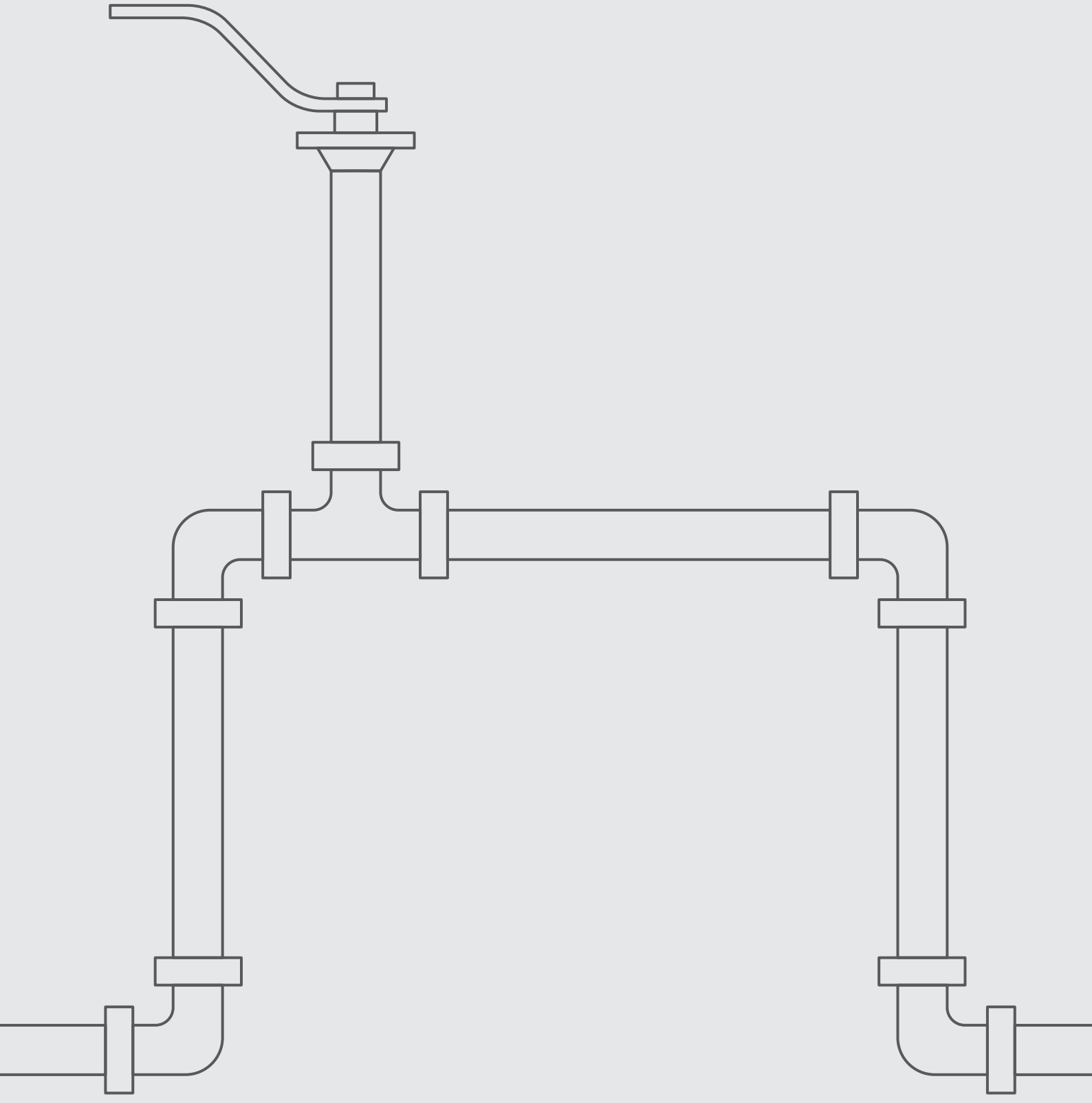
TC









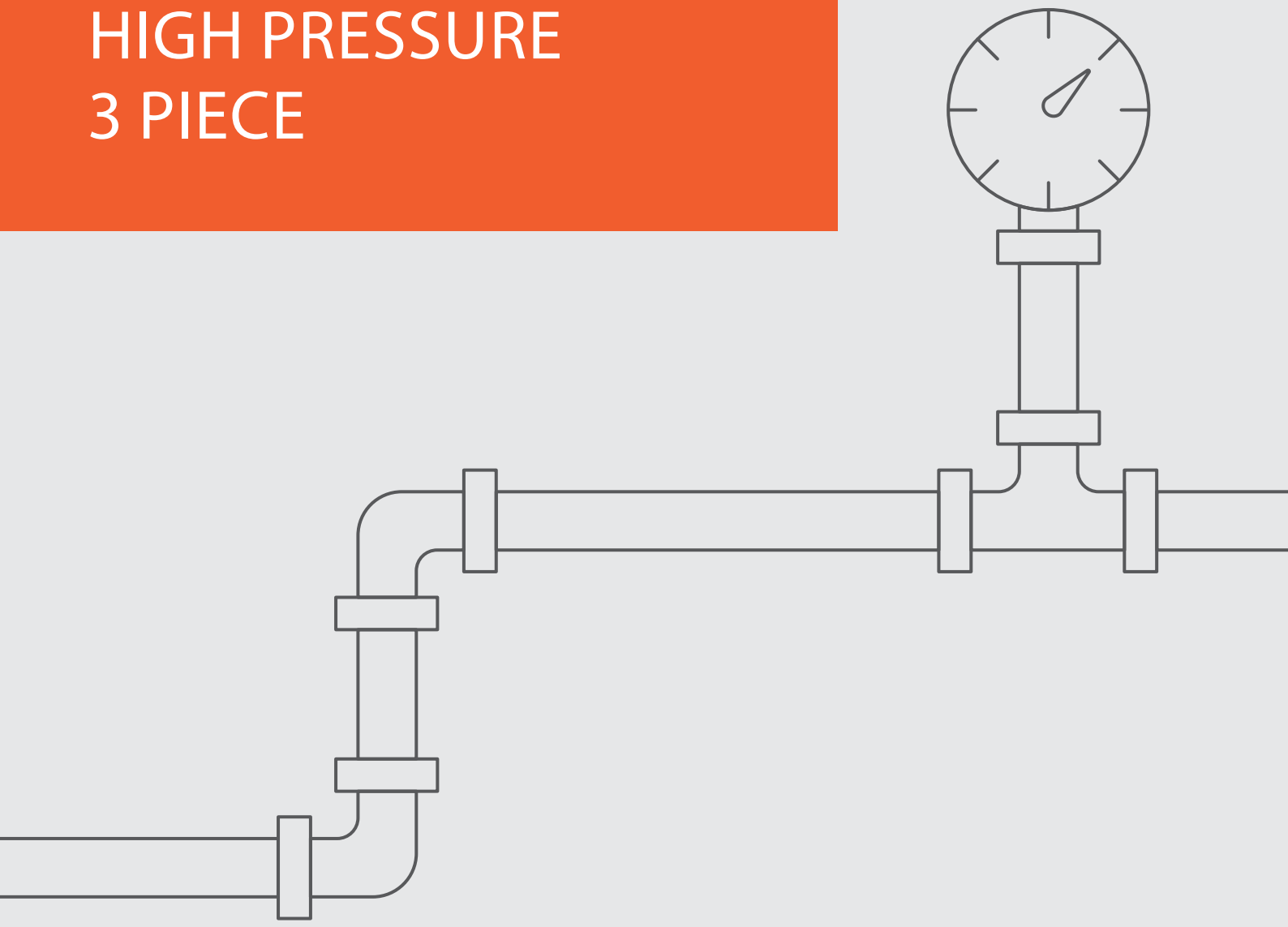


Z28

High Temp. Valves

FLOATING BALL

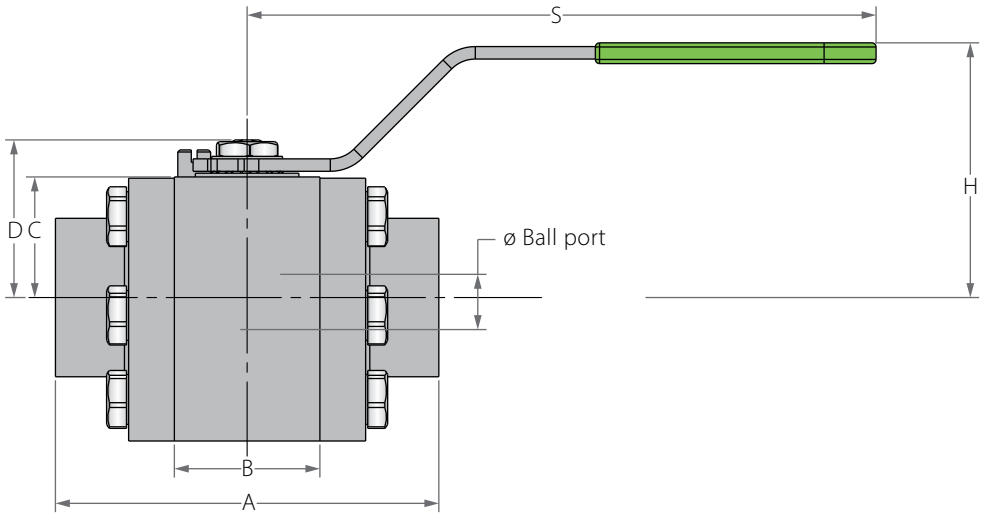
HIGH PRESSURE
3 PIECE

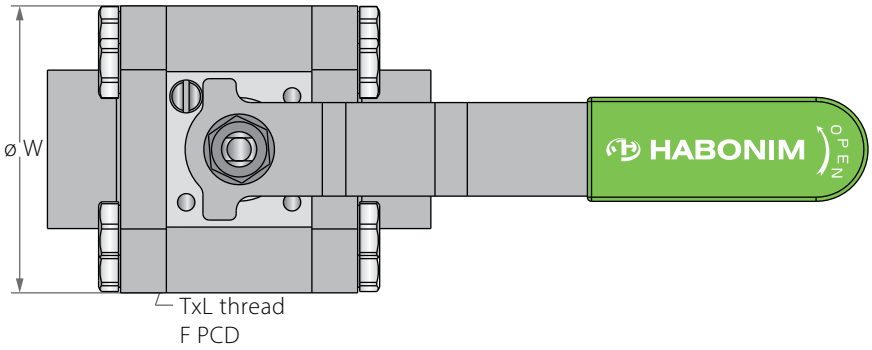


Z28W Z28Z ½"-1¼" | DN15-DN32 | CLASS 2500

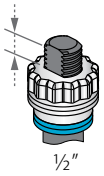
HP Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

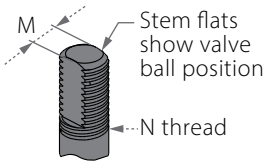
Valve Dimensions





Preparation for actuation



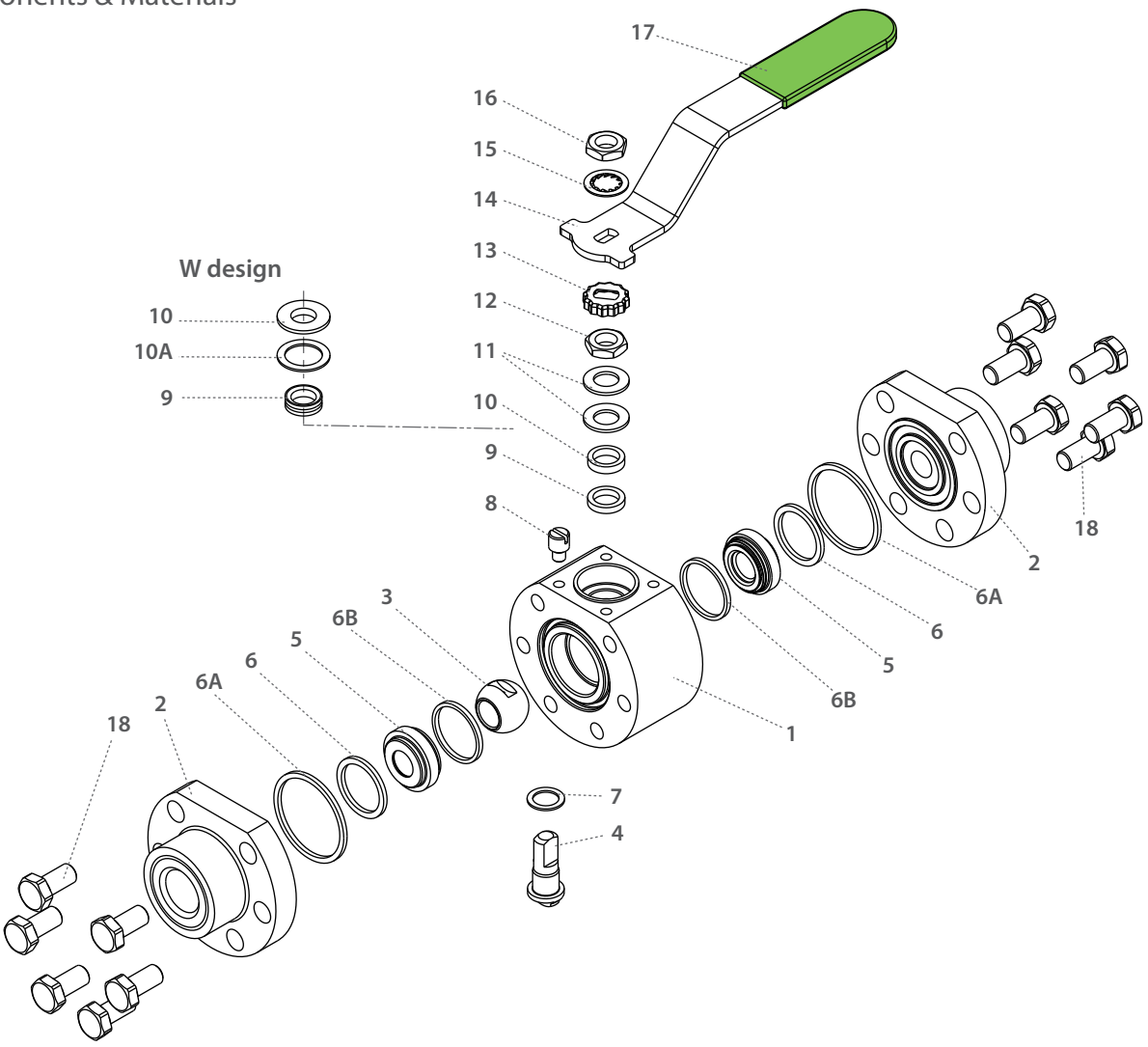


Std. port	Full port	Unit	Ball port	A THD	A XBW/ XSW	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN15	DN8, DN10	mm	11.15	92.2	158.6	35.0	29.0	37.9	63.0	150.0	45.5	5.5	⅜" UNF	6.65	F03	36.0	M5X6	2.8	7
½"	¼" , ⅜"	inch	0.44	3.63	6.24	1.38	1.14	1.49	2.48	5.91	1.79	0.22		0.26		1.42		6.16	8
DN20	DN15	mm	13.0	100.0	168.6	40.0	34.1	51.0	76.5	187.0	89.0	7.5	7⁄16" UNF	6.65	F04	42.0	M5X8	4.3	10
¾"	½"	inch	0.51	3.94	6.64	1.57	1.34	2.01	3.01	7.36	3.50	0.30		0.26		1.65		9.46	12
DN25	DN20	mm	20.6	125.2	189.6	49.0	43.75	65.9	90.0	237.0	104.0	8.7	9⁄16" UNF	6.65	F05	50.0	M6X8	6.8	28
1"	¾"	inch	0.81	4.93	7.46	1.93	1.72	2.59	3.54	9.33	4.09	0.34		0.26		1.97		14.96	32
DN32	DN25	mm	25.4	133.0	192.6	49.0	51.5	69.5	92.5	237.0	69.0	8.7	9⁄16" UNF	6.65	F05	50.0	M6X9	9.5	49
1¼"	1"	inch	1.0	5.24	7.58	1.93	2.03	2.74	3.64	9.33	2.72	0.34		0.26		1.97		20.90	57

Z28W Z28Z ½"-1¼" | DN15-DN32 | CLASS 2500

HP Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	1
6*	Inner Body Seal	Graphite	2
6A*	Outer Body Seal	Graphite	2
6B*	Seat Seal	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	1
7A*	Anti Abrasion Ring	PEEK	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	Graphite, CF PTFEM	1
10	Follower	S. Steel	1

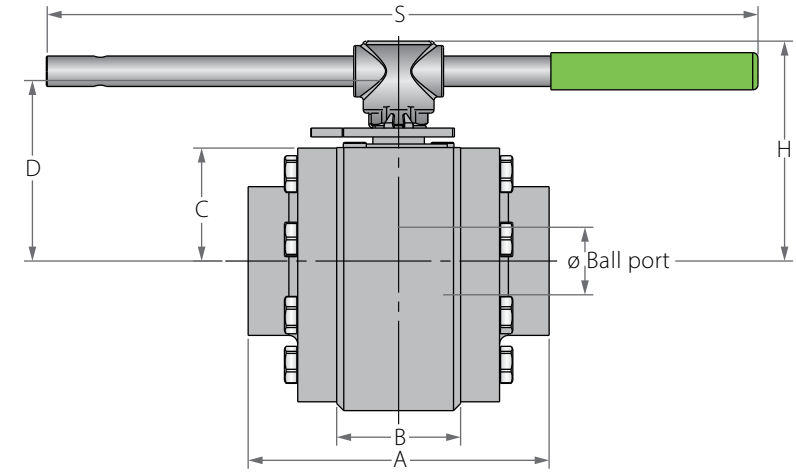
Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16-24
23	Tag (not shown)	S. Steel	1

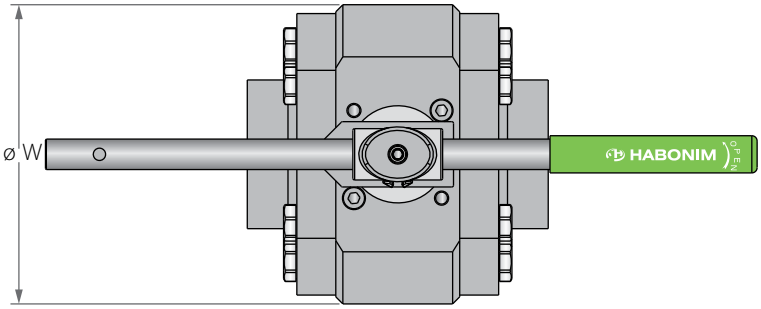
* Seals kit components
** Ball and seats kit components

Z28W Z28Z 1½"-6" | DN40-DN150 | CLASS 2500

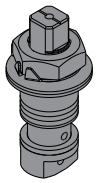
HP Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

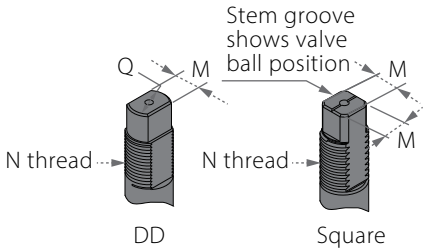
Valve Dimensions





Preparation for actuation



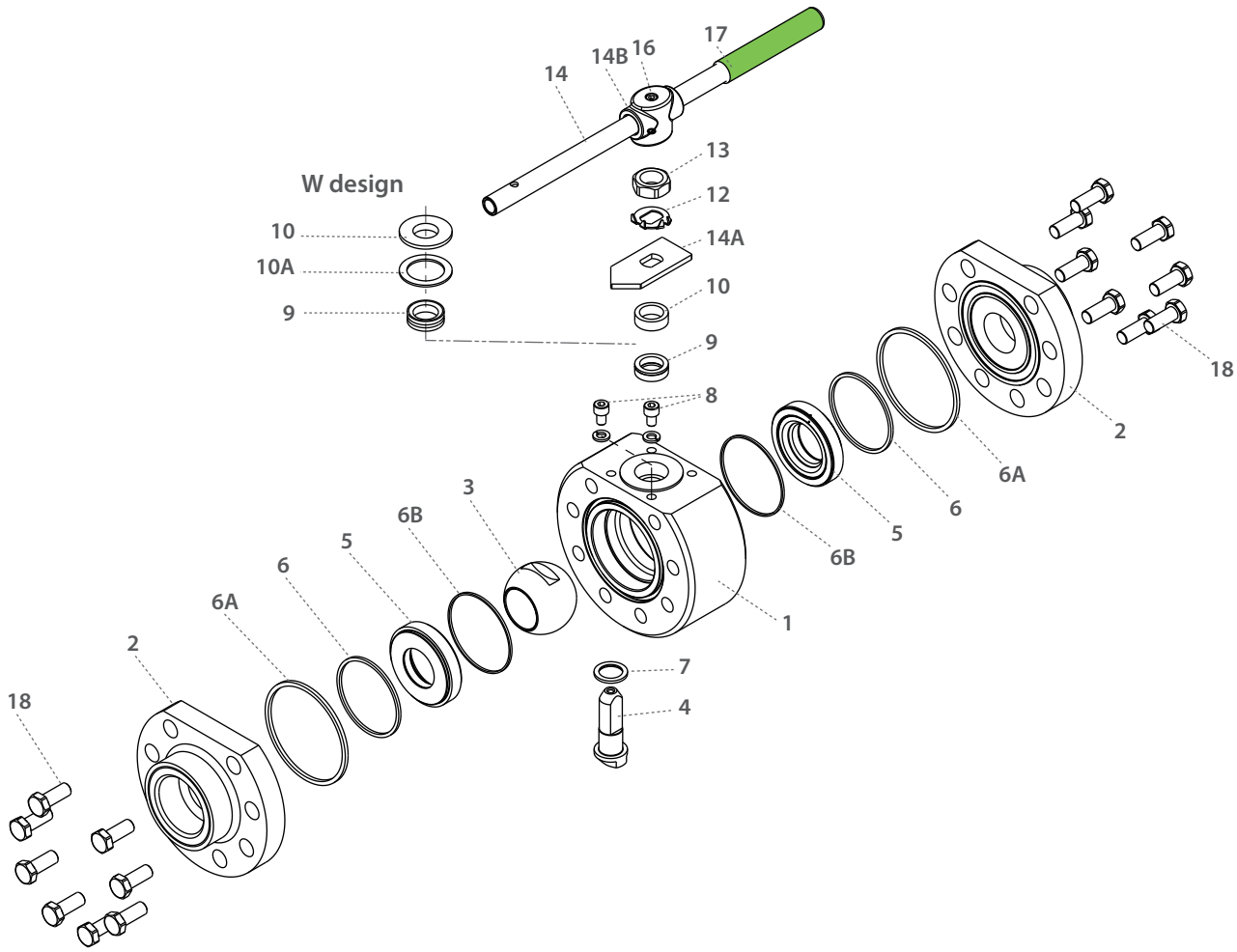


Std. port	Full port	Unit	Ball port	A THD	A XBW/ XSW	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN40	DN32	mm	31.8	154.0	237.0	70.0	53.0	94.6	120.0	400.0	79.0	13.9	M20x2.5	6.65	F07	70.0	M8X12	14.5	69
1½"	1¼"	inch	1.25	6.06	9.33	2.76	2.09	3.72	4.72	15.75	3.11	0.55		0.26		2.76		31.90	80
DN50	DN40	mm	38.1	170.0	241.0	70.0	64.1	105.7	124.0	400.0	90.5	13.9	M20x2.5	14.6	F07	70.0	M8X12	22.0	102
2"	1½"	inch	1.50	6.69	9.49	2.76	2.52	4.16	4.88	15.75	3.56	0.55		0.57		2.76		48.40	118
DN65	DN50	mm	50.8	214.0	302.4	94.0	87.5	134.0	158.5	610.0	108.0	18.9	1"-14 UNS-2A	16.7	F10	102.0	M10X16	36.0	208
2½"	2"	inch	2.0	8.43	11.91	3.70	3.44	5.28	6.24	24.02	4.25	0.74		0.66		4.02		79.20	241
DN80	DN65	mm	63.5	276.6	378.0	115.0	112.0	181.5	227.0	916.0	250.0	28.45	1½"-12 UNF-2A	26.2	F12	125.0	M12X15	76.0	301
3"	2½"	inch	2.50	10.89	14.88	4.53	4.41	7.15	8.94	36.06	9.84	1.12		1.03		4.92		167.20	348
DN100	DN80	mm	82.7	-	410.0	130.0	136..0	205.5	265.0	916.0	298.0	28.45	1½"-12 UNF-2A	26.2	F12	125.0	M12X15	110.0	616
4"	3"	inch	3.26	-	16.14	5.12	5.35	8.09	10.43	36.06	11.73	1.12		1.03		4.92		242.00	713
DN150	DN100	mm	100.0	-	615.0	175.0	177.0	289.6	-	-	389.0	35.9	2"-8 UN-2A	40.0	F14	140.0	M16X20	235.0	746
6"	4"	inch	3.94	-	24.21	6.89	6.97	11.40	-	-	15.31	1.41		1.57		5.51		517.00	863

Z28W Z28Z 1½"-6" | DN40-DN150 | CLASS 2500

HP Floating Ball 3 Piece Up to W 260°C (500°F) | Z 450°C (842°F)

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	2
6*	Inner Body Seal	Graphite	2
6A*	Outer Seat Seal	Graphite	2
6B*	Seat Seal	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	1
7A*	Anti Abrasion Ring	PEEK	1
8	Stop Pin	S. Steel	2
9*	Stem Seal	Graphite, CF PTFE	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16-24
23	Tag (not shown)	S. Steel	1

* Seals kit components
** Ball and seats kit components

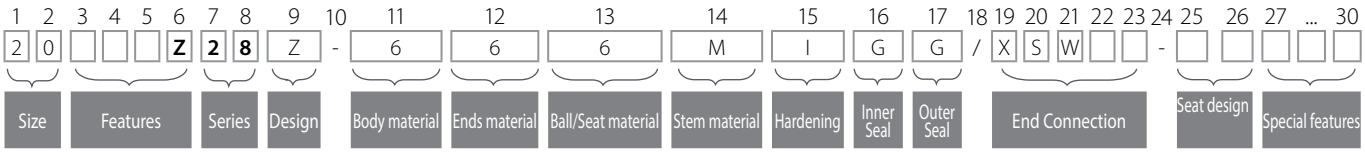
Z28W Z28Z

Face To Face Sizes

Valve Size	B		A-XBW, XSW, GR		A-Flange #900		A-Flange #900 RTJ		A-Flange #1500		A-Flange #1500RTJ		A-Flange #2500		A-Flange #2500RTJ		PN250-PN400 F3	
	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port
DN8	50.0	-	173.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
¼"	1.97	-	6.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DN10	50.0	-	173.6	-	-	-	-	-	-	-	-	-	-	-	-	-	230.0	-
⅜"	1.97	-	6.83	-	-	-	-	-	-	-	-	-	-	-	-	-	9.06	-
DN15	50.0	60.0	173.6	188.6	216.0	216.0	216.0	216.0	21.06	216.0	216.0	216.0	264.0	264.0	264.0	264.0	230.0	230.0
½"	1.97	2.36	6.83	7.43	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	10.39	10.39	10.39	10.39	9.06	9.06
DN20	60.0	68.0	188.6	208.6	229.0	229.0	229.0	229.0	229.0	229.0	229.0	229.0	273.0	273.0	273.0	273.0	260.0	260.0
¾"	2.36	2.68	7.43	8.21	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02	10.75	10.75	10.75	10.75	10.24	10.24
DN25	68.0	68.0	208.6	211.6	254.0	254.0	254.0	254.0	254.0	254.0	25.04	254.0	308.0	308.0	308.0	308.0	260.0	260.0
1"	2.68	2.68	8.21	8.33	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	12.13	12.13	12.13	12.13	10.24	10.24
DN32	68.0	95.0	211.6	262.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	349.0	349.0	352.0	352.0	300.0	300.0
1¼"	2.68	3.74	8.33	10.31	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	13.74	13.74	13.86	13.86	11.81	11.81
DN40	95.0	95.0	262.0	266.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	384.0	384.0	387.0	387.0	300.0	300.0
1½"	3.74	3.74	10.31	10.47	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	15.12	15.12	15.24	15.24	11.81	11.81
DN50	95.0	105.0	266.0	313.4	368.0	368.0	371.0	371.0	368.0	368.0	371.0	371.0	451.0	451.0	454.0	454.0	350.0	350.0
2"	3.74	4.13	10.47	12.34	14.49	14.49	14.61	14.61	14.49	14.49	14.61	14.61	17.76	17.76	17.87	17.87	13.78	13.78
DN65	105.0	140.0	313.4	403.0	419.0	419.0	422.0	422.0	419.0	419.0	422.0	422.0	508.0	508.0	514.0	514.0	400.0	400.0
2½"	4.13	5.51	12.34	15.87	16.50	16.50	16.61	16.61	16.50	16.50	16.61	16.61	20.0	20.0	20.24	20.24	15.75	15.75
DN80	140.0	150.0	403.0	430.0	381.0	381.0	384.0	384.0	470.0	470.0	473.0	473.0	578.0	578.0	584.0	584.0	450.0	450.0
3"	5.51	5.91	15.87	16.93	15.0	15.00	15.12	15.12	18.50	18.50	18.62	18.62	22.76	22.76	22.99	22.99	17.72	17.72
DN100	150.0	175.0	430.0	510.0	457.0	457.0	460.0	460.0	546.0	546.0	549.0	549.0	673.0	673.0	683.0	683.0	520.0	520.0
4"	5.91	6.89	16.93	20.08	17.99	17.99	18.11	18.11	21.50	21.50	21.61	21.61	26.50	26.50	26.89	26.89	20.47	20.47
DN150	175.0	-	510.0	-	610.0	-	457.0	-	705.0	-	711.0	-	914.0	-	927.0	-	700.0	-
6"	6.89	-	20.08	-	24.02	-	17.99	-	27.76	-	27.99	-	35.98	-	36.50	-	27.56	-

High Temperature - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background



Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
Z	Metal seats
B	Full Port
N	Control service

Series (7-8)	
28	HP Floating ball 3 piece

Design (9)	
Z	-60°C to 450°C (-76°F to 842°F)
W	-60°C to 260° C(-76°F to 500°F) HermetiX stem seal

Body Material (11)	
6	S. Steel 316L
F*	LF2

* 425°C (800°F)

Ends Material (12)	
6	316
F*	LF2

* 425°C (800°F)

Ball / Seat material (13) Sizes up to ¾" std. port	
M*	High Strength S. Steel

* ball - XM19, seat - 316

Ball / Seat material (13) Sizes ¾" full bore and up	
6	316
N*	St. Steel 410

* For O hardening only

Stem material (14)	
M	High Strength S. Steel
Z	Inconel 718

Hardening (15)	
I	Cr3C2- Chromium Carbide with Nickel Chrome binder- HVOF technique
O*	WC-Co- Tungsten Carbide with Coblat binder- HVOF technique

* Only with N ball material

Inner Seal (16)	
G	Expanded graphite
B*	NBR
V**	Viton
K***	FFKM

* Up to 80°C (175°F)
** Up to 120°C (250°F)
*** Up to 327°C (620°F)

Outer Seal (17)	
G	Expanded graphite

End connections (19-23)	
Welded Ends	
XBW160*	Extended buttweld ends (sch160)
XSW	Extended socket weld ends
SW	Socket weld ends
BW80	buttweld ends (sch80)
BW160*	buttweld ends (sch160)
XBW80	Extended buttweld ends (sch80)
XBWXXS *	Extended buttweld ends (sch XXS)
Threaded Ends	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	AS 5202 on-face gasket sealing threaded connection
Flanged	
1500	ANSI B16.5 #1500 RF
2500	ANSI B16.5 #2500 RF
PN160-F3	EN1092 PN160, FTF F3
PN250-F3	EN1092 PN250, FTF F3
PN320-F3	EN1092 PN320, FTF F3
PN400-F3	EN1092 PN400, FTF F3
Flanged RTJ	
1500RTJ	ANSI B16.5 #1500 RTJ
2500RTJ	ANSI B16.5 #2500 RTJ
Flanged SAE J518 / ISO 6162 Threaded	
SAE3000	Code 61/ISO 6162-1 Flat face
SAE6000	Code 62/ISO 6162-2 Flat face

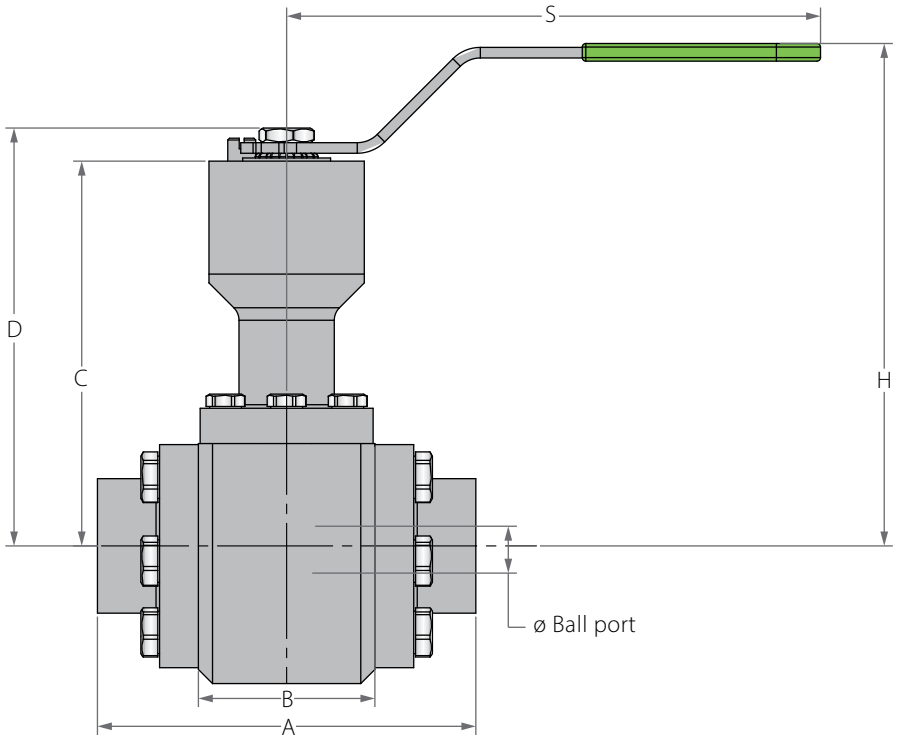
* Std. port only

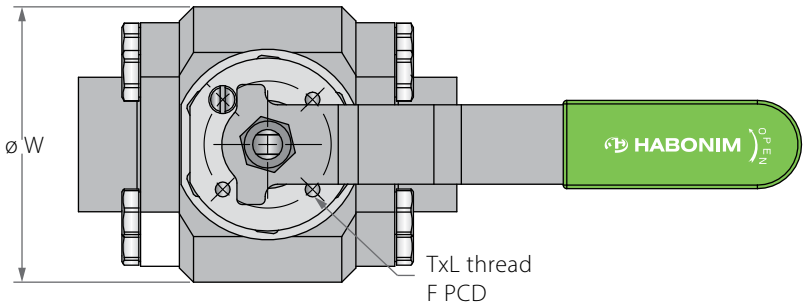
Seat design (25-26)	
Blank	(New type)

Special Features (27-30)	
Vxx	Characterized control ball xx = angle

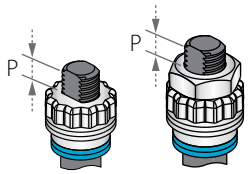
High Temperature HP Floating Ball 3 Piece Up to 650°C (1200°F)

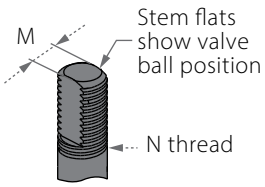
Valve Dimensions





Preparation for actuation

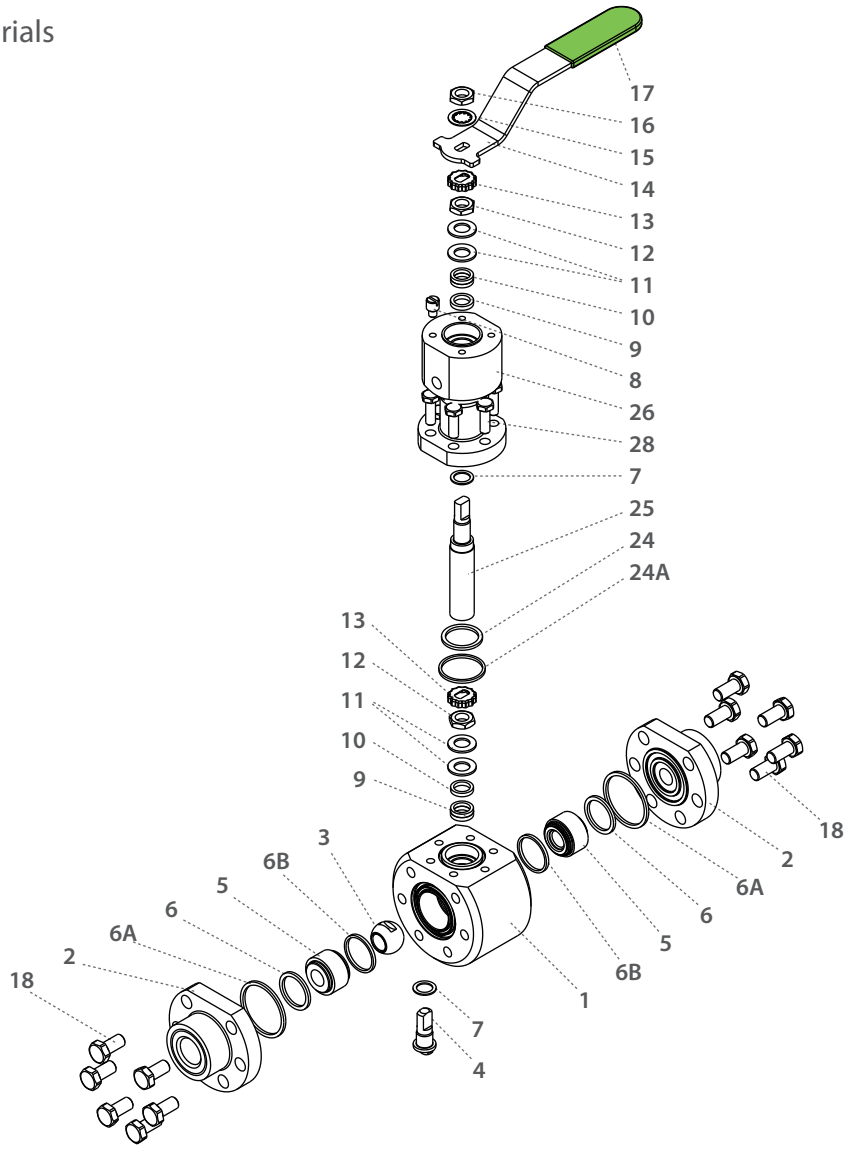




Std. port	Full port	Unit	Ball port	A THD	A XBW/ XSW	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN15	DN8, DN10	mm	11.15	92.2	158.6	35	29	37.9	63	150.0	45.5	5.5	3⁄8" UNF	6.65	F03	36.0	M5X6	2.8	7
½"	¼" , 3⁄8"	inch	0.44	3.63	6.24	1.38	1.14	1.49	2.48	5.91	1.79	0.22		0.26		1.42		6.16	8
DN20	DN15	mm	13.0	100.0	168.6	40.0	34.1	51.0	76.5	187	89.0	7.5	7⁄16" UNF	6.65	F04	42.0	M5X8	4.3	10
¾"	½"	inch	0.51	3.94	6.64	1.57	1.34	2.01	3.01	7.36	3.50	0.30		0.26		1.65		9.46	12
DN25	DN20	mm	20.6	125.2	189.6	49.0	43.75	65.9	90.0	237	104.0	8.7	9⁄16" UNF	6.65	F05	50.0	M6X8	6.8	28
1"	¾"	inch	0.81	4.93	7.46	1.93	1.72	2.59	3.54	9.33	4.09	0.34		0.26		1.97		14.96	32
DN32	DN25	mm	25.4	133.0	192.6	49.0	51.5	69.5	92.5	237	69.0	8.7	9⁄16" UNF	6.65	F05	50.0	M6X9	9.5	49
1¼"	1"	inch	1.00	5.24	7.58	1.93	2.03	2.74	3.64	9.33	2.72	0.34		0.26		1.97		20.90	57

High Temperature HP Floating Ball 3 Piece Up to 650°C (1200°F)

Components & Materials



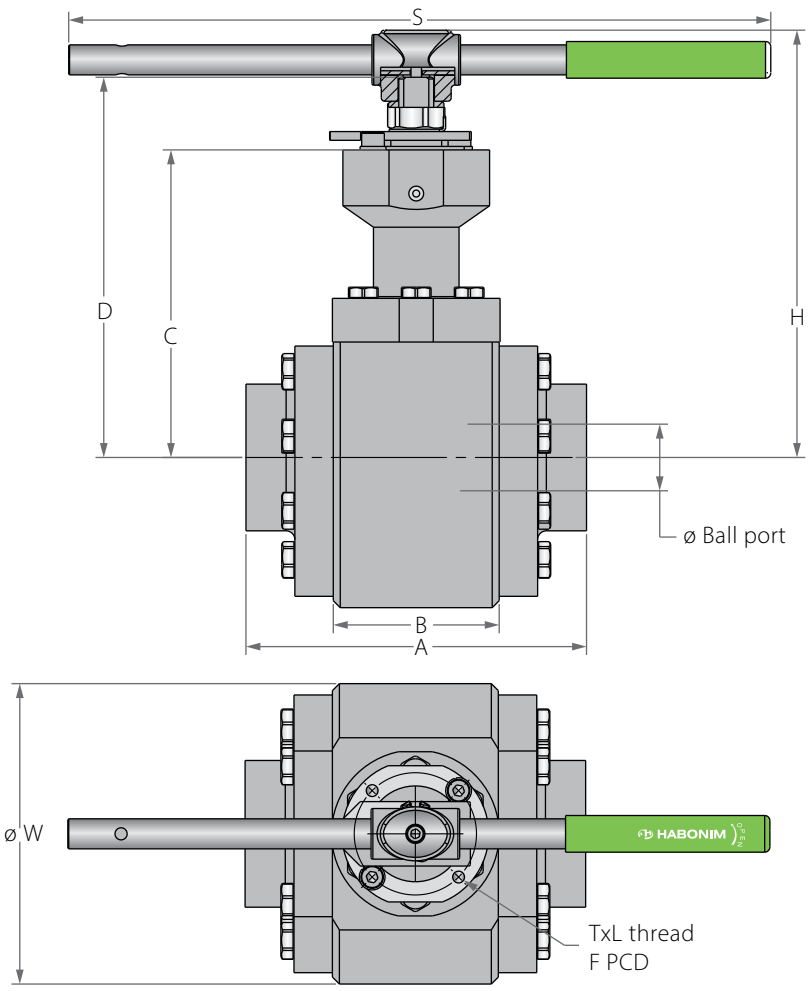
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	2
6*	Inner Body Seal	Graphite	2
6A*	Outer Body Seal	Graphite	2
6B*	Inner Body Seal	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	2
7A*	Anti Abrasion Ring	PEEK	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	Graphite, CF PTFE	2
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	4
12	Stem Nut	S. Steel	2

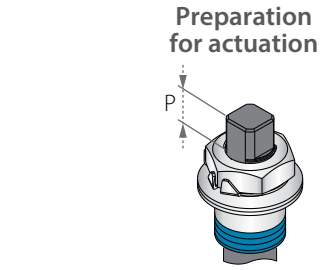
Item	Description	Material specification	Qty.
13	Locking Clip	S. Steel	2
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	12-16
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1
24*	Inner Bonnet Seal	Graphite	1
24A*	Outer Bonnet Seal	Graphite	1
25	Bonnet stem High Temp	S. Steel	1
26	Bonnet High Temp	S. Steel	1
28	Bonnet Bolts	S. Steel	6

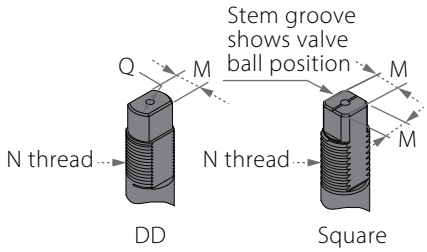
* Seals kit components
** Ball and seats kit components

High Temperature HP Floating Ball 3 Piece Up to 650°C (1200°F)

Valve Dimensions



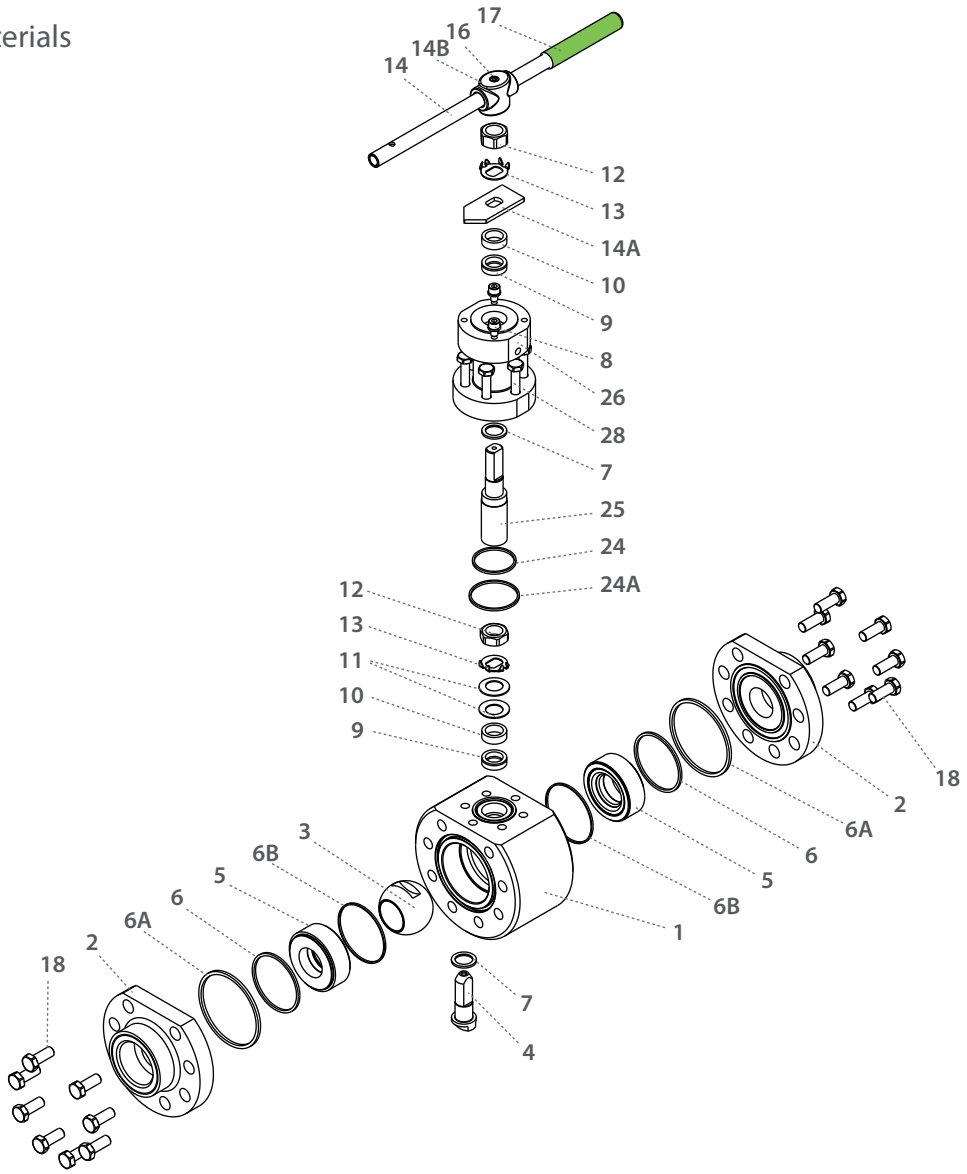




Std. port	Full port	Unit	Ball port	A THD	A XBW/ XSW	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN40	DN32	mm	31.8	154.0	237.0	70.0	53.0	94.6	120.0	400.0	79.0	13.9	M20x2.5	6.65	F07	70.0	M8X12	14.5	69
1½"	1¼"	inch	1.25	6.06	9.33	2.76	2.09	3.72	4.72	15.75	3.11	0.55		0.26		2.76		31.90	80
DN50	DN40	mm	38.1	170.0	241.0	70.0	64.1	105.7	124.0	400.0	90.5	13.9	M20x2.5	14.6	F07	70.0	M8X12	22.0	102
2"	1½"	inch	1.50	6.69	9.49	2.76	2.52	4.16	4.88	15.75	3.56	0.55		0.57		2.76		48.40	118
DN65	DN50	mm	50.8	214.0	302.4	94.0	87.5	134.0	158.5	610.0	108.0	18.9	1"-14 UNS-2A	16.7	F10	102.0	M10X16	36.0	208
2½"	2"	inch	2.0	8.43	11.91	3.70	3.44	5.28	6.24	24.02	4.25	0.74		0.66		4.02		79.20	241
DN80	DN65	mm	63.5	276.6	378.0	115.0	112.0	181.5	227.0	916.0	250.0	28.45	1½"-12 UNF-2A	26.2	F12	125.0	M12X15	76.0	301
3"	2½"	inch	2.50	10.89	14.88	4.53	4.41	7.15	8.94	36.06	9.84	1.12		1.03		4.92		167.20	348
DN100	DN80	mm	82.7	-	410.0	130.0	136.0	205.5	265.0	916.0	298.0	28.45	1½"-12 UNF-2A	26.2	F12	125.0	M12X15	110.0	616
4"	3"	inch	3.26	-	16.14	5.12	5.35	8.09	10.43	36.06	11.73	1.12		1.03		4.92		242.00	713
DN150	DN100	mm	100.0	-	615.0	175.0	177.0	289.6	-	-	389.0	35.9	2"-8 UN-2A	40.0	F14	140.0	M16X20	235.0	746
6"	4"	inch	3.94	-	24.21	6.89	6.97	11.40	-	-	15.31	1.41		1.57		5.51		517.00	863

High Temperature HP Floating Ball 3 Piece Up to 650°C (1200°F)

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3**	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5**	Seat Assembly	Acc. Ordering Code	2
6*	Inner Body Seal	Graphite	2
6A*	Outer body Seal	Graphite	2
6B*	Seat Seal	Graphite	2
7*	Stem Thrust Seal	Graphite + Inconel, PEEK	2
7A*	Anti abrasion ring	PEEK	1
8	Stop Pin	S. Steel	2
9*	Stem Seal	Graphite, CF PTFE	2
10	Follower	S. Steel	2
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	2

Item	Description	Material specification	Qty.
13	Tab Lock Washer	S. Steel	2
14***	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16-24
23	Tag (not shown)	S. Steel	1
24*	Inner Bonnet Seal	Graphite	1
24A	Outer Bonnet Seal	Graphite	1
25	Bonnet Stem High Temp	S. Steel	1
26	Bonnet High Temp	S. Steel	1
28	Bonnet Bolts	S. Steel	6-8

* Seals kit components
** Ball and seats kit components
*** Gear operator should be used for size 3" DN80 and above (handle components are not included)

Z28Q

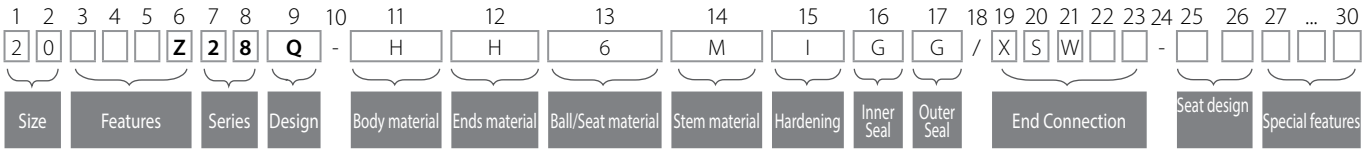
Face To Face Sizes

Valve Size	B		A-XBW, XSW, GR		A-Flange #900		A-Flange #900 RTJ		A-Flange #1500		A-Flange #1500RTJ		A-Flange #2500		A-Flange #2500RTJ		PN250-PN400 F3	
	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port
DN8	50.0	-	173.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
¼"	1.97	-	6.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DN10	50.0	-	173.6	-	-	-	-	-	-	-	-	-	-	-	-	-	230.0	-
⅜"	1.97	-	6.83	-	-	-	-	-	-	-	-	-	-	-	-	-	9.06	-
DN15	50.0	60.0	173.6	188.6	216.0	216.0	216.0	216.0	216.0	216.0	216.0	216.0	264.0	264.0	264.0	264.0	230.0	230.0
½"	1.97	2.36	6.83	7.43	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	10.39	10.39	10.39	10.39	9.06	9.06
DN20	60.0	68.0	188.6	208.6	229.0	229.0	229.0	229.0	229.0	229.0	229.0	229.0	273.0	273.0	273.0	273.0	260.0	260.0
¾"	2.36	2.68	7.43	8.21	9.02	9.02	9.02	9.02	9.02	9.02	9.02	9.02	10.75	10.75	10.75	10.75	10.24	10.24
DN25	68.0	68.0	208.6	211.6	254.0	254.0	254.0	254.0	254.0	254.0	254.0	254.0	308.0	308.0	308.0	308.0	260.0	260.0
1"	2.68	2.68	8.21	8.33	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	12.13	12.13	12.13	12.13	10.24	10.24
DN32	68.0	95.0	211.6	262.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	279.0	349.0	349.0	352.0	352.0	300.0	300.0
1¼"	2.68	3.74	8.33	10.31	10.98	10.98	10.98	10.98	10.98	10.98	10.98	10.98	13.74	13.74	13.86	13.86	11.81	11.81
DN40	95.0	95.0	262.0	266.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	384.0	384.0	387.0	387.0	300.0	300.0
1½"	3.74	3.74	10.31	10.47	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	15.12	15.12	15.24	15.24	11.81	11.81
DN50	95.0	105.0	266.0	313.4	368.0	368.0	371.0	371.0	368.0	368.0	371.0	371.0	451.0	451.0	454.0	454.0	350.0	350.0
2"	3.74	4.13	10.47	12.34	14.49	14.49	14.61	14.61	14.49	14.49	14.61	14.61	17.76	17.76	17.87	17.87	13.78	13.78
DN65	105.0	140.0	313.4	403.0	419.0	419.0	422.0	422.0	419.0	419.0	422.0	422.0	508.0	508.0	514.0	514.0	400.0	400.0
2½"	4.13	5.51	12.34	15.87	16.50	16.50	16.61	16.61	16.50	16.50	16.61	16.61	20.0	20.0	20.24	20.24	15.75	15.75
DN80	140.0	150.0	403.0	430.0	381.0	381.0	384.0	384.0	470.0	470.0	473.0	473.0	578.0	578.0	584.0	584.0	450.0	450.0
3"	5.51	5.91	15.87	16.93	15.0	15.0	15.12	15.12	18.50	18.50	18.62	18.62	22.76	22.76	22.99	22.99	17.72	17.72
DN100	150	175	430	510.0	457.0	457.0	460.0	460.0	546.0	546.0	549.0	549.0	673.0	673.0	683.0	683.0	520.0	520.0
4"	5.91	6.89	16.93	20.08	17.99	17.99	18.11	18.11	21.50	21.50	21.61	21.61	26.50	26.50	26.89	26.89	20.47	20.47
DN150	175.0	-	510.0	-	610.0	-	457.0	-	705.0	-	711.0	-	914.0	-	927.0	-	700.0	-
6"	6.89	-	20.08	-	24.02	-	17.99	-	27.76	-	27.99	-	35.98	-	36.50	-	27.56	-

Z28Q

High Temperature - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background



Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150
80*	8"	200

* std. port only

Features (3-6)	
Z	Metal seats
B	Full Port
N	Control service

Series (7-8)	
28	HP Floating ball 3 piece

Design (9)	
Q	-60°C to 650°C (-76°F to 1200°F)

Body Material (11)	
H	321H
J*	F22

* Up to 595°C (1100°F)

Ends Material (12)	
H	321H
J*	F22

* Up to 595°C (1100°F)

Ball / Seat material (13) Sizes up to ¾" std. port	
M*	High Strength S. Steel

* ball - XM19, seat - 316

Ball / Seat material (13) Sizes ¾" full bore and up	
6	316

Stem material (14)	
M	High Strength S. Steel
Z	Inconel 718

Hardening (15)	
I	Cr3C2- Chromium Carbide with Nickel Chrome binder- HVOF technique

Inner Seal (16)	
G	Expanded graphite

Outer Seal (17)	
G	Expanded graphite

End connections (19-23)	
Welded Ends	
XBW160*	Extended buttweld ends (sch160)
XSW	Extended socket weld ends
SW	Socket weld ends
BW80	buttweld ends (sch80)
BW160*	buttweld ends (sch160)
XBW80	Extended buttweld ends (sch80)
XBWXXS*	Extended buttweld ends (sch XXS)
Threaded Ends	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	AS 5202 on-face gasket sealing threaded connection

* Std. port only

Flanged*	
1500	ANSI B16.5 #1500 RF
2500	ANSI B16.5 #2500 RF
PN160-F3	EN1092 PN160, FTF F3
PN250-F3	EN1092 PN250, FTF F3
PN320-F3	EN1092 PN320, FTF F3
PN400-F3	EN1092 PN400, FTF F3
Flanged RTJ*	
1500RTJ	ANSI B16.5 #1500 RTJ
2500RTJ	ANSI B16.5 #2500 RTJ

* Up to 538°C (1,000°F)

Seat design (25-26)	
Blank	(New type)

Special Features (27-30)	
Vxx	Characterized control ball xx = angle



CONTROL VALVES

General 238
Sizer Software (HVS) 250
Floating Ball
3 Piece 253
Flanged 261



CONTROL VALVES

General



Habonim's Control product line valves are subject to the general Habonim valves design, materials, practices, methodologies and certifications – for more information, see Valves General chapter.



Habonim Control valves are equipped (in some series) with the Total HermetiX integrity package for superior sealing, safety and environmental care.

Control Valve

Habonim control valves are designed for accurate, flexible, simple maintained and cost-effective flow control systems for the harshest environments. these offer a compact, lightweight, long-life solution with: step-less characterized pressure and flow control for fast response times, wide rangeability, and bubble-tight shutoff. Critical performance features include: high pressure drop capacity with straight-through flow, high Cv, and large exhaust capacity. Other design features ensure ease of maintenance and zero backlash.

Features

Design

- V-Ball or V-Port designs in multiple shapes.
- V-port with metal-Seat to ball down stream sealing.

Materials

- Variety of surface treatments for durable operation.

Reference standards

- Testing & acceptance criteria ANSI/FCI 70-2.

Availability

Control features can be added to most of Habonim valves series.

This chapter describe the Industrial valves control series,yet similar capabilities can be added to some of the Cryogenic, High Pressure, High Temperature (metal seated) valves.

Quick Selection Table

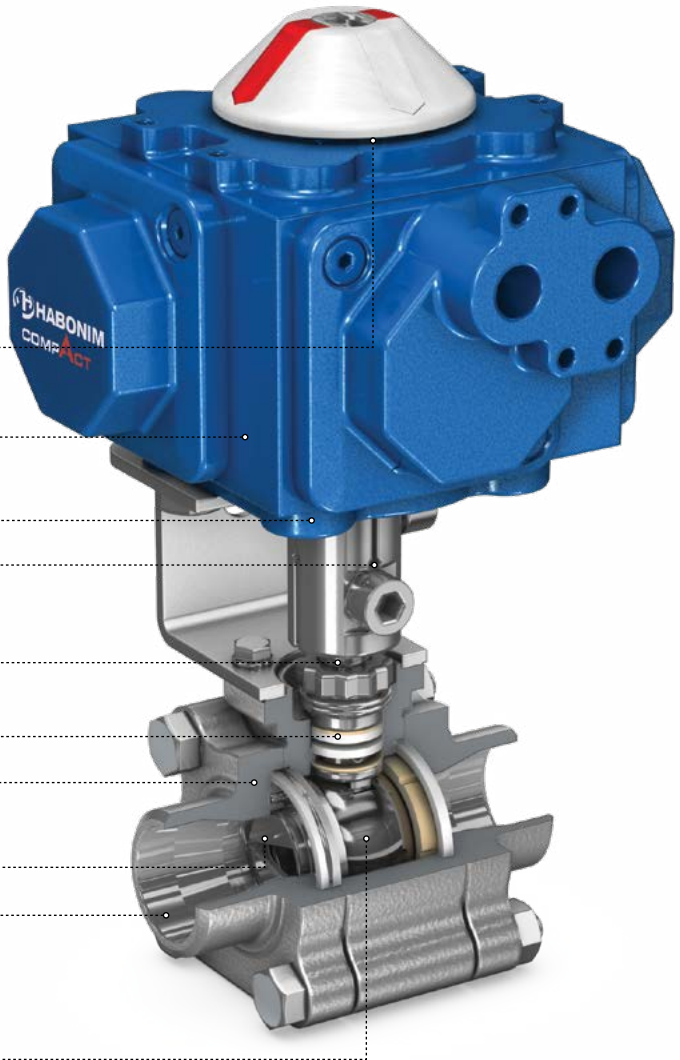
Total Hermetix™ | **Port:** Standard Port Full Port Tube Size | **End Connections:** Threaded Flanged Welded

OC Ordering Code

	Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16
Temperature: -60°C ÷ +260°C (-76 °F ÷ +500 °F)	Floating Ball	3 Piece	OC	N47	TH	Port	End Con.	900								400								
		1 Piece	OC	N31	TH	Port	End Con.			150														
			OC	N32	TH	Port	End Con.			300														
		1 Piece 2 Piece	OC	N73	TH	Port	End Con.			150														
			OC	N74	TH	Port	End Con.			300														
			OC	N77	TH	Port	End Con.										PN16							
			OC	N78	TH	Port	End Con.			PN40														

ASME Class			150	300	600	900	1500	2500	6000
Pressure Bar	0	16	20	50	100	150	250	400	1034
Pressure psi	0	290	290	725	1450	2175	3600	5800	15000

Note: Control features can be added to most of Habonim valves series - see Ordering Codes.



Design features

Zero hysteresis 4-piston actuator

Calibrated and tested complete control package

Light weight, compact control unit with exceptional hydraulic performance

Zero backlash adaptor

Tight tolerance trim

HermetiX™ stem seal certified to ISO 15848-1

Unique LTPN surface treatment of ball/seat set

Wide range of ball/seat set geometries for equal percentage, linear characteristics and modified flow solutions

Streamlined flow passage

Lapped ball/seat set perfect matching

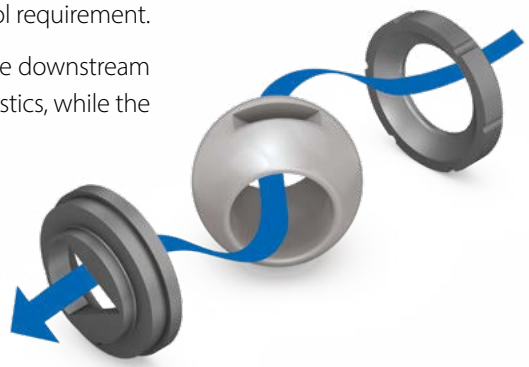
CONTROL VALVES

V-Port & V-Ball Valves

V-Port and V-Ball valves offer a viable alternative to other valve types including globe valves, which tend to be large, expensive and cannot always guarantee bubble-tight shut-off.

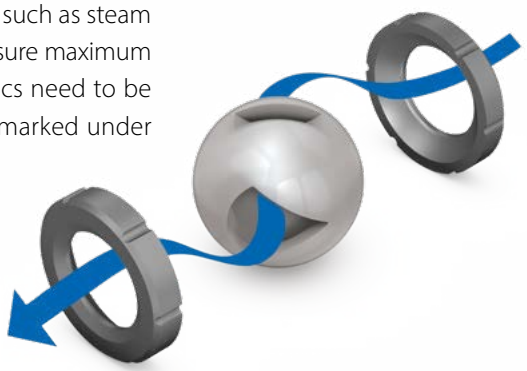
Habonim's V-design provides the high rangeability and precision throttling required for clean or dirty liquids and gases, as well as fibrous suspension applications. The streamlined flow passage allows for high recovery, maximum efficiency and excellent erosion resistance. Balls come in a variety of slot shapes and can be custom designed to meet any control requirement.

Superior control performance and accuracy is designed into the geometry of the downstream V-port. The precision laser cut 'V' shape enables equal percentage flow characteristics, while the 'slot' design provides linear flow characteristics downstream.



V-Port

Extremely high performance is achieved with Habonim's V-Port valve assembly, comprised of a ball and laser cut metal seat, lapped together into a single seamless component. Both the ball and metal seat are surface treated and hard coated (LTPN-standard) to resist abrasion and galling. A nitride coating is applied as standard by a thermo-chemical diffusion process that transforms the outer base-metal layer of the ball and seat to a hard matrix. A standard profile seat located upstream maintains the preload of the floating ball and metal seat downstream. The end result is a superior control valve, with bubble-tight factory-tested shut-off, exceeding ANSI FCI 70-2 class VI. The V-Port design is applicable for rugged environments such as steam control with a maximum pressure drop of 20 bar (290 psi), high differential pressure maximum pressure drop of 35 bar (507 psi), and abrasive media. If control characteristics need to be modified, then changes are also made to the complete ball seat assembly (marked under the same part number).



V-Ball

This control valve solution is suited for less demanding control applications, such as clear liquid at a maximum pressure drop of 6 bar (87 psi), or clean gas at a maximum pressure drop of 10 bar (145 psi), and temperatures of 120 °C (248 °F)max. The design, comprised of a floating characterized ball mounted between two seats, maintains a trim preload and bubble-tight shut-off. The V-Ball exerts low torque, making it suitable for smaller actuators that reduce weight and space and are more cost-efficient. V-Balls come in a variety of 'V' and 'slot' shapes, and can be custom designed to meet any control requirement. The V-Ball is available in a wide range of high-alloy materials and coatings for highly corrosive applications.

Flow pattern



V-Port



V-Ball

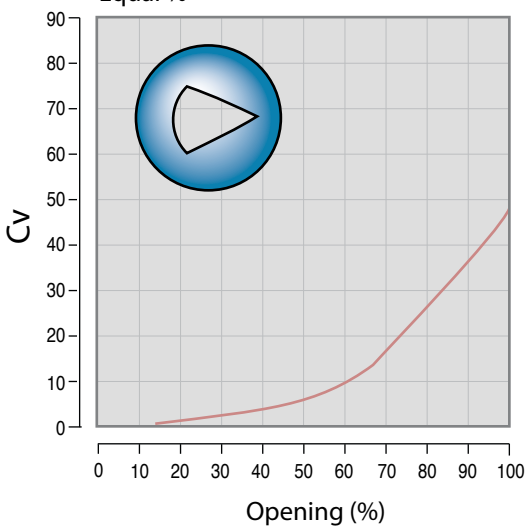


Slot Port

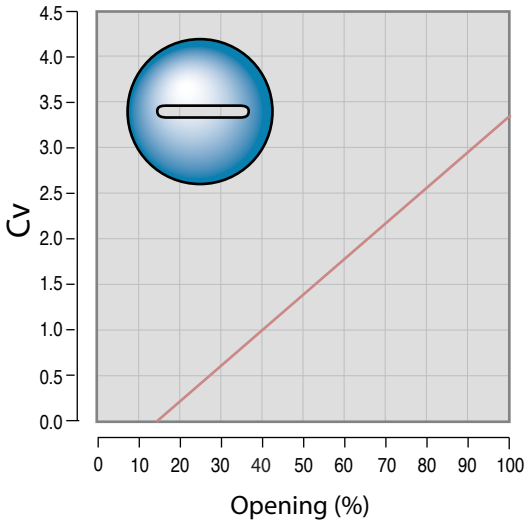


Round Port

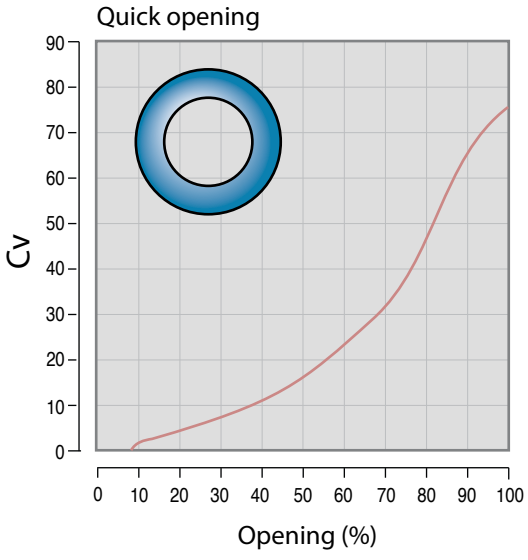
Equal %



Linear



Quick opening



CONTROL VALVES

Design simplicity

Converting a standard Habonim quarter-turn ball valve into an accurate and efficient flow control V-ball valve is equivalent to a routine maintenance procedure. Habonim provides a conversion kit that adapts standard valves to flow control operations. The kit includes a V-Ball with a high tensile, tight tolerance stem and a , hard wearing stem seal and thrust bearing, plus seat and seal materials that are suitable for the most demanding flow control operations.

Zero seat leakage

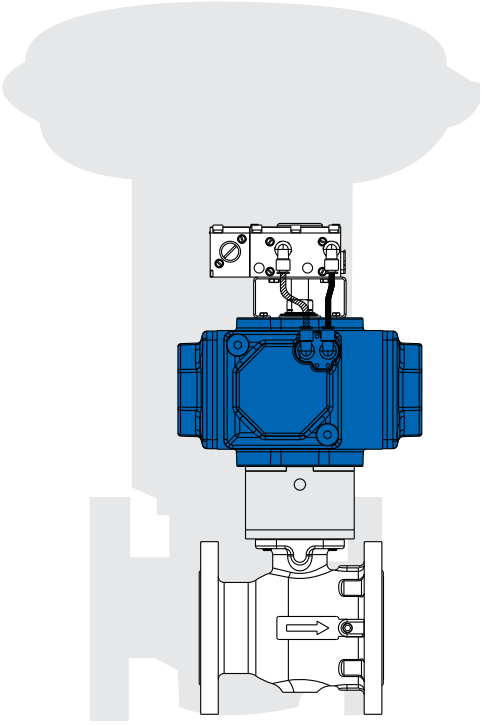
Habonim control valves undergo meticulous machining and stringent factory testing to ensure bubble-tight shut-off for zero leakage. Leak-tight operation is provided by one of two characterized flow control options. The V-Port option is comprised of a characterized metal seat lapped-in with the ball for a perfect fit, and aided by an upstream spring effect soft-seat, for positive preload. The V-Ball option uses a configuration of two soft-seats.

Both 'V' options ensure zero leakage in the most demanding applications and across a wide range of temperature and pressure requirements. Other valve types, such as globe valves, have been proven completely ineffective in providing bubble-tight shut off without a secondary shut- off valve assembly.

Smaller size - less weight

Habonim's streamlined design dissipates less energy and hence has a higher flow coefficient (Cv) compared with other valve designs such as the tortuous globe valve design). This means that Habonim's smaller size ball valve can be used to handle the same flow as the larger size globe valve.

An entire flow system comprised of smaller valves doing the same job as larger ones will require less space on the line, will weigh less and will provide a more cost efficient and maintenance friendly solution.



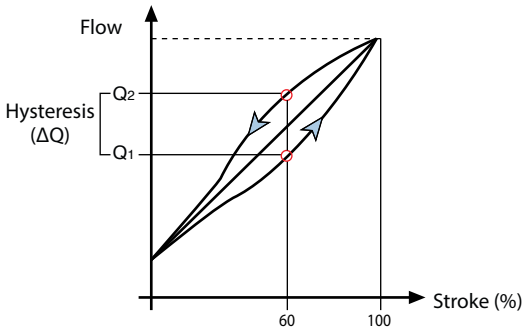
Minimum hysteresis / outstanding repeatability

Optimum control loop performance often hinges on a few carefully designed moving parts within the valve assembly, and how well they work together. The most vulnerable areas in a standard quarter-turn valve are the torque transmission shaft between the positioner and the segmented ball (ball-stem, stem-adaptor, adaptor-actuator, actuator-positioner).

Considerable engineering expertise goes into the design and manufacture of these connecting surfaces to provide the tightest fit possible, which in turn provides uniform movement of all parts along the line of rotation.

Habonim carefully engineers all the adjoining parts to eliminate problems such as backlash, leakage and hysteresis. The result is that the overall control unit has a maximum tolerance of no more than 2%.

Test results measuring identical flow input from both directions illustrates the negligible difference between up- scale and down-scale load.

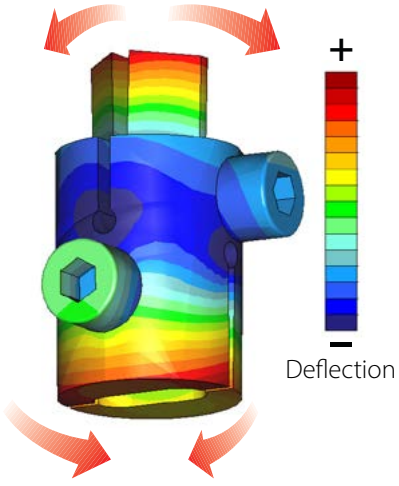


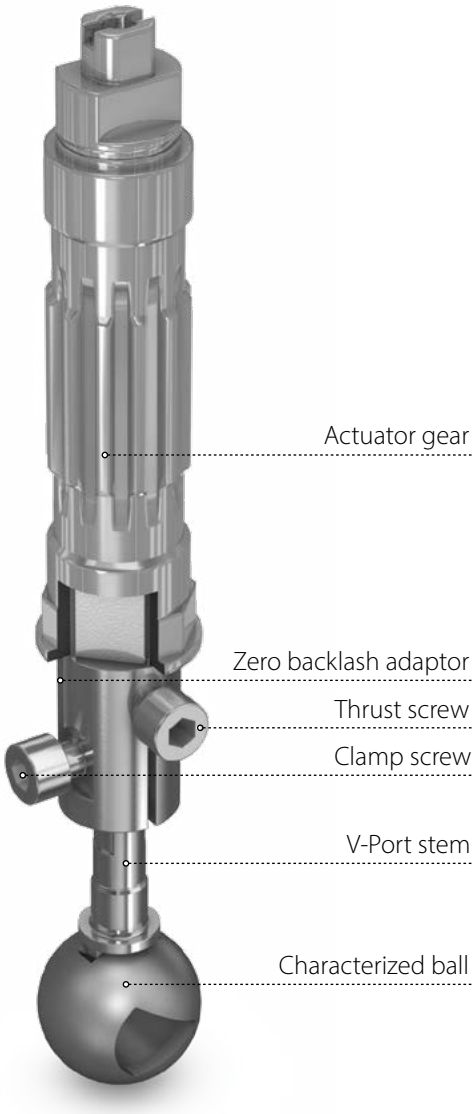
Zero backlash adaptor - Optional (ZB)

Habonim's Zero backlash adaptor design is based on the inherent flexibility of stainless steel.

Two grooves allow the adaptor to clamp the valve stem on one side, whilelocking the actuator gear in place on the other side.

The Zero backlash adaptor ensures repeatability, zero backlash, and virtually no hysteresis for the complete control unit.





CONTROL VALVES

Less stem seal wear

The Habonim quarter-turn ball valve operation is far less prone to leakage due to resilient seat and seal designs that deliver tighter shut-off, and a stem sealing that requires less torque output from the actuator. This translates into longer lasting, continuous valve operation with minimum upkeep. The rotary movement of Habonim's valves make them safe and simple to automate and they are ideal for flow control operations. In contrast, linear- movement globe valves have a tendency to seize up, are susceptible to blockages, and require constant maintenance to deal with stem leakage problems.

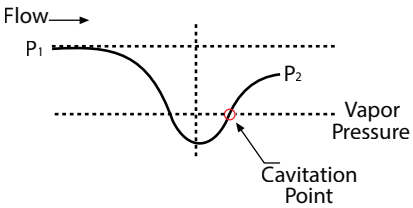
The Habonim valve is fitted with specially designed packing configurations. A variety of packing materials are available to meet the needs of demanding control applications including aggressive media, extreme temperature, and pressure conditions that range from deep vacuum to high pressure. The end result is a high-endurance control valve assembly that is more cost-effective and maintenance-friendly than any other type of actuated valve.

Less cavitation damage

The Habonim valve offers a streamlined configuration that is less prone to cavitation damage. As liquid passes through the vena contracta velocity increases and pressure decreases. If the pressure in this area falls below the vapor pressure of the flowing liquid, vaporization (boiling) occurs. Vapor bubbles continue downstream where velocity decreases and pressure recovers. The vapor bubbles then collapse or implode.

Imploding vapor bubbles can cause serious cavitation damage, i.e., pitting of the valve metal surfaces. In globe valves this damage occurs inside the valve casing, causing an erosive effect that may eventually result in costly valve replacement. However, with a Habonim ball valve, no damage occurs to the valve itself in the event of cavitation, as it occurs downstream of the valve seat area and beyond the valve outlet.

Habonim R&D engineers have developed a new line of anti-cavitation trims for extreme applications. A grid of tubular holes facilitates linear or equal flow percentage characteristics that greatly reduce noise and vibration, as well as limiting cavitation damage. The grid is electro-eroded into the downstream metal seat and then lapped for a perfect match with the ball. The complete set is hardened to eliminate galling and increase erosion resistance.





Wide rangeability and stability

Control valve rangeability is the ratio of maximum controllable flow to minimum controllable flow. The Habonim ball valve has an inherently high flow ratio of 1:50..

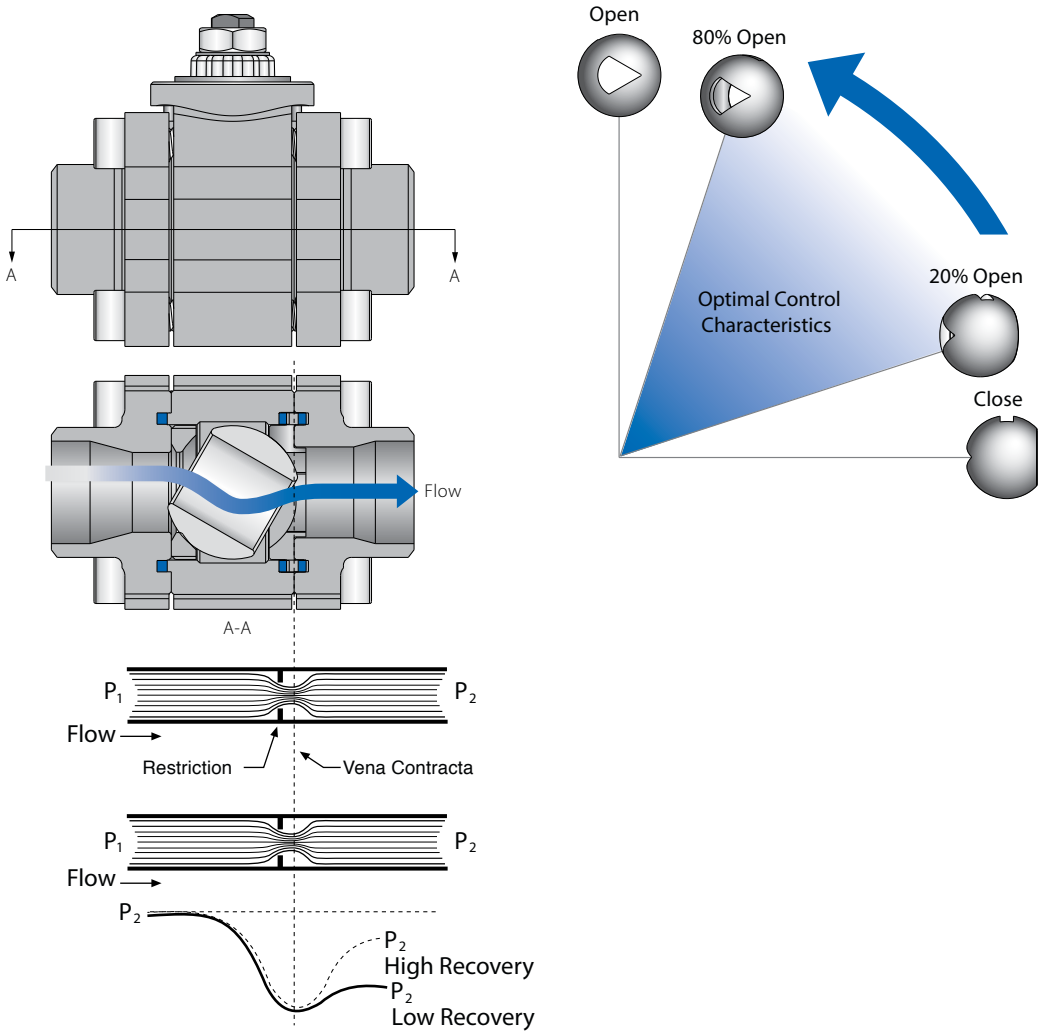
This unique advantage allows diverse process parameters with the same control unit. However, optimum flow control through the valve is achieved within the 20-80% range of rotation because the hydraulic flow curve is unstable outside the limits of this range.

The Habonim design offers exceptionally wide rangeability with maximum stability of process conditions.

High recovery

A high recovery valve is designed with streamlined internal contours and minimal flow turbulence that dissipates relatively little flow stream energy. Therefore pressure downstream of the valve's vena contracta recovers to a high percentage of its inlet value.

The streamlined interior design of the Habonim valve dissipates little energy, resulting in higher recovery and a more cost efficient flow process, especially when compared with the tortuous flow globe valve.



CONTROL VALVES

Calculations

Flow equation		
Fluid	**Service condition**	**Equation**
Liquid	Sub-critical condition $\Delta P < FL_2 (P_1\text{-}P_V)$	$C_V = 1.17 \bullet Q_L \bullet \sqrt{\frac{G_L}{\Delta P}}$ or $C_V = \frac{1.17 \bullet W_L}{\sqrt{\Delta P \bullet G_L}}$
	Critical condition $\Delta P < FL_2 (P_1\text{-}P_V)$	$C_V = \frac{1.17 \bullet Q_L}{F_L} \bullet \sqrt{\frac{G_L}{(P_1 - P_V)}}$ or $C_V = \frac{1.17 \bullet W_L}{F_L \bullet \sqrt{(P_1 - P_V) \bullet G_L}}$
Gas	$X < FK \bullet XT$	$C_V = \frac{Q_g}{387 \bullet P_1 \bullet Y} \bullet \sqrt{\frac{G_g \bullet T_1 \bullet Z}{X}}$ or $C_V = \frac{W_g}{27.1 \bullet Y \bullet \sqrt{X \bullet P_1 \bullet \rho_1}}$
	$X => FK \bullet XT$	$C_V = \frac{Q_g}{258 \bullet P_1} \bullet \sqrt{\frac{G_g \bullet T_1 \bullet Z}{F_K \bullet X_T}}$ or $C_V = \frac{W_g}{18.1 \bullet \sqrt{F_K \bullet X_T \bullet P_1 \bullet \rho_1}}$
Saturated steam	$X < FK \bullet XT$	$C_V = \frac{W_g}{19.3 \bullet P_1 \bullet Y \bullet \sqrt{X}}$
	$X => FK \bullet XT$	$C_V = \frac{W_g}{12.9 \bullet P_1 \bullet \sqrt{F_K \bullet X_T}}$
Superheated steam	$X < FK \bullet XT$	$C_V = \frac{W_g \ (1+0.00126 \bullet \Delta t)}{19.3 \bullet P_1 \bullet Y \bullet \sqrt{X}}$
	$X => FK \bullet XT$	$C_V = \frac{W_g \bullet (1+0.00126 \bullet \Delta t)}{12.9 \bullet P_1 \bullet \sqrt{F_K \bullet X_T}}$

Glossary

Cv:	Valve flow coefficient
F_L:	Liquid pressure recovery factor of a valve without attached fittings (dimensionless) - Refer to Table 1
G_L:	Liquid specific gravity (1.0 for water @ 15°C)
P_1:	Upstream absolute static pressure (kgf/cm²A)
P_2:	Downstream absolute static pressure (kgf/cm²A)
P_V:	Absolute vapour pressure of liquid at inlet temperature (kgf/cm²A) - Refer to Table 2
ΔP:	Differential pressure (P1-P2) (kgf/cm²)
Q_L:	Volumetric flow rate of liquid (m³/h)
W_L:	Weight or mass flow rate of liquid (t/h)
G_g:	Gas specific gravity - Refer to Table 3
Q_g:	Volumetric flow rate of gas (m³/h)
X:	Ratio of pressure drop (ΔP/P1)
X_T:	Pressure drop ratio factor (dimensionless) - Refer to Table 1
W_g:	Gas or steam mass flow rate (kg/h)
ρ1:	Specific gravity, upstream conditions (kg/m³).
F_K:	Ratio of specific heat factors, (dimensionless) - Refer to Table 3
Y:	Expansion factor = $1 - \frac{X}{3 \bullet F_K \bullet X_T}$
T_1:	Absolute upstream temperature (K)
Δt:	Upstream superheated steam temperature (°C)
Z:	Compressibility factor, dimensionless = 1

Table 1

		Percent of valve rotation (degree of rotation)										
		0(0)	**10(9)**	**20(18)**	**30(27)**	**40(36)**	**50(45)**	**60(54)**	**70(63)**	**80(72)**	**90(81)**	**100(90)**
Equal %	F_L	0.00	0.96	0.95	0.94	0.93	0.92	0.90	0.88	0.86	0.82	0.75
	X_T	0.00	0.72	0.65	0.60	0.54	0.48	0.42	0.36	0.28	0.16	0.12
Round port	F_L	0.00	0.92	0.91	0.91	0.90	0.86	0.80	0.72	0.61	0.61	0.50
	X_T	0.00	0.78	0.74	0.71	0.67	0.62	0.56	0.49	0.38	0.26	0.15

Table 2

Pv factor		
Liquid	**Formula**	**Pv**
Acetone	C_2H_4	47.861
Acetic acid	$C_2H_4O_2$	0.0273
Ammonia	NH_3	0.7310
Benzene	C_6H_6	0.1621
Butane	C_4H_{10}	2.89
Carbon dioxide	CO_2	58.420
Ethene	C_2H_6	47.861
Ethanol	C_2H_6O	0.1029
Ethylene glycol	$C_2H_4(OH)_2$	69.58 e-6
Glycerin	$C_3H_5(OH)_3$	110.50 e-9
Nitrogen	-	0.988
OIL WT32	-	205.48 e-6
OIL WT46	-	306.59 e-6
Sulfur dioxide	SO_2	3.3929
Water	H_2O	0.0238

Table 3

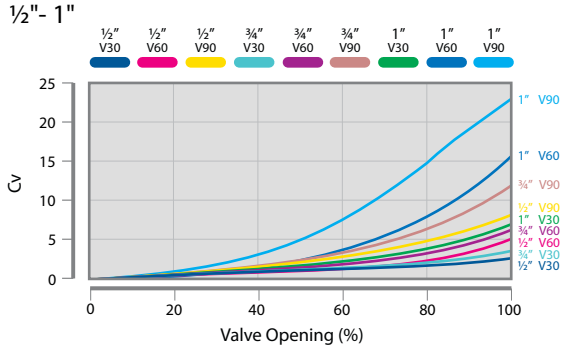
Gg and Fk factors			
Gas	**Formula**	**Gg**	**Pk**
Air	-	1.00	1.00
Ammonia	NH_3	0.59	0.92
Argon	Ar	1.38	1.19
Carbon dioxide	CO_2	1.52	0.91
Carbon monoxide	CO	0.97	1.01
Ethylene	C_2H_4	0.97	0.87
Chlorine	Cl_2	2.49	0.96
Ethane	C_2H_6	1.05	0.87
Helium	He	0.14	1.19
Hydrogen	H_2	0.07	1.00
Methane	CH_4	0.55	0.90
Oxygen	O_2	1.10	1.00
Nitrogen	N_2	0.97	1.00
Saturated steam	H_2O	-	0.94
Superheated steam	H_2O	-	0.94

Habonim's valve sizing software (HVS) is available to download from Habonim website: **www.habonim.com**, to support sizing

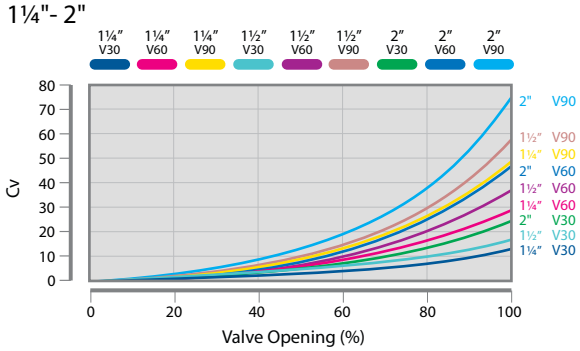
Flow Coefficient - Cv

Equal %

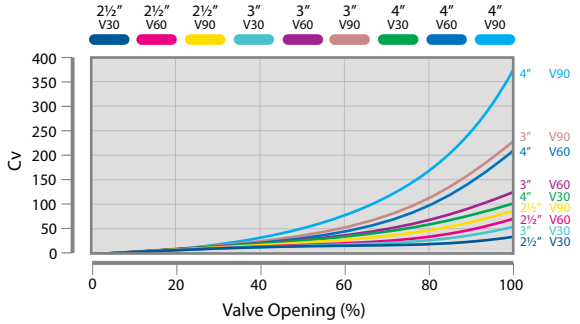
½"- 1"



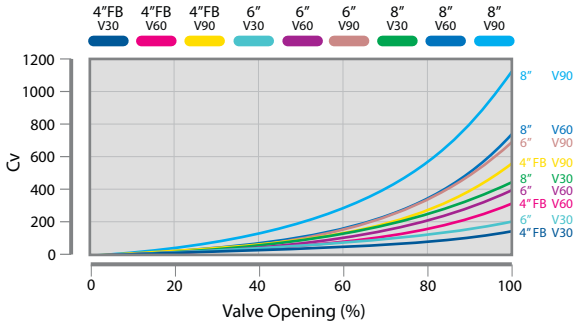
1¼"- 2"



2½"- 4"



4"FB - 8"



Valve size	V shape	Percent of valve rotation (degree of rotation)										
		0(0)	10(9)	20(18)	30(27)	40(36)	50(45)	60(54)	70(63)	80(72)	90(81)	100(90)
½"	V30	0.00	0.05	0.118	0.236	0.405	0.624	0.880	1.200	1.550	1.954	2.380
	V60	0.00	0.07	0.161	0.378	0.670	1.000	1.450	2.050	2.780	3.710	4.960
	V90	0.00	0.10	0.230	0.570	1.050	1.770	2.710	3.740	4.940	6.270	8.100
¾"	V30	0.00	0.02	0.130	0.270	0.440	0.650	0.940	1.300	1.750	2.370	3.200
	V60	0.00	0.10	0.270	0.570	1.040	1.550	2.210	2.930	3.850	5.040	6.480
	V90	0.00	0.10	0.400	0.860	1.620	2.600	3.730	5.220	6.870	8.800	11.200
1"	V30	0.00	0.06	0.178	0.420	0.840	1.460	2.230	3.160	4.130	5.300	6.900
	V60	0.00	0.13	0.350	0.924	1.720	2.640	4.070	5.780	8.150	10.950	15.170
	V90	0.00	0.22	0.810	1.680	3.050	4.600	6.960	9.950	13.720	18.590	23.200
1¼"	V30	0.00	0.11	0.344	0.811	1.621	2.818	4.304	6.099	7.971	10.229	13.317
	V60	0.00	0.24	0.676	1.783	3.320	5.095	7.855	11.155	15.730	21.134	29.278
	V90	0.00	0.43	1.563	3.242	5.887	8.878	13.433	19.204	26.480	35.879	50.200
1½"	V30	0.00	0.17	0.598	0.989	1.679	2.875	4.600	6.670	9.856	13.513	17.733
	V60	0.00	0.26	0.713	2.036	3.611	6.440	9.890	13.800	19.320	27.945	37.375
	V90	0.00	0.48	1.281	3.335	6.095	10.350	14.835	21.160	29.210	41.200	58.200
2"	V30	0.00	0.19	0.800	1.900	3.100	4.900	6.860	9.540	13.160	17.900	24.400
	V60	0.00	0.34	0.970	2.880	5.400	8.200	12.100	17.700	25.100	34.300	48.400
	V90	0.00	0.55	1.571	4.200	8.100	12.600	18.300	26.900	37.600	53.200	74.600
2½"	V30	0.00	0.38	1.010	2.470	4.200	6.400	9.240	13.320	18.260	24.300	32.300
	V60	0.00	0.54	1.340	4.180	8.400	11.300	17.300	25.100	36.000	52.200	70.000
	V90	0.00	0.77	2.140	6.340	11.900	16.700	24.800	34.000	48.000	64.000	84.000
3"	V30	0.00	0.50	1.600	3.700	7.200	11.600	17.600	24.700	32.400	42.300	52.900
	V60	0.00	0.81	1.860	6.340	12.700	20.400	32.200	47.900	67.000	93.100	122.000
	V90	0.00	1.22	3.040	9.370	19.100	28.600	47.300	73.900	112.500	162.000	225.000
4"	V30	0.00	1.00	1.000	4.500	11.500	20.500	31.500	43.700	58.000	79.000	102.000
	V60	0.00	1.47	2.660	8.500	18.290	31.800	43.000	68.000	104.000	148.600	206.000
	V90	0.00	2.18	4.890	13.400	28.000	45.400	73.000	111.100	166.000	240.000	360.000
4" FB	V30	0.00	1.53	2.590	6.885	17.595	31.365	48.195	66.861	88.740	120.870	156.060
	V60	0.00	2.25	4.070	13.005	27.984	48.654	65.790	104.040	159.120	227.358	315.180
	V90	0.00	3.34	7.482	20.502	42.840	69.462	111.690	169.983	253.980	367.200	550.800
6"	V30	0.00	1.91	3.200	8.595	21.965	39.155	60.165	83.467	110.780	150.890	194.820
	V60	0.00	2.81	5.081	16.235	34.934	60.738	82.130	129.880	198.640	283.826	393.460
	V90	0.00	4.16	9.340	25.594	53.480	86.714	139.430	212.201	317.060	458.400	687.600
8"	V30	0.00	3.15	4.200	14.175	36.225	64.575	88.000	137.655	218.000	298.000	421.000
	V60	0.00	4.63	8.379	26.775	57.614	91.000	135.450	214.200	327.600	468.090	723.000
	V90	0.00	6.87	15.404	42.210	88.200	143.010	229.950	349.965	522.900	756.000	1134.000

CONTROL VALVES

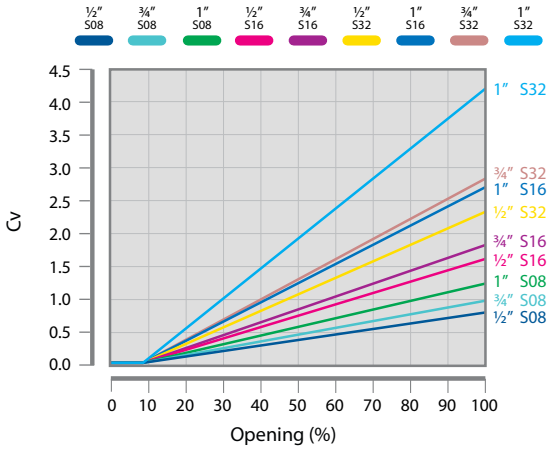
Flow Coefficient - Cv

Valve size	Slot shape	Percent of valve rotation (degree of rotation)					
		0(0)	10(9)	20(18)	30(27)	40(36)	50(45)
½"	0.8	0.00	0.00	0.038	0.078	0.120	0.162
	1.6	0.00	0.00	0.107	0.224	0.347	0.475
	3.2	0.00	0.00	0.187	0.383	0.583	0.770
¾"	0.8	0.00	0.00	0.05	0.11	0.16	0.21
	1.6	0.00	0.00	0.14	0.28	0.43	0.57
	3.2	0.00	0.00	0.23	0.47	0.73	0.98
1"	0.8	0.00	0.00	0.080	0.152	0.225	0.304
	1.6	0.00	0.00	0.238	0.495	0.739	0.988
	3.2	0.00	0.00	0.374	0.765	1.170	1.600

Valve size	Slot shape	Percent of valve rotation (degree of rotation)				
		60(54)	70(63)	80(72)	90(81)	100(90)
½"	0.8	0.202	0.242	0.284	0.324	0.366
	1.6	0.595	0.720	0.840	0.970	1.111
	3.2	0.957	1.152	1.360	1.574	1.800
¾"	0.8	0.27	0.33	0.38	0.44	0.49
	1.6	0.71	0.86	1.01	1.16	1.33
	3.2	1.24	1.50	1.76	2.00	2.30
1"	0.8	0.380	0.463	0.545	0.618	0.710
	1.6	1.232	1.473	1.728	1.965	2.210
	3.2	2.035	2.450	2.900	3.316	3.700

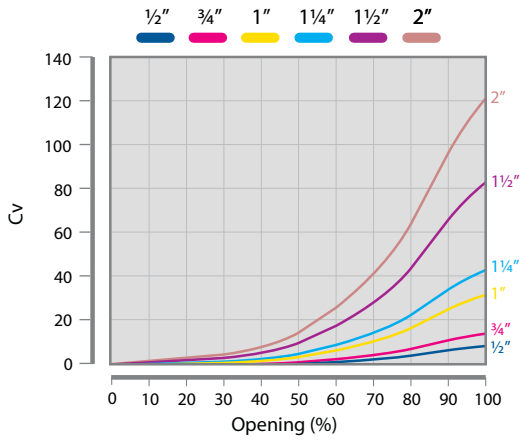
Linear characteristics

½"- 1"



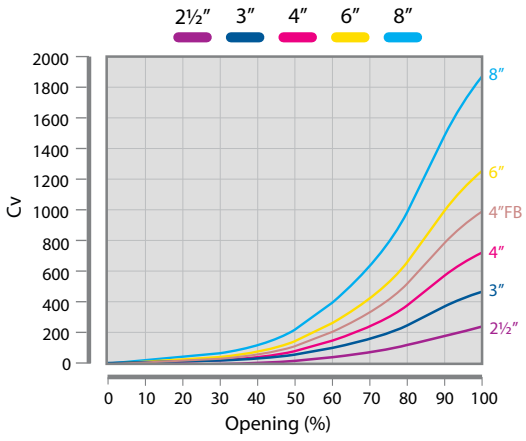
Quick opening characteristics

½"- 2"



Quick opening characteristics

2 ½"- 8"



Valve size	Percent of valve rotation (degree of rotation)										
	0(0)	10(9)	20(18)	30(27)	40(36)	50(45)	60(54)	70(63)	80(72)	90(81)	100(90)
½"	0.00	0.15	0.29	0.46	0.70	1.09	1.76	2.60	4.30	6.40	8.00
¾"	0.00	0.21	0.43	0.70	1.05	1.62	2.64	4.00	6.40	9.60	12.00
1"	0.00	0.58	1.15	1.90	2.80	4.30	7.00	10.50	17.00	26.00	32.00
* 1¼"	0.00	0.83	1.65	2.67	4.05	6.50	10.00	15.20	24.60	36.00	42.80
1½"	0.00	1.48	2.95	4.75	7.20	11.00	18.00	27.00	44.00	65.50	82.00
2"	0.00	2.16	4.33	6.95	10.50	16.20	26.40	39.60	64.00	96.00	120.00
* 2½"	0.00	4.30	9.10	15.60	23.70	34.60	52.50	83.00	126.00	185.00	256.00
3"	0.00	8.20	16.20	26.00	40.00	61.00	100.00	148.00	240.00	360.00	450.00
4"	0.00	13.10	26.00	42.10	63.10	97.20	159.00	238.00	385.00	575.00	720.00
* 4" FB	0.00	16.00	31.00	51.00	76.00	117.00	192.00	288.00	465.00	695.00	870.00
** 6"	0.00	18.40	36.70	59.00	90.00	138.00	224.00	338.00	545.00	815.00	1020.00
** 8"	0.00	34.00	68.00	109.00	165.00	254.00	415.00	620.00	1010.00	1500.00	1880.00

* Available with N47 Series only
** Available with N31/N32 Series only

Manual Control



Habonim has developed a convenient and economical manual operation control valve package that provides a cost effective flow control solution for process applications that do not demand dynamic adjustment or the use of a fully automated control unit with sensors, positioners and various additional control devices. If the flow process is stable and accurate dynamic adjustment is not an issue, then Habonim's manual control package permits manual setting of the process parameters to a specified angular ball position.

Habonim's angular positioning device is comprised of a polished stainless steel 'Scale' (0°- 90°), mounted on top of the valve's ISO pad. The oval handle is designed with an integrated pointer that indicates the angle of the opening position. To avoid unintentional rotation of the valve stem, Habonim offers a special multi-position lockable handle.

D Series

3-Way control valve



"Habonim" D Series 3-way control valve, fitted with a V-Port characterized metal seat, provides accurate diverting or mixing over a wide range of flow rates for various applications.

Diverting

Diverter valves direct flow from the inlet towards two outlets simultaneously. The opening of each outlet port is determined by the process requirement translated into a PLC signal. A T-Port ball lapped with a V-notch metal seat on one side provides equal percentage hydraulic characteristics for the flow process loop. The round port on the other side of the ball re-circulates the surplus flow while eliminating increased pressure in the valve inlet.

Mixing

Mixing valves are designed to combine the flow of two inlets into a single outlet. They are used in industrial applications where specific concentrations must be combined and regulated or their temperature maintained. Optimum performance is achieved with equal pressure on both inlets.

Applications for the D Control Valve Series for both flow configurations (diverting or mixing) include: refineries, chemical plants and oil production, all of which use boilers, coolers, heaters and condensers. They are also ideal for engines, turbines, gear boxes and heat exchanges, where air cooling, fuel and lube oil preheating, co-generation and engine jacket water demand precise control.

The D Series can also be fitted with a range of accessories from position feedback to full control capabilities.

CONTROL VALVE SIZER SOFTWARE (HVS)

Habonim's Valve Sizer Software (HVS)

Habonim Valve Sizer (HVS) is a unique software tool which simplifies the task of selecting the perfect control valve package for most services. HVS has access to a database of over 5,800 different media. Accurate calculations of process Cv, valve opening percentages, velocity, critical condition warnings and predicted noise levels are just some of the many features provided by HVS in a variety of output formats. Operating in accordance with International Standards of IEC60534 and ISA 75-17 1989, HVS can be used for multiple requirements as well as individual packages.



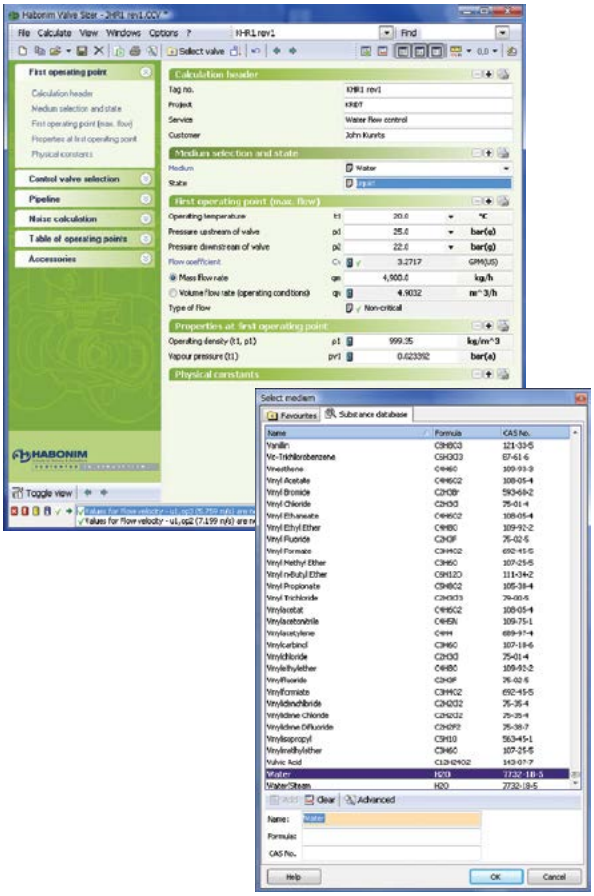
Available to download free of charge from Habonim website: https://www.habonim.com/control-valve-sizer-hvs/

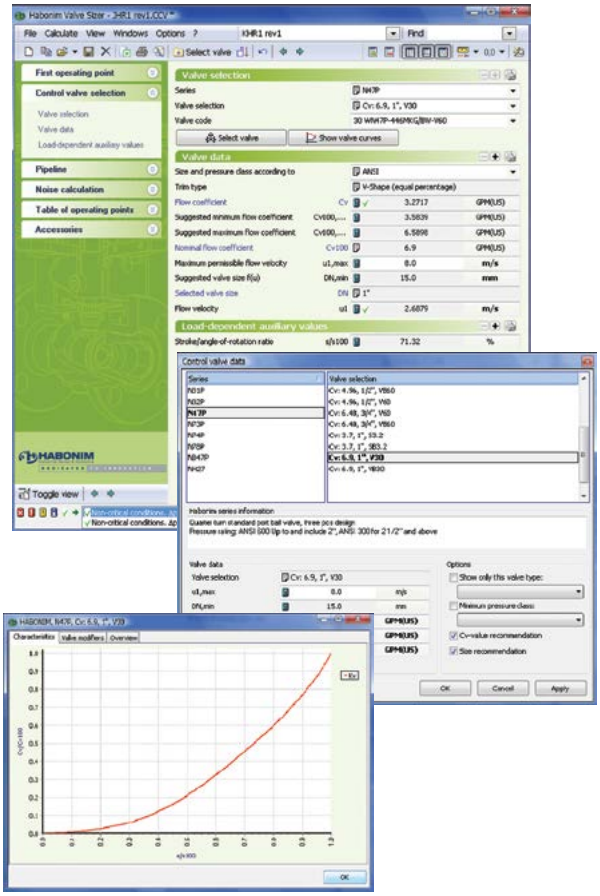
Define the process

HVS leads the engineer step-by-step through all the parameters needed to accurately define the process from the first operating point. Simultaneously, HVS calculates the flow rate according to IEC 60534 and ISA S75-17 1989, including gases and vapors. HVS provides the industry's most comprehensive database of coefficient parameters for more than 5,800 flow media, including density, vapor pressure, critical pressure, and saturated steam temperature at a given pressure.

Select the control valve

With the process now defined, HVS displays a list of all the control valves that meet the process acceptance criteria. Once the desired valve is chosen, HVS indicates the velocity through the valve, angle of rotation, valve modifiers and more.





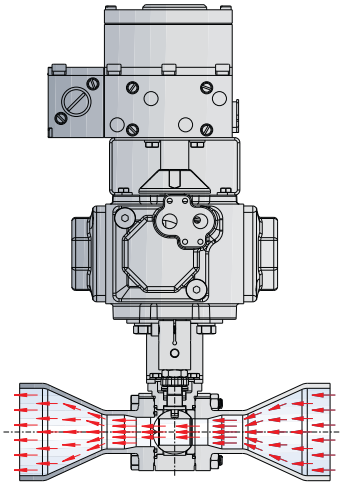
Habonim's Valve Sizer Software (HVS)

Dynamic Cv correction

Unique among industry software tools, HVS automatically performs a correction of the flow rate calculation, taking into account the resistance of installed fittings.

Noise level calculation

Unlike most control sizing software programs, HVS calculate the sound pressure level for both liquids and gases. HVS provides sound pressure level at a distance of 1 m from the valve surface, and then presents the spectrum of sound levels, by frequency, in both table and bar graph format.



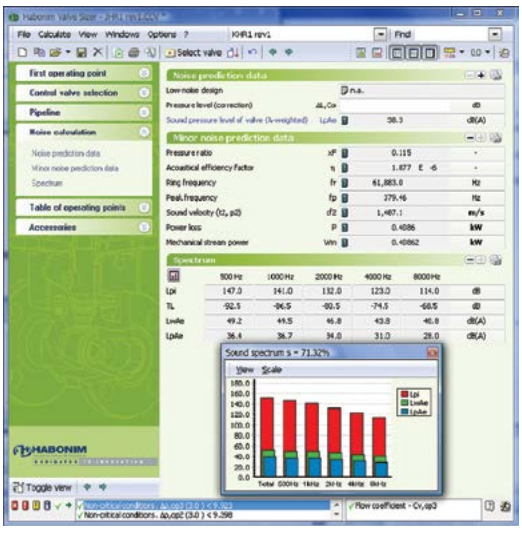
Define multiple operating points (min, mean, max)

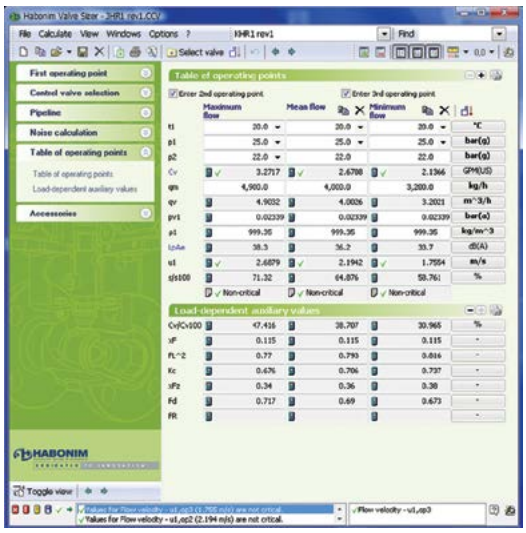
It is easy to add up to two additional operating points. There is no need to re-type the parameters for each additional point - either accept the default values for the maximum flow rate or modify them as needed.

A complete control package!

In the Accessories section you can select the best pneumatic actuator and positioner for safe operation, in accordance with site standards. HVS guides you with simple, drop-down menus to complete the definition of the service point.







CONTROL VALVE SIZER SOFTWARE (HVS)

Generate detailed summary reports

HVS summarizes all the engineering data of the defined control valve configuration in an easy-to-read report. All program inputs, process data, HVS-calculations, fluid and pipe data, valve data can be displayed, in addition to numerous other fields. The HVS summary report can be output in a number of convenient formats including ISA and HVS.

HVS provides many accessible tutorial aids throughout the HVS program, providing answers to most questions. For further assistance, please contact the Habonim support team at: hvs@habonim.com

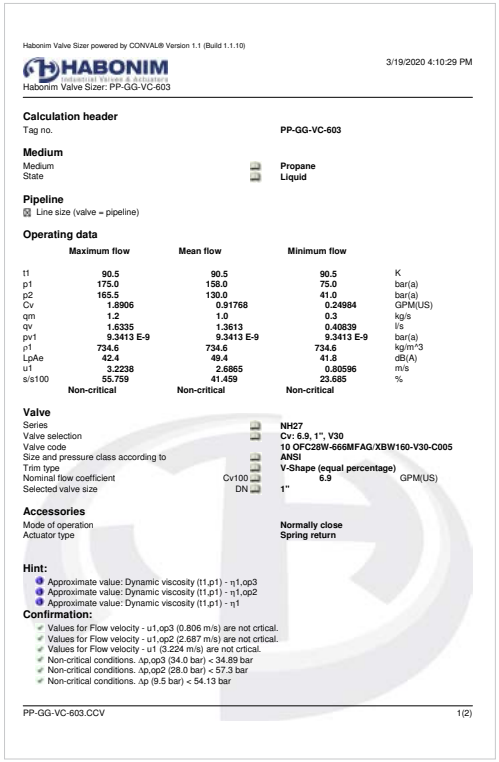
Download HVS at www.habonim.com

You can download a FREE copy of the newest version of HVS from the Habonim website. Follow the installation instructions and save the program to your local workstation.

Once the installation is complete, just click the HVS icon on your desktop or run it from the Windows® Start menu. Email the simple registration form and you will soon receive a personal license code from the HVS support team.

Save the license to your computer and you now have access to this powerful engineering tool.

As an HVS registered user you will benefit from free future software updates, Habonim newsletters, new product announcements and success stories.



Habonim Valve Sizer powered by CONVAL® Version 1.1 (Build 1.1.10)

HABONIM Industrial Valves & Actuators

3/19/2020 4:10:29 PM

Habonim Valve Sizer: PP-GG-VC-603

Calculation header

Tag no. **PP-GG-VC-603**

Medium

Medium **Propane**
State **Liquid**

Pipeline

☒ Line size (valve = pipeline)

Operating data

	Maximum flow	Mean flow	Minimum flow	
t1	90.5	90.5	90.5	K
p1	175.0	158.0	75.0	bar(a)
p2	165.5	130.0	41.0	bar(a)
Cv	1.8906	0.91768	0.24984	GPM(US)
qm	1.2	1.0	0.3	kg/s
qv	1.6335	1.3613	0.40839	l/s
pv1	9.3413 E-9	9.3413 E-9	9.3413 E-9	bar(a)
ρ1	734.6	734.6	734.6	kg/m^3
LpAe	42.4	49.4	41.8	dB(A)
u1	3.2238	2.6865	0.80596	m/s
s/s100	55.759	41.459	23.685	%
	Non-critical	Non-critical	Non-critical	

Valve

Series **NH27**
Valve selection **Cv: 6.9, 1", V30**
Valve code **10 OFC28W-666MFAG/XBW160-V30-C005**
Size and pressure class according to **ANSI**
Trim type **V-Shape (equal percentage)**
Nominal flow coefficient Cv100 **6.9** GPM(US)
Selected valve size DN **1"**

Accessories

Mode of operation **Normally close**
Actuator type **Spring return**

Hint:

- Approximate value: Dynamic viscosity (t1,p1) - η1,op3
- Approximate value: Dynamic viscosity (t1,p1) - η1,op2
- Approximate value: Dynamic viscosity (t1,p1) - η1

Confirmation:

- Values for Flow velocity - u1,op3 (0.806 m/s) are not crtical.
- Values for Flow velocity - u1,op2 (2.687 m/s) are not crtical.
- Values for Flow velocity - u1 (3.224 m/s) are not crtical.
- Non-critical conditions. Δp,op3 (34.0 bar) < 34.89 bar
- Non-critical conditions. Δp,op2 (28.0 bar) < 57.3 bar
- Non-critical conditions. Δp (9.5 bar) < 54.13 bar

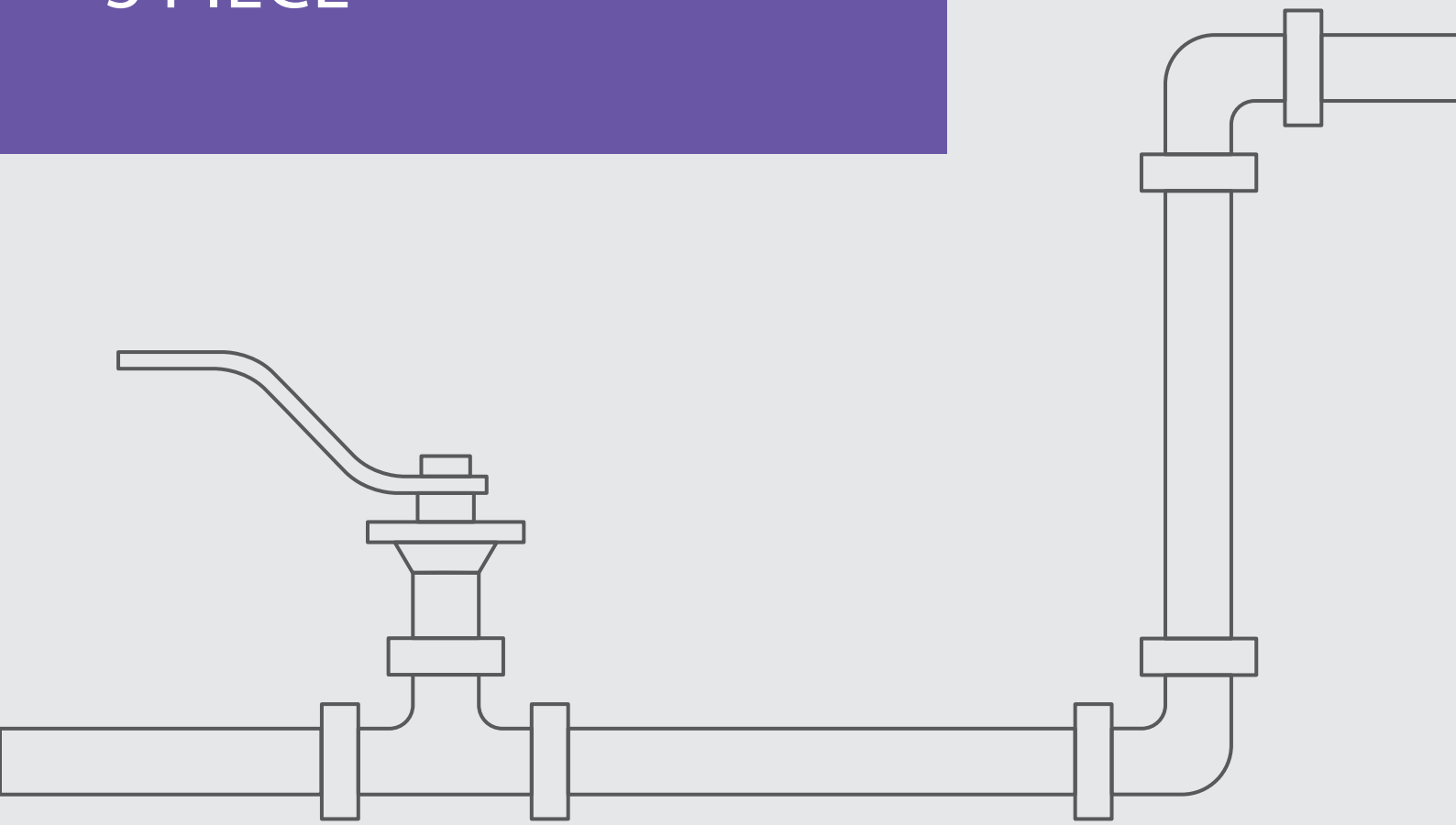
PP-GG-VC-603.CCV 1(2)

N47

Control Valves

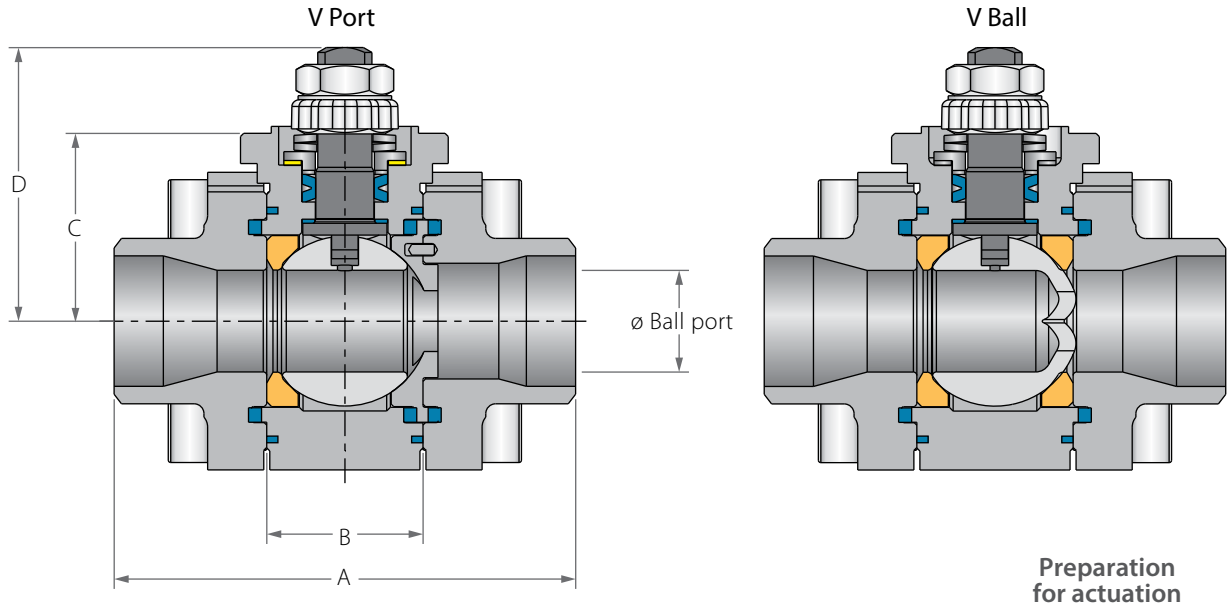
FLOATING BALL

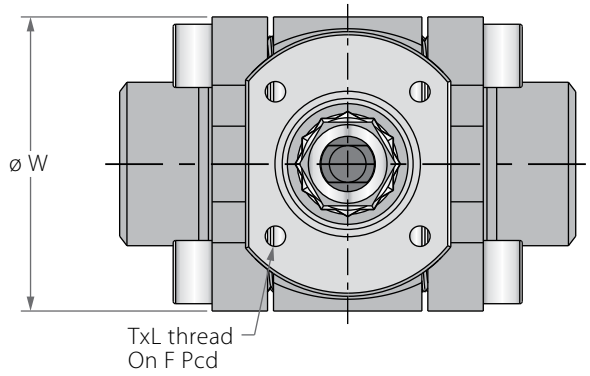
3 PIECE



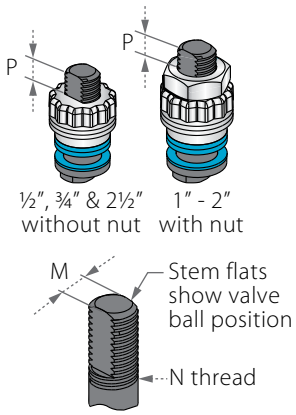
Control Floating Ball 3 Piece

Components & Materials





Preparation for actuation



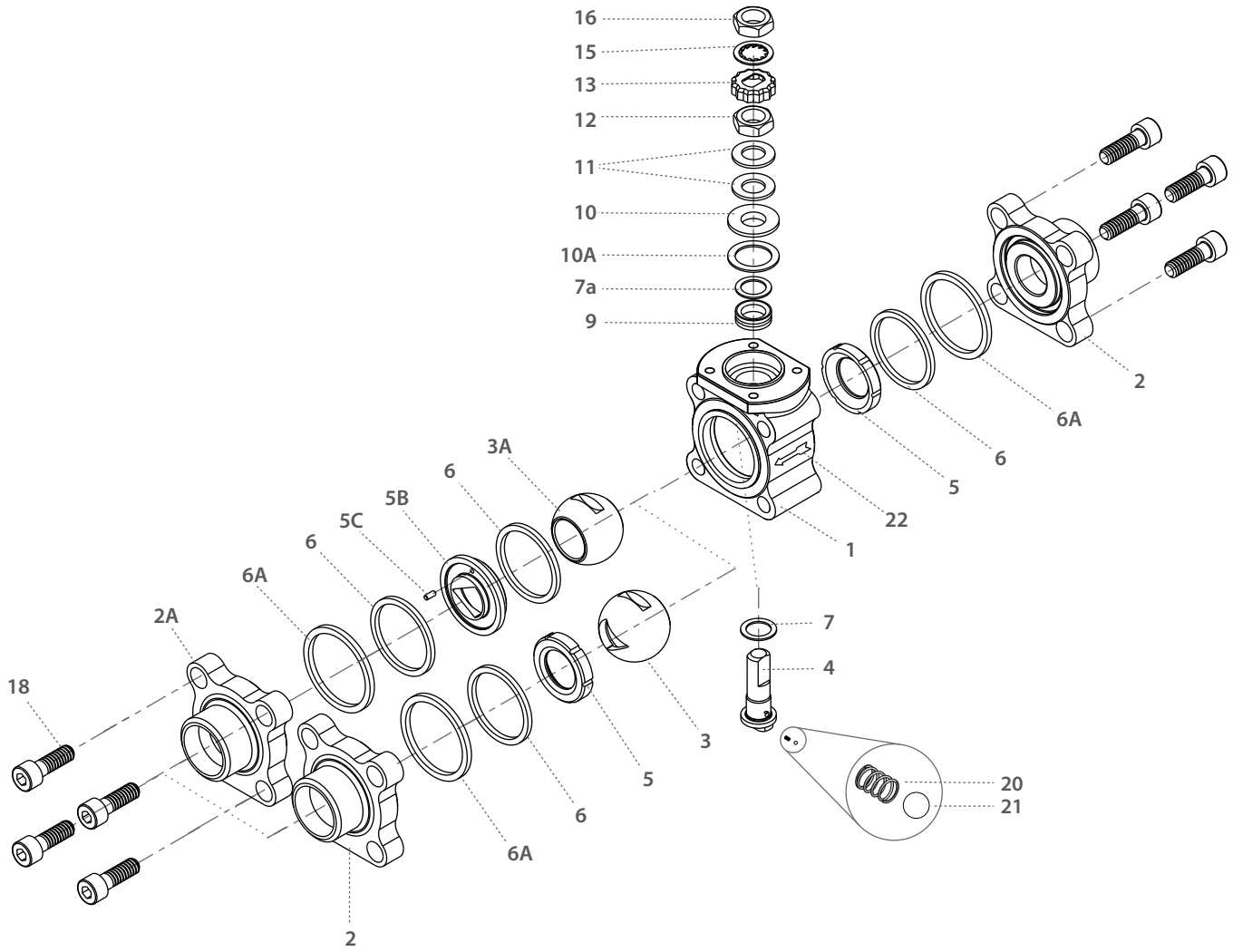
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	W	M	N	P	F		TxL	Weight kg/lb
DN15	DN10	mm	11.15	66.0	20.60	29.0	38.70	47.0	5.54	⅜" UNF	6.65	F03	36.0	M5X10	0.60
½"	⅜"	inch	0.44	2.60	0.81	1.14	1.52	1.85	0.22		0.26		1.42		1.33
DN20	DN15	mm	14.30	70.60	24.50	31.40	40.30	53.70	5.54	⅜" UNF	6.65	F03	36.0	M5X10	0.80
¾"	½"	inch	0.56	2.78	0.97	1.24	1.59	2.11	0.22		0.26		1.42		1.77
DN25	DN20	mm	20.60	93.70	31.70	38.20	55.60	63.70	7.54	7/16" UNF	7.40	F04	42.0	M5X10	1.60
1"	¾"	inch	0.81	3.69	1.25	1.50	2.19	2.51	0.30		0.29		1.65		3.54
DN32	DN25	mm	25.40	108.0	41.30	42.70	60.20	71.70	7.54	7/16" UNF	7.40	F04	42.0	M5X10	2.50
1¼"	1"	inch	1.0	4.25	1.62	1.68	2.37	2.82	0.30		0.29		1.65		5.53
DN40	DN32	mm	31.80	115.50	48.40	43.60	73.0	86.70	8.71	9/16" UNF	8.50	F05	50.0	M6X12	3.60
1½"	1¼"	inch	1.25	4.55	1.91	1.72	2.87	3.41	0.34		0.33		1.97		7.96
DN50	DN40	mm	38.10	128.0	56.30	48.30	77.80	96.90	8.71	9/16" UNF	8.50	F05	50.0	M6X12	4.50
2"	1½"	inch	1.50	5.04	2.22	1.90	3.06	3.82	0.34		0.33		1.97		9.95
DN50	DN50	mm	50.80	158.0	72.60	70.0	88.10	108.0	8.71	9/16" UNF	13.50	F07	70.0	M8X12	9.50
2½"	2"	inch	2.0	6.22	2.86	2.76	3.47	4.25	0.34		0.53		2.76		21.0

(1) 2½" (DN65) size maximum pressure rating is Class 600.

Control Floating Ball 3 Piece

Components & Materials



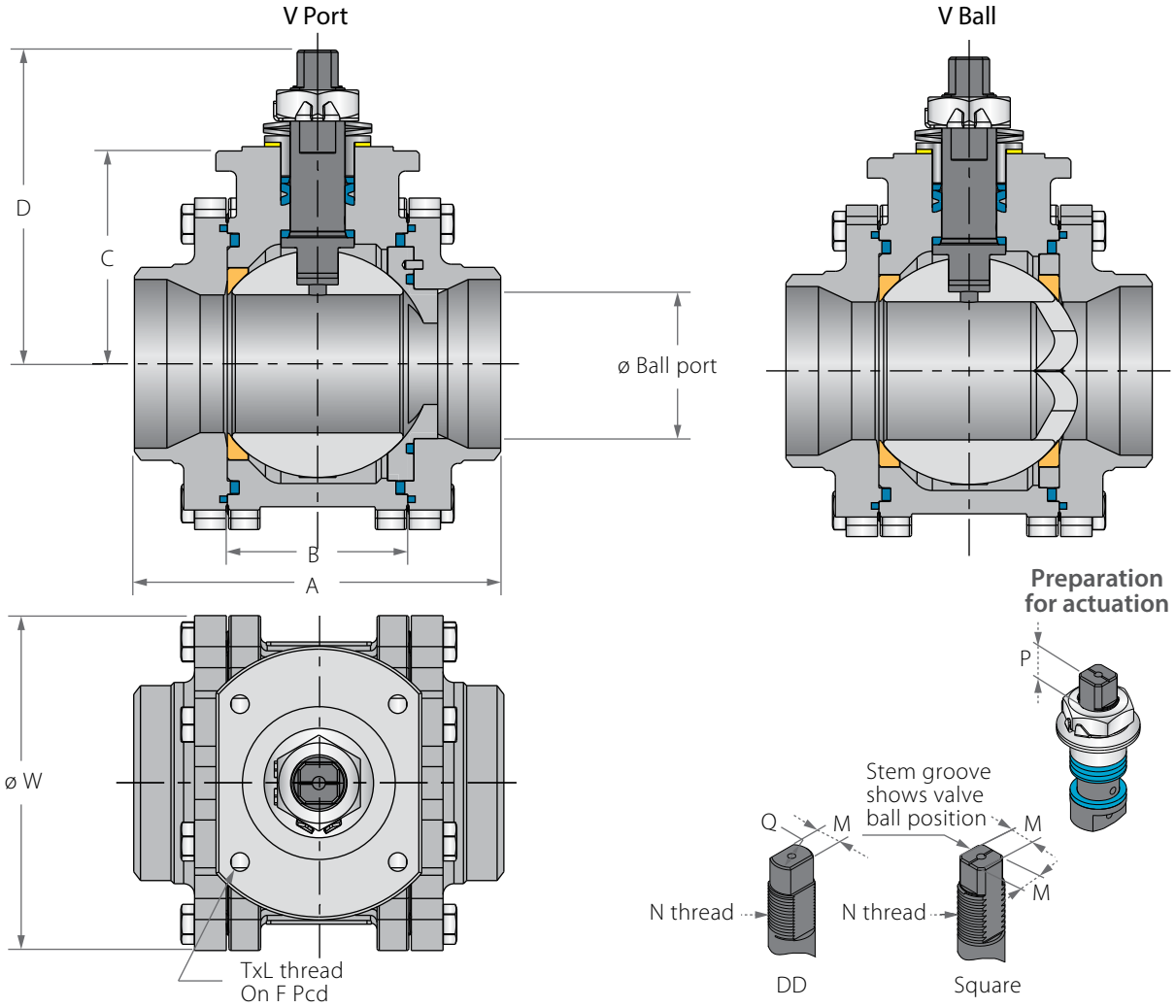
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1-2
2A	V- Port End	Acc. Ordering Code	1
3	V Ball	Acc. Ordering Code	1
3A	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	1-2
5B	V Seat	Acc. Ordering Code	1
5C	Dowel Pin	S. Steel	1
6*	Body Seal	Acc. Ordering Code	2-3
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1

Item	Description	Material specification	Qty.
7a*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
16	Handle Nut	S. Steel	1
18	Body Bolts	S. Steel	8
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

Control Floating Ball 3 Piece

Valve Dimensions

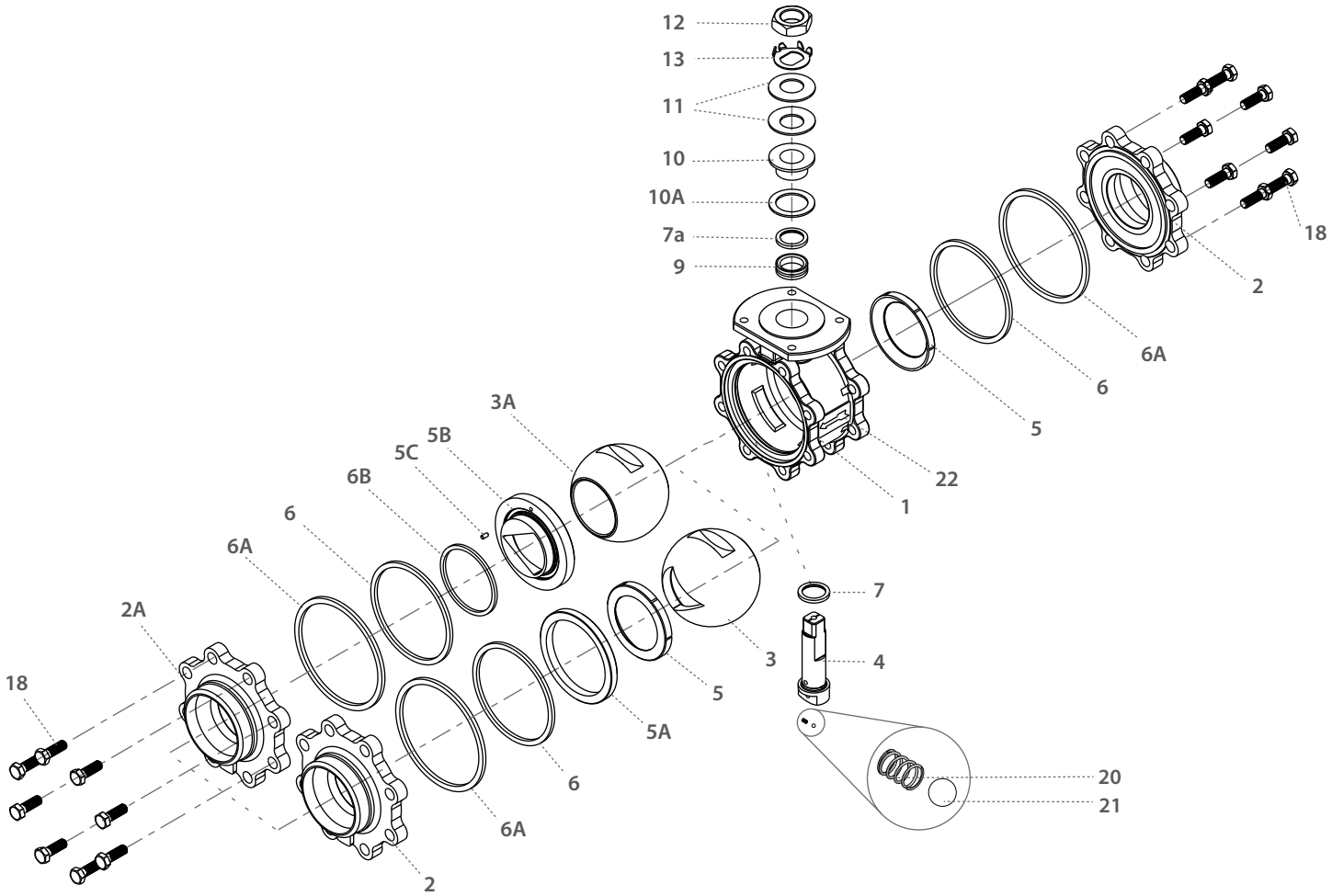


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	W	M	N	P	Q	F		TxL	Weight kg/lb
DN80	DN65	mm	63.50	169.0	83.30	98.30	144.90	140.0	18.90	1"-14 UNS-2A	16.70	22.70	F10	102.0	M10x20	13.70
3"	2½"	inch	2.50	6.65	3.28	3.87	5.71	5.50	0.74		0.66	0.89		4.02		30.30
DN100	DN80	mm	82.60	214.0	108.80	114.10	160.70	177.0	18.90	1"-14 UNS-2A	16.70	22.70	F10	102.0	M10x20	23.70
4"	3"	inch	3.25	8.43	4.28	4.49	6.33	6.97	0.74		0.66	0.89		4.02		52.40
	DN100	mm	100.0	239.0	123.0	124.0	170.50	217.0	18.90	1"-14 UNS-2A	16.70	22.70	F10	102.0	M10x20	30.00
	4"	inch	3.94	9.41	4.84	4.88	6.71	8.54	0.74		0.66	0.89		4.02		66.30

Control Floating Ball 3 Piece

Valve Dimensions



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1-2
2A	V-End	Acc. Ordering Code	1
3	V-Ball	Acc. Ordering Code	1
3A	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	1-2
5A	Seat Support	S. Steel	1
5B	V Seat	Acc. Ordering Code	1
5C	Dowel Pin	S. Steel	1
6*	Body Seal	Acc. Ordering Code	2
6A	Outer Seal	Acc. Ordering Code	2
6B	Seat Seal	Acc. Ordering Code	1

Item	Description	Material specification	Qty.
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7a*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
18	Body Bolts	S. Steel	16
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

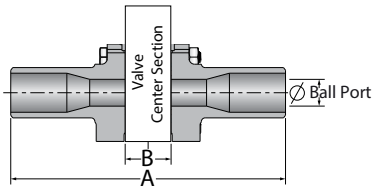
* Maintenance Kit Component

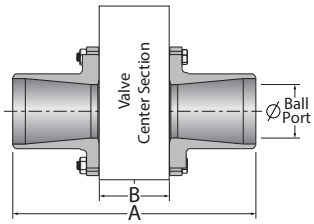
Face To Face Sizes

Valve Size	Unit	B		A-XBW / ETI / ETD		A-ETO	A-Flanged CLASS 150 FTF CLASS 300		A-Flanged CLASS 300 FTF CLASS 300		A-Flanged CLASS 600 FTF CLASS 600		A-Flanged DIN PN16-PN100		A-TC
		Std. port	Full port	Std. port	Full port	Std. port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Full port
DN10	mm	20.6	20.6	140.6	143	108.6									
⅜"	inch	0.8	0.8	5.5	5.6	4.3									
DN15	mm	20.6	24.6	140.6	147.0	137.0	140.0	140.0	140.0	140.0	165.0	140.0*	130.0	130.0	88.8
½"	inch	0.8	1.0	5.5	5.8	5.4	5.5	5.5	5.5	5.5	6.5	5.5*	5.1	5.1	3.5
DN20	mm	24.6	31.7	147.0	168.7	147.0	152.0	152.0	152.0	152.0	152.0*	152.0*	150.0	150.0	101.6
¾"	inch	1.0	1.2	5.8	6.6	5.8	6.0	6.0	6.0	6.0	6.0*	6.0*	5.9	5.9	4.0
DN25	mm	31.7	41.3	168.7	179.3	164.1	165.1	165.1	165.1	165.1	216.0	165.1*	160.0	160.0	114.3
1"	inch	1.2	1.6	6.6	7.1	6.5	6.5	6.5	6.5	6.5	8.5	6.5*	6.3	6.3	4.5
DN32	mm	41.3	48.4	179.3	189.4	179.3	178.1	178.1	178.1	178.1	178.1*	178.1*	180.0	180.0	
1¼"	inch	1.6	1.9	7.1	7.5	7.1	7.0	7.0	7.0	7.0	7.0*	7.0*	7.1	7.1	
DN40	mm	48.4	56.3	189.4	200.3	184.0	190.0	190.0	190.0	190.0	241.0	190.0*	200.0	200	139.8
1½"	inch	1.9	2.2	7.5	7.9	7.2	7.5	7.5	7.5	7.5	9.5	7.5*	7.9	7.9	5.5
DN50	mm	56.3	72.6	200.3	232.6	193.5	216.1	216.1	216.1	216.1	292.0	216.1*	230.0	230.0	158.9
2"	inch	2.2	2.9	7.9	9.2	7.6	8.5	8.5	8.5	8.5	11.5	8.5*	9.0	9.0	6.3
DN65	mm	72.6	83.4	232.6	283.4	222.6	241.0	241.0	241.0	241.0	241.0*	330.0	230.0	270.0	213
2½"	inch	2.9	3.3	9.2	11.2	8.8	9.5	9.5	9.5	9.5	9.5*	13.0	9.1	10.6	8.4
DN80	mm	83.4	108.8	283.4	348.8	250.4	282.0	282.0	282.0	282.0	356.0	356.0	280.0	310.0	215.8
3"	inch	3.3	4.3	11.2	13.7	9.9	11.1	11.1	11.1	11.1	14.0	14.0	11.0	12.2	8.5
DN100	mm	108.8	123.0	348.8	390.0	348.8	305.0	305.0	305.0	305.0	432.0	432.0	350.0	350.0	245.4
4"	inch	4.3	4.8	13.7	15.4	13.7	12.0	12.0	12.0	12.0	17.0	17.0	13.78	13.78	9.7
DN150	mm	146.1	180	444.1	180.0	444.1	403.1	403.1	403.1	403.1	559.0	559.0	350.0	480.0	146.1
6"	inch	5.8	7.1	17.5	7.1	17.5	15.9	15.9	15.9	15.9	22.0	22.0	13.78	18.9	5.8

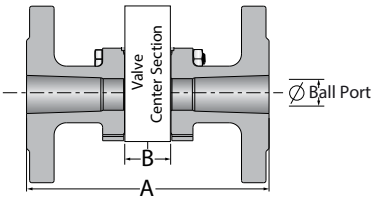
* Complay with class 300 FTF

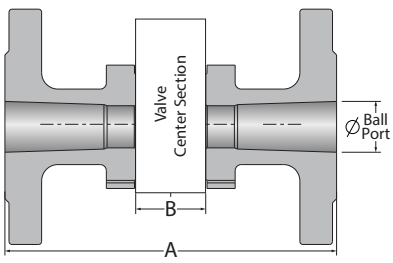
XBW / ETO / ETI / ETD



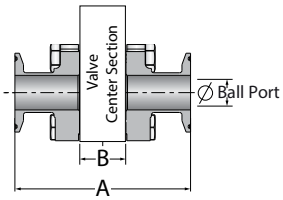


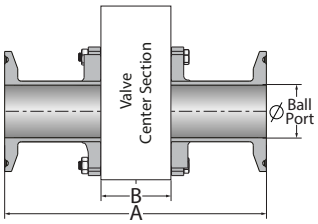
Flanged





TC





Control Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	...	28	29	30
4	0			F	N	4	7	W	-	6	M	6	M	A	T	S	/	B	W			-	S	0	8	-	
Size		Features				Series		Design		Body material	Ends material	Ball/Stem material		Seat material	Inner Seal	Outer Seal		End Connection					Control Feature				Special features

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100

Features (3-6)	
N	Control valve
F	Fire safe
B	Full port
O	Oxygen service
C	Cryogenic [R]
Z	High Temp. (MTM) [R]
H*	Hydrogen Service

* for material selection - see Hydrogen Service chapter

Series (7-8)	
47	Floating ball 3 piece

Design (9)	
W	Total HermetiX Integrity package
G	Total HermetiX Integrity package - FDA compliant

Body material (11) [R]
Per base series

Ends material (12) [R]
Per base series

Ball material (13)	
6*	S. SteelCF8M/CF3M
W**	Hastelloy-C22
S**	254SMO
D**	Duplex
K**	Super Duplex
7**	Monel
A**	Alloy-20
C**	Hastelloy-C276

* V-port must use St. St. St. St. is optional for V-ball
** V-ball only

Stem Material (14)	
M	High Strength S. Steel
6	S. Steel316L
Z	Inconel 718
W	Alloy-C22
S	254SMO A479
A	Alloy-20
D	Duplex A479
K	Super Duplex A479
7	Monel
C	Hastelloy-C276

Seat material (15)	
P	CF PTFE
K	CF PEEK
A	TFM

Inner Seal material (16) [R]
Per base series

Outer Seal material (17) [R]
Per base series

End connections (19-23) [R]
Per base series

Control Feature (24-28)	
V-Port	
S08*	0.8mm Slot on downstream seat
S16*	1.6mm Slot on downstream seat
S32*	3.2mm Slot on downstream seat
V30	V30° Shape on downstream seat
V60	V60° Shape on downstream seat
V90	V90° Shape on downstream seat

* Up to 1"

V-Ball	
SB08*	0.8mm Slot on ball
SB16*	1.6mm Slot on ball
SB32*	3.2mm Slot on ball
VB30	V30° Shape on ball
VB60	V60° Shape on ball
VB90	V90° Shape on ball

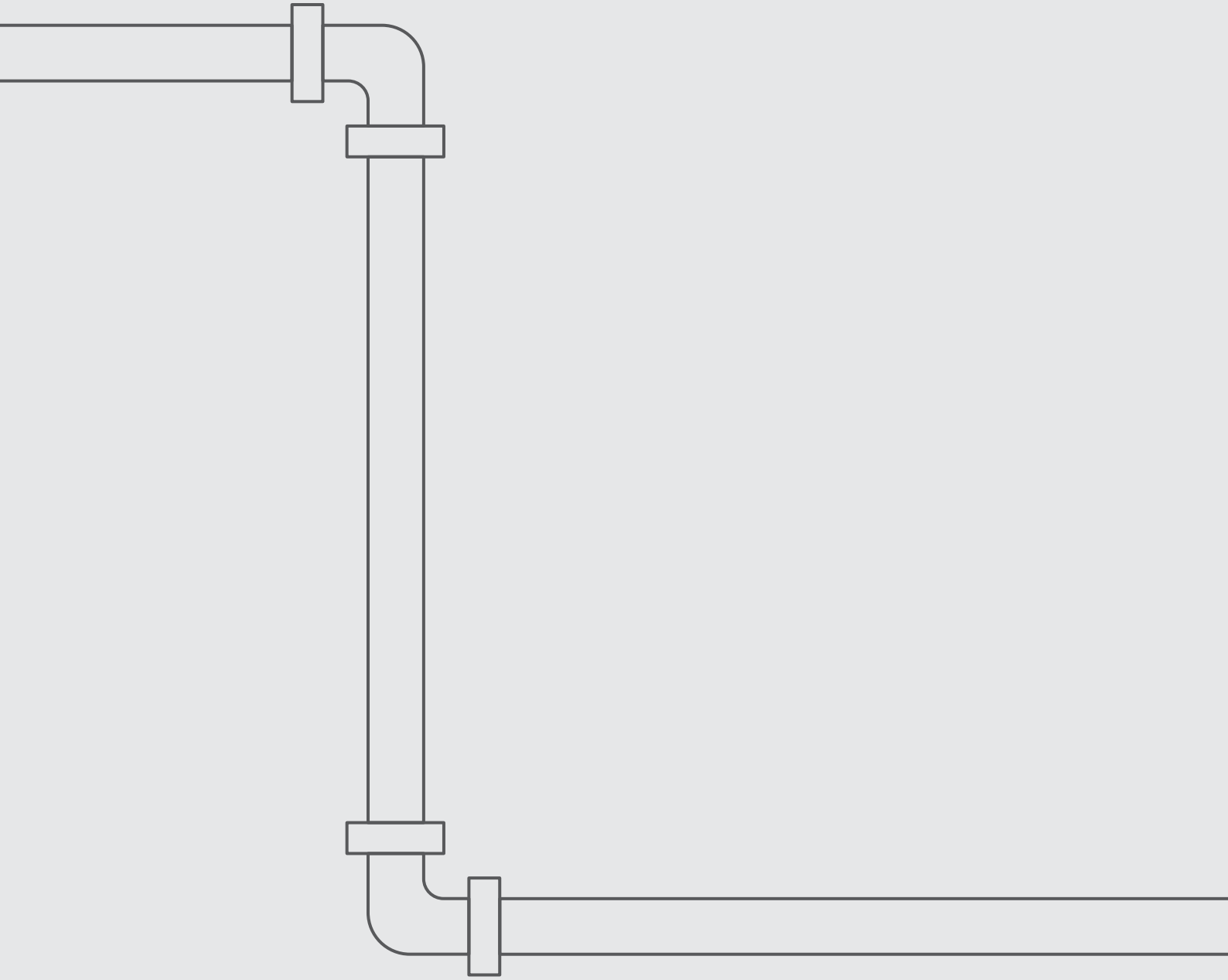
* Up to 1"

Hardening	
I	Cr3C2 - Chromium Carbide with Nickel Chrome binder - HVOF technique
O	WC-Co - Tungsten Carbide with Cobalt binder - HVOF technique

Special Features (30-...) [R]	
SRS	Self Relief Seat
B	Body made from barstock
EP	Electropolished
J2N05	Jacketed valve - number of ports(2), type(NPT) and size(½")

Valve Special Stem Seals
Per base series

[R]:
- For Cryogenic CNxx valve see options in Cryogenic chapter.
- For High Temp. (MTM) ZNxx valve see options in High Temp. (MTM) chapter.

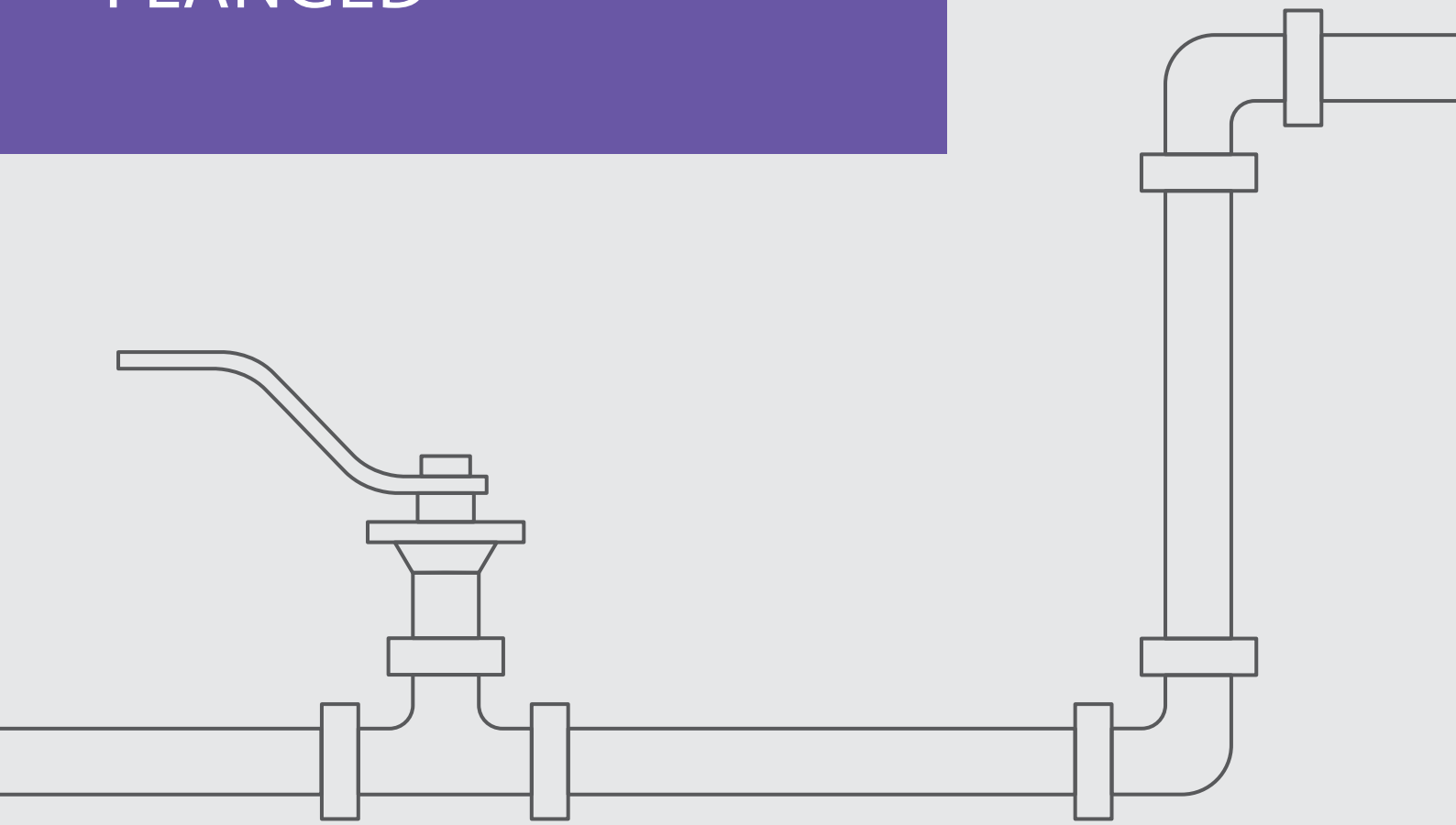


N31 N32 N73 N74 N77 N78

Control Valves

FLOATING BALL

FLANGED

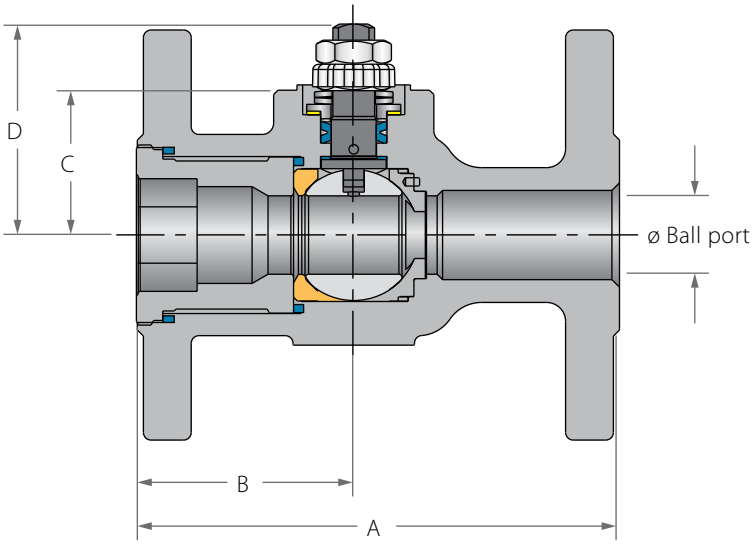


N31 N32 ½"-2" | DN15-DN50 | ANSI CLASS 150/300

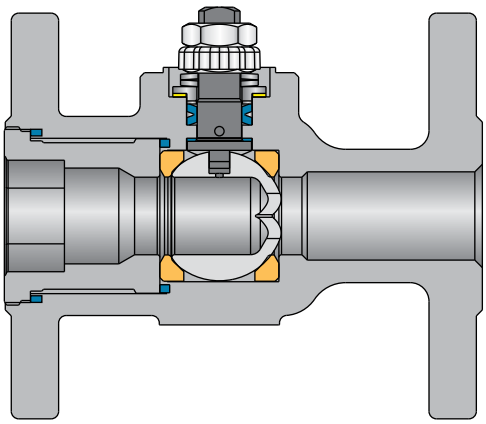
Control Flanged Floating Ball

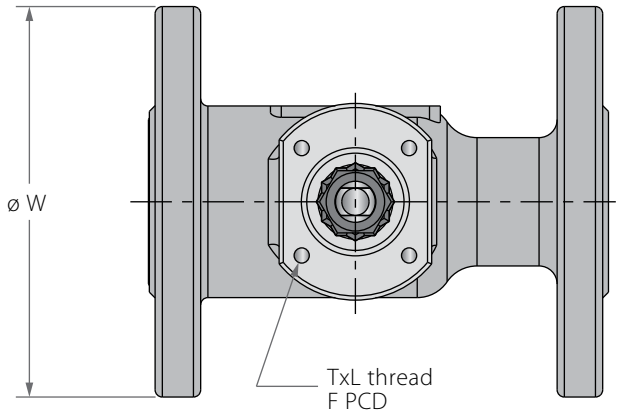
Valve Dimensions

V Port

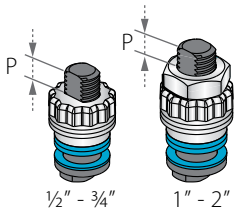


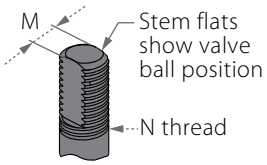
V Ball





Preparation for actuation

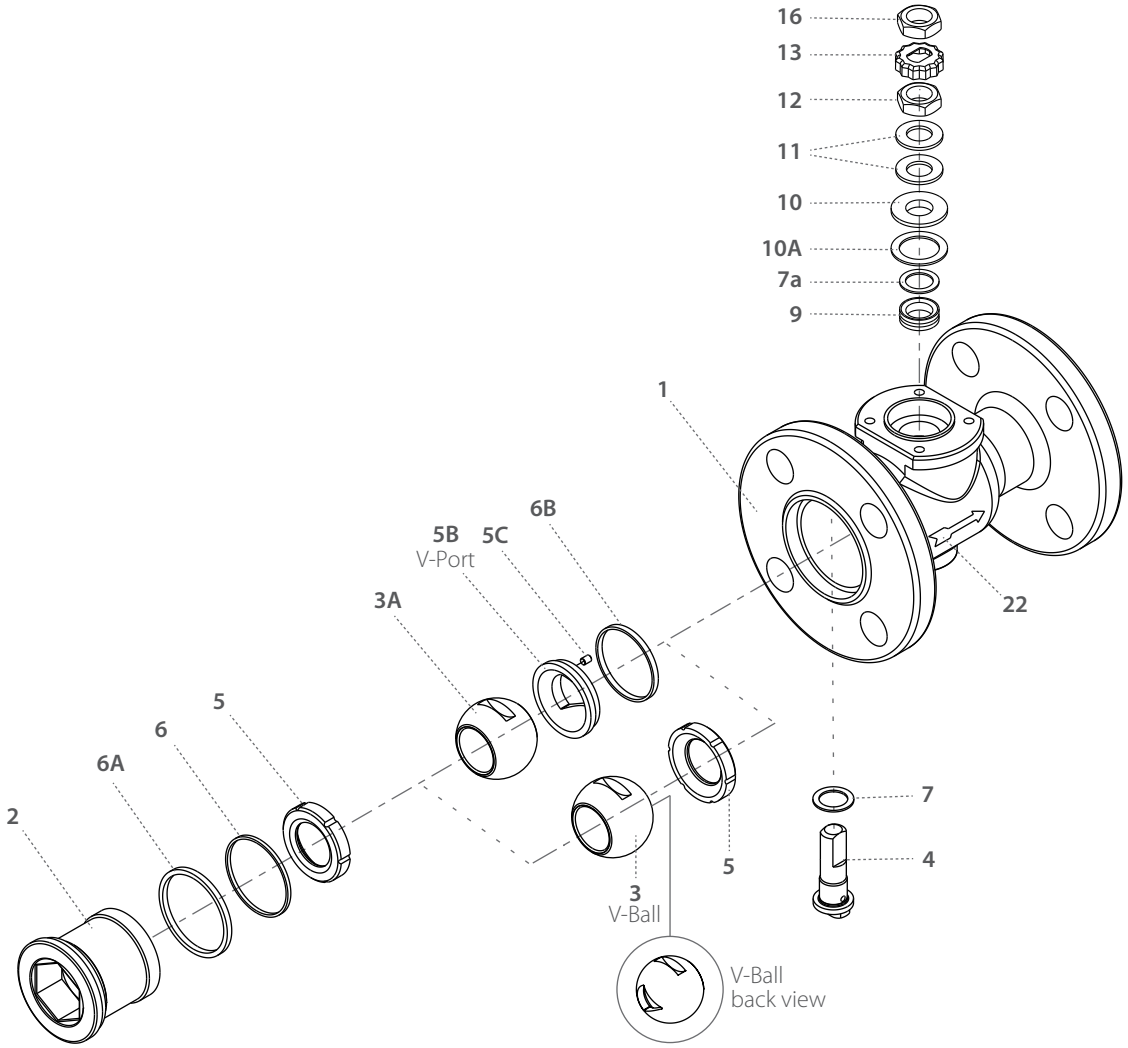




Std. port	Unit	Ball port	A		B	C	D	W		M	N	P	F		TxL	Weight kg/lb	
			150	300				150	300							150	300
DN15	mm	11.15	108.0	140.0	46.0	29.0	38.0	88.90	95.25	5.54	⅜" UNF	6.65	F03	36.0	M5x10	1.70	2.40
½"	inch	0.44	4.25	5.50	1.81	1.14	1.50	3.50	3.75	0.22		0.26		1.42		3.80	5.30
DN20	mm	14.30	117.0	152.0	49.0	31.40	40.30	98.55	163.07	5.54	⅜" UNF	6.65	F03	36.0	M5x10	2.30	3.30
¾"	inch	0.56	4.61	6.0	1.93	1.24	1.59	3.88	6.42	0.22		0.26		1.42		5.10	7.30
DN25	mm	20.60	127.0	165.0	57.0	38.20	55.60	107.95	123.95	7.54	7⁄16" - UNF	7.40	F04	42.0	M5x10	3.10	4.60
1"	inch	0.81	5.0	6.50	2.25	1.50	2.19	4.25	4.88	0.30		0.29		1.65		7.30	10.20
DN40	mm	31.80	165.0	190.0	62.0	43.60	73.10	127.0	155.52	8.71	9⁄16" - UNF	8.50	F05	50.0	M6x12	5.50	8.70
1½"	inch	1.25	6.50	7.50	2.44	1.72	2.88	5.0	6.10	0.34		0.33		1.97		12.20	19.30
DN50	mm	38.20	178.0	216.0	68.0	48.30	77.80	152.40	165.10	8.71	9⁄16" - UNF	8.50	F05	50.0	M6x12	8.10	10.80
2"	inch	1.50	7.0	8.50	2.67	1.90	3.06	6.0	6.50	0.34		0.33		1.97		18.00	24.00

Control Flanged Floating Ball

Components & Materials



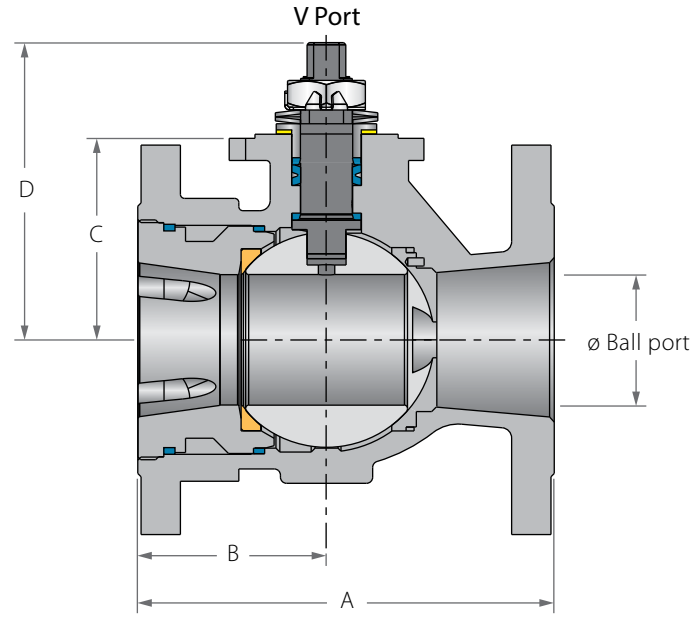
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	V Ball	Acc. Ordering Code	1
3A	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	1-2
5B	V Seat	Acc. Ordering Code	1
5C	Dowel Pin	S. Steel	1
6*	Body Seal	PTFE	1
6a*	Outer Seal	Acc. Ordering Code	1
6B*	Seat Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1

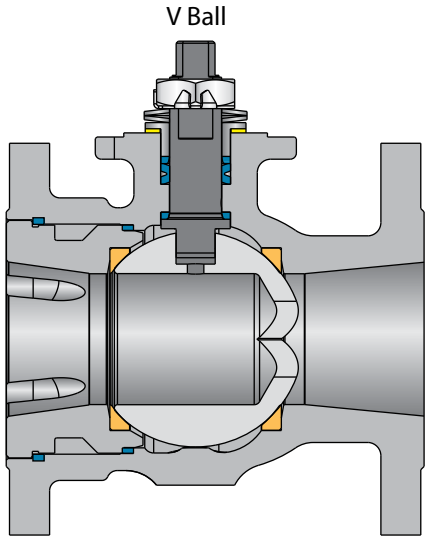
Item	Description	Material specification	Qty.
7a*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
16	Handle Nut	S. Steel	1
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

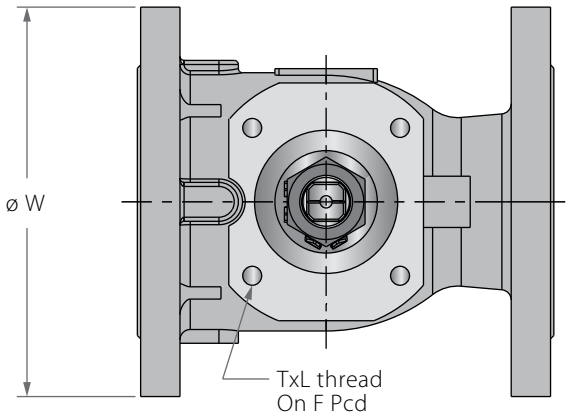
* Maintenance kit components

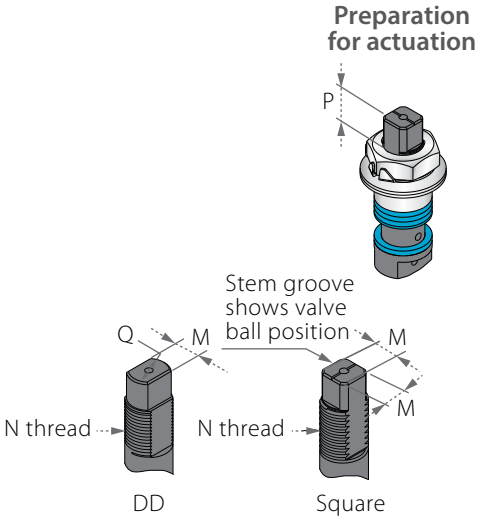
Control Flanged Floating Ball

Valve Dimensions





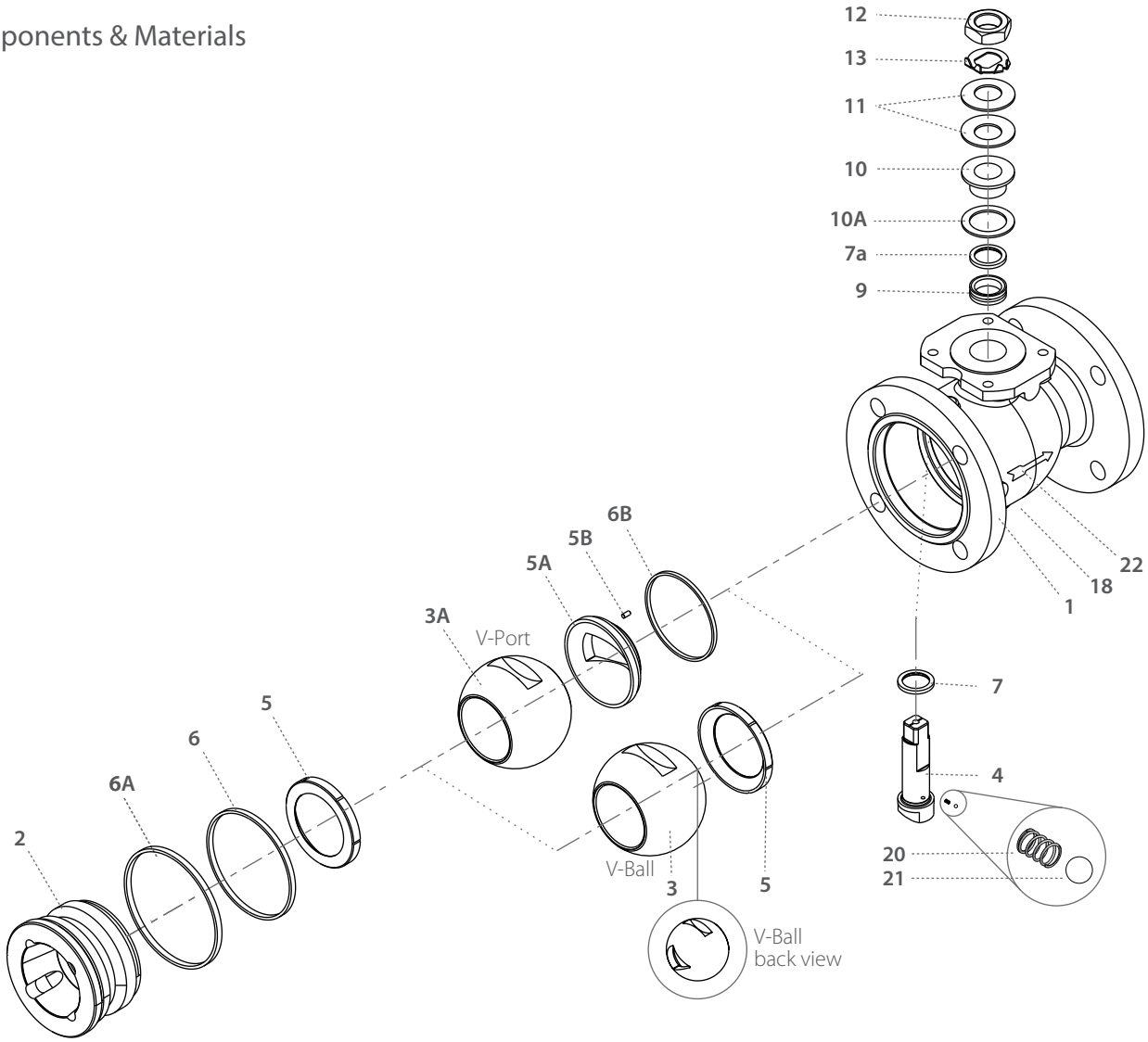




Std. port	Unit	Ball port	A		B	C	D	W		M	N	P	Q	F		TxL	Weight kg/lb	
			150	300				150	300								150	300
DN80	mm	63.50	203.0	284.0	92.0	98.40	145.0	190.50	209.55	18.90	1" - 14 UNS-2A	16.70	22.70	F10	102.0	M10x20	18.00	22.70
3"	inch	2.50	8.0	11.18	3.62	3.88	5.72	7.50	8.25	0.74		0.66	0.89		4.02		40.00	50.40
DN100	mm	82.60	229.0	305.0	102.0	114.10	161.0	228.60	254.0	18.90	1" - 14 UNS-2A	16.70	22.70	F10	102.0	M10x20	28.20	36.30
4"	inch	3.25	9.0	12.0	4.0	4.49	6.34	9.0	10.0	0.74		0.66	0.89		4.02		62.80	80.60
DN150	mm	111.10	267.0	403.20	108.0	157.40	226.0	279.40	317.50	28.45	1½" - 12 UNF-2A	26.20	35.20	F12	125.0	M12x20	41.00	69.00
6"	inch	4.38	10.50	15.88	4.25	6.20	8.91	11.0	12.50	1.12		1.03	1.39		4.92		91.00	153.00
DN200	mm	144.40	292.0	419.0	163.50	185.20	254.0	342.90	381.0	28.45	1½" - 12 UNF-2A	26.20	35.20	F12	125.0	M12x20	82.00	105.00
8"	inch	5.68	11.50	16.50	5.37	7.30	10.0	13.50	15.0	1.12		1.03	1.39		4.92		182.00	233.00

Control Flanged Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	V Ball	Acc. Ordering Code	1
3A	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	1-2
5A	V Seat	A479 316L	1
5B	Dowel Pin	Acc. Ordering Code	1
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
6B*	Seat Seal	Acc. Ordering Code	1

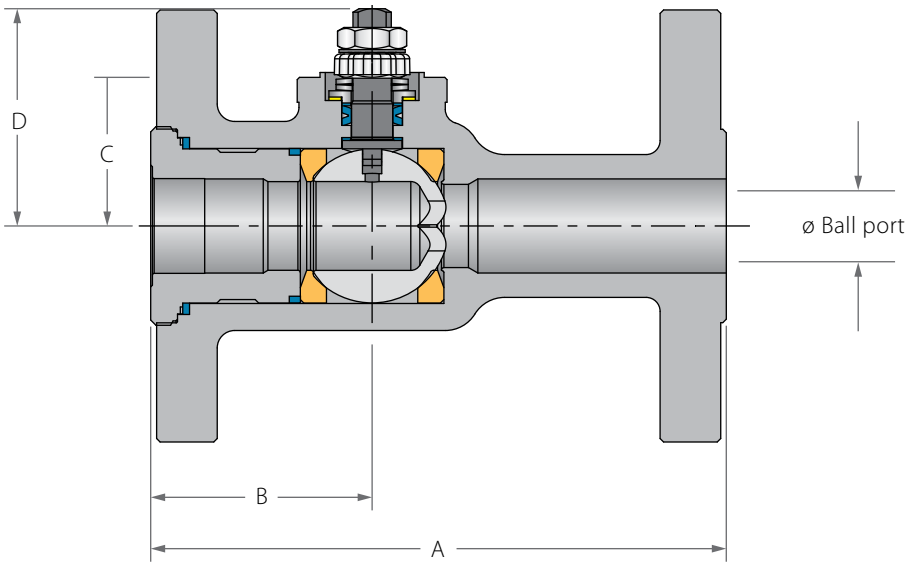
Item	Description	Material specification	Qty.
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7a*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

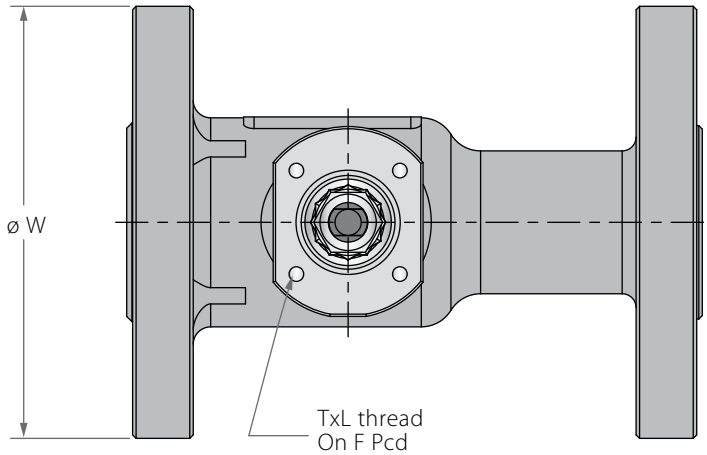
* Maintenance kit components

N73 N74 ½"-1" | DN15-DN25 | ANSI CLASS 150/300

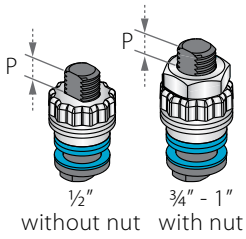
Control Flanged Floating Ball

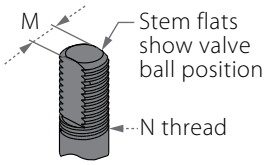
Valve Dimensions





Preparation for actuation

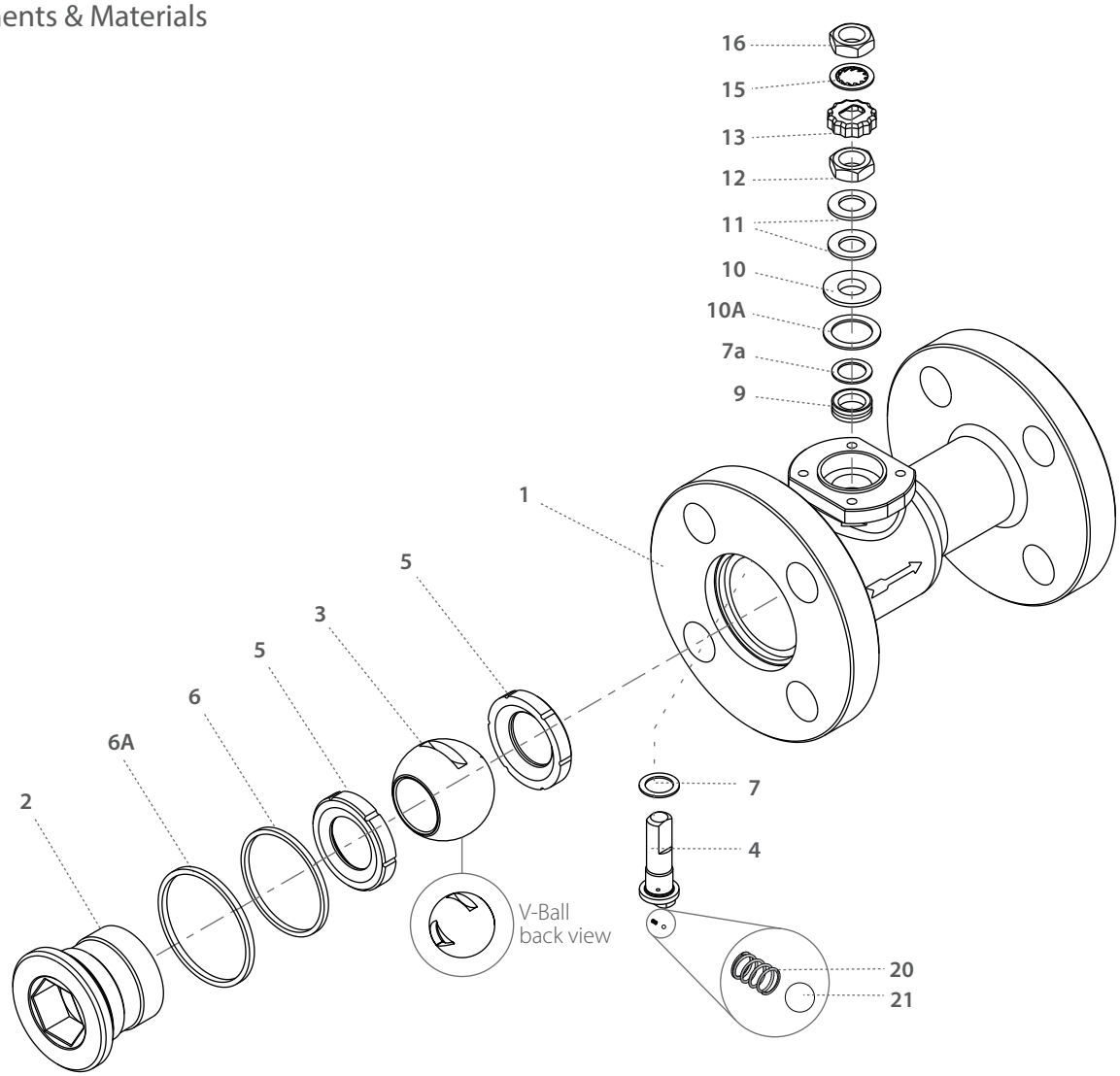




Std. port	Unit	Ball port	A		B	C	D	W		M	N	P	F		TxL	Weight kg/lb	
			150	300				150	300							150	300
DN15	mm	14.30	108.0	140.0	47.0	31.40	40.50	89.0	95.0	5.54	⅜" UNF	11.10	F03	36.0	M5x10	1.80	2.30
½"	inch	0.56	4.25	5.51	1.85	1.24	1.59	3.50	3.74	0.22		0.44		1.42		4.00	5.10
DN20	mm	20.60	117.0	152.0	57.0	38.20	55.60	98.0	117.0	7.54	7/16" UNF	15.40	F04	42.0	M5x10	2.20	3.30
¾"	inch	0.81	4.61	5.98	2.24	1.50	2.19	3.86	4.61	0.30		0.61		1.65		4.80	7.30
DN25	mm	25.40	127.0	165.0	62.0	42.70	60.30	108.0	124.0	7.54	7/16" UNF	15.40	F04	42.0	M5x10	3.20	4.60
1"	inch	1.0	5.0	6.50	2.44	1.68	2.37	4.25	4.88	0.30		0.61		1.65		7.00	10.10

Control Flanged Floating Ball

Components & Materials



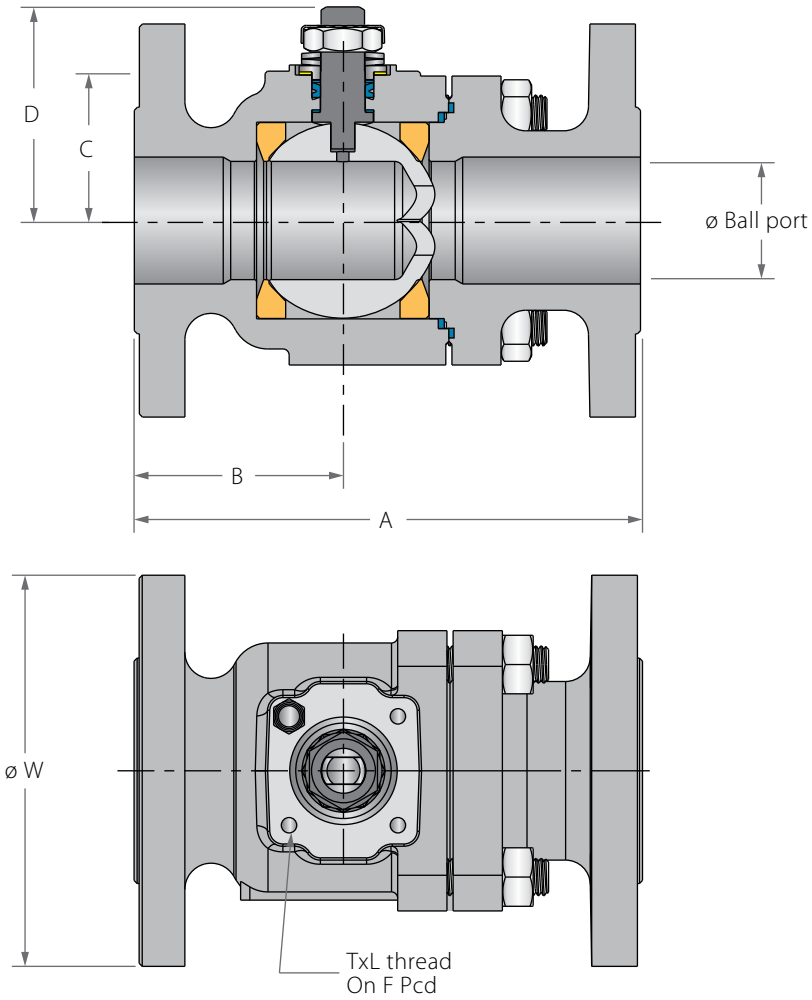
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Insert	Acc. Ordering Code	1
3	V-Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	CF PEEK, PCTFE, CF PTFE	1
7a*	Anti-Abrasion Ring	CF PEEK, PCTFE, CF PTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

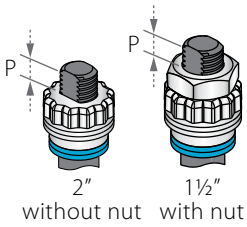
* Maintenance Kit Component

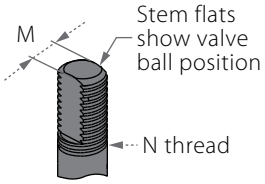
Control Flanged Floating Ball

Valve Dimensions



Preparation for actuation

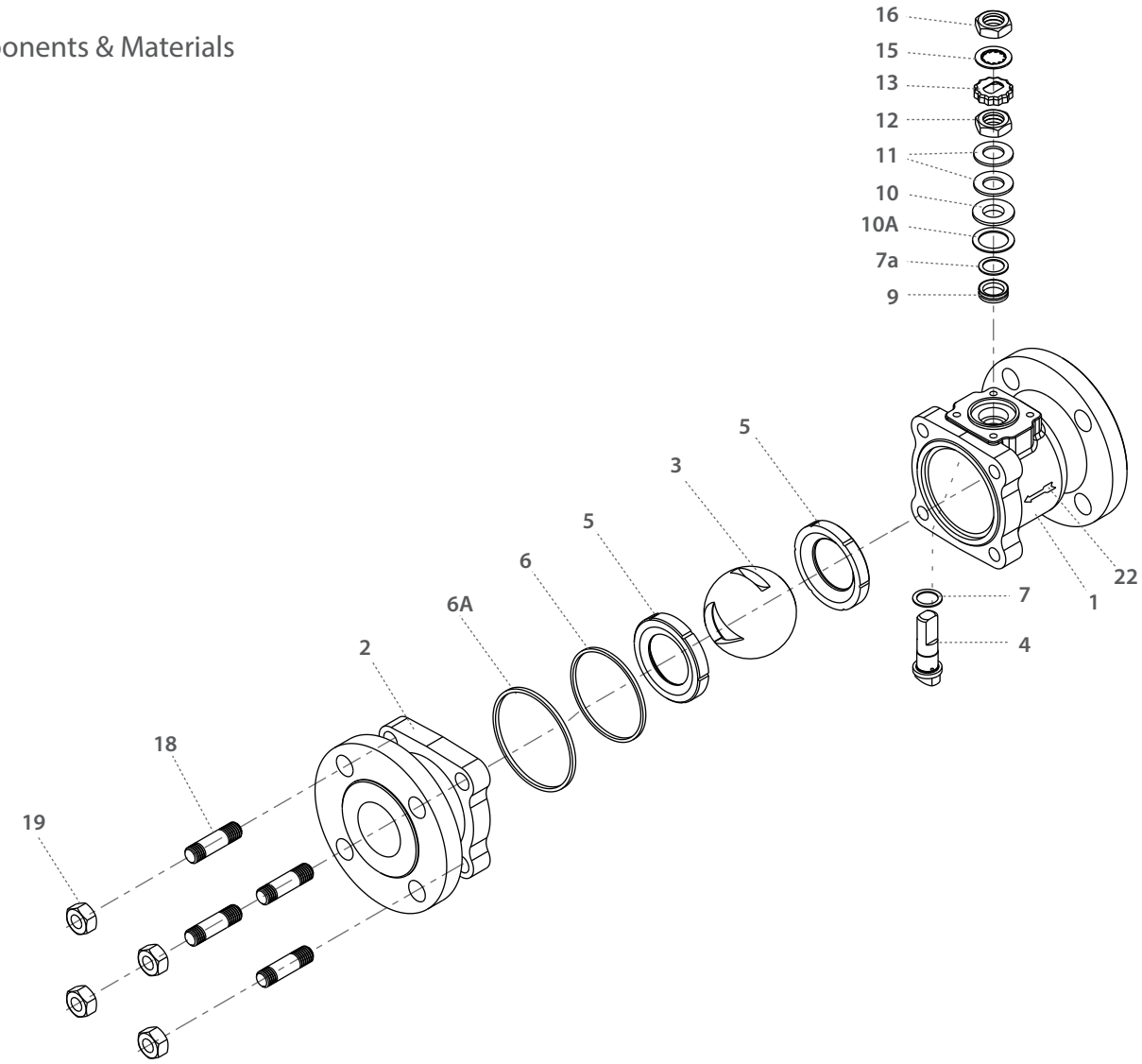




Std. port	Unit	Ball port	A		B		C	D	H	S	W		M	N	P	F		TxL	Weight kg/lb	
			150	300	150	300					150	300							150	300
DN32	mm	31.8	140.0	178.0	59.0	-	49.0	73.0	120.5	220.1	115.0	135.0	8.71	9⁄16" UNF	8.5	F05	50.0	M6x12	-	-
1¼"	inch	1.25	5.51	7.0	2.32	-	1.92	2.87	4.74	8.66	4.53	5.31	0.34		0.33		1.97		-	-
DN40	mm	38.1	165.0	190.0	97.0	110.0	48.30	77.8	124.0	220.1	127.0	156.0	8.71	9⁄16" UNF	8.5	F07	50.0	M6x12	6.6	9.8
1½"	inch	1.50	6.50	7.50	3.82	4.33	1.90	30.60	4.88	8.66	5.0	6.14	0.34		0.33		1.97		14.5	21.5
DN50	mm	50.0	178.0	216.0	109.0	141.0	70.0	88.0	134.2	220.1	152.0	165.0	8.71	9⁄16" UNF	13.5	F07	70.0	M8x12	13	15
2"	inch	2.0	7.0	8.50	4.29	5.55	2.75	3.46	5.28	8.66	5.98	6.50	0.34		0.53		2.75		28.6	33

Control Flanged Floating Ball

Components & Materials



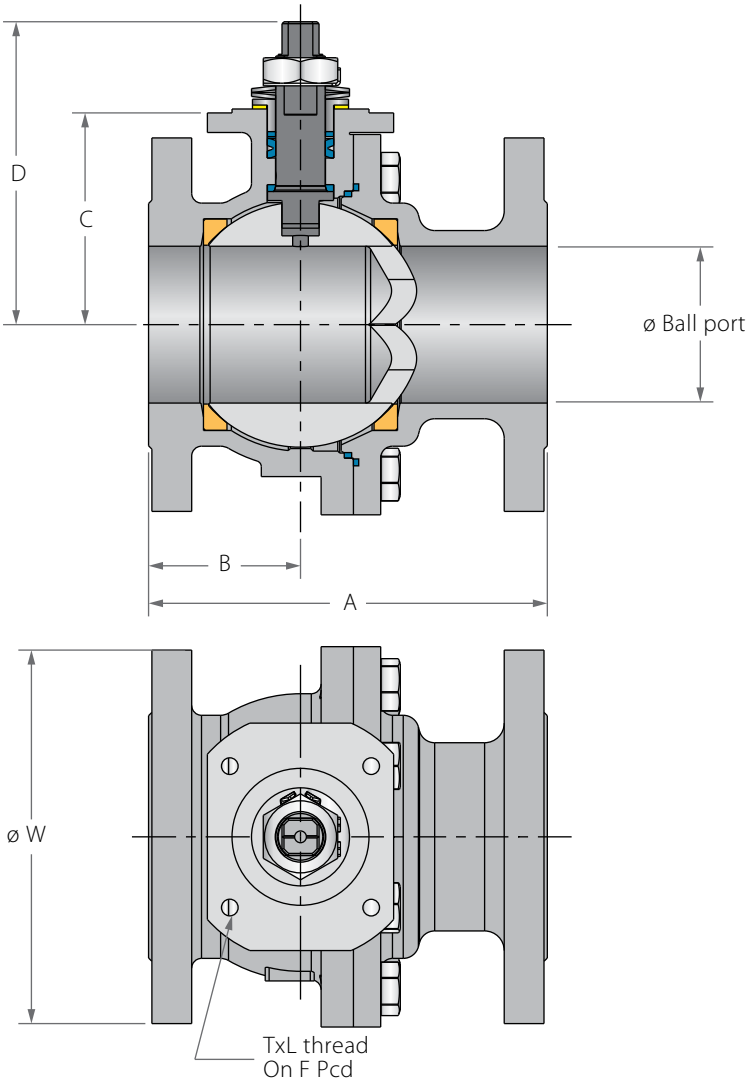
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	V-Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	CF PEEK, PCTFE, CF PTFE	1
7a*	Anti-Abrasion Ring	CF PEEK, PCTFE, CF PTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

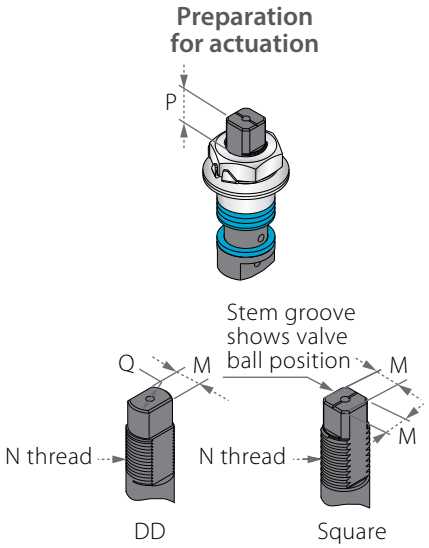
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
16	Handle Nut	S. Steel	1
18	Studs	S. Steel	4
19	Body Nuts	S. Steel	4
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Maintenance Kit Component

Control Flanged Floating Ball

Valve Dimensions

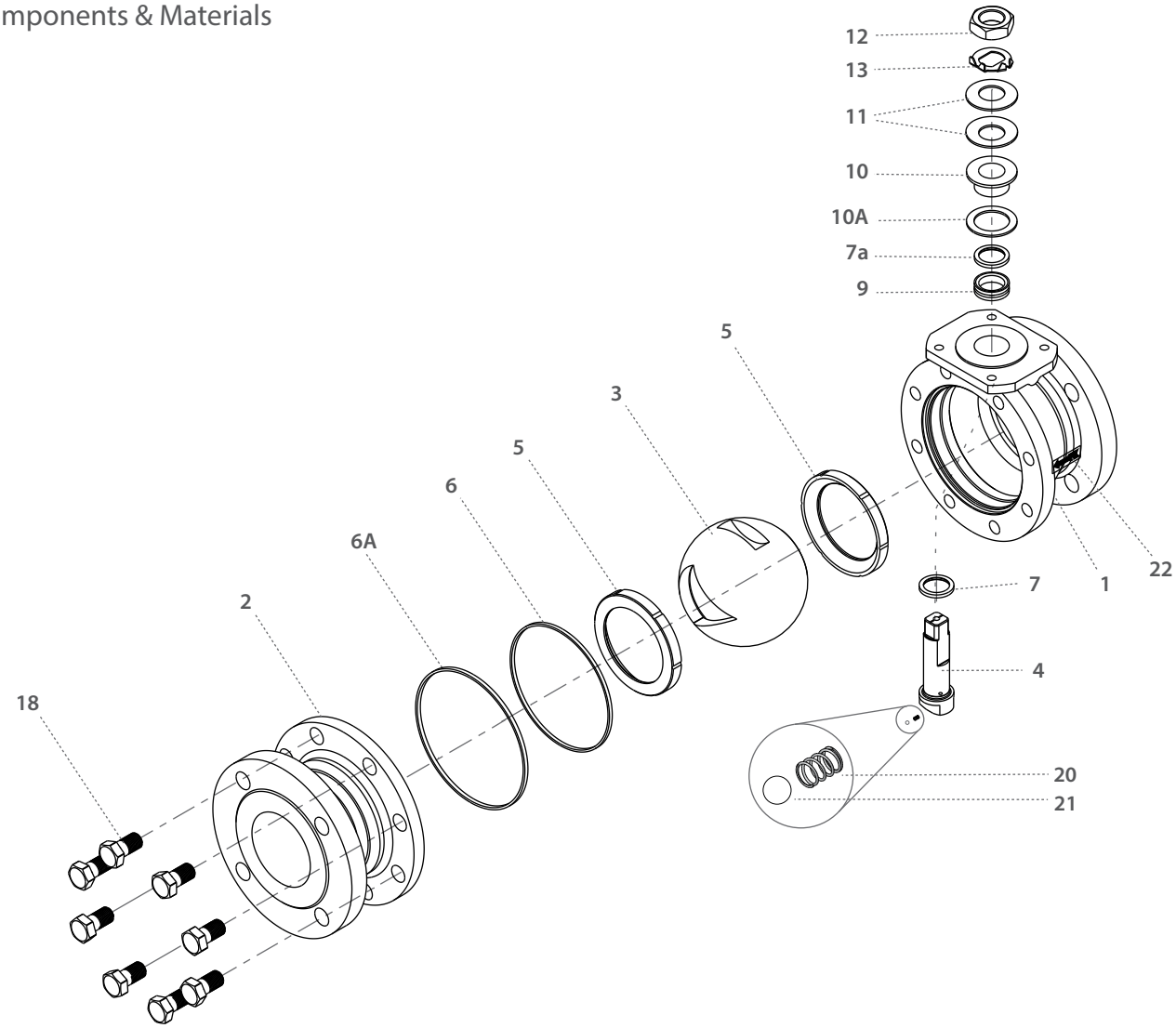




Std. port	Unit	Ball port	A		B		C	D	H	S	W		M	M-DO	N	P	Q	F		TxL	Weight kg/lb	
			150	300	150	300					150	300									150	300
DN80	mm	80.0	203.0	283.0	126.0	185.0	108.0	154.60	194.80	400.0	191.0	210.0	18.90	15.90	1" -14 UNF-2A	16.70	22.70	F10	102.0	M10x20	26	29
3"	inch	3.25	8.0	11.14	4.96	7.28	4.25	6.08	7.67	15.75	7.52	8.27	0.74	0.63		0.66	0.89		4.02		57	64
DN100	mm	100.0	229.0	305.0	144.0	200.0	124.0	170.60	211.0	610.0	230.0	254.0	18.90	15.90	1" -14 UNF-2A	16.70	22.70	F10	102.0	M10x20	34	39
4"	inch	3.94	9.0	12.01	5.67	7.87	4.88	6.71	8.31	24.0	9.06	10.0	0.74	0.63		0.66	0.89		4.02		75	86
DN150	mm	150.0	394.0	403.0	230.0	229.0	179.0	248.50	308.0	916.0	328.0	328.0	28.45	23.75	1½" -12 UNF-1A	26.20	35.20	F12	125.0	M12x20	71	78
6"	inch	5.91	15.51	15.87	9.06	9.02	7.05	9.78	12.12	36.0	12.91	12.91	1.12	0.94		1.03	1.39		4.92		156	172
DN200	mm	200.0	457.20	403.50	215.0	261.0	241.0	353.70	-	-	450.0	450.0	35.92	35.92	2"-8 UN-2A	37.50	46.50	F14	140.0	M16x30	190	225
8"	inch	7.87	18.0	15.89	8.46	10.28	9.49	13.93	-	-	17.72	17.72	1.41	1.41		1.48	1.83		5.51		419	496

Control Flanged Floating Ball

Components & Materials



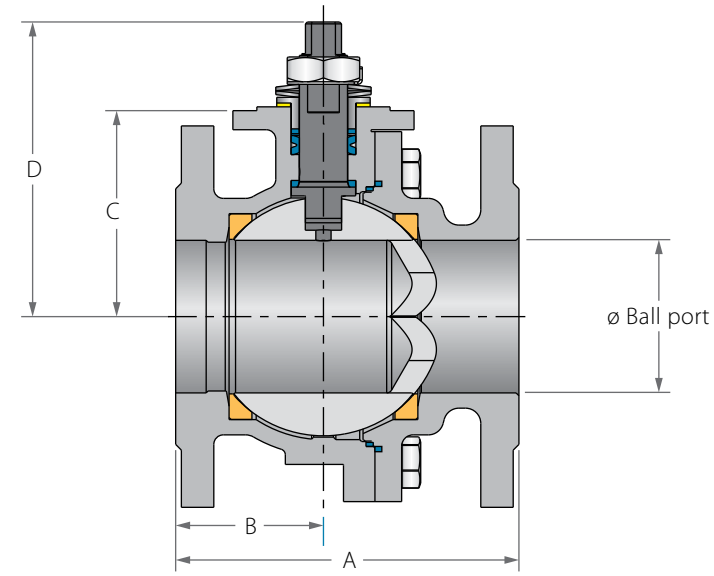
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	V-Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	CF PEEK, PCTFE, CF PTFE	1
7a*	Anti-Abrasion Ring	CF PEEK, PCTFE, CF PTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

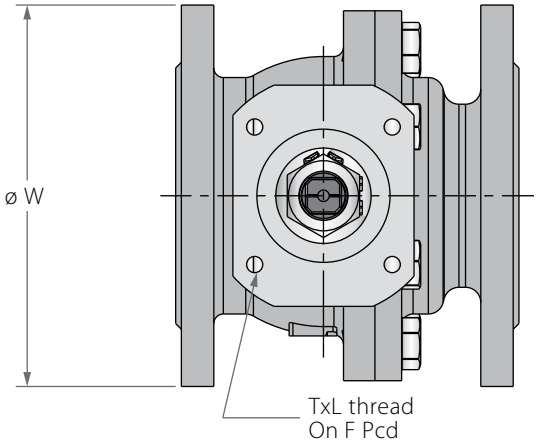
Item	Description	Material specification	Qty.
10A	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
18	Bolt	S. Steel	8-12
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

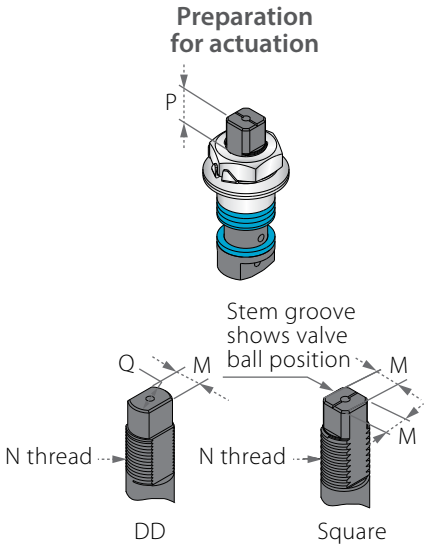
* Maintenance Kit Component

Control Flanged Floating Ball

Valve Dimensions



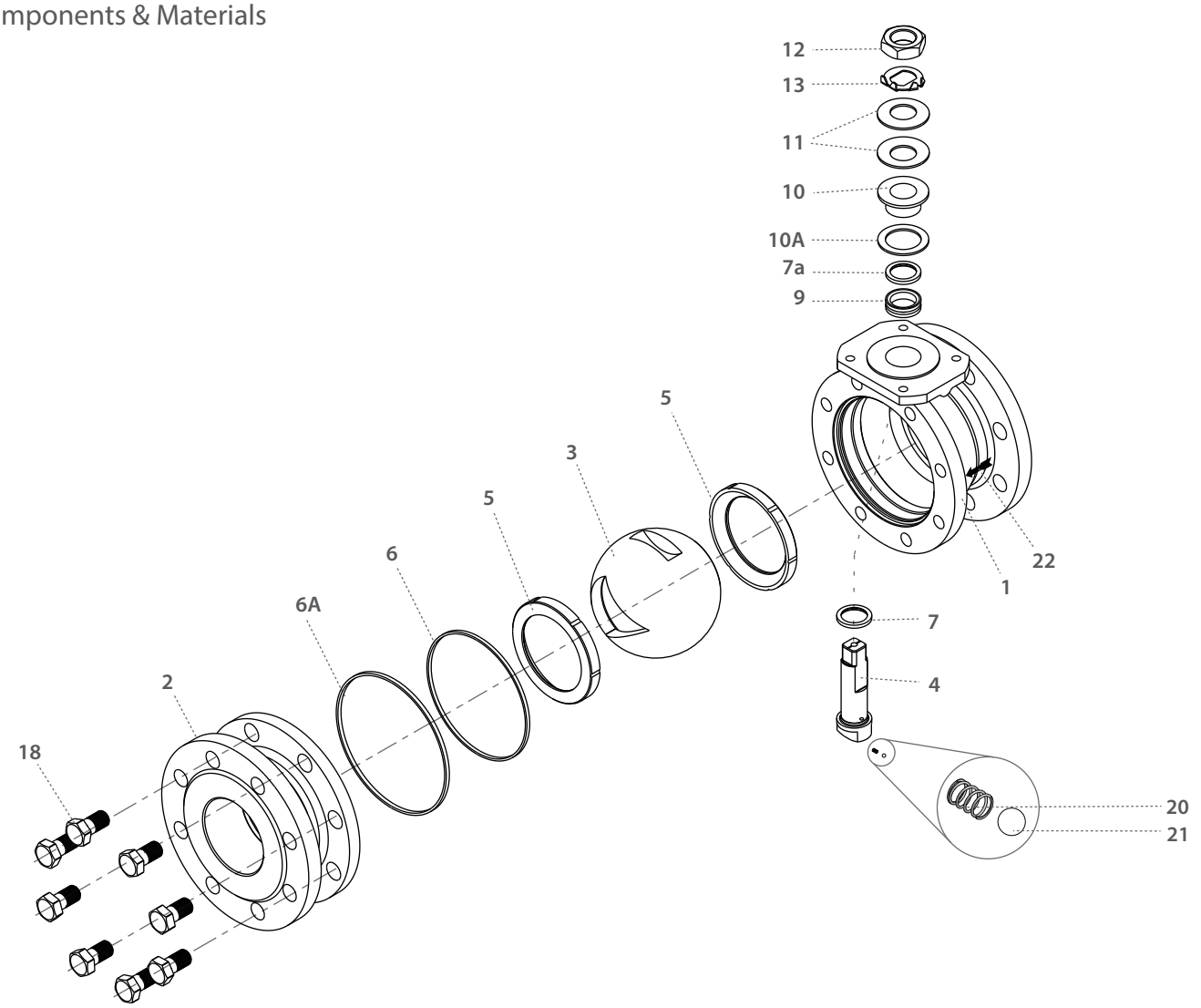




Std. port	Unit	Ball port	A		B		C	D	H	S	W	M	M-DD	N	P	F		TxL	Weight kg/lb	
			FS/F1	F4	16	40													F5	F4
DN80	mm	80.0	-	180.0	77.5	-	108.0	162.0	194.8	400.0	200.0	18.9	15.9	M24	22.70	F10	102.0	M10x20	-	24
3"	inch	3.20	-	7.09	3.05	-	4.25	6.40	7.67	15.75	7.87	0.74	0.63		0.89		4.02		-	52.8
DN100	mm	100.0	-	190.0	84.5	-	132.0	186.0	211.0	610.0	225.0	18.9	15.9	M24	22.70	F10	102.0	M10x20	-	30
4"	inch	3.94	-	7.48	3.33	-	5.20	7.32	8.31	24.02	8.86	0.74	0.63		0.89		4.02		-	66
DN150	mm	150.0	350.0	-	163.5	-	178.0	236.0	308.0	916.0	328.0	28.45	23.75	M35	35.20	F12	125.0	M12x20	63	-
6"	inch	5.91	13.78	-	6.44	-	7.01	9.29	12.13	36.06	12.91	1.12	0.94		1.03		4.92		139	-

Control Flanged Floating Ball

Components & Materials



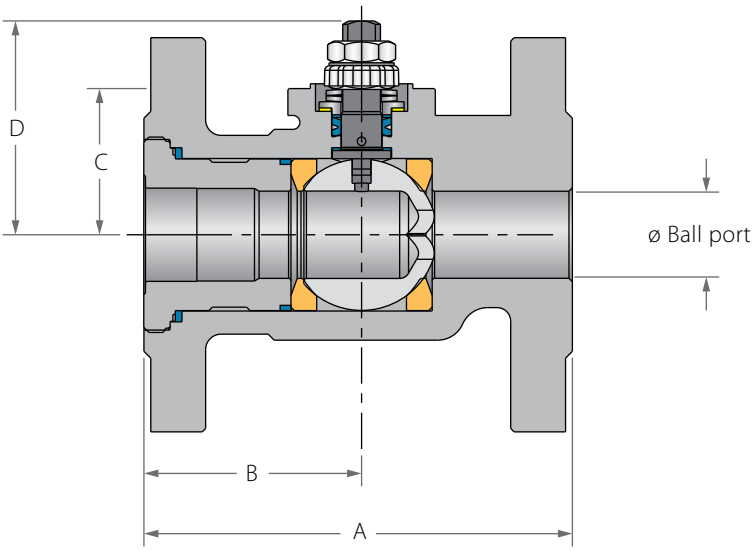
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	V-Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE, CF PTFE	1
7a*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE, CF PTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

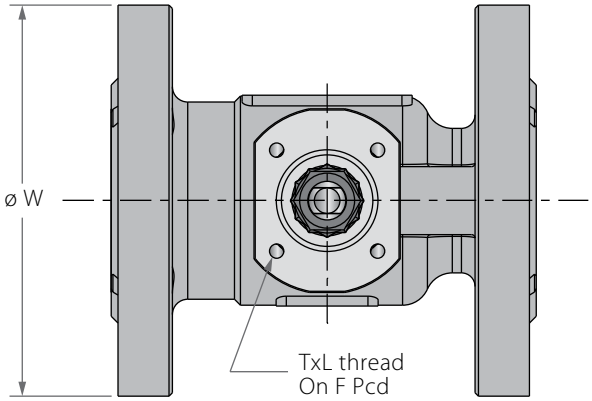
Item	Description	Material specification	Qty.
10A	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
18	Body Bolts	S. Steel	8-10
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

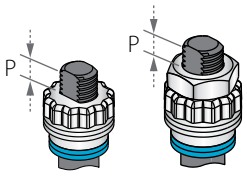
Control Flanged Floating Ball

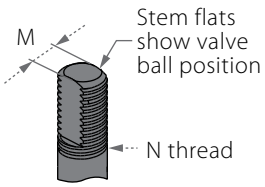
Valve Dimensions





Preparation for actuation

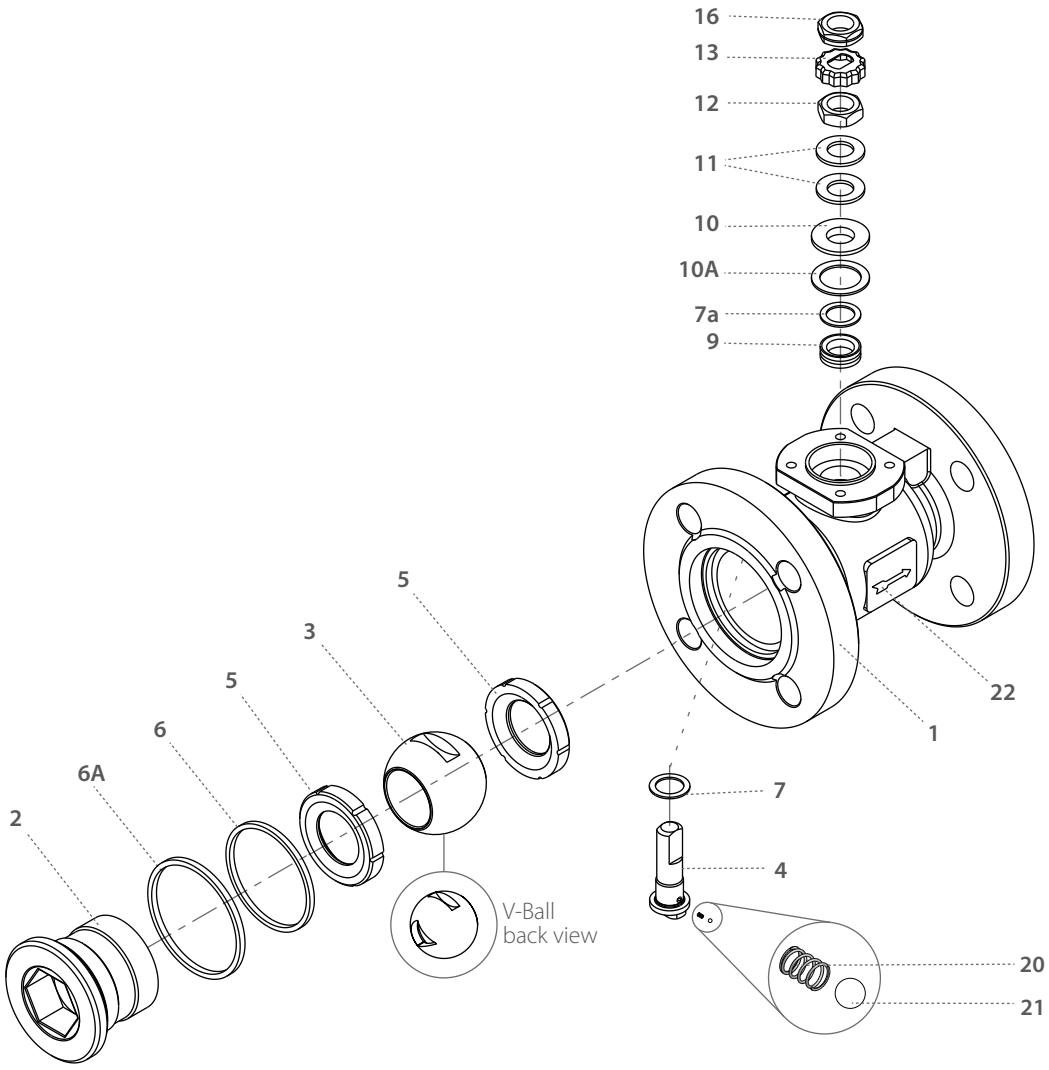




Std. port	Unit	Ball port	A		B	C	D	W	M	N	P	Q	F		TxL	Weight kg/lb	
			F1	F4												F1	F4
DN15	mm	14.30	130.0	115.0	48.0	31.50	40.50	5.54	5.54	1"-14 UNF-2A	6.65	95.0	F03	36.0	M5x10	2.2	2.1
½"	inch	0.56	5.12	4.53	1.89	1.24	1.59	0.22	0.22		0.26	3.74		1.42		4.80	4.60
DN20	mm	20.60	150.0	120.0	58.0	38.30	56.50	7.54	7.54	1"-14 UNF-2A	7.40	105.0	F04	42.0	M5x10	3.2	3
¾"	inch	0.81	5.91	4.72	2.28	1.51	2.22	0.30	0.30		0.29	4.13		1.65		7.00	6.60
DN25	mm	25.40	160.0	125.0	63.50	41.80	61.0	7.54	7.54	1"-14 UNF-2A	7.40	115.0	F04	42.0	M5x10	4.2	4
1"	inch	1.0	6.30	4.92	2.50	1.65	2.40	0.30	0.30		0.29	4.53		1.65		9.20	8.8

Control Flanged Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7	Stem Thrust Seal	CF PEEK, PCTFE, CF PTFE	1
7a*	Anti-Abrasion Ring	CF PEEK, PCTFE, CF PTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

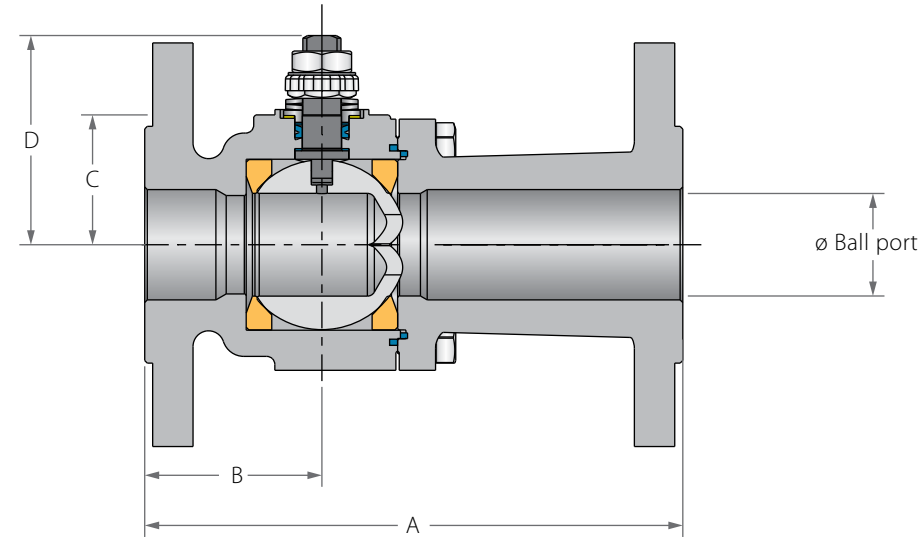
Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
16	Handle Nut	S. Steel	1
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1

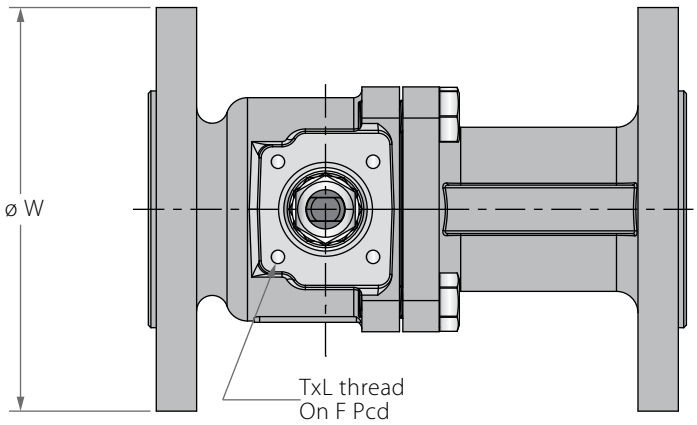
* Maintenance kit components

N78 2½" | DN65 | DIN PN40

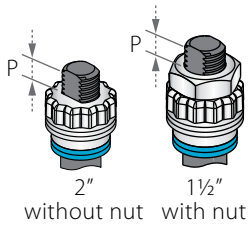
Control Flanged Floating Ball

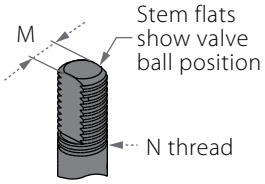
Valve Dimensions





Preparation for actuation

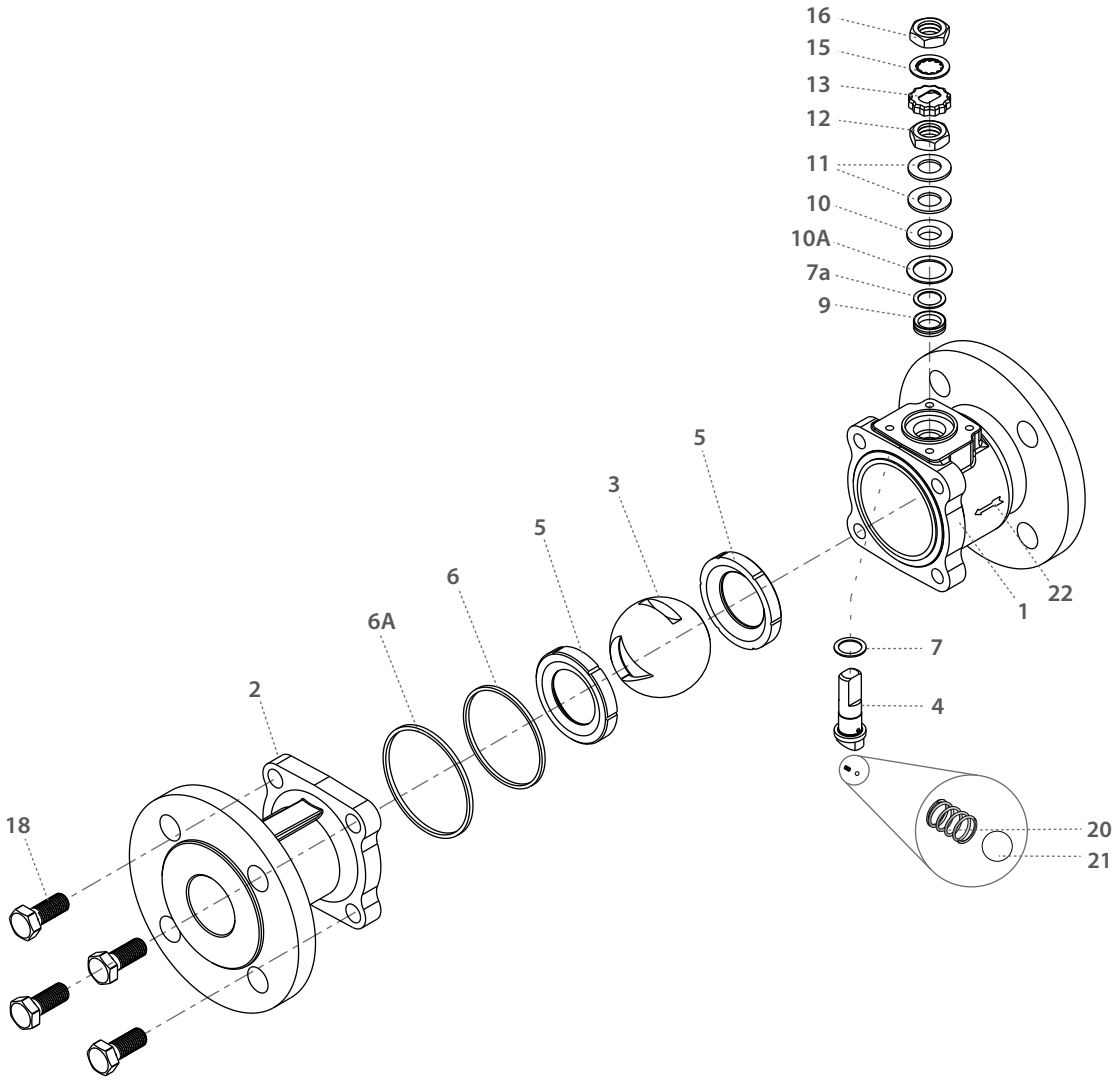




Std. port	Unit	Ball port	A		B		C	D	H	S	W		M	M-DD	N	P	F		TxL	Weight kg/lb		Kv
			150	300	150	300					150	300								150	300	Cv
DN65	mm	65.0	190.0	241.0	83.0	-	119.0	165.5	194.8	400.0	180.0	190.0	18.9	15.9	1"-14 UNS-2A	16.7	F10	102.0	M10x20	-	-	-
2½"	inch	2.56	7.48	9.48	3.26	-	4.76	6.51	7.67	15.75	7.08	7.48	0.74	0.63		0.66		4.02		-	-	-

Control Flanged Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	V-Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	CF PEEK, PCTFE, CF PTFE	1
7a*	Anti-Abrasion Ring	CF PEEK, PCTFE, CF PTFE	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A	Slide Bearing	S. Steel	1

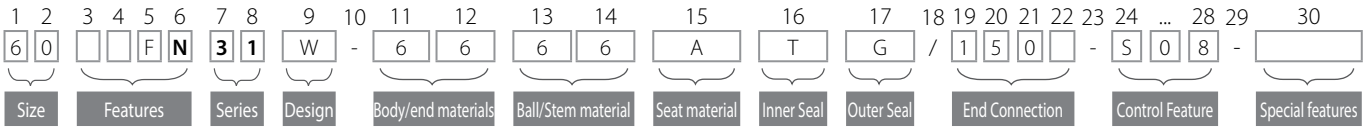
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
18	Body Bolt	S. Steel	4-8
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
22	Arrow Flow	S. Steel	2
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

N31 N32 N73 N74 N77 N78

Control Flanged Floating Ball - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background



Size (1-2)		
Code	inch	mm
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150
80*	8"	200

* 31/32 series only

Features (3-6)	
N	Control service
F	Fire safe
O	Clean assembly for O2 service
C	Cryogenic [R]
Z	High Temp. (MTM) [R]
H*	Hydrogen Service

* for material selection - see Hydrogen Service chapter

Series (7-8)	
31	ANSI #150 std. port
32	ANSI #300 std. port
73	ANSI #150 full port
74	ANSI #300 full port
77	DIN PN 16 full port
78	DIN PN 40 full port

Design (9)	
W	Total HermetiX Integrity package
G	Total HermetiX Integrity package - FDA compliant [R]

Body/Ends material (11-12) [R]
Per base series

Ball material (13) [R]	
6	S. SteelCF8M/CF3M
M	High Strength S. Steel
W	Hastelloy-C22
S	254SMO
D	Duplex
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

Stem material (14)	
M	High Strength S. Steel
6	S. Steel316L
Z	Inconel 718
W	Alloy-C22
S	254SMO A479
A	Alloy-20
D	Duplex A479
K	Super Duplex A479
7	Monel
C	Hastelloy-C276

Seat material (15)	
P	CF PTFE
K	CF PEEK
A	TFM

Inner Seal material (16) [R]
Per base series

Outer Seal material (17) [R]
Per base series

End connections (19-22)	
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF

Control Feature (24-28)	
V-Port	
S08*	0.8mm Slot on downstream seat
S16*	1.6mm Slot on downstream seat
S32*	3.2mm Slot on downstream seat
V30	V30^0 Shape on downstream seat
V60	V60^0 Shape on downstream seat
V90	V90^0 Shape on downstream seat

* Up to 1"

V-Ball	
SB08*	0.8mm Slot on ball
SB16*	1.6mm Slot on ball
SB32*	3.2mm Slot on ball
VB30	V30^0 Shape on ball
VB60	V60^0 Shape on ball
VB90	V90^0 Shape on ball

* Up to 1"

Hardening	
I	Cr3C2 - Chromium Carbide with Nickel Chrome binder - HVOF technique
O	WC-Co - Tungsten Carbide with Cobalt binder - HVOF technique

Special Features (24-30) [R]
Per base series

[R]:
- For Cryogenic CNxx valve see options in Cryogenic chapter.
- For High Temp. (MTM) ZNxx valve see options in High Tem. (MTM) chapter.

SANITARY VALVES

General 280

Floating Ball

ASME BPE | 3 Piece 283

3A | 3 Piece 289

ASME BPE Flush Tank | 3 Piece 293

SANITARY VALVES

General

Habonim's Sanitary product line valves are subject to the general Habonim valves design, materials, practices, methodologies and certifications – for more information, see Valves General chapter.

Habonim Sanitary valves are equipped (in some series) with the Total HermetiX integrity package for superior sealing, safety and environmental care.

Sanitary Valve

Habonim's line of Sanitary ball valves for the pharmaceutical, bioprocessing, food and beverage industries is in wide use in leading production and research facilities.

Features

Materials

- FDA and USP Class VI compliant polymers or elastomers are used in the series.
- Controlled ferrite cast or forged bar materials are used and polished (in some series) to avoid rouging on austenitic stainless-steel surfaces and corrosion attack on welding areas.
- Electro-polished surface finishes are available upon request for some series.
- EC 1935 - as an option

Design

- Purge and drain ports are available upon request to facilitate CIP/SIP operation.
- Diverter and various multiport configurations are available upon request.

Reference standards

- 48 and R48 series valves are designed and tested according to ASME BPE standard.
- EC 1935 compliance – as an option.

Quick Selection Table

Total Hermetix™ | **Port:** Standard Port Full Port Tube Size | **End Connections:** Threaded Clamp Welded
Ordering Code

	Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	6
Temperature: -60°C - +260°C (-76 °F ÷ +500 °F)	Floating Ball	3 Piece	OC	48	TH			300							150				
			OC	L47	TH				300										
		Flush tank	OC	R48				300							150				

ASME Class				150	300	600	900	1500	2500	6000
Pressure Bar	-1*	0	16	20	50	100	150	250	400	1034
Pressure psi	-14*	0	290	290	725	1450	2175	3600	5800	15000

* Vacuum 10^{-6} Tor

Polishing and Electro-polishing (for 48 / 48R Series)

To minimize contamination and to avoid corrosion/rouging problems, inner surfaces which come into direct or indirect contact with the flow media are polished and, upon request, electro-polished.

For cast/forged valves the body, ball, seat retainer (2" size and above) and the end connections are polished internally. For bar stock valves, additional polishing is carried out the body and end connections outer surfaces.

When requested, electro-polishing is carried out on the body, ball, seat retainer (2" size and above) and end connections.

The standard line polishing level is 0.625 µ-m (25 µ-in) Ra max. Higher levels of surface finish up to 0.375 µ-m (15 µ-in) Ra max are available, including internal and external electro-polishing.

Habonim does not use Animal Derived Ingredients (ADI's) in its surface finishing processes.

Ra Reading for Metallic Contact Surfaces			
ASME BPE Surface designation	Ra Max.		Habonim
	µ-in.	µ-m	Code
SF1	20	0.51	G32
SF2*	25	0.64	G24

* SF2 is the 48/R48 series standard surface finish, no need to add 'G24' suffix

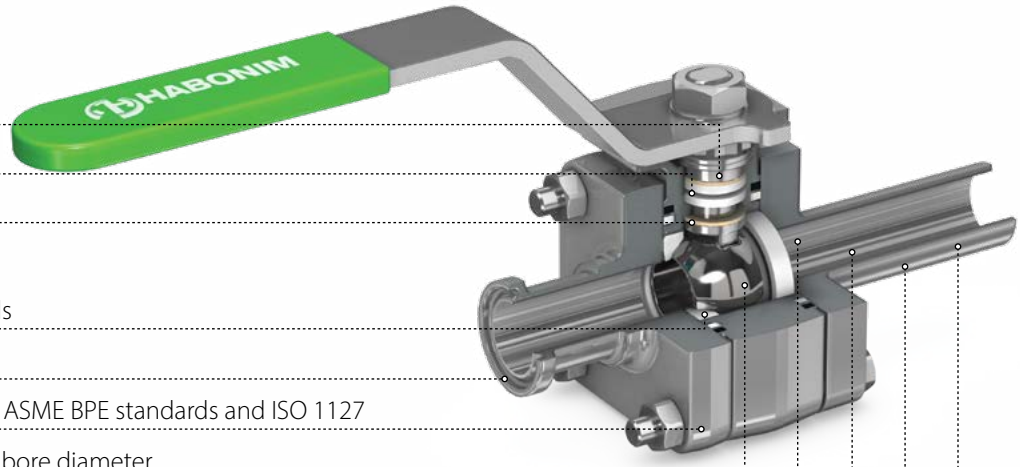
Mechanically Polished and Electropolished			
ASME BPE Surface designation	Ra Max.		Habonim
	µ-in.	µ-m	Code
SF4	15	0.38	E32
SF5	20	0.51	E24
SF6	25	0.64	E18

SANITARY VALVES

Cleaning and Assembling

Habonim's cleaning, assembly and inspection procedure for the Sanitary line ensures the cleanliness required by Bioprocessing, Pharmaceutical or Oxygen services.

Habonim uses a state of the art, environmentally friendly, alkaline-based automatic degreasing system with multiple stages of cleaning, rinsing and drying chambers to ensure that particles, grease, metal chips and other contamination hazards that can be introduced by a poor deburring process or shop dirt are removed thoroughly before the assembly process begins. Upon completion of the cleaning process, the valves are assembled in an oil free restricted area by qualified personnel who are specially trained to perform this task. The employees wear clean working clothes and latex gloves throughout the procedure. The equipment and tools are cleaned before use and the work surfaces are covered with a clean polyethylene sheet before performing the valve assembly.



Durable polymer anti-abrasion ring

HermetiX™ TFM stem seal

Durable polymer thrust seal

FDA approved material seats and seals

Sanitary clamp end

Castings or forgings are applicable to ASME BPE standards and ISO 1127

End-to-End continuous and identical bore diameter

SF2 - Standard internal polishing level of 0.625 µ-m (25 µ-in) Ra max

Austenitic materials with controlled Sulfur 0.005% < S < 0.017 %

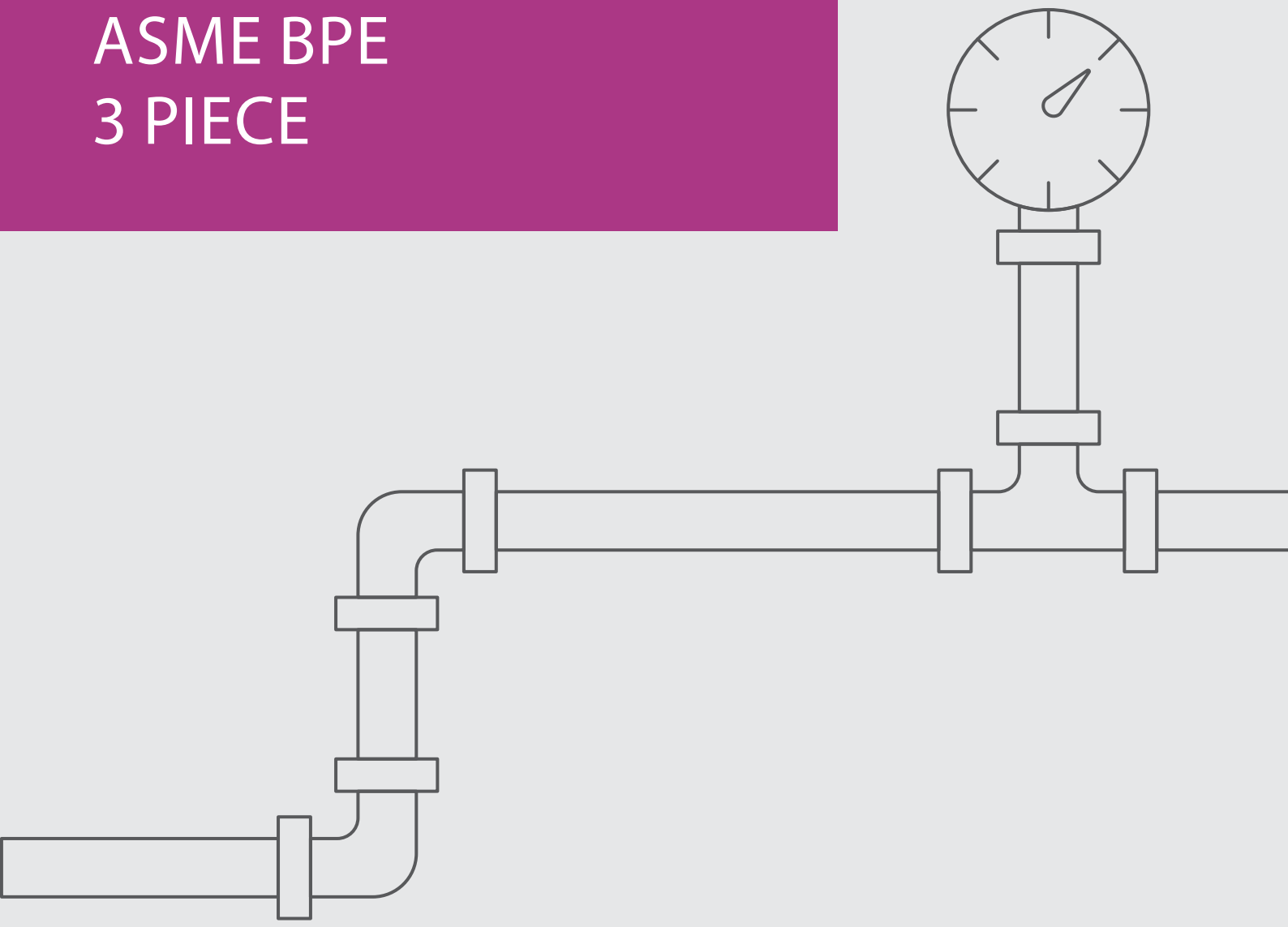
Extended ends for orbital welding

Austenitic forged material with Ferrite below 1%.

Austenitic cast materials with controled ferrite.

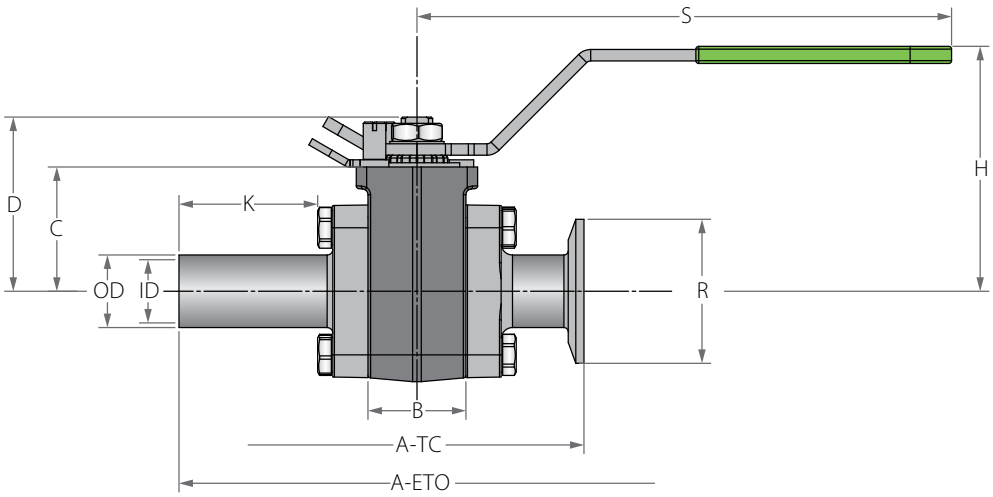
FLOATING BALL

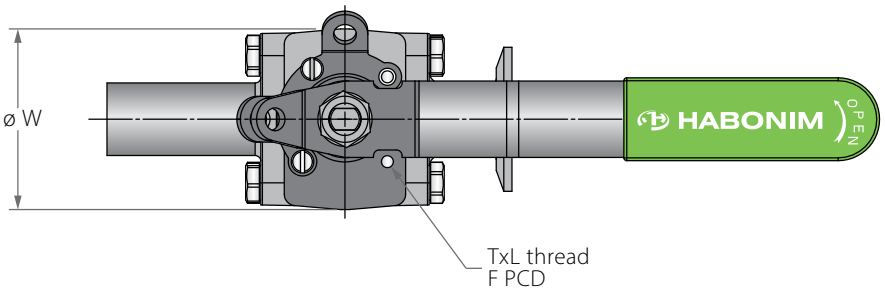
ASME BPE
3 PIECE



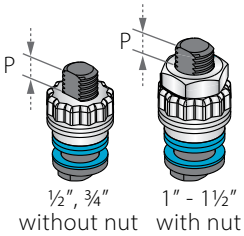
ASME BPE Floating Ball 3 Piece

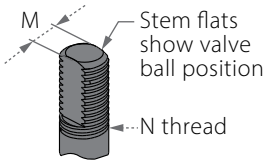
Valve Dimensions





Preparation for actuation

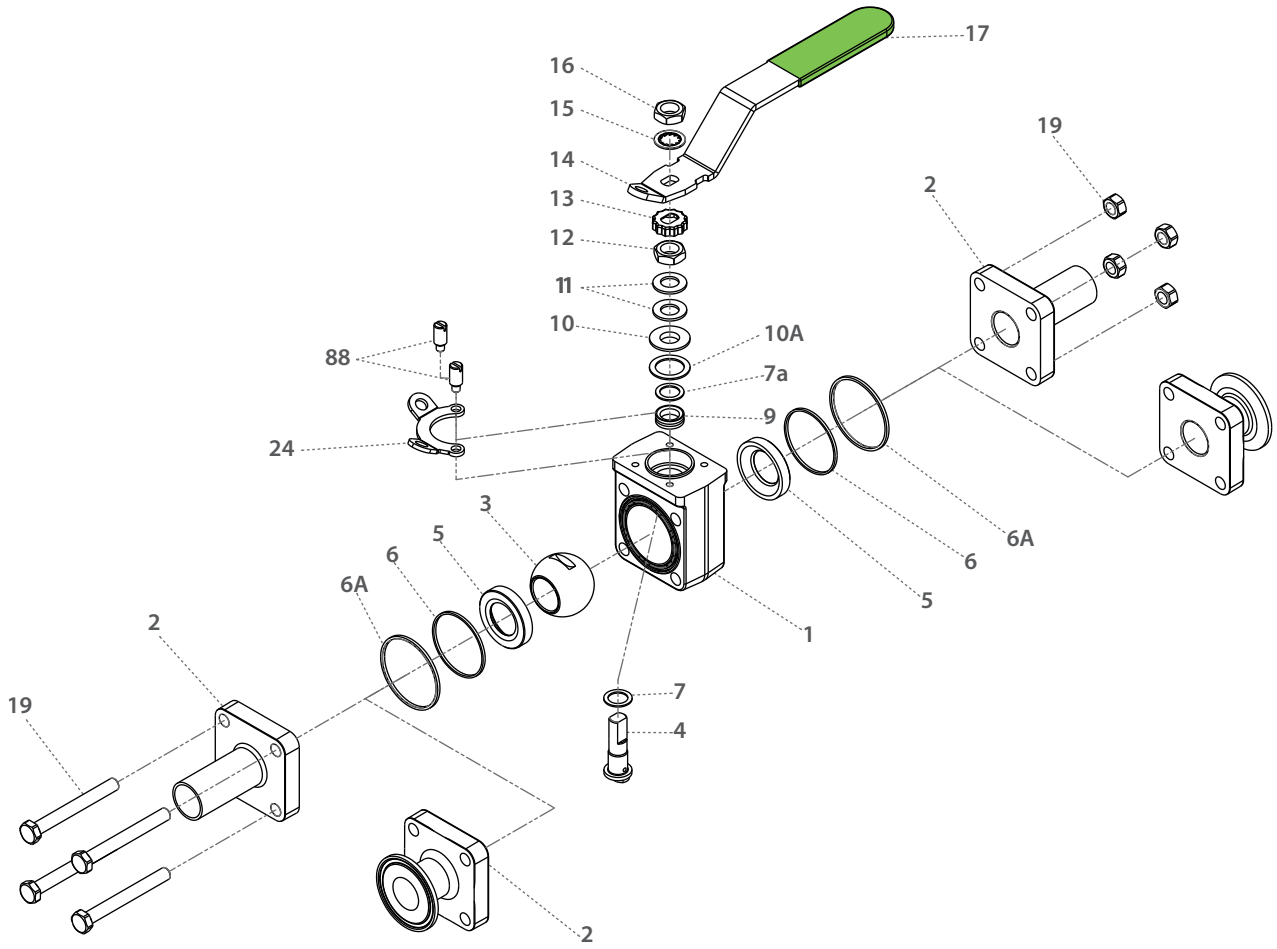




Port	Unit	Ball port	A-ETO	A-TC	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv
																		Cv
DN15	mm	9.4	68.5	44.4	20.6	29.0	38.2	62.13	151.3	47.23	5.5	⅜" UNF	6.65	F03	36.0	M5X10	0.94	8
½"	inch	0.37	2.70	1.75	0.81	1.14	1.50	2.45	5.95	1.86	0.22		0.26		1.42		2.07	9
DN20	mm	15.75	71.5	50.78	24.55	36.0	46.0	69.9	151.3	53.88	5.5	⅜" UNF	6.65	F03	36.0	M5X10	1.184	29
¾"	inch	0.62	2.81	2.00	0.97	1.42	1.81	2.75	5.95	2.12	0.22		0.26		1.42		2.60	34
DN25	mm	22.1	167.81	118.1	35.5	43.5	61.0	85.7	187.13	63.24	7.5	7⁄16" UNF	6.65	F04	42.0	M5X10	2.003	53
1"	inch	0.87	6.61	4.65	1.40	1.71	2.40	3.38	7.37	2.49	0.30		0.26		1.65		4.41	62
DN40	mm	34.8	92.8	70.7	50.0	55.5	84.97	109.1	237.13	83.2	8.7	9⁄16" UNF	6.65	F05	50.0	M6X12	4.057	150
1½"	inch	1.37	3.65	2.78	1.97	2.19	3.35	4.29	9.34	3.27	0.34		0.26		1.97		8.93	175

ASME BPE Floating Ball 3 Piece

Components & Materials



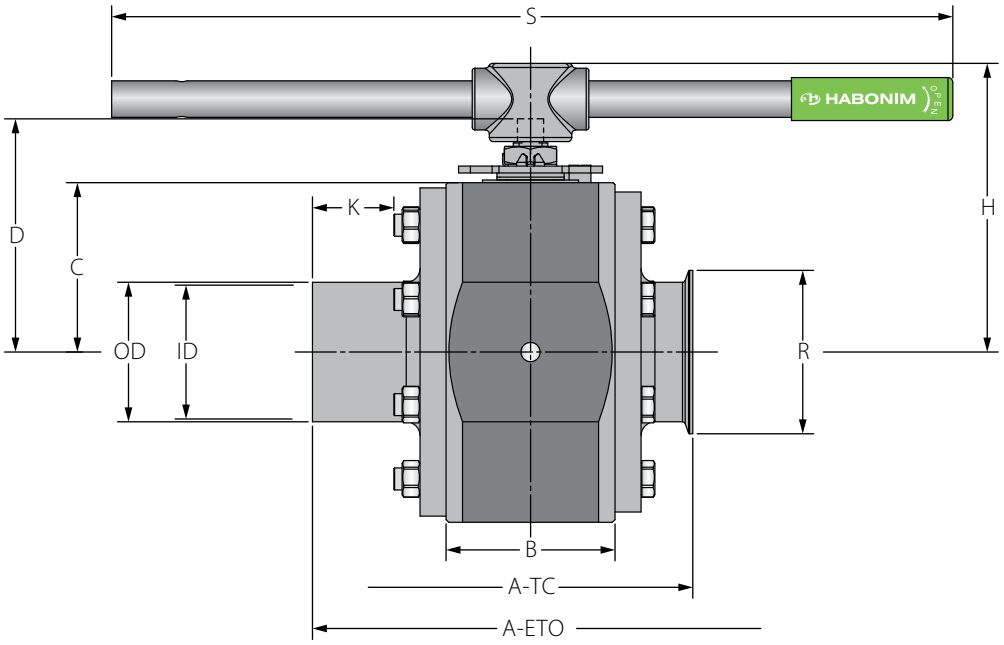
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	V. PEEK	1
7A*	Anti-Abrasion Ring	V. PEEK	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

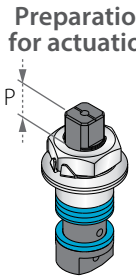
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Hadle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	4
19	Body Nut	S. Steel	4
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

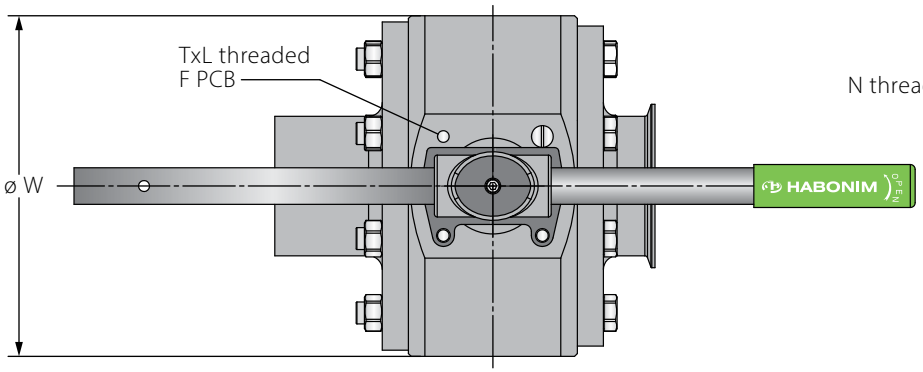
* Maintenance kit components

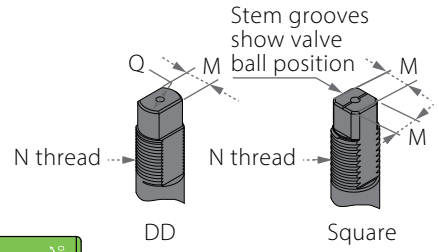
ASME BPE Floating Ball 3 Piece

Valve Dimensions





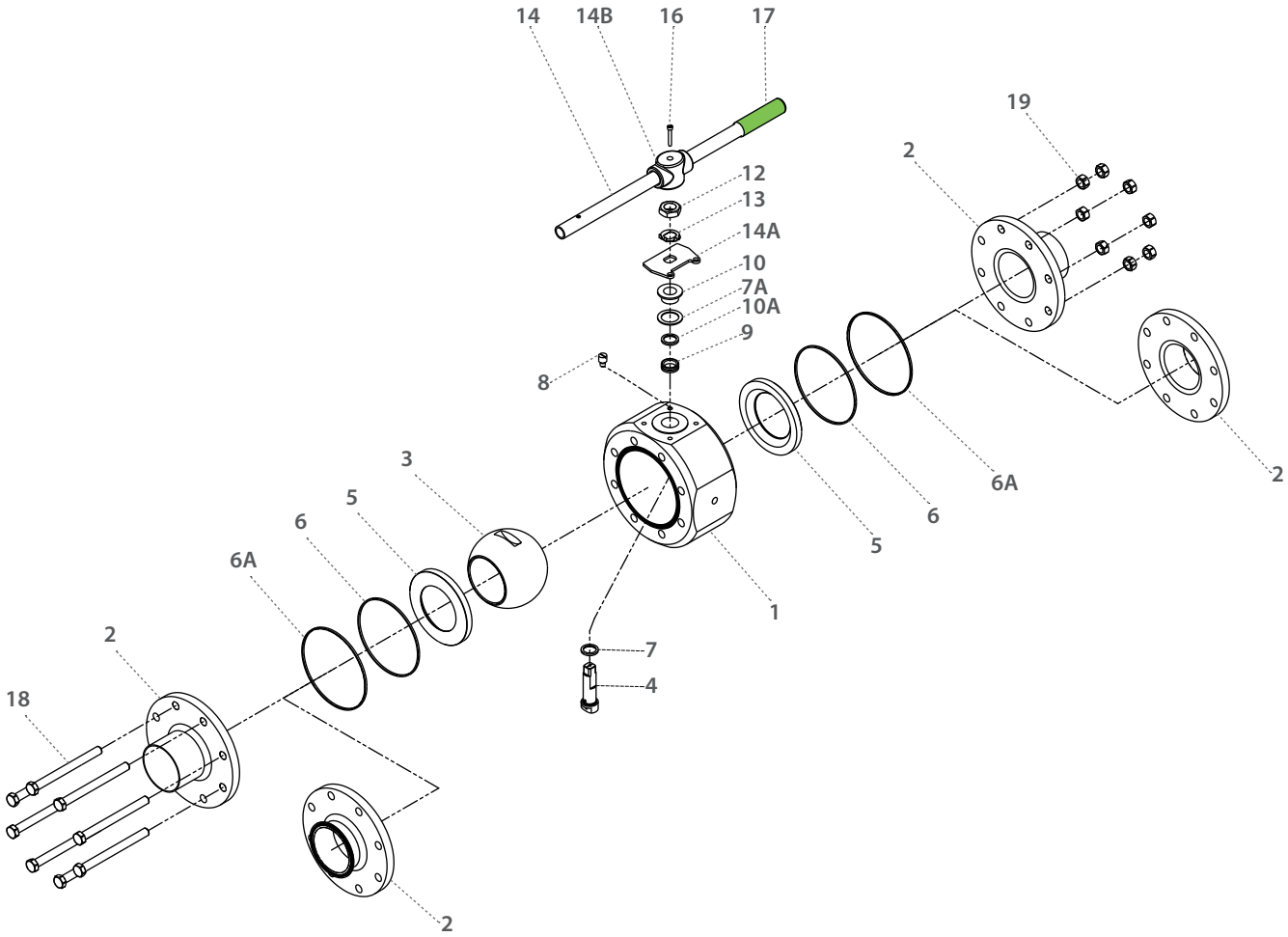




Port	Unit	Ball port	A-ETO	A-TC	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN50	mm	47.5	223.0	184.0	72.65	70.0	111.6	136.2	256	158.0	13.9	M20x2.5	14.6	F07	70.0	M8X12	15.9244	410
2"	inch	1.87	8.78	7.24	2.86	2.76	4.39	5.36	10.08	6.22	0.55		0.57		2.76		35.03	480
DN65	mm	60.2	250.4	169.1	83.35	82.4	144.9	185.3	401.0	189.0	18.9	1"-14	16.7	F10	102.0	M10X20	20.775	681
2½"	inch	2.37	9.86	6.66	3.28	3.24	5.70	7.29	15.79	7.44	0.74	UNS-2A	0.66		4.02		45.71	680
DN80	mm	72.9	302.0	193.0	96.4	105.0	152.1	192.5	401.0	210.0	18.9	1"-14	16.7	F10	102.0	M10X20	33.688	748
3"	inch	2.87	11.89	7.60	3.80	4.13	5.99	7.58	15.79	8.27	0.74	UNS-2A	0.66		4.02		74.11	875
DN100	mm	97.4	317.5	236.2	123.0	123.3	169.8	210.2	619.0	248.0	18.9	1"-14	16.7	F10	102.0	M10X20	55.06	1333
4"	inch	3.83	12.50	9.30	4.84	4.85	6.69	8.28	24.37	9.76	0.74	UNS-2A	0.66		4.02		121.13	1560
DN150	mm	97.4	460.0	328.0	180.0	179.0	248.5	308.3	916.5	360.0	28.45	1½"-14	26.2	F12	125.0	M12X20	145.174	1333
6"	inch	3.83	18.11	12.91	7.09	7.05	9.78	12.14	36.08	14.17	1.12	UNS-2A	1.03		4.92		319.38	1560

ASME BPE Floating Ball 3 Piece

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	V. PEEK	1
7A*	Anti-Abrasion Ring	V. PEEK	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Hadle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	8-12
19	Body Nuts	S. Steel	8-12
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

ASME BPE Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	.	30
1	0				F	**4**	**8**	**G**	-	6	6	6	6	A	A	G	/	E	T	O		-	E	2	4		
Size		Features				Series		Design		Body/End material		Ball/Stem material		Seat	Inner Seal	Outer Seal		End Connection					Special features				

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
F	Fire Safe
D	Diverter, Bottom entry
S	Diverter, Side entry
Q	Cavity filler seats

Series (7-8)	
48	ASME BPE Clean valves

Design (9)	
G	Total HermetiX Integrity package - FDA compliant

Body/Ends material (11-12)	
6	CF3M
P	S. St. 316L Forged
3	S. St. DIN 1.4435 Forged
W	ALLOY-C22

Ball material (13)	
6	ASTM A479 S. Steel316L
W	ALLOY-C22

Stem material (14)	
6	ASTM A479 S. Steel316L
W	ALLOY-C22

Seat material (15)	
A	TFM
L	Virgin PEEK

Inner Seal Material (16)	
A	TFM

Outer Seal Material (17)	
A	TFM
G	Expanded graphite

End connections (19-23)	
Welded	
ETO	Extended tube OD
Clamp	
TC	Tri-Clamp

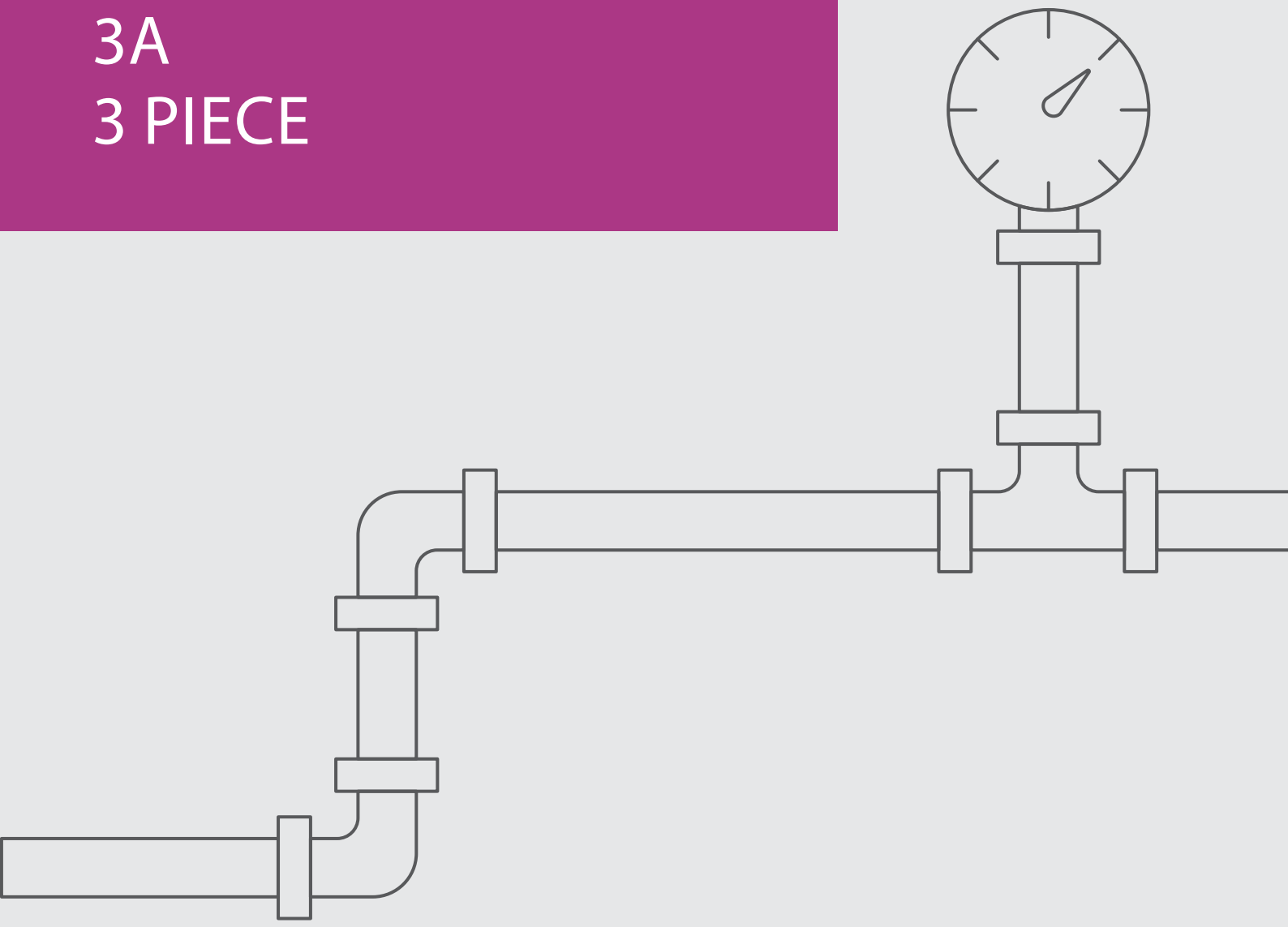
Special Features (24-30)	
E24	ASME BPE surface designation SF5 - Internal polishing & EP level of 0.51 µ-m, 20 µ-in Ra max.
G32	ASME BPE surface designation SF1 - Internal polishing level of 0.51 µ-m, 20 µ-in Ra max.
E32	ASME BPE surface designation SF4 - Internal polishing & EP level of 0.38 µ-m, 15 µ-in Ra max.
B	Valve made from rolled bar

L47

Sanitary Valves

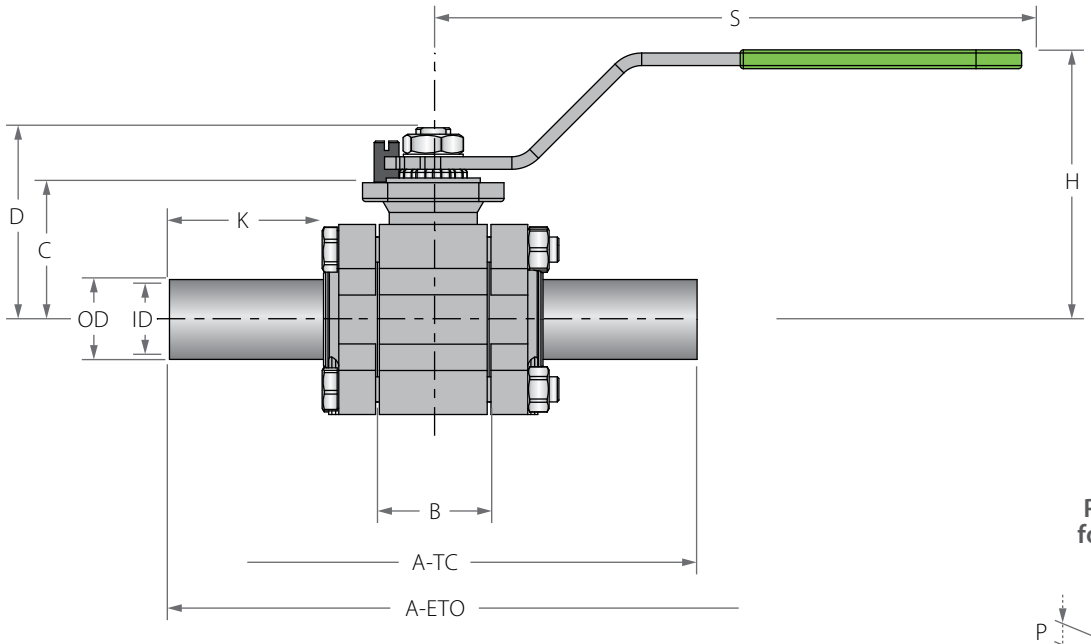
FLOATING BALL

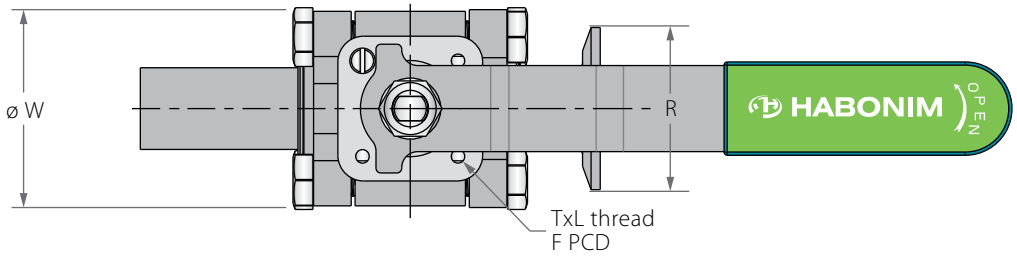
3A
3 PIECE



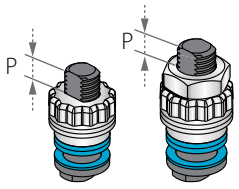
3A Floating Ball 3 Piece

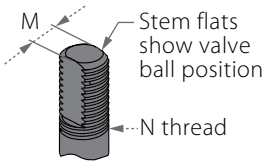
Valve Dimensions





Preparation for actuation

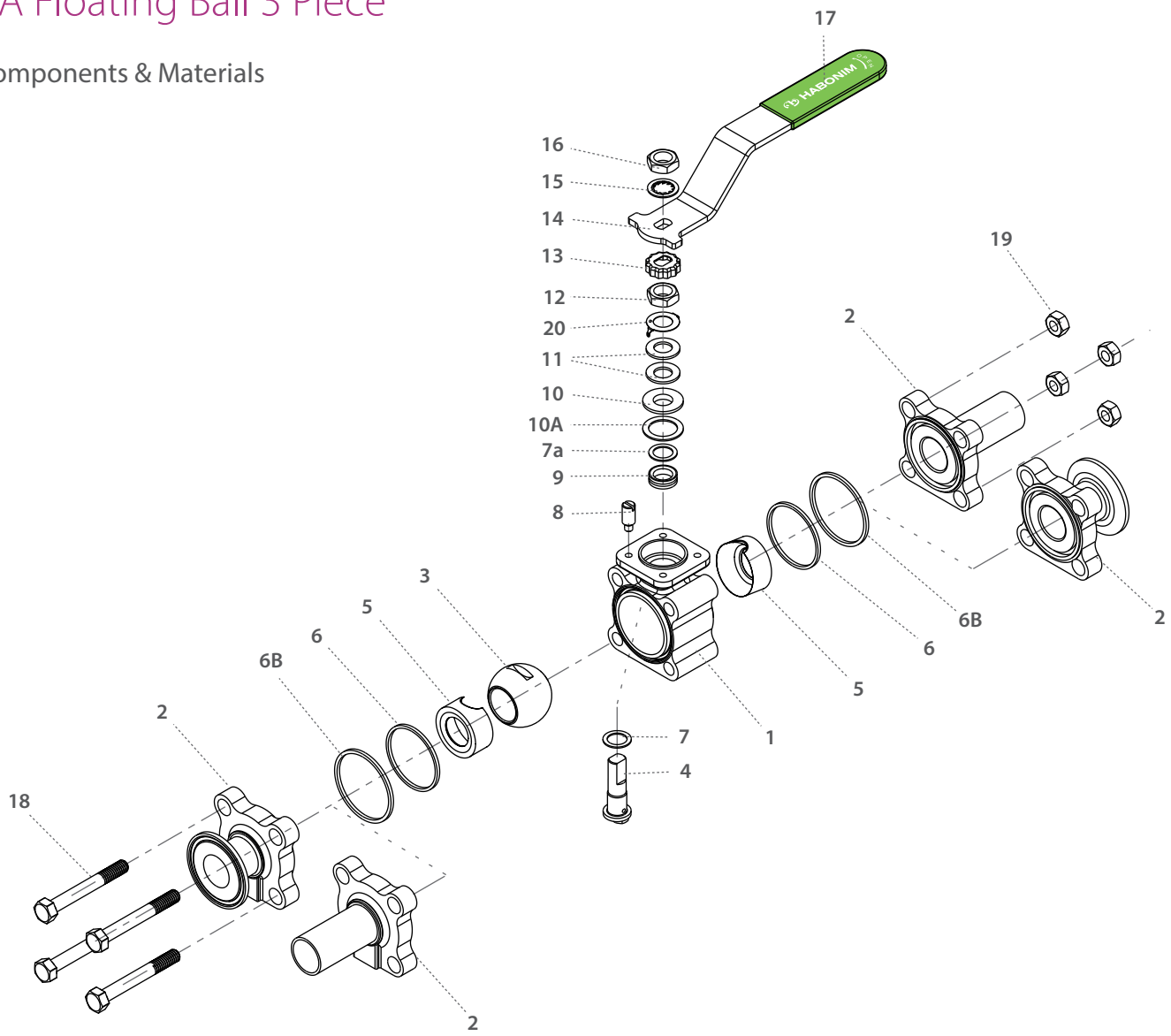




Std. port	Unit	OD	ID	A ETO	A TC	B	C	D	H	K	S	W	R TC	M	M-DD	N	P	F		TxL	Weight kg/lb	Kv Cv
DN15	mm	12.70	9.40	137.0	89.0	20.60	29.0	38.0	61.60	41.50	150.0	45.75	25	5.54	-	⅜" UNF	6.65	F03	36.0	M5X10	0.90	8
½"	inch	0.50	0.37	5.39	3.50	0.81	1.14	1.50	2.42	1.63	5.91	1.80	0.99	0.22	-		0.26		1.42		2.00	9
DN20	mm	19.05	15.75	147.0	102.0	24.60	36.0	45.0	67.90	43.90	150.0	52.10	25	5.54	-	⅜" UNF	6.65	F03	36.0	M5X10	1.00	29
¾"	inch	0.75	0.62	5.79	4.0	0.97	1.42	1.77	2.67	1.73	5.91	2.05	0.99	0.22	-		0.26		1.42		2.10	34
DN25	mm	25.40	22.10	168.0	118.0	35.50	43.50	61.0	84.80	43.90	187.0	60.45	50.40	7.54	-	7⁄16" UNF	7.40	F04	42.0	M5X10	1.70	53
1"	inch	1.0	0.87	6.61	4.65	1.40	1.71	2.41	3.34	1.73	7.36	2.38	1.98	0.30	-		0.29		1.65		3.80	62
DN40	mm	38.10	34.80	186.0	141.0	50.0	55.50	85.0	107.10	44.0	236.0	79.15	50.40	8.71	-	9⁄16" UNF	8.50	F05	50.0	M6X12	3.50	150
1½"	inch	1.50	1.37	7.31	5.57	1.97	2.19	3.35	4.22	1.73	9.29	3.12	1.98	0.34	-		0.33		1.97		7.70	175
DN50	mm	50.80	47.50	223.0	184.0	72.70	70.0	112.10	143.10	45.0	256.0	108.0	64.20	-	13.90	M20x2.5	14.60	F07	70.0	M8X12	9.40	410
2"	inch	2.0	1.87	8.77	7.23	2.86	2.76	4.41	5.63	1.77	10.08	4.25	2.53	-	0.55		0.57		2.76		20.80	480

3A Floating Ball 3 Piece

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Inner Seal	Acc. Ordering Code	2
6B*	Body Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	Virgin PEEK	1
7a*	Anti-Abrasion Ring	Virgin PEEK	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	4
19	Body Nut	S. Steel	4
20	Anti-Static Device	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

3A Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	.	30
1	0				L	4	7	G	-	6	6	6	6	A	A	A	/	E	T	O		-					
Size		Features				Series		Design		Body/End material		Ball/Stem material		Seat	Inner Seal	Outer Seal		End Connection					Special features				

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
15	1½"	40
20	2"	50

Features (3-6)	
L	3A Compliance

Series (7-8)	
47	3A Clean valves

Design (9)	
G	Total HermetiX Integrity package - FDA compliant

Body/Ends material (11-12)	
6	CF3M
P	S. St. 316L Forged
3	S. St. DIN 1.4435 Forged
W	ALLOY-C22

Ball material (13)	
6	ASTM A479 S. Steel316L
W	ALLOY-C22

Stem material (14)	
6	ASTM A479 S. Steel316L
W	ALLOY-C22

Seat material (15)	
A	TFM

Inner Seal Material (16)	
A	TFM

Outer Seal Material (17)	
A	TFM

End connections (19-23)	
Welded	
ETO	Extended tube OD
Clamp	
TC	Tri-Clamp

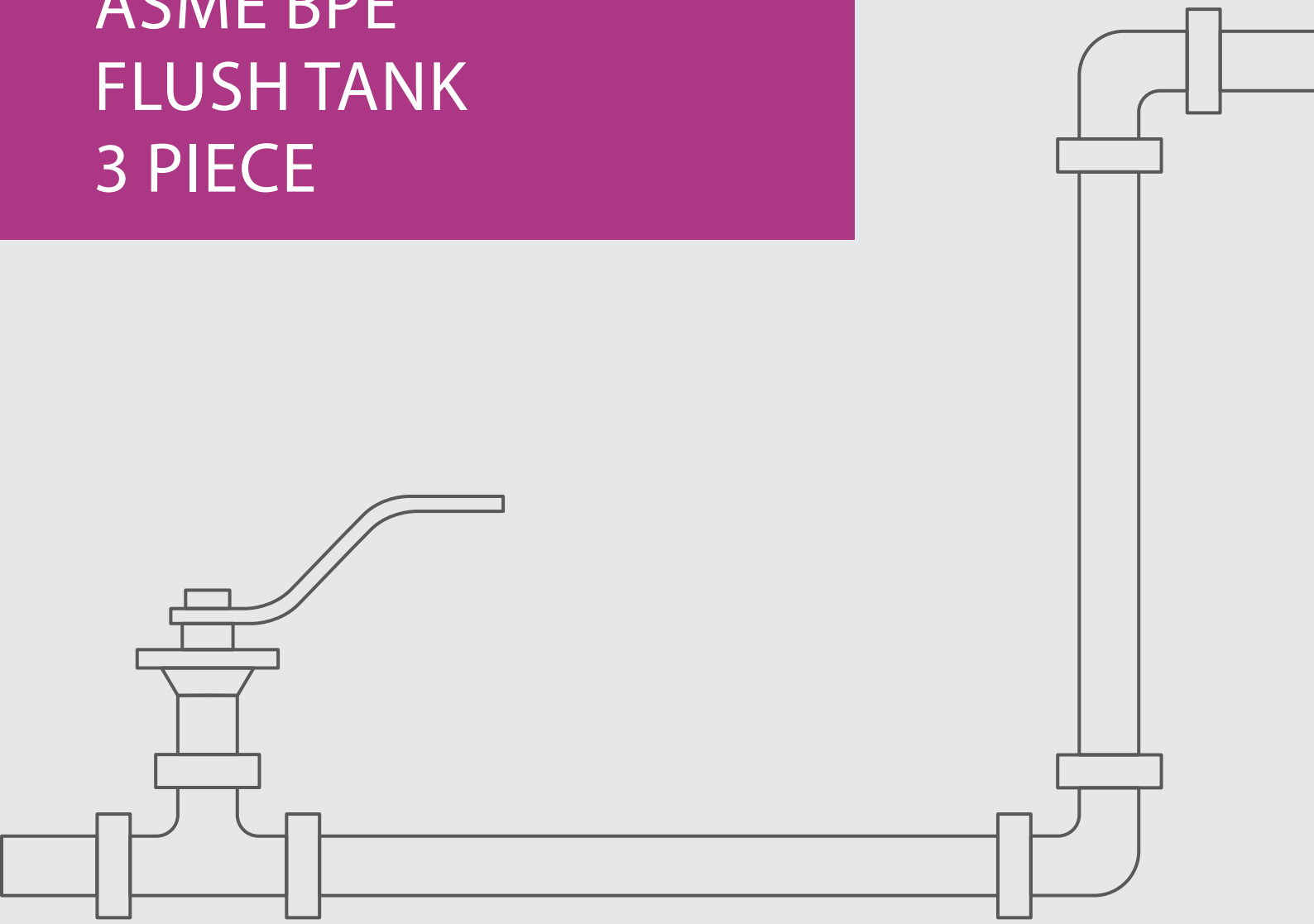
Special Features (24-30)	
B	Valve made from rolled bar

R48

Sanitary Valves

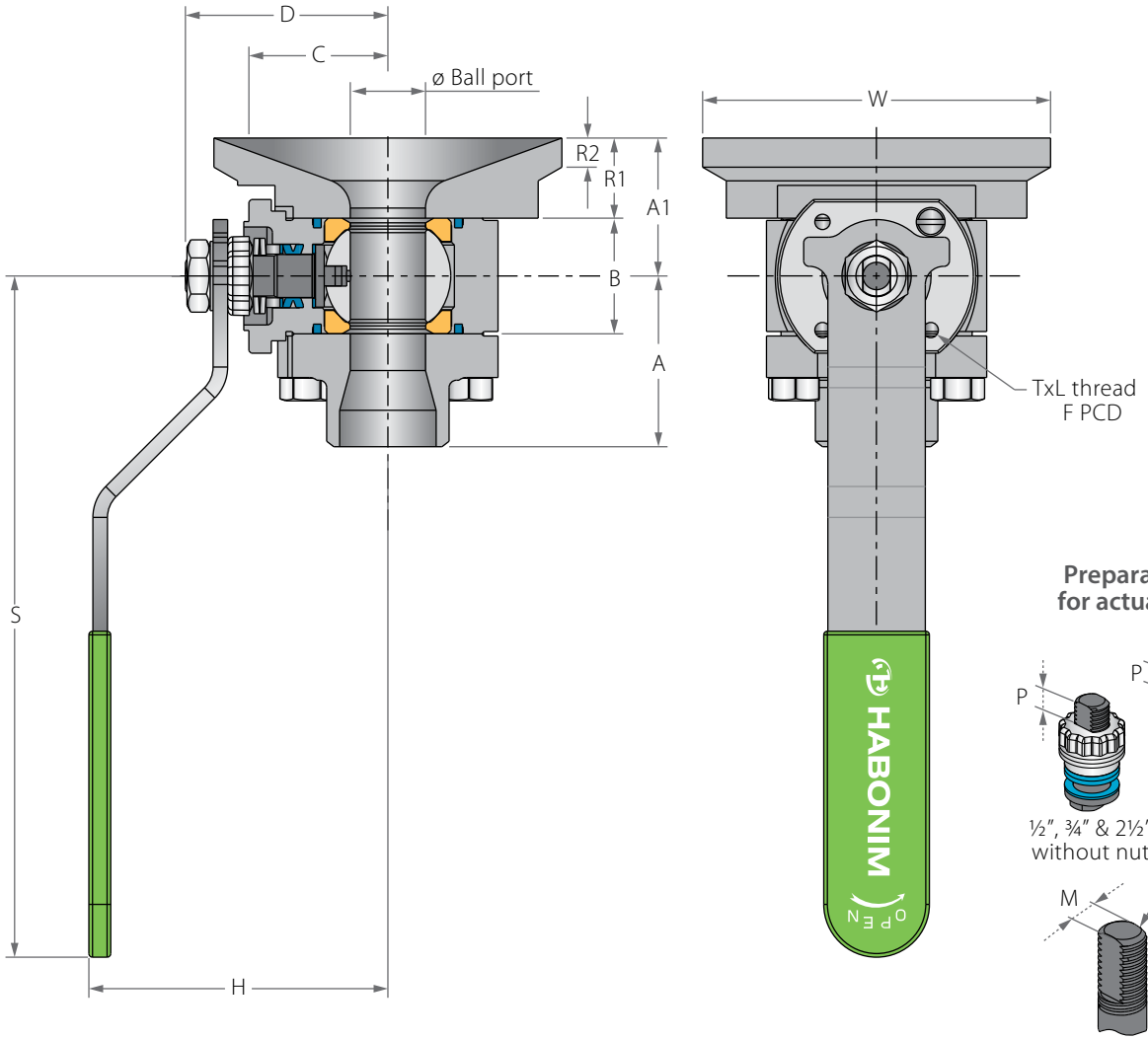
FLOATING BALL

ASME BPE
FLUSH TANK
3 PIECE

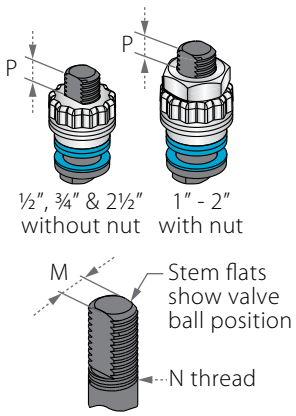


ASME BPE Flush Tank Floating Ball

Valve Dimensions



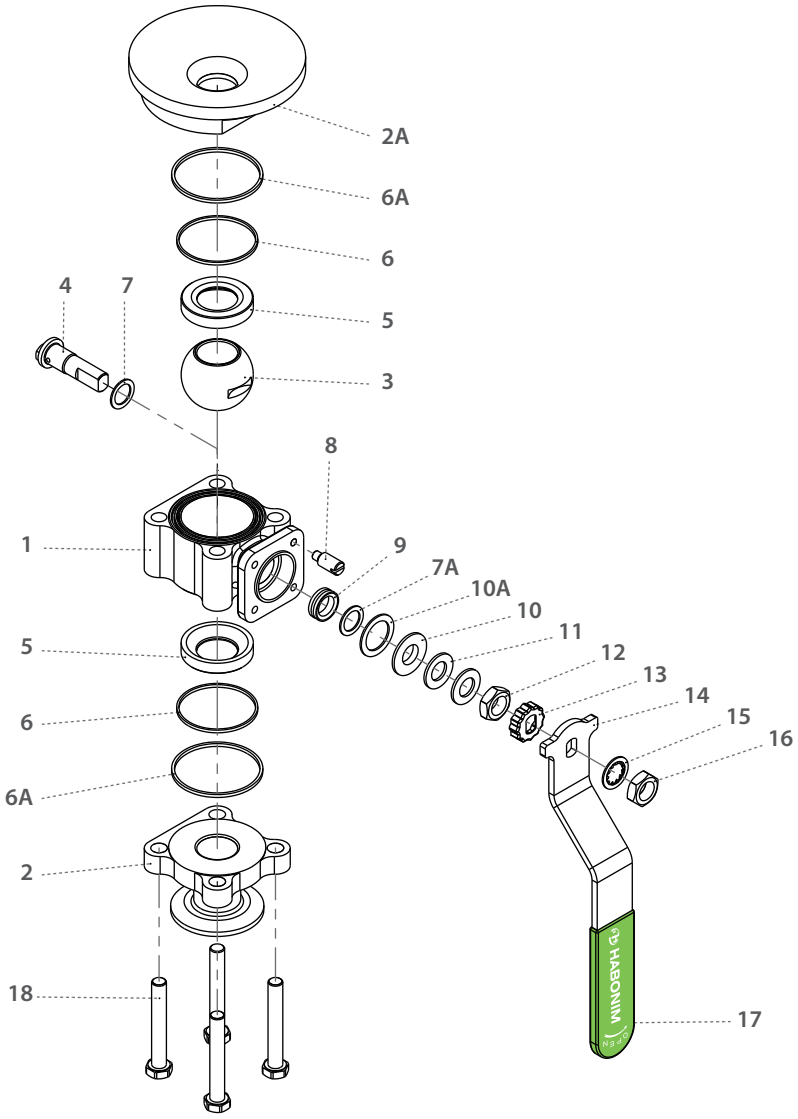
Preparation for actuation



Port	Unit	Ball port	R1	R2	A-ETO	A-TC	A1	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN15	mm	9.4	21.0	6.0	68.5	44.4	31.3	20.6	29.0	37.9	87.0	150.0	60.0	5.5	⅜ UNF	6.65	F03	36.0	M5X10	1.1	8
½"	inch	0.37	0.83	0.24	2.70	1.75	1.23	0.81	1.14	1.49	3.43	5.91	2.36	0.22		0.26		1.42		2.42	9
DN20	mm	15.75	20.5	6.0	71.5	50.78	32.8	24.55	36.0	45.0	69.5	150.0	79.5	5.5	⅜ UNF	6.65	F03	36.0	M5X10	1.5	29
¾"	inch	0.62	0.81	0.24	2.81	2.0	1.29	0.97	1.42	1.77	2.74	5.91	3.13	0.22		0.26		1.42		3.30	34
DN25	mm	22.1	22.0	8.0	83.9	59	39.75	35.5	43.5	61.0	85.6	187	95.5	7.5	7/16 UNF	6.65	F04	42.0	M5X10	2.2	53
1"	inch	0.87	0.87	0.31	3.30	2.32	1.56	1.40	1.71	2.40	3.37	7.36	3.76	0.30		0.26		1.65		4.84	62
DN40	mm	34.8	27.0	8.0	92.8	70.7	52.0	50.0	55.5	85.0	109.0	237.0	113.0	8.7	9/16 UNF	6.65	F05	50.0	M6X12	4.5	150
1½"	inch	1.37	1.06	0.31	3.65	2.78	2.05	1.97	2.19	3.35	4.29	9.33	4.45	0.34		0.26		1.97		9.90	175
DN50	mm	47.5	30.0	10.0	111.3	92.0	66.3	72.65	70.0	111.6	136.2	256.0	164.0	13.9	M20x2.5	14.6	F07	70.0	M6X12	11	410
2"	inch	1.87	1.18	0.39	4.38	3.62	2.61	2.86	2.76	4.39	5.36	10.08	6.46	0.55		0.57		2.76		24.20	480
DN65	mm	60.2	34.0	10.0	125.2	84.6	75.7	83.35	98.3	144.9	165.5	401.0	188	18.9	1"-14" UNS-2A	16.7	F10	102.0	M8X20	16	681
2½"	inch	2.37	1.34	0.39	4.93	3.33	2.98	3.28	3.87	5.70	6.51	15.79	7.40	0.74		0.66		4.02		35.20	680

ASME BPE Flush Tank Floating Ball

Components & Materials



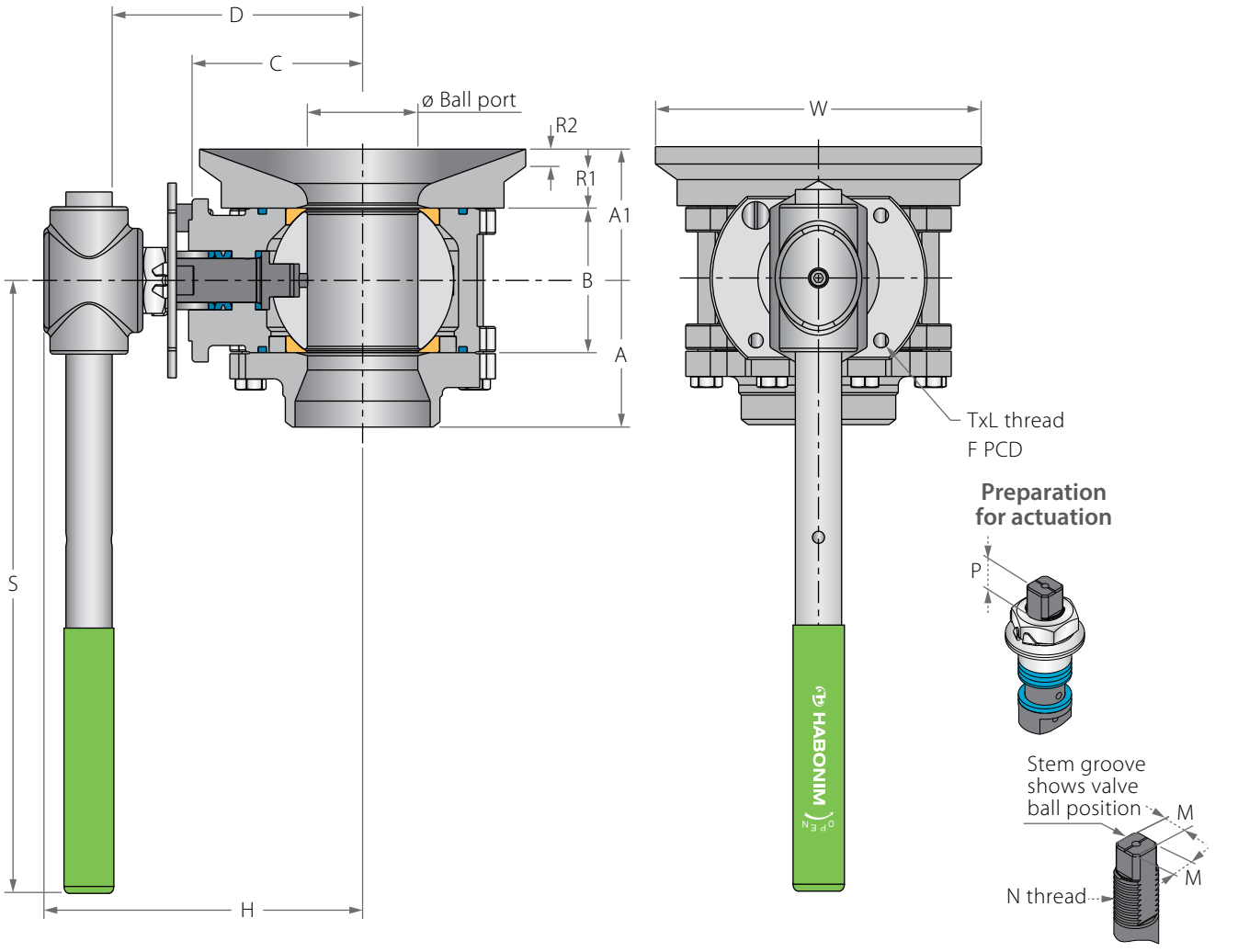
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
2A	FT End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5	Seat	Acc. Ordering Code	2
6	Inner Seal	Acc. Ordering Code	2
6A	Outer Seal	Acc. Ordering Code	2
7	Stem Thrust Seal	V. PEEK	1
7A	Anti-Abrasion Ring	V. PEEK	1
8	Stop Pin	S. Steel	1
9	Stem Seal	TFM	1

Item	Description	Material specification	Qty.
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body bolt	S. Steel	4

* Maintenance kit components

ASME BPE Flush Tank Valves

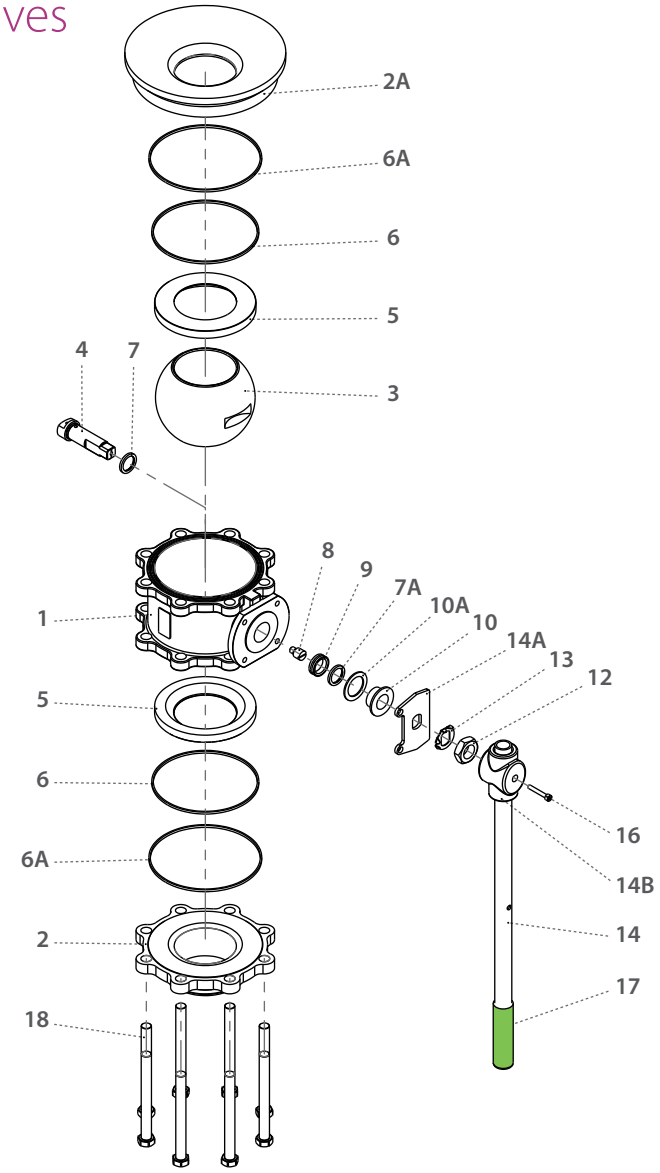
Valve Dimensions



Port	Unit	Ball port	R1	R2	A-ETO	A-TC	A1	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv / Cv
DN80	mm	72.9	43.0	10.0	151.2	96.5	91.2	96.4	107.5	151.1	189.0	401.0	226.0	18.9	1"-14	16.70	F10	102	M10x20	22	748
3"	inch	2.87	1.69	0.39	5.95	3.80	3.59	3.80	4.23	5.95	7.44	15.79	8.90	0.74	UNS-2A	0.66		4.02		48.40	875
DN100	mm	97.4	44.6	10.0	158.8	118.1	106.1	123.0	123.3	170.83	206.8	619.0	252.0	18.9	1"-14	16.70	F10	102	M10x20	36	1333
4"	inch	3.83	1.76	0.39	6.25	4.65	4.18	4.84	4.85	6.73	8.14	24.37	9.92	0.74	UNS-2A	0.66		4.02		79.20	1560

ASME BPE Flush Tank Valves

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
2A	FT End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5	Seat	Acc. Ordering Code	2
6	Inner Seal	Acc. Ordering Code	2
6A	Outer Seal	Acc. Ordering Code	2
7	Stem Thrust Seal	V. PEEK	1
7A	Anti-Abrasion Ring	V. PEEK	1
8	Stop Pin	S. Steel	1
9	Stem Seal	TFM	1

Item	Description	Material specification	Qty.
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	8
19	Body Nuts	S. Steel	8

* Maintenance kit components

ASME BPE Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
1	0				R	4	8	G	-	6	6	6	6	A	A	-	/	E	T	O		-				
Size		Features				Series		Design		Body material		Ends material		Ball/Stem material		Seat material		Seal material			End Connection				Special features		

Size (1-2)		
Code	inch	mm
02	¼"	10
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
R	Flush tank
F	Fire Safe
D	Diverter, Bottom entry
S	Diverter, Side entry
Q	Cavity filler seats

Series (7-8)	
48	ASME BPE Clean valves

Design (9)	
G	Total HermetiX Integrity package - FDA compliant

Body/Ends material (11-12)	
6	CF3M
3	S. St. EN10222-5 Forged
P	S. St. 316L Forged
W	ALLOY-C22

Ball/Stem material (13-14)	
6	ASTM A479 S. Steel316L
W	ALLOY-C22

Seat material (15)	
A	TFM
L	Virgin Peek

Inner Seal Material (16)	
A	TFM

Outer Seal Material (17)	
A	TFM
G	Expanded graphite

End Connection (19-22)	
Welded	
ETO	Extended tube OD
Clamp	
TC	Tri-Clamp

Special Features (24-30)	
G32	ASME BPE surface designation SF1 - Internal polishing level of 0.51 µ-m, 20 µ-in Ra max.
E24	ASME BPE surface designation SF5 - Internal polishing & EP level of 0.51 µ-m, 20 µ-in Ra max.
E32	ASME BPE surface designation SF4 - Internal polishing & EP level of 0.38 µ-m, 15 µ-in Ra max.
B	Valve made from rolled bar

INDUSTRIAL VALVES

General 300

Trunnion

Top Entry 303

3 piece 307

2 piece 317

Floating Ball

3 piece 327

Flanged 341

DS (DBB) | 3 piece 353

DS (DBB) | Flanged 359

Multiport 363

Diverter Side Entry | 3 piece 399

Diverter Side Entry | Flanged 411

Flush Tank 423

INDUSTRIAL VALVES

General

Habonim's Industrial valves product line are subject to the general Habonim valves design, materials, practices, methodologies and certifications – formore information, see Valves General chapter.

Habonim General use Industrial valves are equipped with the Total HermetiX integrity package for superior sealing, safety and environmental care (for some series).

Habonim's wide range of industrial ball valves are in service for many decades and have been evolved to guarantee superb long-lasting performances in demanding applications as well as for general use. The standard basic valve construction offered by Habonim is an all-in-one high-end industrial valve that meets the latest safety, environmental, durability and maintainability requirements of modern industrial systems, piping and equipment.

Habonim's standard valves are supplied with the Total HermetiX integrity package that offers superior valve construction with a higher quality level and a unified design approach to allow minimal variants of valve parts to support a wider range of applications that guarantee higher availability, lower level of spare parts and reduced total cost of ownership.

Features

Total HermetiX:

- Zero fugitive-emission no maintenance stem sealing
- Double body sealing
- Fire safe
- 100% tested
- 100% materials & processing back-tracking

End Connections Variety:

- Wide range of end connections available for assembly on a generic center section in 3 piece series, standard or full port.
- Flanged connections comply with ANSI B16.5 with standard or full port valves.

Certifications

Type tested certified by leading certification bodies and other on request (for part of the series).

Quick Selection Table

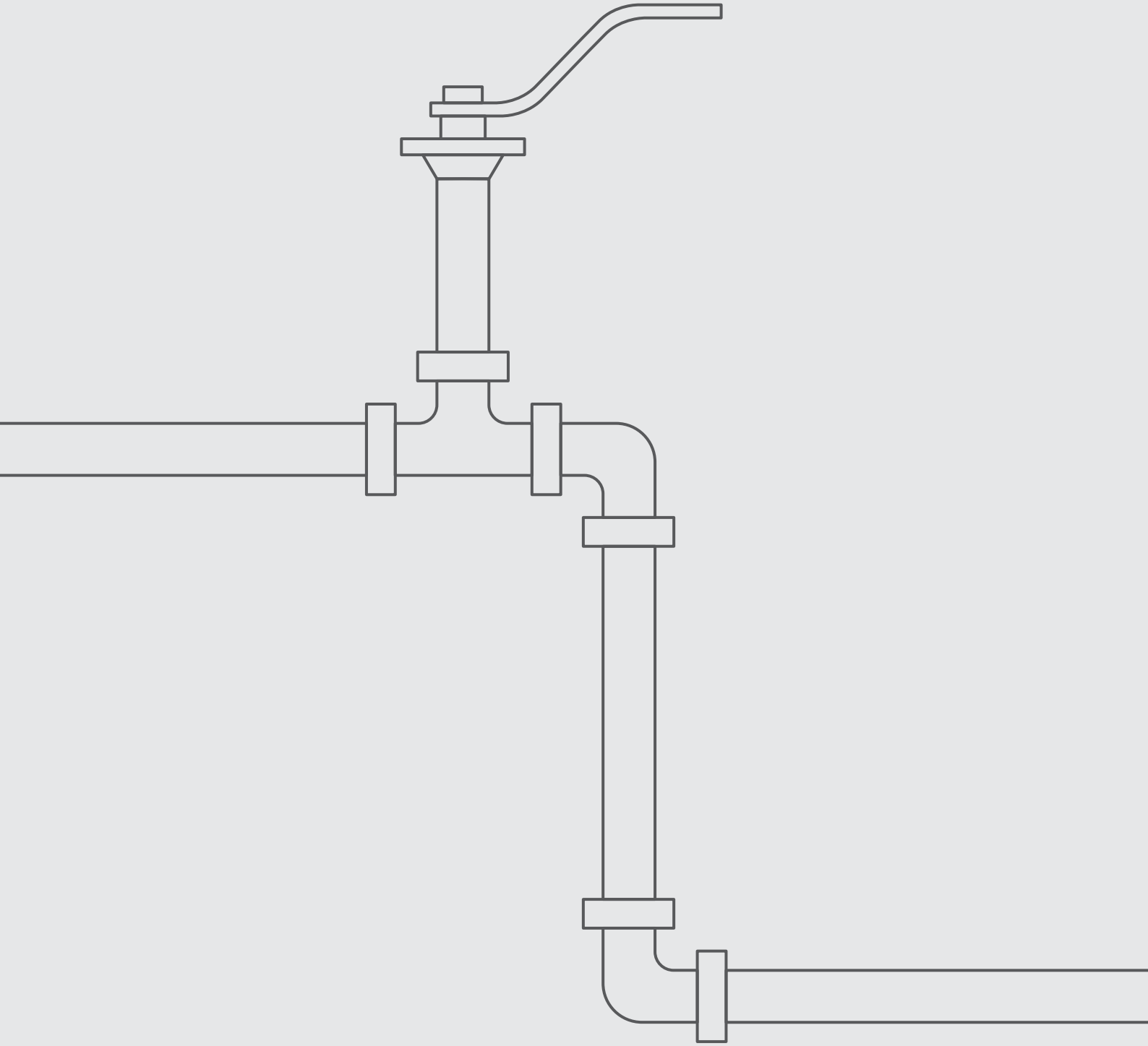
Total Hermetix™ | **Port:** Standard Port | Full Port | Tube Size | **End Connections:** Threaded | Flanged | Welded | Ordering Code

Temperature: -60°C - +260°C (-76 °F ÷ +500 °F)

Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16 — MWP (ASME Class / DIN PN)
Trunnion Mounted Ball	Top Entry	OC	52	TH	Full Port	Welded	300						300										
	3 Piece	OC	91	TH	Standard Port	Flanged										150							
		OC	92	TH	Standard Port	Flanged										300							
		OC	93	TH	Standard Port	Flanged										600							
		OC	94	TH	Standard Port	Flanged										900							
	2 Piece	OC	81	TH	Full Port	Flanged										150							
		OC	82	TH	Full Port	Flanged										300							
		OC	83	TH	Full Port	Flanged										600							
Floating Ball	3 Piece	OC	47	TH	Standard Port	Flanged	900								600	400							
		OC	26	TH	Full Port	Flanged								600									
	1 Piece	OC	31	TH	Standard Port	Flanged			150														
		OC	32	TH	Standard Port	Flanged			300														
	1 Piece 2 Piece	OC	73	TH	Full Port	Flanged			150														
		OC	74	TH	Full Port	Flanged			300														
		OC	77	TH	Full Port	Flanged										PN16							
		OC	78	TH	Full Port	Flanged			PN40														
	DS (DBB)	OC	47DS	TH	Standard Port	Flanged	600																
		OC	73DS	TH	Full Port	Flanged										150							
		OC	74DS	TH	Full Port	Flanged										300							
		OC	77DS	TH	Full Port	Flanged										PN16							
		OC	78DS	TH	Full Port	Flanged										PN16							
	Multiport 3 Pcs.	OC	61/D61	TH	Standard Port	Flanged	600							300									
		OC	62/D62	TH	Standard Port	Flanged																	
	Diverter 3 Pcs.	OC	D47	TH	Standard Port	Flanged			600					300									
	Side-Entry 3 Pcs.	OC	S47	TH	Standard Port	Flanged																	
	Diverter 2 Pcs.	OC	D31	TH	Standard Port	Flanged			150														
		OC	D32	TH	Standard Port	Flanged																	
	Side-Entry 2 Piece	OC	S31	TH	Standard Port	Flanged																	
		OC	S32	TH	Standard Port	Flanged																	
	Flush tank	OC	R47	TH	Standard Port	Flanged			300														

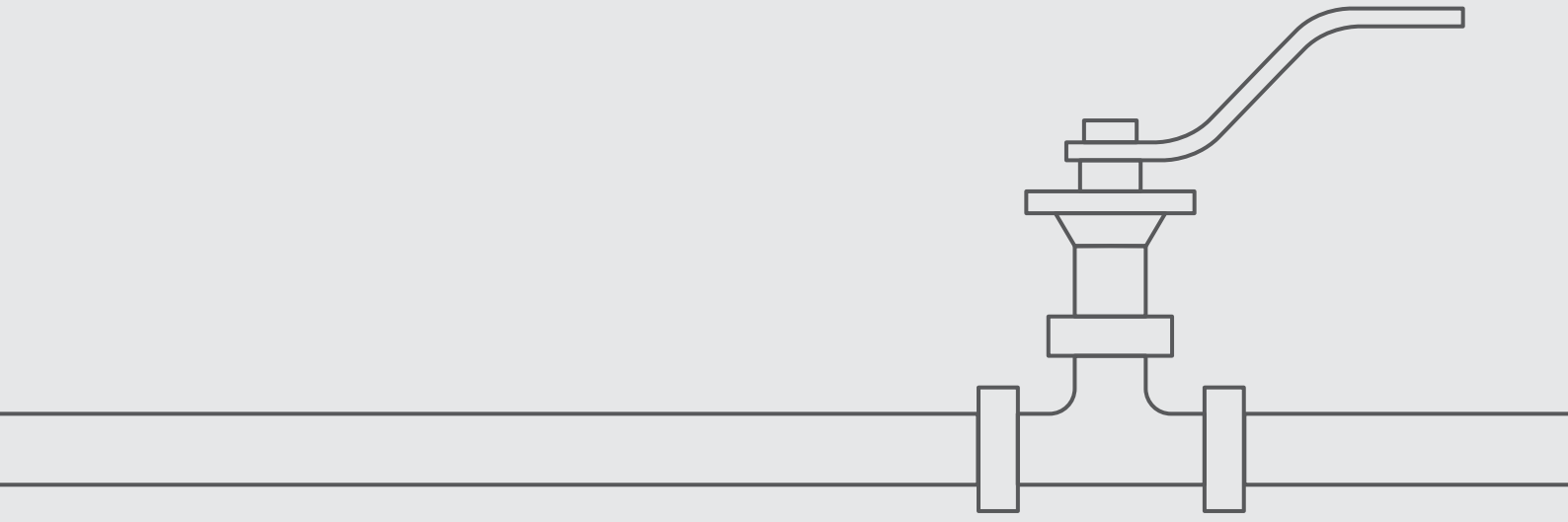
ASME Class			150	300	600	900	1500	2500	6000
Pressure Bar	-1*	0	16	50	100	150	250	400	1034
Pressure psi	*-14*	Vacuum 0	232	725	1450	2175	3600	5800	15000





TRUNNION

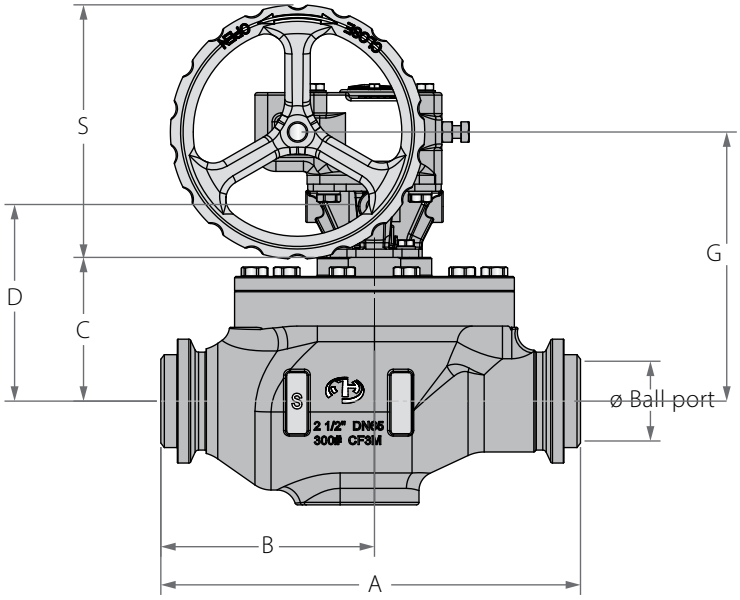
TOP ENTRY

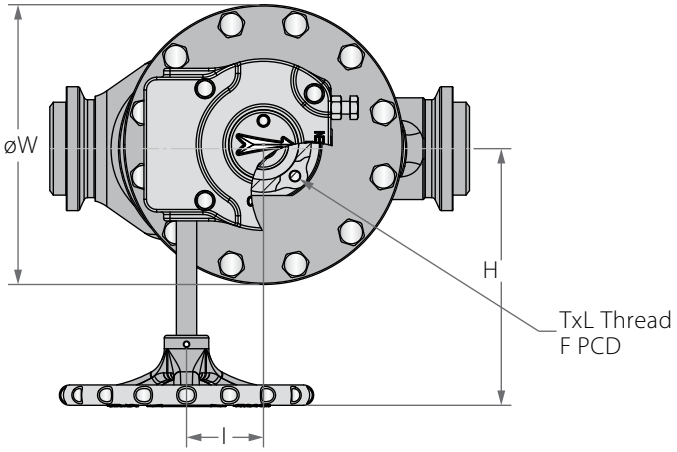


Top Entry Trunnion Mounted Ball Valve

PATENTED
US 11181201

Valve Dimensions





Standard stem tops

DD Type
for sizes 1½" - 2½"

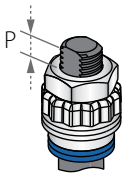
Stem flats
show valve
ball position

Square Type
for sizes 2" - 6"

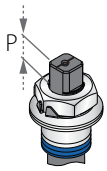
Stem groove
shows valve
ball position



Preparation for actuation



½" - 1"
with nut



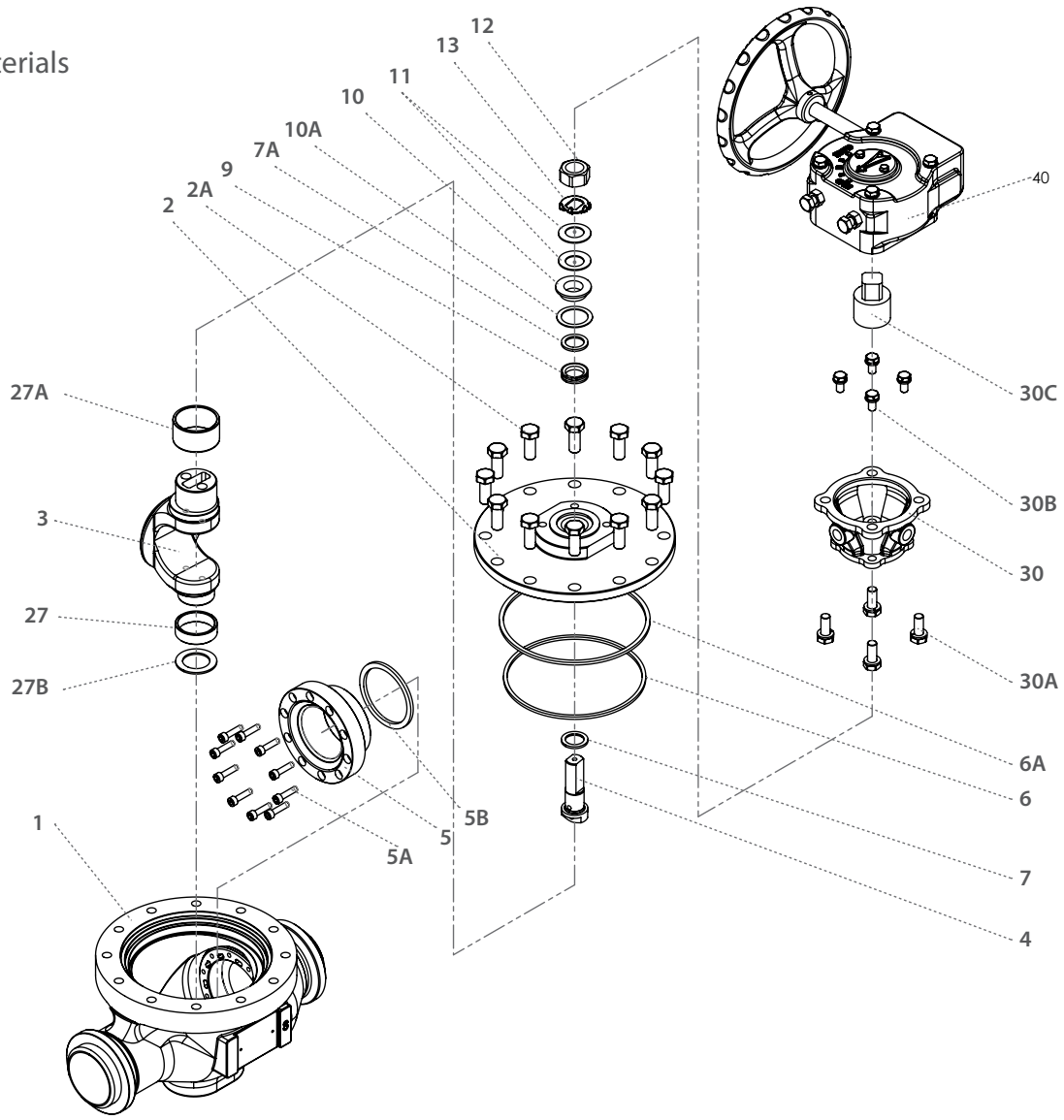
1½" - 6"

Full Port	Units	Ball port	A	B	C	D	G*	H*	I*	S*	W	M	N	P	F		TxL	Weight kg/lb	KV CV
DN40	mm	38.2	241.0	129.0	88.6	118.0	177.2	192.0	52.0	200	169.0	8.7	9/16" - 18 UNF	7.1	F05	50.0	M8x9	11.5	164
1½"	inch	1.5	9.49	5.08	3.49	4.65	6.98	7.56	2.05	7.87	6.65	0.34		0.28		1.97		25.4	190
DN50	mm	50.8	292.0	151.0	103.9	145.5	192.5	197.0	52.0	250.0	43.0	13.9	M20x2.5	13.9	F07	70.0	M10x15	20.5	327
2"	inch	2.0	11.50	5.94	4.09	5.73	7.58	7.76	2.05	9.84	1.69	0.55		0.55		2.76		45.2	378
DN65	mm	62.7	330.0	168.0	113.0	154.6	211.6	208.2	60.5	300.0	220.0	13.9	M20x2.5	13.2	F07	70.0	M12x15	27.8	668
2½"	inch	2.5	12.99	6.61	4.45	6.09	8.33	8.20	2.38	11.81	8.66	0.55		0.52		2.76		61.3	772
DN80	mm	74.0	356.0	186	142.5	189.1	263.5	270.0	60.5	400.0	240.0	18.9	1"- 14 UNS	18.3	F10	102.0	M12x15	38.5	823
3"	inch	3.0	14.02	7.32	5.61	7.44	10.37	10.63	2.38	15.75	9.45	0.74		0.72		4.02		84.9	951
DN100	mm	100.0	432.0	220.0	155.3	201.8	276.3	489.0	70.0	400.0	305.0	18.9	1"- 14 UNS	18.3	F10	102.0	M12x15	64.0	1678
4"	inch	4.0	17.01	8.66	6.11	7.94	10.88	19.25	2.76	15.75	12.01	0.74		0.72		4.02		141.1	1940
DN150	mm	150.0	559.0	280.0	214.7	284.1	370.2	372.0	122.5	600.0	410.0	28.5	1½" - 12 UNF	28.5	F12	125.0	M16x20	158.0	4199
6"	inch	6.0	22.01	11.02	8.45	11.19	14.57	14.65	4.82	23.62	16.14	1.12		1.12		4.92		348.3	4854

* Gear position dimensions may be a subject for changes for some applications
weight of the valve BS (whithout gear & MK)

Top Entry Trunnion Mounted Ball Valve

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Cover	Acc. Ordering Code	1
2A	Cover Bolts	S.Steel	12
3	Ball	S.Steel	1
4	Stem	High Strength S.Steel	1
5*	Hybrid Seat	S.Steel	1
5A*	Seat Bolts	S.Steel	10
5B*	Seat Seal	Graphite	1
6*	Cover Inner Seal	TFM	1
6A*	Cover Outer Seal	Graphite	1
7*	Stem Thrust Seal	PCTFE	1
7A*	Anti-Abrasion Ring	PCTFE	1
9*	Stem Seal	TFM	1
10	Follower	S.Steel	1
10A*	Slide Bearing	S.Steel	1

Item	Description	Material specifications	Qty.
11	Disc Spring	S.Steel	2
12	Stem Nut	S.Steel	1
13	Locking Clip (Tab Lock Washer For 2" And Up)	S.Steel	1
27*	Upper Ball Radial Bearing	S.Steel	1
27A	Lower Ball Radial Bearing	S.Steel	1
27B*	Lower Thrust Bearing	S.Steel + PTFE	1
30	Bridge	S.Steel	1
30A	Bridge Upper Bolts	S.Steel	4
30B	Bridge Lower Bolts	S.Steel	4
30C	Lower Thrust Washer	S.Steel	1
40	Bonnet Bolt	---	1

* Maintenance kit components

Top Entry Trunnion Mounted Ball Valve - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
3	0		F		**B**	**5**	**2**	**W**	-	6	M	6	Z	C	A	G	/	X	B	W						
Size		Features				Series		Design		Body/Ends material		Ball material	Stem material	Seat material	Inner seal	Outer seal		End connection				Special features				

Size (1-2)		
Code	**inch**	**mm**
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
B	Full port
F	Fire safe

Series (7-8)	
52	ASME #300 Top Entry

Design (9)	
W	Total HermetiX Integrity package

Body & Bonnet (11)	
6	S. Steel

Stem material (12)	
M	High Strength S. Steel

Ball & seat ring material (13)	
6	S. Steel

Seat feature (14)	
Z	Eccentric C-Ball

Seat insert (15)	
C	PCTFE

Primary bonnet seal (16)	
A	TFM

Outer Seal material (17)	
G	Expanded graphite

End Connection (19-22)	
XBW	Butt weld ASME B16.25 SCH40
XBW10	Butt weld ASME B16.25 SCH10
XBW80	Butt weld ASME B16.25 SCH80
ETI1.6	Butt weld ISO 1127, 1.6mm
ETI2.0	Butt weld ISO 1127, 2.0mm
ETI2.3	Butt weld ISO 1127, 2.3mm

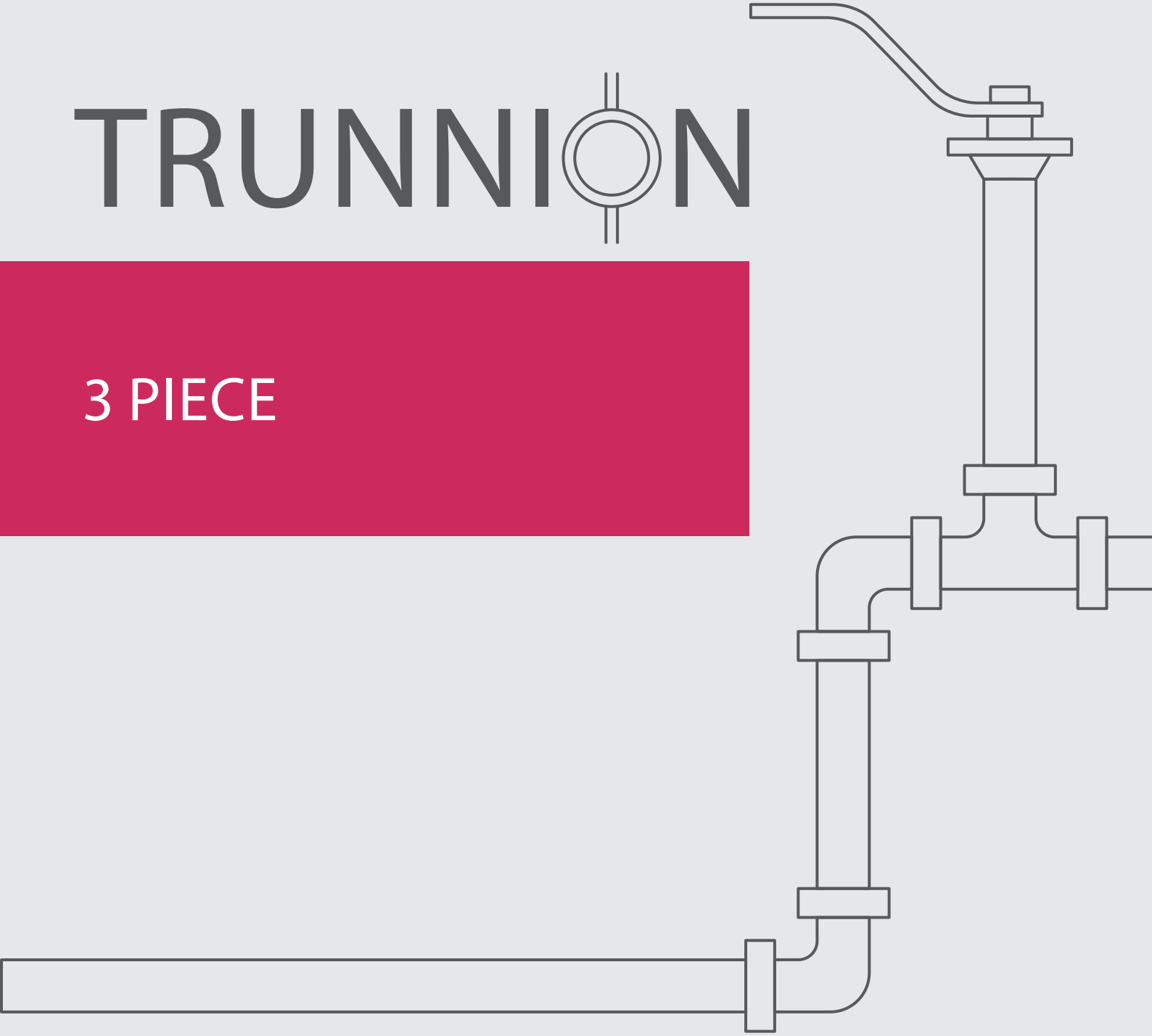
Special Features (24-30)

91 92 93 94

Industrial Valves

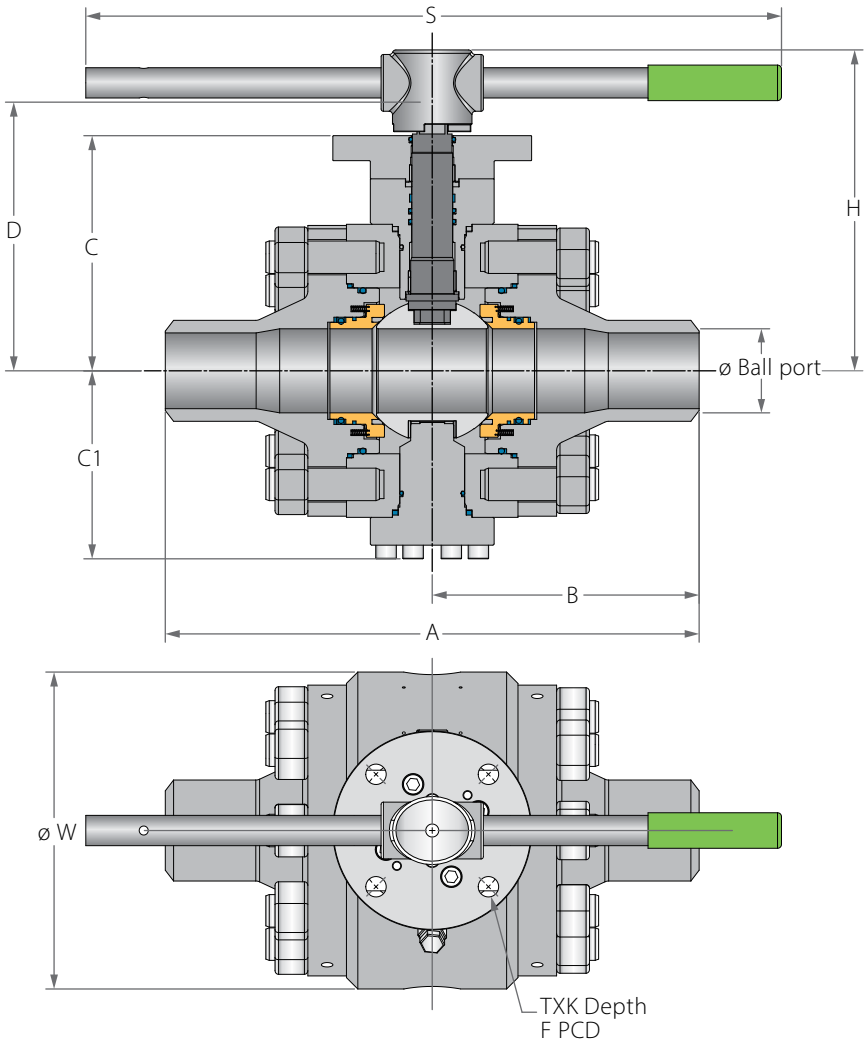
TRUNNION

3 PIECE

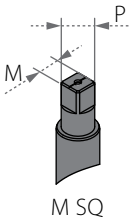


Trunnion Mounted Ball 3 Piece

Valve Dimensions



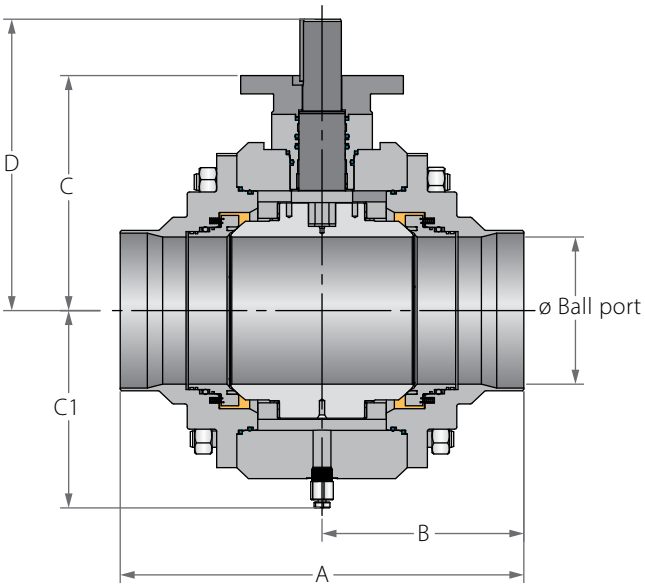
Preparation for actuation

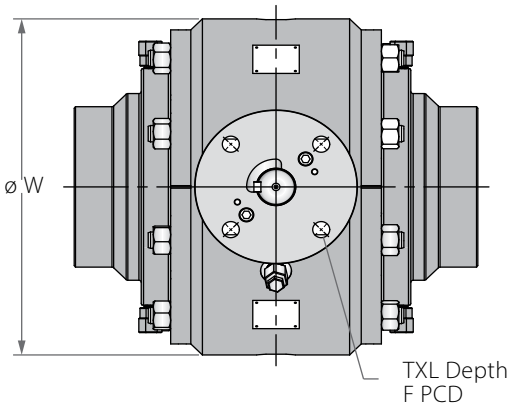


Std. port	Full port	Unit	Ball port	A		B		C	C1	D	W		Msq	Psq	H	S	F		TxL	Weight kg/ib		Kv / Cv	
				150	300	150	300				150	300								150	300	150	300
DN80	DN50	mm	49.0	216.0	216.0	108.0	108.0	127.0	91.50	144.50	169.0	169.0	17.0	22.0	196.0	401.0	F10	102.0	11 X15 (4 holes)	20	22	400	363
3"	2"	inch	1.93	8.50	8.50	4.25	4.25	5.0	3.60	5.69	6.65	6.65	0.67	0.87	7.72	15.79		4.02		44	49	463	420
DN100	DN80	mm	74.0	283.0	283.0	141.50	141.50	148.0	117.0	172.0	209.0	219.0	22.0	32.0	223.0	610.0	F12	125.0	13x15 (4 holes)	43	46	1125	952
4"	3"	inch	2.91	11.14	11.14	5.57	5.57	5.83	4.61	6.77	8.23	8.62	0.87	1.26	8.78	24.02		4.92		95	101	1300	1100
DN150	DN100	mm	100.0	305.0	305.0	152.50	152.50	171.0	139.0	198.50	259.0	268.0	27.0	35.0	247.50	610.0	F14	140.0	18x15 (4 holes)	56	69	2154	1860
6"	4"	inch	3.94	12.01	12.01	6.0	6.0	6.73	5.47	7.81	10.20	10.55	1.06	1.38	9.74	24.02		5.51		123	152	2490	2150
DN200	DN150	mm	150.0	457.0	457.0	228.50	228.50	254.0	191.0	290.50	355.0	359.0	36.0	46.20	356.50	916.0	F16	165.0	22x25 (4 holes)	168	181	4723	4628
8"	6"	inch	5.91	17.99	17.99	9.0	9.0	10.0	7.52	11.44	13.98	14.13	1.42	1.82	14.04	36.06		6.50		370	399	5460	5350

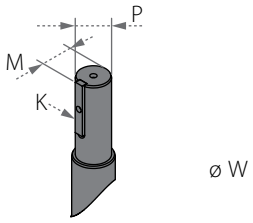
Trunnion Mounted Ball 3 Piece

Valve Dimensions





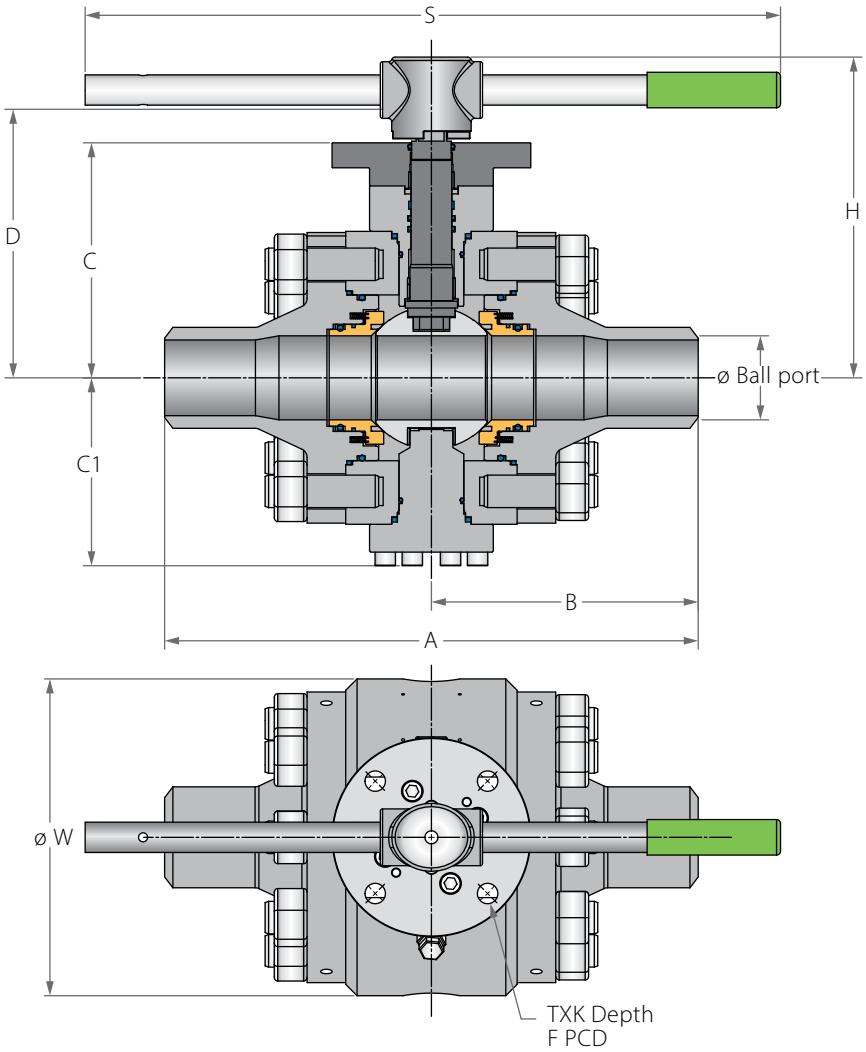
Preparation for actuation



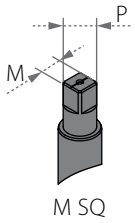
Std. port	Full port	Unit	Ball port	A		B		C		C1		D		W		P		M		K		F		TxL	Weight kg/ib		Kv / Cv	
				150	300	150	300	150	300	150	300	150	300	150	300	150	300	150	300	150	300				150	300	150	300
DN250	DN200	mm	201.0	521.0	521.0	260.50	260.50	325.0	305.0	247.0	232.0	405.50	379.50	459.0	459.0	50.0	50.0	54.0	61.0	14.0	14.0	F16	165.0	22x25 (4 holes)	305	335	9273	8737
10"	8"	inch	7.91	20.51	20.51	10.26	10.26	12.80	12.01	9.72	9.13	15.96	14.94	18.07	18.07	1.97	1.97	2.13	2.40	0.55	0.55		6.50		672	739	10720	10100
DN300	DN250	mm	252.0	559.0	559.0	279.50	279.50	353.0	359.0	297.0	299.0	430.0	454.0	550.0	550.0	50.0	60.0	54.0	65.50	14.0	18.0	F25	254.0	18x25 (8 holes)	517	542	15224	14792
12"	10"	inch	9.92	22.01	22.01	11.0	11.0	13.90	14.13	11.69	11.77	16.93	17.87	21.65	21.65	1.97	2.36	2.13	2.58	0.55	0.71		10.0		1140	1195	17600	17100
DN350	DN300	mm	303.0	635.0	635.0	317.50	317.50	388.0	368.0	324.0	305.0	468.50	464.0	610.0	610.0	60.0	60.0	63.50	65.50	18.0	18.0	F25	254.0	18x25 (8 holes)	792	833	23096	22404
14"	12"	inch	11.93	25.0	25.0	12.50	12.50	15.28	14.49	12.76	12.01	18.44	18.27	24.02	24.02	2.36	2.36	2.50	2.58	0.71	0.71		10.0		1746	1836	26700	25900
DN400	DN350	mm	334.0	762.0	762.0	381.0	381.0	399.0	425.0	422.0	425.0	496.0	522.0	645.0	645.0	72.0	72.0	78.0	76.50	20.0	20.0	F30	254.0	22x30 (8 holes)	897	985	27940	26729
16"	14"	inch	13.15	30.0	30.0	15.0	15.0	15.71	16.73	16.61	16.73	19.53	20.55	25.39	25.39	2.83	2.83	3.07	3.01	0.79	0.79		10.0		1978	2172	32300	30900

Trunnion Mounted Ball 3 Piece

Valve Dimensions



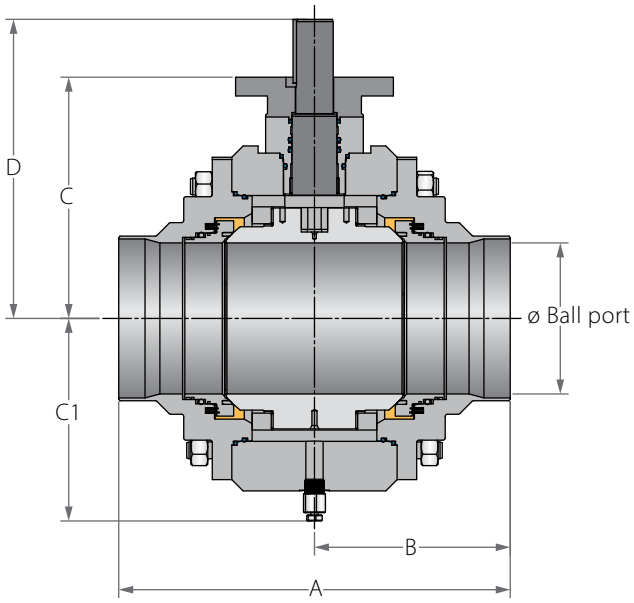
Preparation for actuation

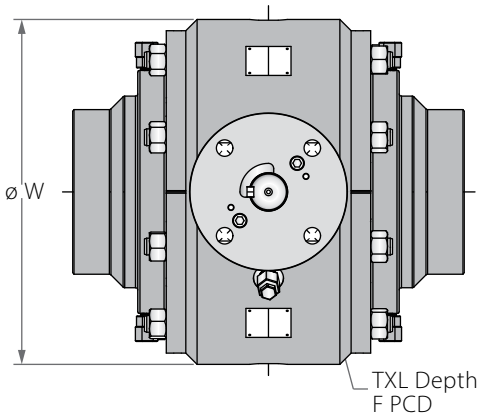


Std. port	Full port	Unit	Ball port	A		B		C		C1		D		W		Msq	Psq	H	S	F		TxL	Weight kg/ib		Kv / Cv	
				600	900	600	900	600	900	600	900	600	900	600	900								600	900	600	900
DN80	DN50	mm	49.0	292.0	368.0	146.0	184.0	144.0	148.50	119.0	263.0	168.50	182.50	205.0	205.0	22.0	28.0	219.50	401.0	F12	125.0	13X15 (4 holes)	41	58	329	294
3"	2"	inch	1.93	11.50	14.49	5.75	7.24	5.67	5.85	4.69	10.35	6.63	7.19	8.07	8.07	0.87	1.10	8.64	15.79		4.92		90	128	380	340
DN100	DN80	mm	74.0	356.0	381.0	178.0	190.50	191.0	214.0	160.0	152.70	215.0	237.50	270.0	275.0	22.0	28.0	266.0	610.0	F14	140.0	22x24 (4 holes)	89	100	874	822
4"	3"	inch	2.91	14.02	15.0	7.01	7.50	7.52	8.43	6.30	6.01	8.46	9.35	10.63	10.83	0.87	1.10	10.47	24.02		5.51		196	220	1010	950
DN150	DN100	mm	100.0	432.0	457.0	216.0	228.50	217.0	193.0	184.0	184.0	246.50	259.0	325.0	325.0	27.0	36.0	316.50	916.0	F16	165.0	22x25 (4 holes)	128	171	1557	1471
6"	4"	inch	3.94	17.01	17.99	8.50	9.0	8.54	7.60	7.24	7.24	9.70	10.20	12.80	12.80	1.06	1.42	12.46	36.06		6.50		282	377	1800	1700
DN200	DN150	mm	150.0	559.0	610.0	279.50	305.0	282.50	368.0	214.50	224.0	320.50	463.0	400.0	435.0	36.0	48.20	385.0	916.0	F16	165.0	22x25 (8 holes)	277	335	3893	3823
8"	6"	inch	5.91	22.01	24.02	11.0	12.01	11.12	14.49	8.44	8.82	12.62	18.23	15.75	17.13	1.42	1.90	15.16	36.06		6.50		611	739	4500	4420

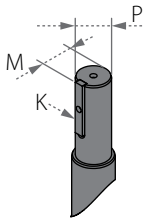
Trunnion Mounted Ball 3 Piece

Valve Dimensions





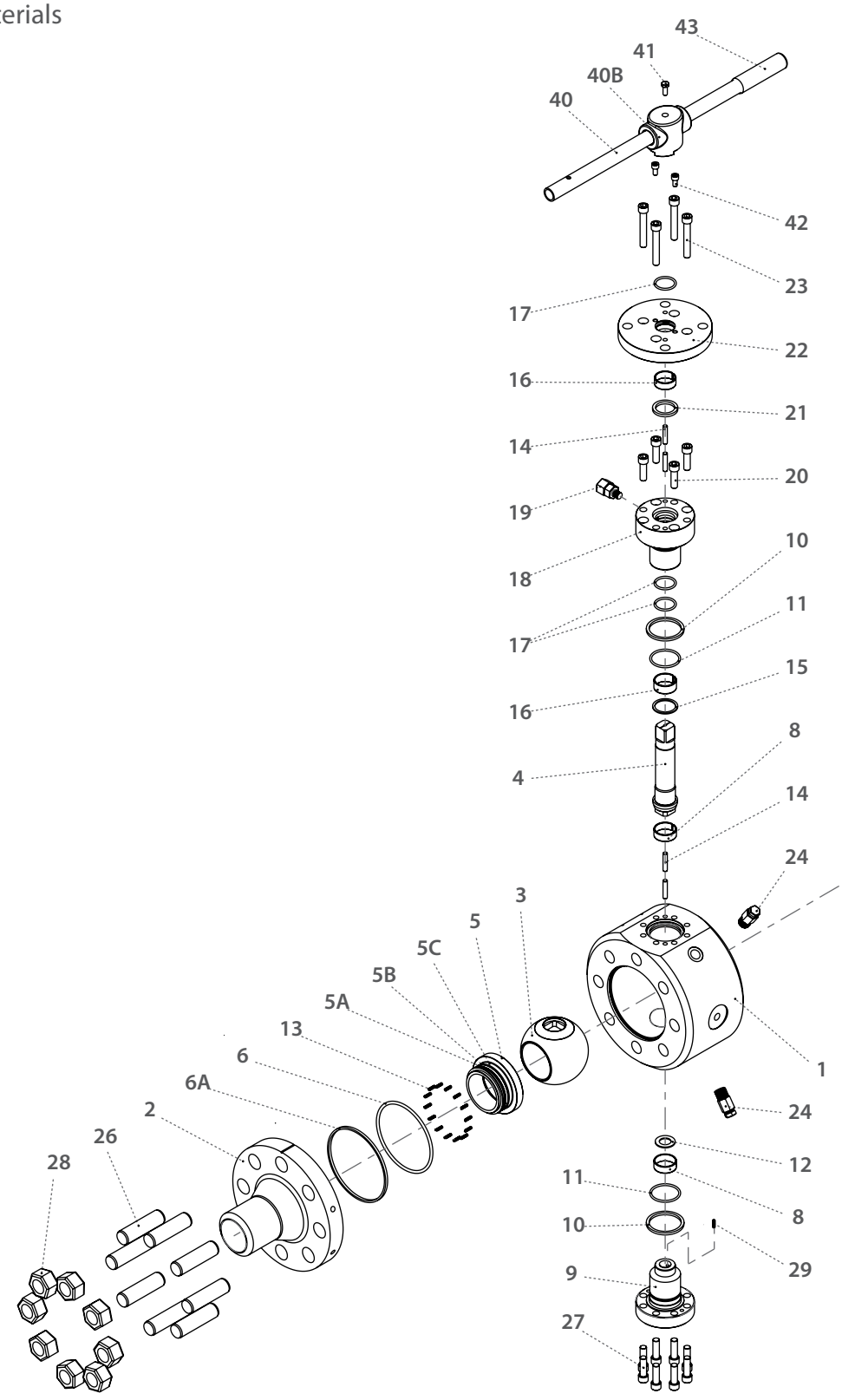
Preparation for actuation



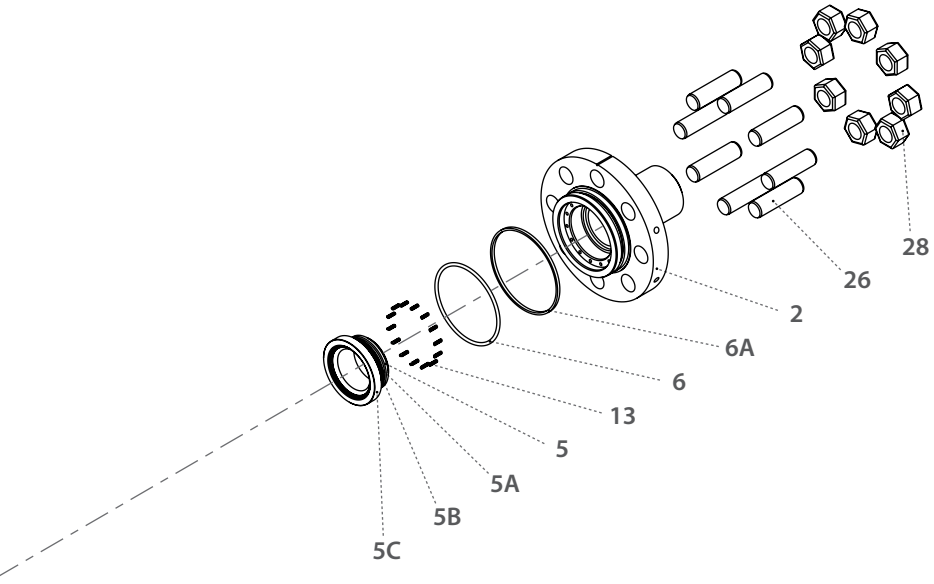
Std. port	Full port	Unit	Ball port	A		B		C		C1		D		W		P	M	K	F		TxL	Weight kg/ib		Kv / Cv	
				600	900	600	900	600	900	600	900	600	900	600	900							600	900	600	900
DN250	DN200	mm	201.0	660.0	737.0	330.0	368.50	312.0	307.0	263.0	263.0	409.0	403.0	500.0	519.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	486	520	7742	7344
10"	8"	inch	7.91	25.98	29.02	12.99	14.51	12.28	12.09	10.35	10.35	16.10	15.87	19.69	20.43	2.83	3.01	0.79		10.0		1071	1146	8950	8490
DN300	DN250	mm	252.0	787.0	838.0	393.50	419.0	374.0	393.0	310.0	347.0	471.0	490.0	595.0	609.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	758	945	12543	12110
12"	10"	inch	9.92	30.98	32.99	15.49	16.50	14.72	15.47	12.20	13.66	18.54	19.29	23.43	23.98	2.83	3.01	0.79		10.0		1671	2083	14500	14000
DN350	DN300	mm	303.0	838.0	965.0	419.0	482.50	402.0	419.0	344.0	361.0	499.0	544.0	695.0	709.0	72.0	76.50	20.0	F25	254.0	18x35 (8 holes)	1183	1398	19809	18598
14"	12"	inch	11.93	32.99	37.99	16.50	19.0	15.83	16.50	13.54	14.21	19.65	21.42	27.36	27.91	2.83	3.01	0.79		10.0		2608	3082	22900	21500
DN400	DN350	mm	334.0	889.0	-	444.50	-	435.0	-	412.0	-	565.0	-	730.0	-	80.0	87.0	22.0	F30	298.0	22x35 (8 holes)	1530	-	24739	23528
16"	14"	inch	13.15	35.0	-	17.50	-	17.13	-	16.22	-	22.24	-	28.74	-	3.15	3.43	0.87		11.73		3373	-	28600	27200

Trunnion Mounted Ball 3 Piece

Components & Materials



Trunnion Mounted Ball 3 Piece



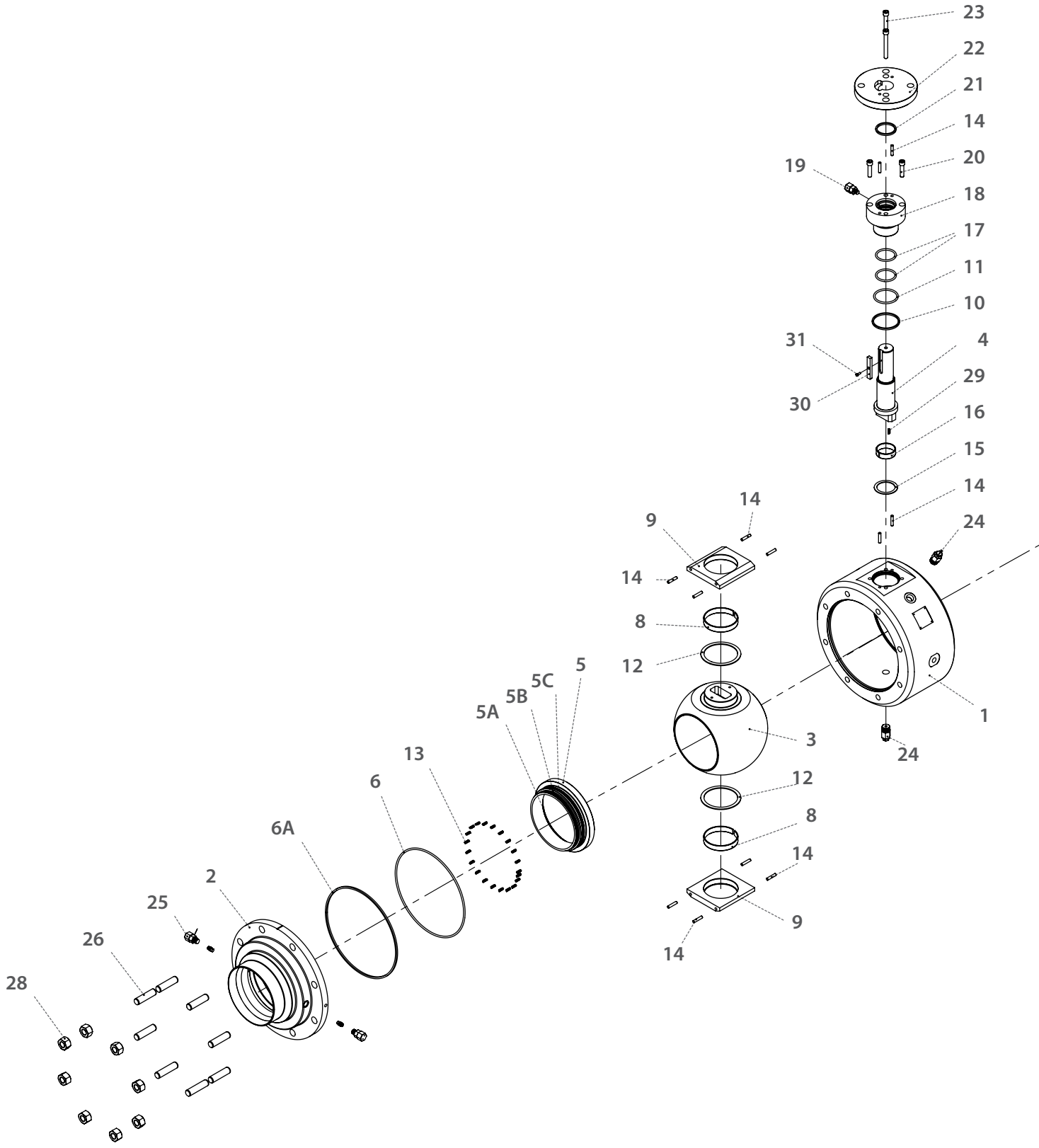
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A	Seat Insert	Acc. Ordering Code	2
5B*	Seat Seal	HNBR, VITON	2-4
5C*	Seat Fire Safe Seal	Graphite	2
6*	Body Inner Seal	HNBR, VITON	2
6A*	Body Outer Seal	Graphite	2
8*	Ball Bearing	S.Steel 316+PTFE	2
9	Trunnion Plate	S.Steel / C.Steel	2
10*	Gland Plate Fire Safe Seal	Graphite	1
11*	Gland Plate Seal	HNBR, VITON	1
12*	Ball Thrust Washer	S.Steel 316+PTFE	2
13	Seat Spring	INCONEL X750	10-24
14	Gland Pin (not shwon)	S.Steel / C.Steel	12
15*	Stem Thrust Washer	S.Steel 316+PTFE	1
16*	Stem Bearing	S.Steel 316+PTFE	1
16A	ISO Plate Bearing	S.Steel 316+PTFE	1

Item	Description	Material specification	Qty.
17*	Stem Seal	HNBR, VITON	2
18	Gland Plate	S.Steel / C.Steel	1
19	Stem Grease Fitting	S.Steel	1
20	Lower Gland Bolts	A193-B8M / A320 L7	2-6
21*	Stem Fire Safe Seal	Graphite	1
22	Iso Plate	S.Steel / C.Steel	1
23	Upper Gland Bolts	A193-B8M / A320 L7	2
24	Plug Valve	S.Steel	2
25	Seat Grease Fitting + Check Valve	S.Steel	4
26	Body Studs	A193-B8M / A320 L7	8-40
27	External Trunnion Bolts	A320 L7, A193 B8M	4-12
28	Body Nut	A194-8M / A194 L7	8-40
29	Anti-Static Spring	INCONEL X750	1
40	Pipe Handle	S.Steel	1
40B	Wrench Head	S.Steel	1
41	Wrench Head Bolts	S.Steel	1
42	Stop Bolt	S.Steel	2
43	Sleeve	PCV	1

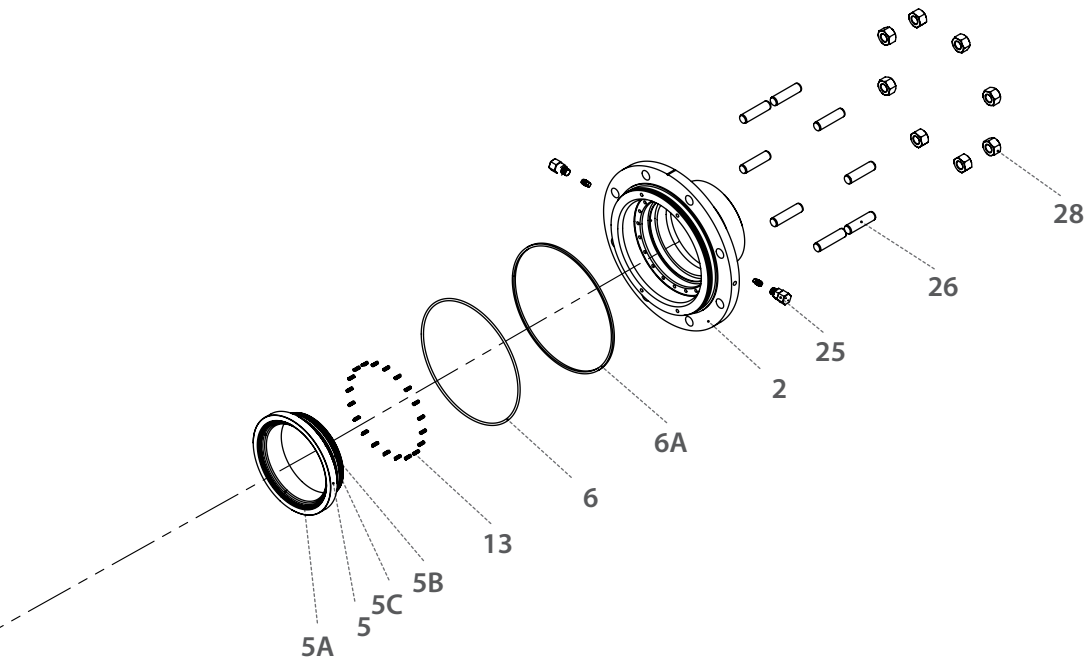
* Maintenance kit component

Trunnion Mounted Ball 3 Piece

Components & Materials



Trunnion Mounted Ball 3 Piece



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code 1	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A	Seat Insert	Acc. Ordering Code	2
5B*	Seat Seal	HNBR, VITON	2-4
5C*	Seat Fire Safe Seal	Graphite	2
6*	Body Inner Seal	HNBR, VITON	2
6A*	Body Outer Seal	Graphite	2
8*	Ball Bearing	S.Steel 316L+PTFE	2
9	Trunnion Plate	S.Steel / C.Steel	2
10*	Gland Plate Fire Safe Seal	Graphite	1
11*	Gland Plate Seal	HNBR, VITON	1
12*	Ball Thrust Washer	S.Steel 316L+PTFE	2
13	Seat Spring	Inconel X750	10-24
14	Gland Pin (not shwon)	S.Steel / C.Steel	12

Item	Description	Material specification	Qty.
15*	Stem Thrust Washer	S.Steel 316L+PTFE	1
16*	Stem Bearing	S.Steel 316L+PTFE	1
17*	Stem Seal	HNBR, VITON	2
18	Gland Plate	S.Steel / C.Steel	1
19	Stem Grease Fitting	S.Steel	1
20	Lower Gland Bolts	A193-B8M / A320 L7	2-6
21*	Stem Fire Safe Seal	Graphite	1
22	Iso Plate	S.Steel / C.Steel	1
23	Upper Gland Bolts	A193-B8M / A320 L7	2-6
24	Plug Valve	S.Steel	2
25	Seat Grease Fitting + Check Valve	S.Steel	4
26	Body Studs	A193-B8M / A320 L7	8-40
28	Body Nuts	A194-8M / A194 L7	8-40
29	Anti-Static Spring	Inconel X750	1
30	Stem Key	S.Steel / C.Steel	1
31	Stem Key Bolt	S.Steel / C.Steel	1

* Maintenance kit component

Trunnion Mounted Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0			F	B	9	1		-	4	6	4	D	V	V	G	/	1	5	0		-				
Size		Features				Series		Design		Body & ends material	Stem material	Ball material	Seat feature	Seat insert material	Inner Seal material	Outer Seal material		End connection					Special features			

Size (1-2)		
Code	inch	mm
20 *	2"	50
30	3"	80
40	4"	100
60	6"	150
80	8"	200
A0	10"	250
A2	12"	300
A4 **	14"	350
A6 [1]	16"	400

* Full port only
** not available at class 900
[1] A6 - std. port only

Features (3-6)	
F	Fire safe
B	Full port
H	Hydrogen Service

Series - 3 Piece (7-8)	
91	ASME B16.5 #150 (PN20)
92	ASME B16.5 #300 (PN50)
93	ASME B16.5 #600 (PN100)
94	ASME B16.5 #900 (PN150)

Design (9)	
Blank	(Stands for future designs)

Body & ends material (11)	
4	C. Steel A105
6	S. Steel 316
F	C. Steel A350 LF2
D	Duplex
K	Super Duplex

Stem material (12)	
6 *	S. Steel A479 316\316L
Q **	S. Steel A182 F6A
M ***	High Strength S. Steel
Z	Inconel 718
W	Hastelloy C-22
D	Duplex
K	Super Duplex

* for 91, 92 not for 93, 94
** for 93, not for 94
*** for 94

Ball material (13)	
6*	S. Steel A182 F316
4**	C. Steel A105+ENP
F	C. Steel A350 LF2+ENP

* S. Steel up to 4"
** C. Steel 6" and up

Seat feature (14)	
D	Double Piston Effect (DPE) (API 6D DIB-1)
S	Single Piston Effect (SPE) (API 6D DBB)
C	DPE & SPE combination (API 6D DIB-2)

Seat insert material (15)	
V	Devlon
P	CF PTFE
K	CF PEEK

Inner Seal material (16)	
V	Viton
H	HNBR

Outer Seal material (17)	
G	Graphite

End Connection (19-22)	
Welded ends	
XBW	Extended buttweld sch 40
XBW80	Extended buttweld sch 80
XBW160	Extended buttweld sch 160
Flanged	
150	ASME B16.5 #150
300	ASME B16.5 #300
600	ASME B16.5 #600
900	ASME B16.5 #900
PN16	DIN EN 1092-1 PN16
PN40	DIN EN 1092-1 PN40
PN63	DIN EN 1092-1 PN63
PN100	DIN EN 1092-1 PN100
PN160	DIN EN 1092-1 PN160
Flanged RTJ	
600RTJ	ASME B16.5 #600 RTJ
900RTJ	ASME B16.5 #900 RTJ
Welded	

Special Features (24-30)	
L *	Seat greasing point
D	Drain & Vent
Blank	Greasing point, Drain & vent is capped
PT **	Basic paint system
PT1	Offshore, Temp Ambient up to 93°C (200°F)
PT2	Offshore, up to 537°C (1000°F)

* for 6" Full Bore and up
** colors RAL 1018 or 7036 (other colors upon request)

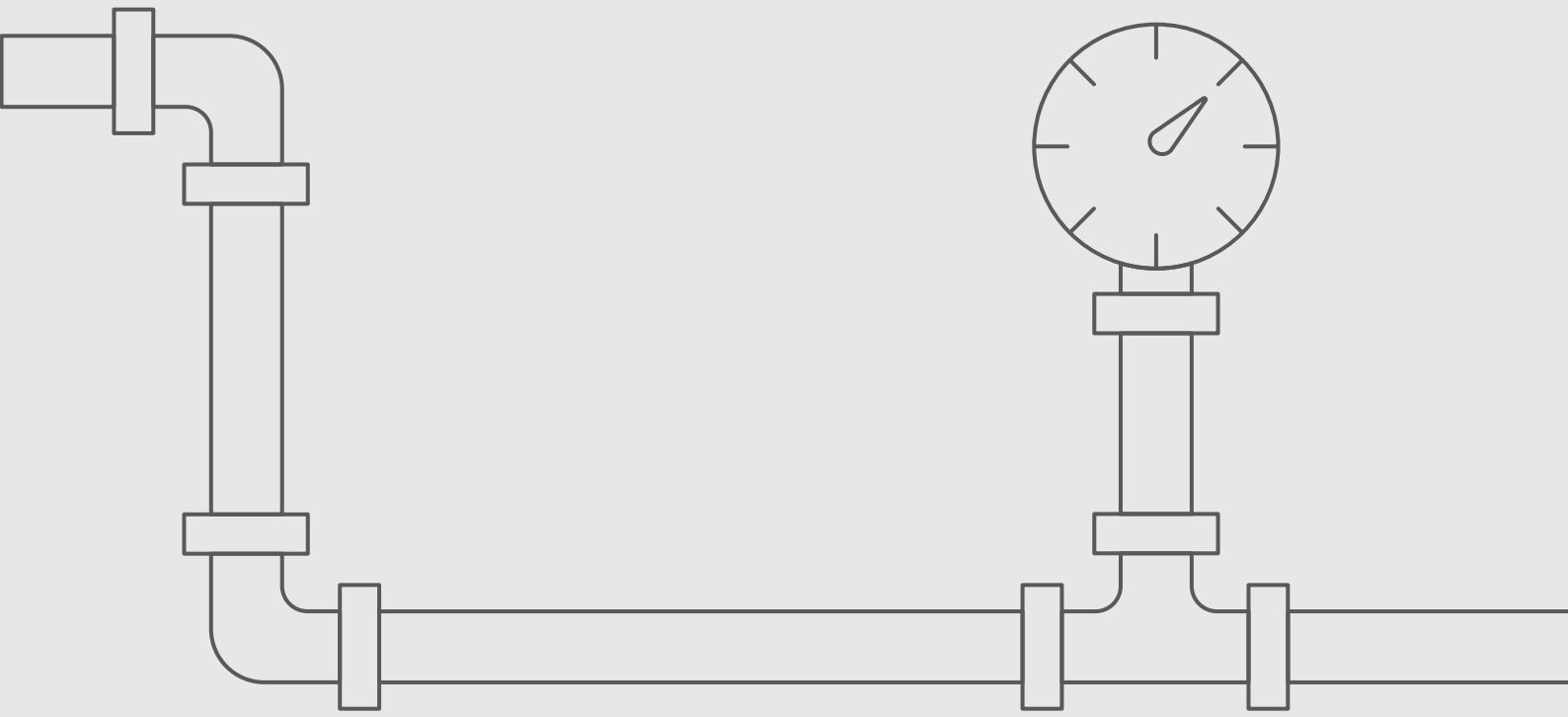
In some applications the available options above are limited to specific sizes please consult with Habonim for details

81 82 83

Industrial Valves

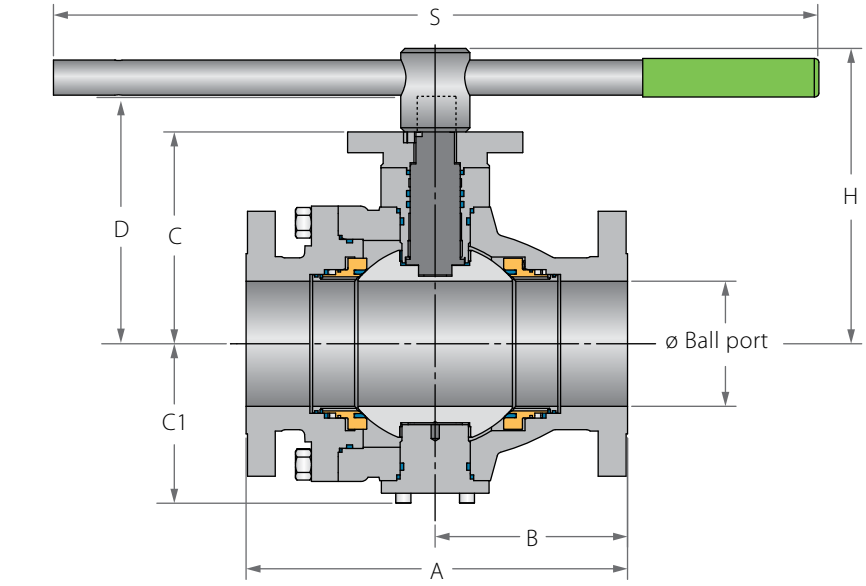
TRUNNION

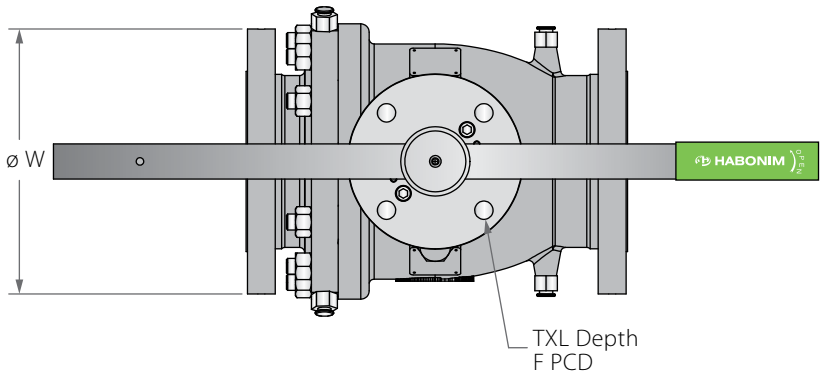
2 PIECE



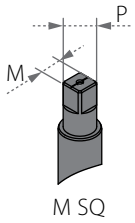
Trunnion Mounted Ball 2 Piece

Valve Dimensions





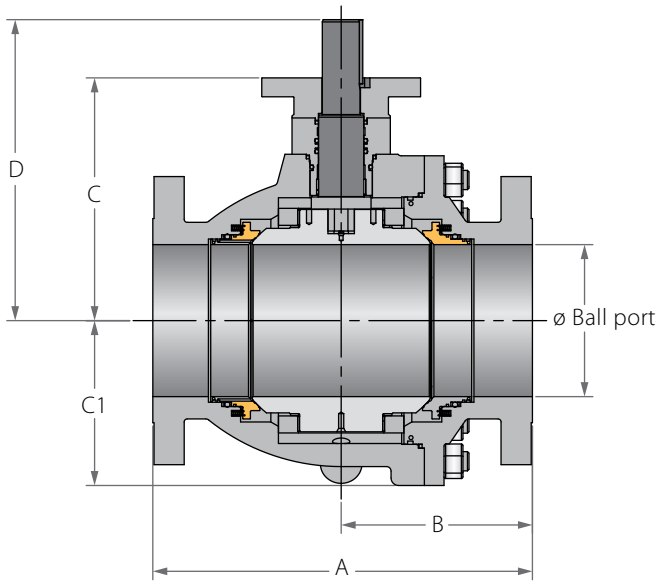
Preparation for actuation

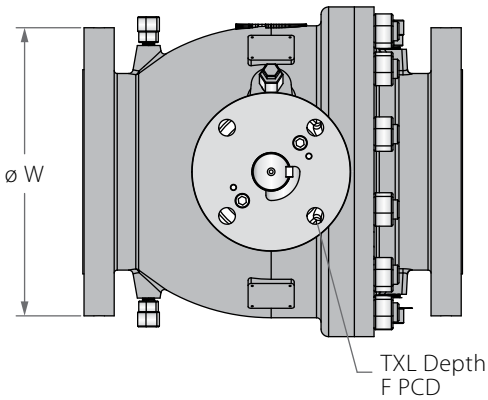


Full port	Unit	Ball port	A		B		C	C1	D	W		M SQ	P SQ	H	S	F		TxL	Weight kg/ib		Kv / Cv	
			150	300	150	300				150	300								150	300	150	300
DN50	mm	49.0	178.0	216.0	89.0	108.0	127.0	91.50	144.50	150.0	165.0	17.0	22.0	196.0	401.0	F10	102.0	11x15 (4 holes)	19	23	400	363
2"	inch	1.93	7.01	8.50	3.50	4.25	5.0	3.60	5.69	5.91	6.50	0.67	0.87	7.72	15.79		4.02		42	51	463	420
DN80	mm	74.0	203.0	283.0	101.50	128.0	148.0	117.0	172.0	190.0	210.0	22.0	32.0	223.0	610.0	F12	125.0	13x15 (4 holes)	33	44	1125	952
3"	inch	2.91	7.99	11.14	4.0	5.04	5.83	4.61	6.77	7.48	8.27	0.87	1.26	8.78	24.02		4.92		73	97	1300	1100
DN100	mm	100.0	229.0	305.0	114.50	140.50	171.0	139.0	198.50	230.0	255.0	27.0	35.0	247.50	610.0	F14	140.0	18x15 (4 holes)	49	69	2154	1860
4"	inch	3.94	9.02	12.0	4.51	5.53	6.73	5.47	7.81	9.06	10.04	1.06	1.38	9.74	24.02		5.51		108	152	2490	2150
DN150	mm	150.0	394.0	403.0	185.0	230.40	254.0	191.0	290.50	280.0	320.0	36.0	46.20	356.50	916.0	F16	165.0	22x25 (4 holes)	133	166	4723	4628
6"	inch	5.91	15.51	17.99	7.28	9.07	10.0	7.52	11.44	11.02	12.60	1.42	1.82	14.04	36.06		6.50		293	366	5460	5350

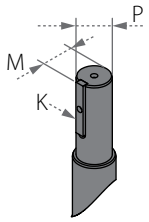
Trunnion Mounted Ball 2 Piece

Valve Dimensions





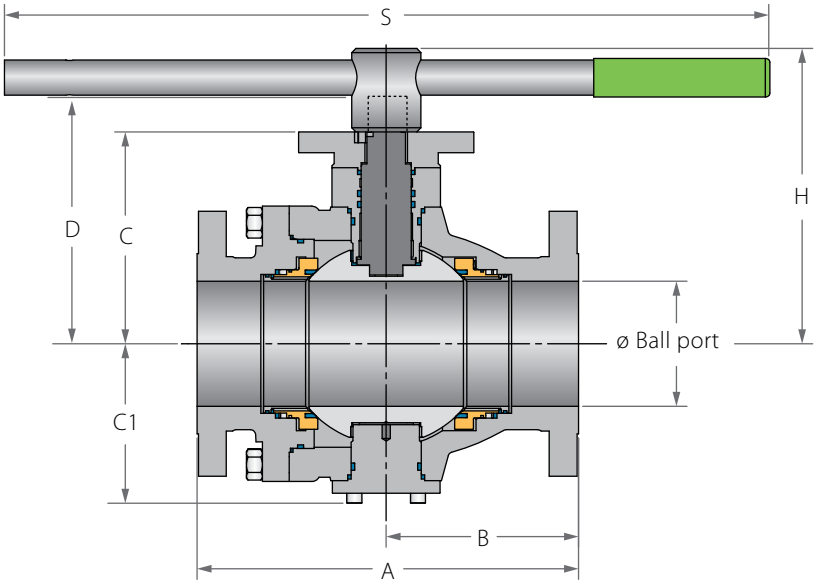
Preparation for actuation

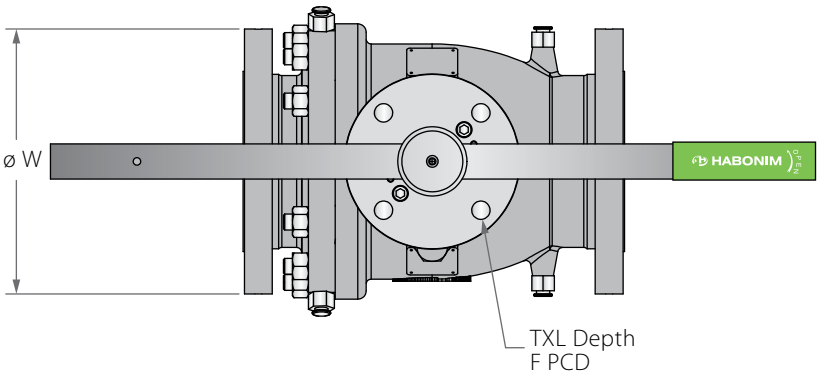


Full port	Unit	Ball port	A		B		C	C1	D	W		P	M	K	F		TxL	Weight kg/ib		Kv / Cv	
			150	300	150	300				150	300							150	300	150	300
DN200	mm	201.0	457.0	502.0	228.50	251.0	325.0	247.0	405.50	345.0	380.0	50.0	54.0	14.0	F16	165.0	22x25 (4 holes)	222	262	9273	8737
8"	inch	7.91	17.99	19.76	9.0	9.88	12.80	9.72	15.96	13.58	14.96	1.97	2.13	0.55		6.50		489	578	10720	10100
DN250	mm	252.0	533.0	568.0	270.0	287.50	353.0	297.0	430.0	405.0	445.0	50.0	54.0	14.0	F25	254.0	18x25 (8 holes)	358	424	15224	14792
10"	inch	9.92	20.98	22.36	10.63	11.32	13.90	11.69	16.93	15.94	17.52	1.97	2.13	0.55		10.0		789	935	17600	17100
DN300	mm	303.0	610.0	648.0	298.0	313.0	388.0	324.0	468.50	485.0	520.0	60.0	63.50	18.0	F25	254.0	18x25 (8 holes)	527	613	23096	22404
12"	inch	11.93	24.02	25.51	11.73	12.32	15.28	12.76	18.44	19.09	20.47	2.36	2.50	0.71		10.0		1162	1351	26700	25900
DN350	mm	334.0	686.0	762.0	343.0	381.0	425.0	372.0	555.0	535.0	585.0	72.0	78.0	20.0	F30	298.0	22x30 (8 holes)	794	896	27940	26729
14"	inch	13.15	27.01	30.0	13.50	15.0	16.73	14.65	21.85	21.06	23.03	2.83	3.07	0.79		11.73		1750	1975	32300	30900

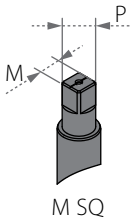
Trunnion Mounted Ball 2 Piece

Valve Dimensions





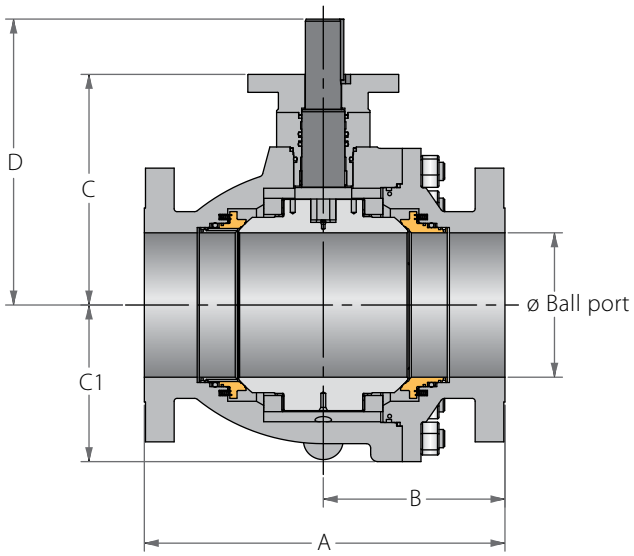
Preparation for actuation

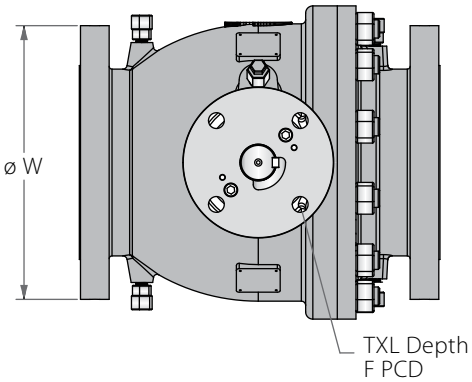


Full port	Unit	Ball port	A	B	C	C1	D	W	M SQ	P SQ	H	S	F		TxL	Weight kg/ib	Kv Cv
DN50	mm	49.0	292.0	131.0	144.0	119.0	168.50	165.0	22.0	28.0	219.50	401.0	F12	125.0	13X15 (4 holes)	35	329
2"	inch	1.93	11.50	5.16	5.67	4.69	6.63	6.50	0.87	1.10	8.64	15.79		4.92		77	380
DN80	mm	74.0	356.0	161.0	191.0	160.0	215.0	210.0	22.0	28.0	266.0	610.0	F14	140.0	18X24 (4 holes)	71	874
3"	inch	2.91	14.02	6.34	7.52	6.30	8.46	8.27	0.87	1.10	10.47	24.02		5.51		157	1010
DN100	mm	100.0	432.0	216.0	217.0	184.0	246.50	275.0	27.0	36.0	316.50	916.0	F16	165.0	22X25 (4 holes)	123	1557
4"	inch	3.94	17.01	8.50	8.54	7.24	9.70	10.83	1.06	1.42	12.46	36.06		6.50		271	1800
DN150	mm	150.0	559.0	278.0	282.50	214.50	320.50	355.0	36.0	48.20	385.0	916.0	F16	165.0	22X25 (4 holes)	244	3893
6"	inch	5.91	22.01	10.94	11.12	8.44	12.62	13.98	1.42	1.90	15.16	36.06		6.50		538	4500

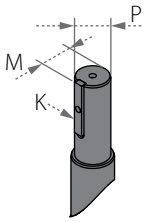
Trunnion Mounted Ball 2 Piece

Valve Dimensions





Preparation for actuation



Full port	Unit	Ball port	A	B	C	C1	D	W	P	M	K	F		TxL	Weight kg/ib	Kv / Cv
DN200	mm	201.0	660.0	330.0	312.0	263.0	409.0	420.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	412	7742
8"	inch	7.91	25.98	12.99	12.28	10.35	16.10	16.54	2.83	3.01	0.79		10.0		908	8950
DN250	mm	252.0	787.0	400.0	374.0	310.0	489.50	510.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	665	12543
10"	inch	9.92	30.98	15.75	14.72	12.20	19.27	20.08	2.83	3.01	0.79		10.0		1466	14500
DN300	mm	303.0	838.0	419.0	402.0	344.0	517.0	560.0	72.0	76.50	20.0	F25	254.0	18x25 (8 holes)	804	19809
12"	inch	11.93	32.99	16.50	15.83	13.54	20.35	22.05	2.83	3.01	0.79		10.0		1772	22900
DN350	mm	334.0	889.0	444.50	435.0	412.0	565.0	605.0	80.0	87.0	22.0	F30	298.0	22x35 (8 holes)	1170	24739
14"	inch	13.15	35.0	17.50	17.13	16.22	22.24	23.82	3.15	3.43	0.87		11.73		2579	28600

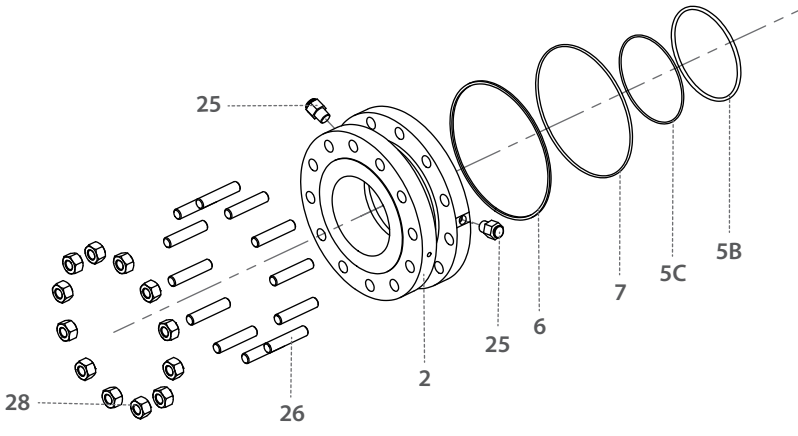
Trunnion Mounted Ball 2 Piece

Components & Materials

Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A	Seat Insert	Acc. Ordering Code	2
5B	Seat Seal	HNBR, VITON	2-4
5C	Seat Fire Safe Seal	Graphite	2
6*	Body Fire Safe Seal	Graphite	1
7*	Body Seal	HNBR, VITON	1
8	Ball Bearing	316L+PTFE	2
9	External Trunnion	A350 LF2+ENP, A479 316L, A182 F6A	1
10*	Gland Plate & External Trunnion Fire Safe Seal	Graphite	2
11*	Gland Plate & External Trunnion Seal	HNBR, VITON	2
12	Lower Thrust Washer	316L+PTFE	1
13	Seat Spring	Inconel X750	10-26
14	Gland Pin	C. Steel, S. Steel	4
15	Stem Thrust Seal	316L+PTFE	1
16	Gland Plate Bearing	316L+PTFE	1
17	Stem Seal	HNBR, VITON	2
18	Gland Plate	A350 LF2+ENP, A479 316L, A182 F6A	1
19	Stem Grease Fitting	S. Steel	1
20	Lower Gland Bolts	A320 L7, A193 B8M	2-6
21*	Stem Gasket	Graphite	1
22	Iso Plate	A350 LF2, A479 316L, A182 F6A	1
23	Upper Gland Bolts	A320 L7, A193 B8M	2-6
24	Plug Drain Valve	S. Steel	2
25**	Seat Grease Fitting + Check Valve	S. Steel	4

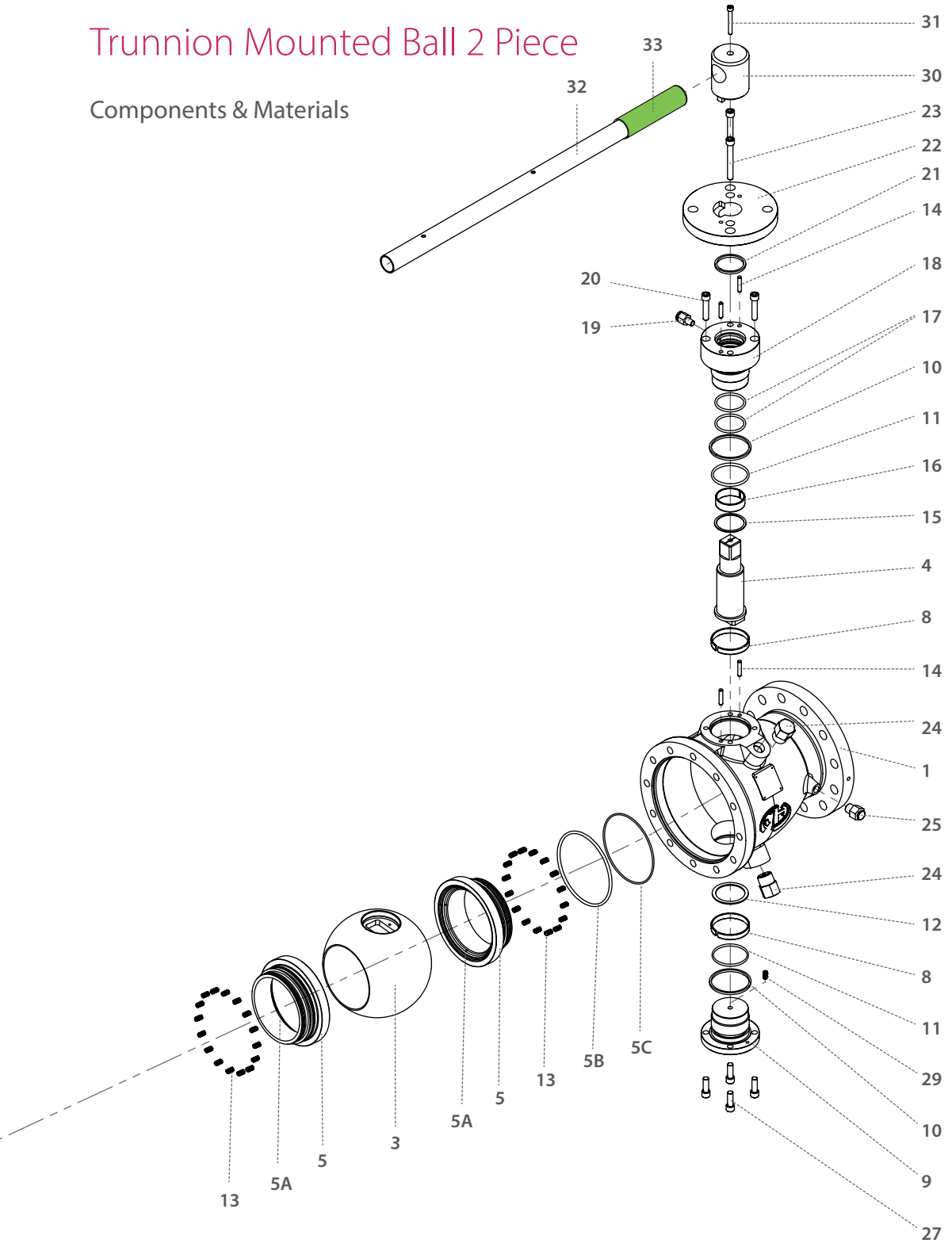
Item	Description	Material specification	Qty.
26	Body Stud	A320 L7, A193 B8M	4-20
27	External Trunnion Bolts	A320 L7, A193 B8M	4-12
28	Body Nut	A194 GR-7, A193 GR-8M	4-20
29	Anti-Static Spring	S. Steel	1
30	Wrench Head	S. Steel	1
31	Wrench Head Bolt	A193 B8M, EN3506-1 A4-80	1
32	Pipe Handle	C.St Zink plate, S.St	1
33	Sleeve	PVC	1

* Maintenance kit components
** Avilable from 6" size only



Trunnion Mounted Ball 2 Piece

Components & Materials



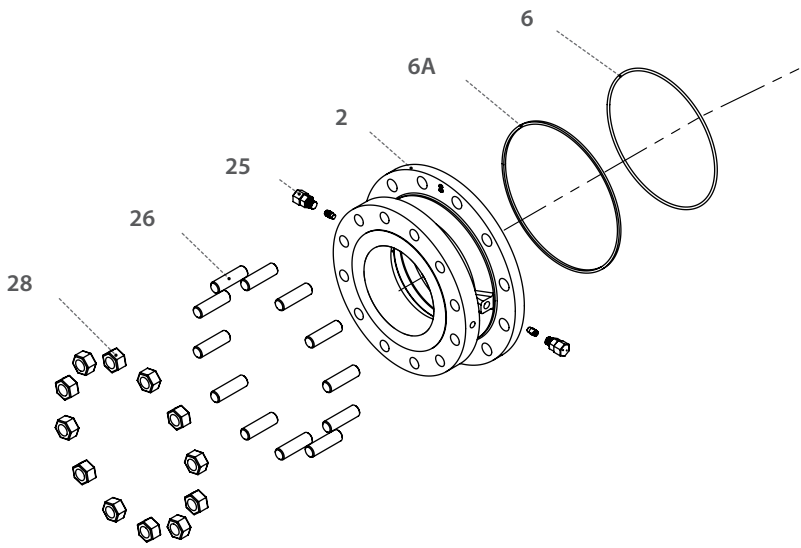
Trunnion Mounted Ball 2 Piece

Components & Materials

Item	Description	Material specification	Qty.
1	Body	Acc. Ordering code	1
2	Ends	Acc. Ordering code	1
3	Ball	Acc. Ordering code	1
4	Stem	Acc. Ordering code	1
5*	Seat	Acc. Ordering code	2
5A*	Seat Insert	Acc. Ordering code	2
5B*	Seat Seal	HNBR, VITON	2-4
5C*	Seat Fire Safe Seal	Graphite	2
6*	Body Inner Seal	HNBR, VITON	1
6A*	Body Outer Seal	Graphite	1
8*	Ball Bearing	S.steel 316 + PTFE	2
9	Trunnion Plate	S.steel / C.steel	2
10*	Gland Plate Fire Safe Seal	Graphite	1
11*	Gland Plate Seal	HNBR, VITON	1
12*	Ball Thrust Washer	S.steel 316 + PTFE	2
13	Seat Spring	Inconel X750	10-24
14	Gland Pins	S.steel / C.steel	12
15*	Stem Thrust Washer	S.steel 316 + PTFE	1
16*	Stem Bearing	S.steel 316 + PTFE	1
17*	Stem Seal	HNBR, VITON	2
18	Gland Plate	S.steel / C.steel	1
19	Stem Grease Fitting	S.steel	1
20	Lower Gland Bolts	A193-B8M / A320 L7	2-6

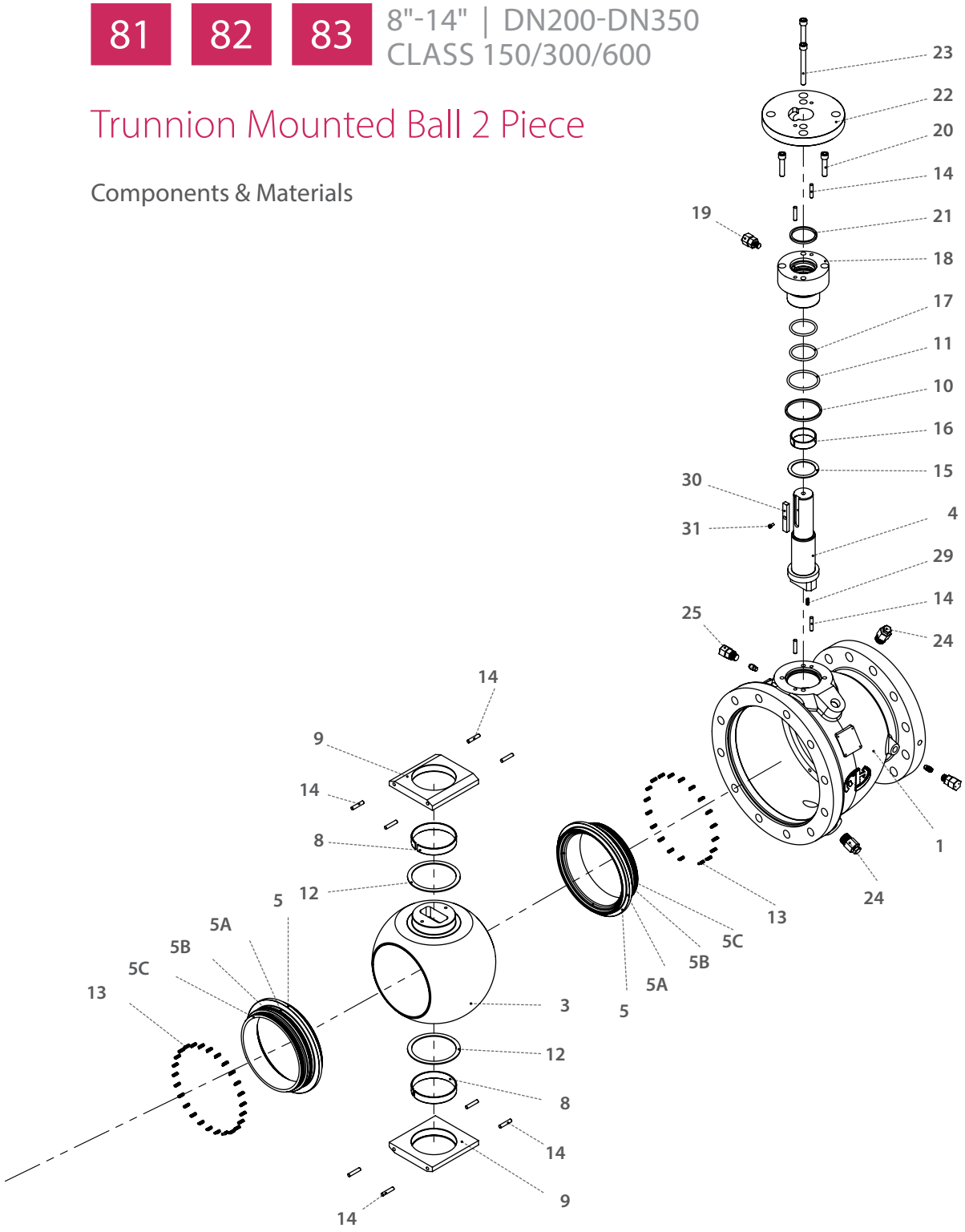
Item	Description	Material specification	Qty.
21*	Stem Fire Safe Seal	Graphite	1
22	ISO Plate	S.steel / C.steel	1
23	Upper Gland Bolts	A193-B8M / A320 L7	2-6
24	Plug Valve	S.steel	2
25	Seat Grease Fitting + Check Valve"	S.steel	4
26	Body Studs	A193-B8M / A320 L7	4-20
28	Body Nuts	A194-8M / A194 L7	4-20
29	Antistatic Spring	Inconel X750	1
30	Stem Key	S.steel / C.steel	1
31	Stem Key Bolt	S.steel / C.steel	1

* Maintenance kit components



Trunnion Mounted Ball 2 Piece

Components & Materials



Trunnion Mounted Ball 2 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	.	.	30
6	0			F	B	8	1		-	4	6	6	D	V	V	G	/	1	5	0					
Size		Features				Series		Design		Body & ends material		Stem material		Ball material		Seat feature		Seat insert		Inner Seal material		Outer Seal material		End connection				Special features			

Size (1-2)		
Code	inch	mm
20	2"	50
30	3"	80
40	4"	100
60	6"	150
80	8"	200
A0	10"	250
A2	12"	300
A4	14"	350

Features (3-6)	
F	Fire safe
B	Full port
H*	Hydrogen Service

* for material selection - see Hydrogen Service chapter

Series - 2 Piece Cast (7-8)	
81	ASME B16.5 #150 Flanged RF
82	ASME B16.5 #300 Flanged RF
83	ASME B16.5 #600 Flanged RF

Design (9)	
Blank	(Stands For future designs)

Body & ends material (11)	
4	C. Steel A216 WCB
6	S. Steel A351 CF8M

Stem material (12)	
6 *	S. Steel A479 316\316L
Q **	S. Steel A182 F6A
M	High Strength S. Steel
Z	Inconel 718
D	Duplex
K	Super Duplex

* for 81, 82 not for 83
** for 83

Ball material (13)	
6*	S. Steel A182 F316
4	C. Steel A105+ENP
F**	C. Steel A350 LF2+ENP

* S. Steel up to 4"
** C. Steel 6" and up

Seat feature (14)	
D	Double Piston Effect (DPE) (API 6D DIB-1)
S	Single Piston Effect (SPE) (API 6D DBB)
C	DPE & SPE combination

Seat insert (15)	
V	Devlon
P	CF PTFE
K	CF PEEK

Inner Seal (16)	
V	Viton
H	HNBR

Outer Seal (17)	
G	Graphite

End Connection (19-22)		
Flanged		Series
150	ASME B16.5 #150	81
300	ASME B16.5 #300	82
600	ASME B16.5 #600	83

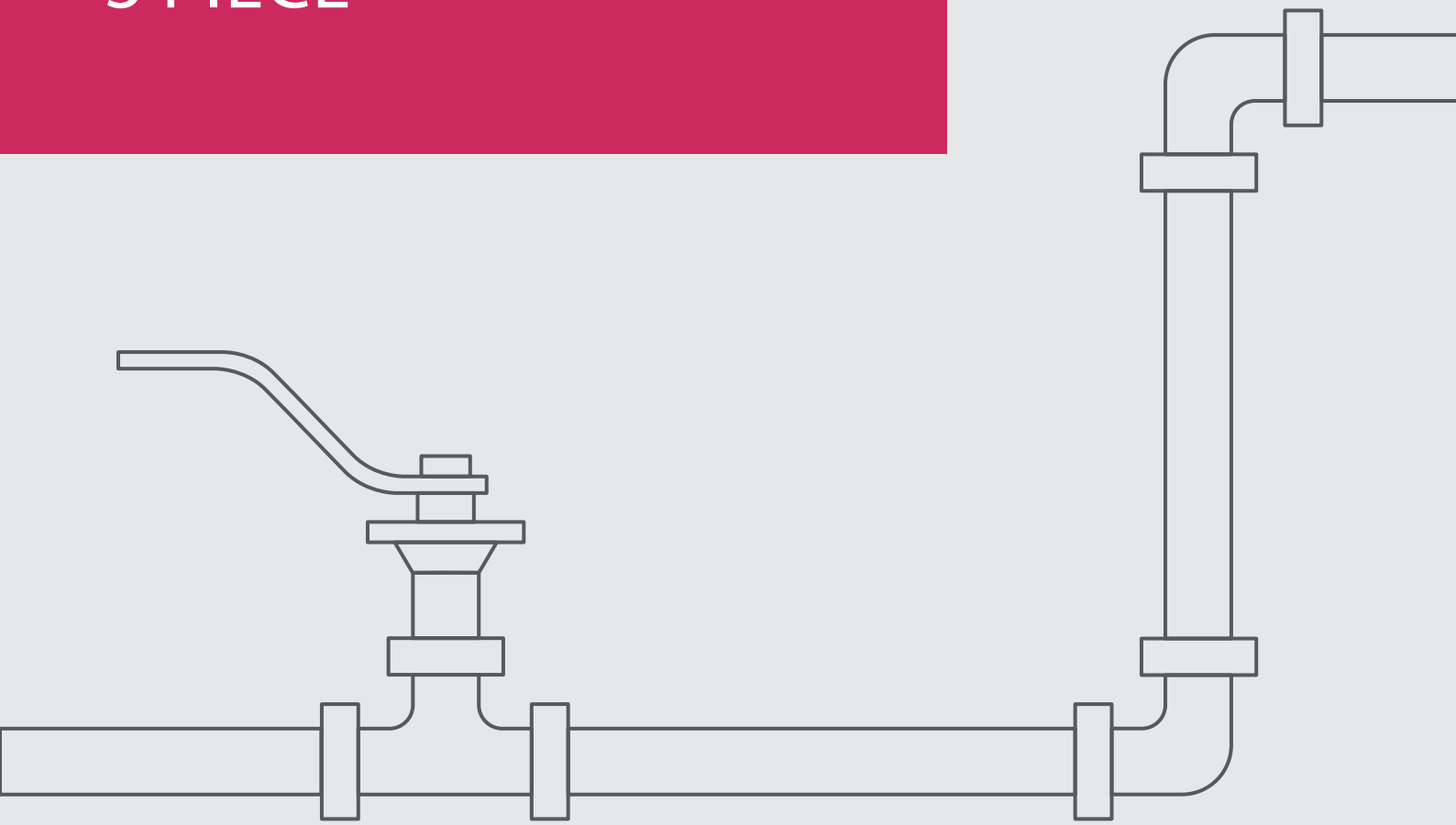
Special Features (23-30)	
L *	Seat greasing point
D	Drain & Vent
Blank	Greasing point, Drain & vent is capped
PT **	Basic paint system
PT1	Offshore, Temp Ambient up to 93°C (200°F)
PT2	Offshore, up to 537°C (1000°F)

* for 6" and up
** colors RAL 1018 or 7036 (other colors upon request)

In some applications the available options above are limited to specific sizes please consult with Habonim for details

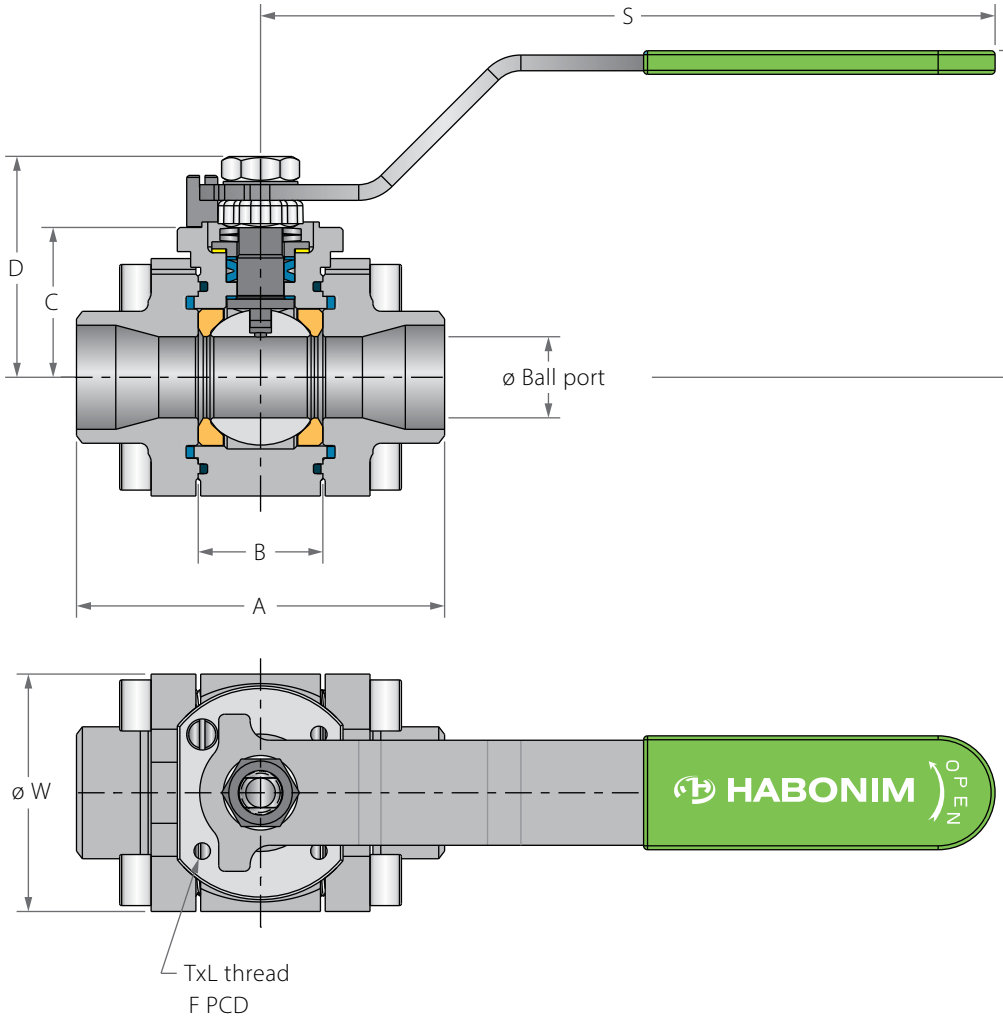
FLOATING BALL

3 PIECE

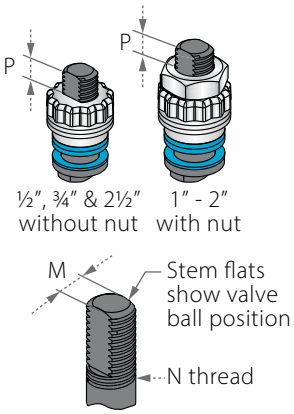


Floating Ball 3 Piece

Valve Dimensions



Preparation for actuation

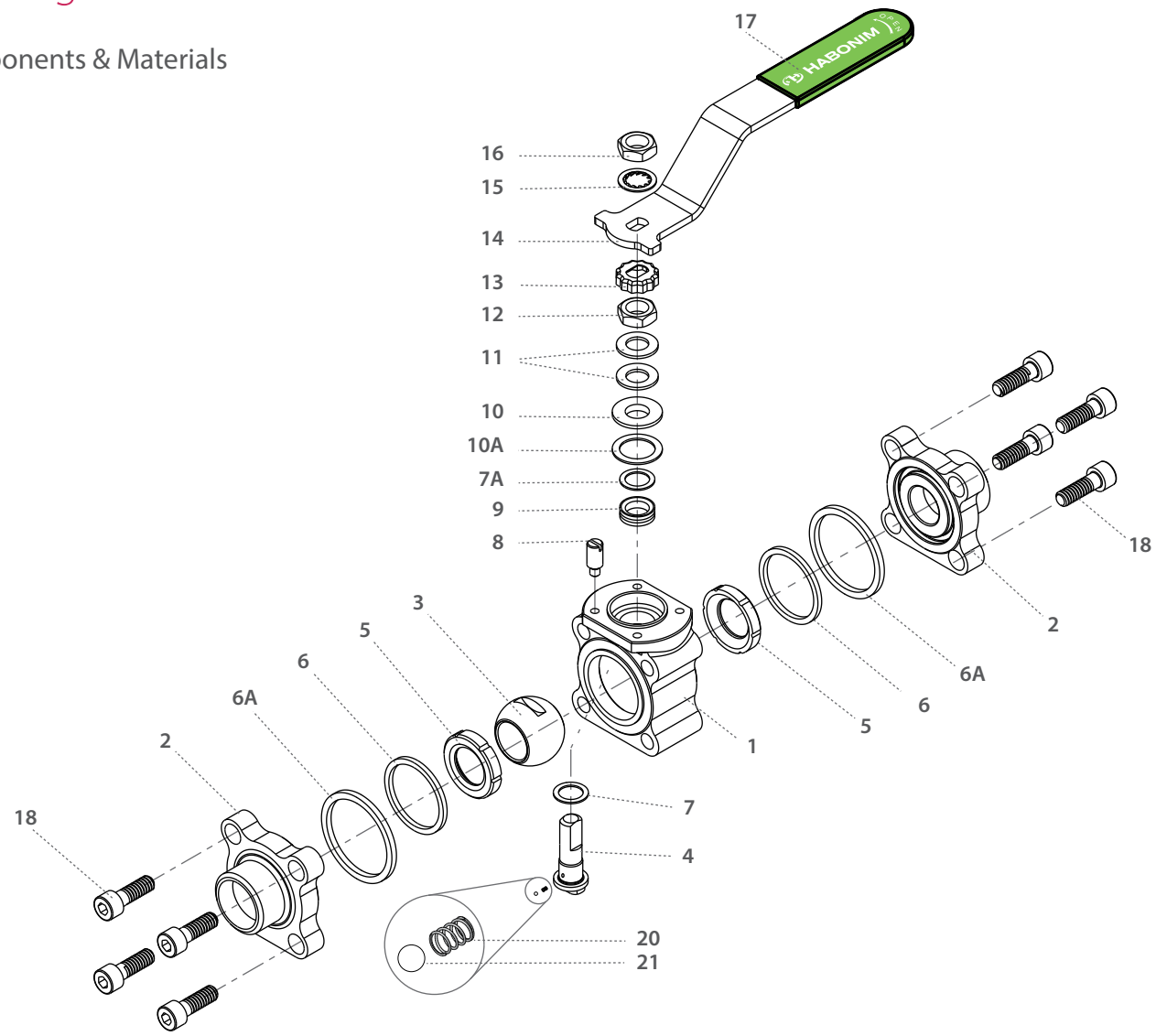


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv / Cv
	DN8	mm	11.15	66.0	20.60	29.0	37.90	61.50	150.0	47.0	5.54	⅜ UNF	6.65	F03	36.0	M5X10	0.60	2.6
	¼"	inch	0.44	2.60	0.81	1.14	1.49	2.42	5.91	1.85	0.22		0.26		1.42		1.33	3.0
DN15	DN10	mm	11.15	66.0	20.60	29.0	37.90	61.50	150.0	47.0	5.54	⅜ UNF	6.65	F03	36.0	M5X10	0.60	6.9
½"	⅜"	inch	0.44	2.60	0.81	1.14	1.49	2.42	5.91	1.85	0.22		0.26		1.42		1.33	8.0
DN20	DN15	mm	14.30	70.60	24.50	31.40	40.30	63.90	150.0	53.70	5.54	⅜ UNF	6.65	F03	36.0	M5X10	0.80	10
¾"	½"	inch	0.56	2.78	0.97	1.24	1.59	2.52	5.91	2.11	0.22		0.26		1.42		1.77	12
DN25	DN20	mm	20.60	93.70	31.70	38.10	55.60	79.40	187.0	63.70	7.54	⅞ UNF	7.40	F04	42.0	M5X10	1.60	28
1"	¾"	inch	0.81	3.69	1.25	1.50	2.19	3.13	7.36	2.51	0.30		0.29		1.65		3.54	32
DN32	DN25	mm	25.40	108.0	41.30	42.70	60.20	84.10	187.0	71.70	7.54	⅞ UNF	7.40	F04	42.0	M5X10	2.50	49
1¼"	1"	inch	1.0	4.25	1.62	1.68	2.37	3.31	7.36	2.82	0.30		0.29		1.65		5.53	57
DN40	DN32	mm	31.80	115.50	48.40	43.60	73.0	97.0	237.0	86.70	8.71	⅝ UNF	8.50	F05	50.0	M6X12	3.60	69
1½"	1¼"	inch	1.25	4.55	1.91	1.72	2.87	3.82	9.33	3.41	0.34		0.33		1.97		7.96	80
DN50	DN40	mm	38.10	128.0	56.30	48.30	77.80	101.80	237.0	96.90	8.71	⅝ UNF	8.50	F05	50.0	M6X12	4.50	102
2"	1½"	inch	1.50	5.04	2.22	1.90	3.06	4.01	9.33	3.82	0.34		0.33		1.97		9.95	118

Floating Ball 3 Piece

Components & Materials



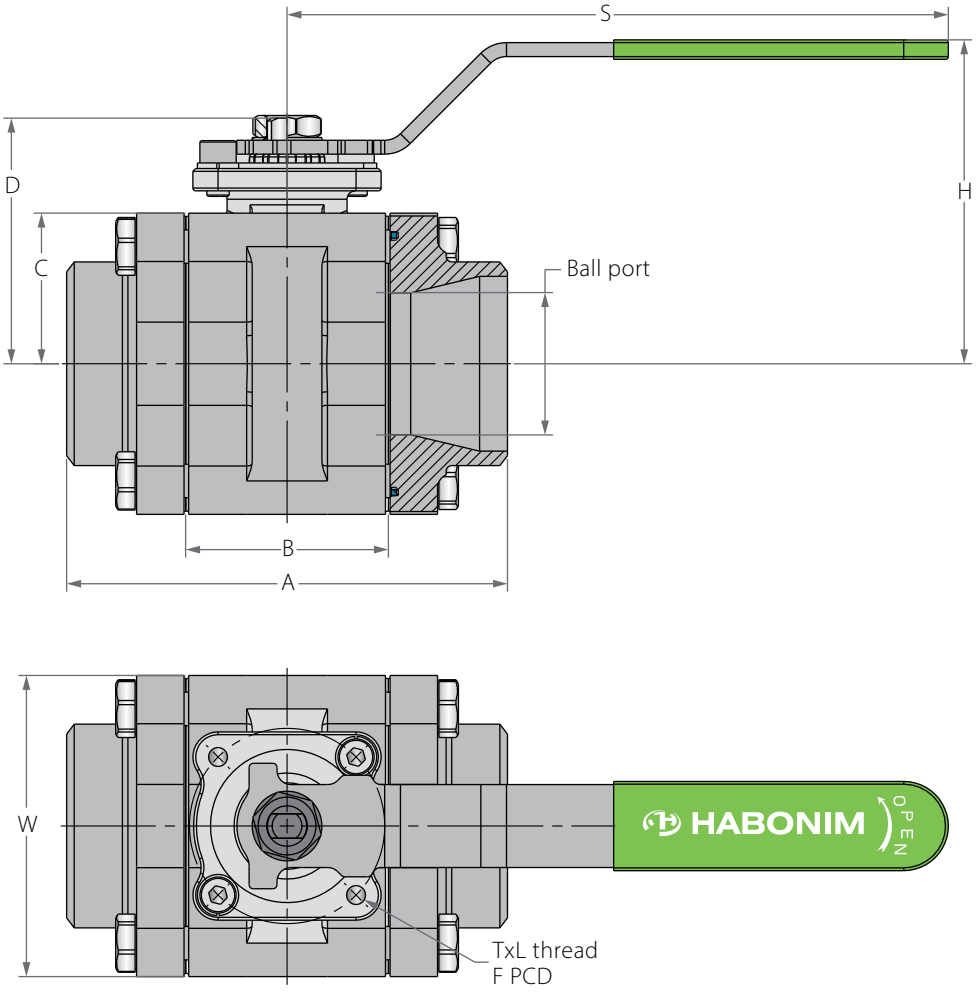
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	PTFE	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	VIRGIN PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	VIRGIN PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	8
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	A167S. Steel304	1

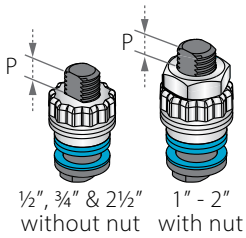
* Maintenance kit components

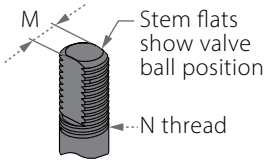
Floating Ball 3 Piece

Valve Dimensions



Preparation for actuation



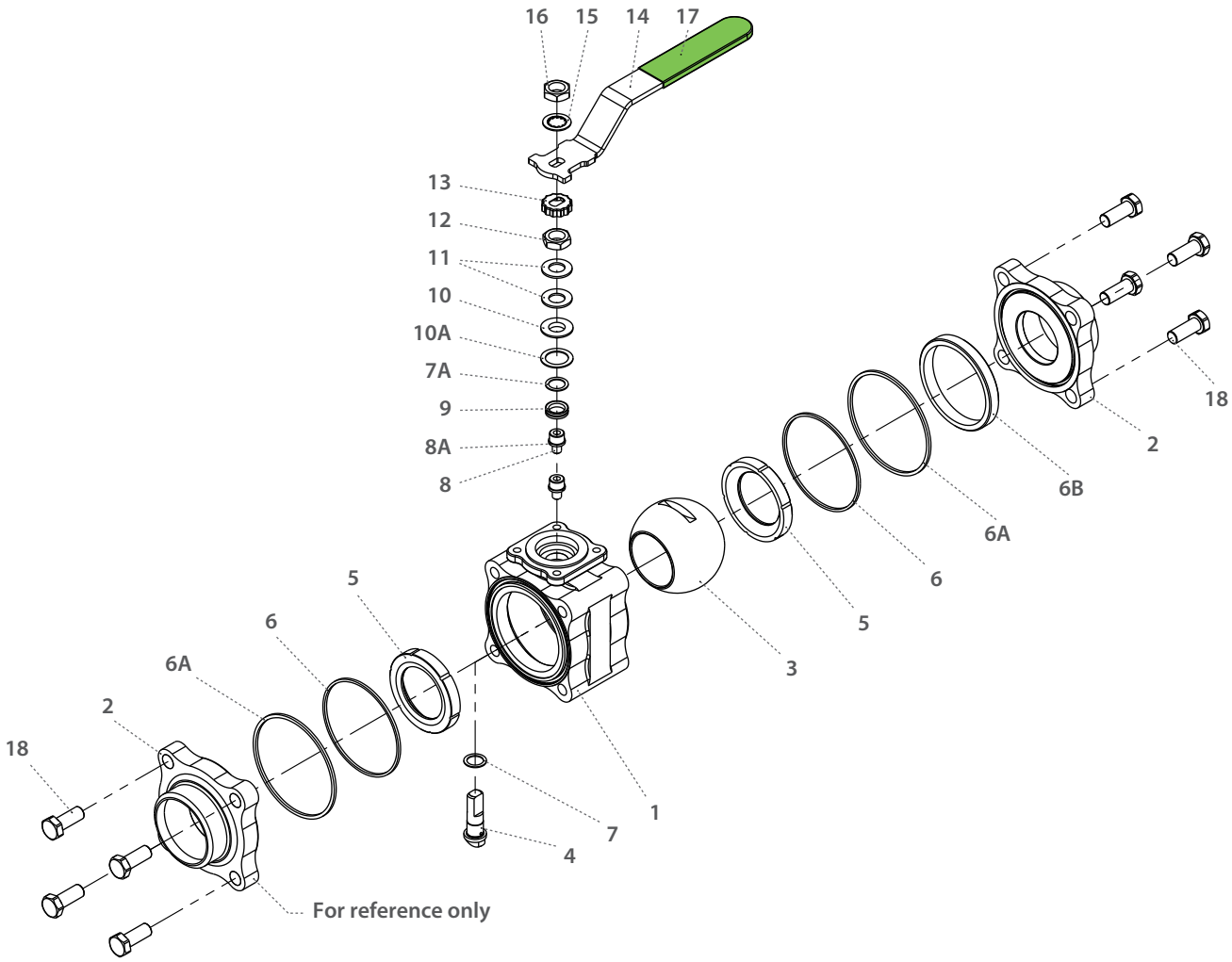


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv / Cv
DN65	DN50	mm	50.80	158.0	72.60	70.0	88.10	115.10	237.0	108.0	8.71	⅜ UNF	13.50	F07	70.0	M8X12	9.50	208
2½"	2"	inch	2.0	6.22	2.86	2.76	3.47	4.53	9.33	4.25	0.34		0.53		2.76		21.00	241

Floating Ball 3 Piece

Components & Materials



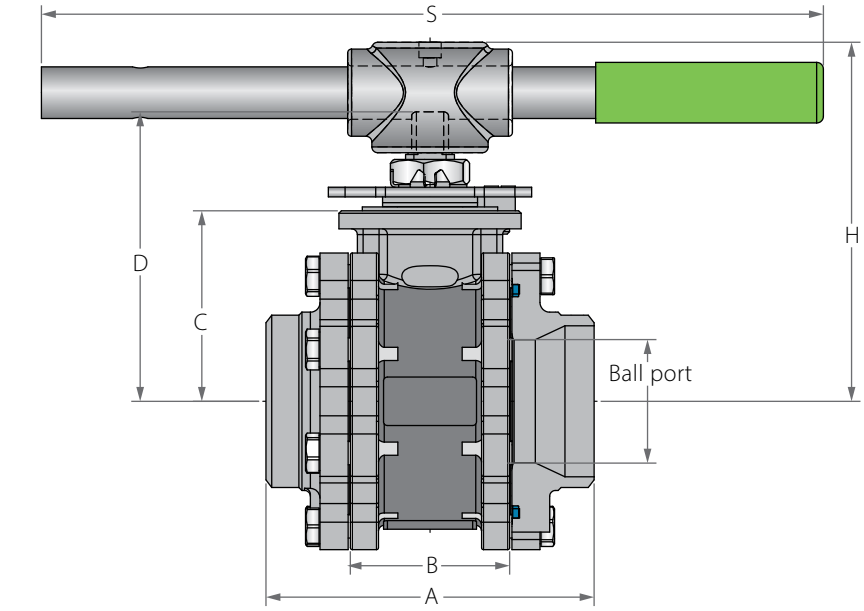
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	PTFE	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	VIRGIN PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	VIRGIN PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

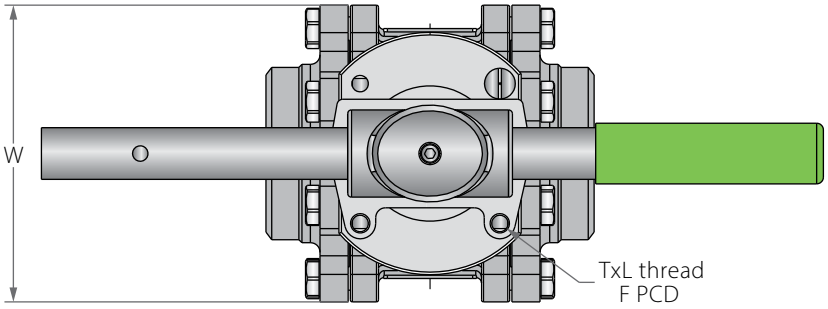
Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	8
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	A167S. Steel304	1

* Maintenance kit components

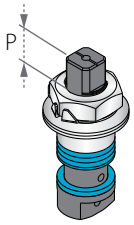
Floating Ball 3 Piece

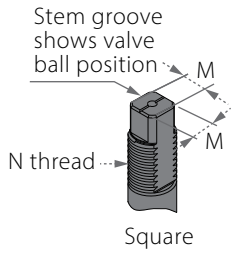
Valve Dimensions





Preparation for actuation



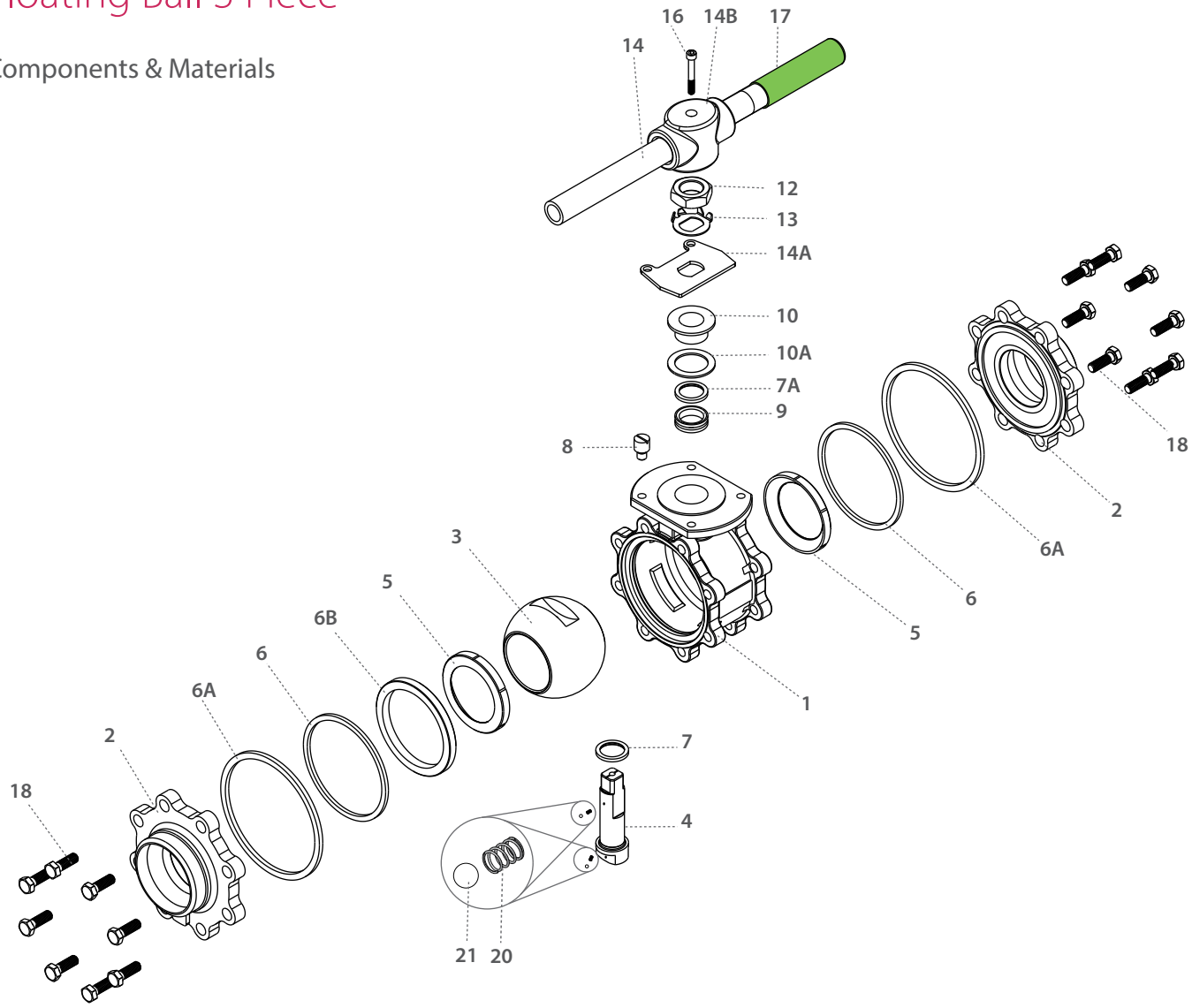


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	H	S	W	M	M-DD	N	P	F		TxL	Weight kg/lb	Kv Cv
DN80	DN65	mm	63.50	169.0	83.30	98.30	144.90	185.0	400.0	140.0	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	13.70	300
3"	2½"	inch	2.50	6.65	3.28	3.87	5.71	7.29	15.75	5.50	0.74	0.63		0.66		4.02		30.30	348
DN100	DN80	mm	82.60	214.0	108.80	114.10	160.70	200.0	600.0	177.0	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	23.70	615
4"	3"	inch	3.25	8.43	4.28	4.49	6.33	7.89	23.62	6.97	0.74	0.63		0.66		4.02		52.40	713
	DN100	mm	100.0	239.0	123.0	124.0	170.50	211.0	600.0	217.0	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	30.00	744
	4"	inch	3.94	9.41	4.84	4.88	6.71	8.30	23.62	8.54	0.74	0.63		0.66		4.02		66.30	863
DN150		mm	111.10	346.0	146.0	157.0	226.0	286.0	916.0	266.0	28.45	23.75	1½"-12 UNF-2A	26.20	F12	125.0	M12x20	63.00	872
6"		inch	4.37	13.62	5.75	6.18	8.90	11.26	36.06	10.47	1.12	0.94		1.03		4.92		138.90	1012

Floating Ball 3 Piece

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	PTFE	2
6A*	Outer Seal	Acc. Ordering Code	2
6B	Support Ring	S. Steel	1
7*	Stem Thrust Seal	VIRGIN PEEK, PCTFE (KEL-F)	1
7A*	Anti-Abrasion Ring	VIRGIN PEEK, PCTFE (KEL-F)	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

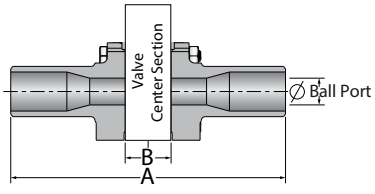
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	C. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16-24
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

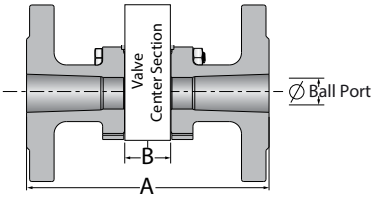
Face To Face Sizes

Valve Size	Unit	B		A-XBW / ETI / ETD / GR		A-ETO	A-TC	A-Flange Class 150+300		A-Flange Class 600		A-Flanged DIN PN16-PN100	
		Std. port	Full port	Std. port	Full port	Std. port	Std. port	Std. port	Full port	Std. port	Full port	Std. port	Full port
DN8	mm	20.6	-----	140.6	-----	104.6	-----	-----	-----	-----	-----	-----	-----
¼"	inch	0.8	-----	5.54	-----	4.12	-----	-----	-----	-----	-----	-----	-----
DN10	mm	20.6	-----	140.6	-----	137.0	-----	-----	-----	-----	-----	130.0	-----
⅜"	inch	0.8	-----	5.54	-----	5.39	-----	-----	-----	-----	-----	5.12	-----
DN15	mm	20.6	24.5	140.6	146.9	137.0	89.0	140.0	139.9	165.0	152.0	130.0	130.0
½"	inch	0.8	1.0	5.54	5.78	5.39	3.5	5.51	5.51	6.5	6.0	5.12	5.11
DN20	mm	24.5	31.7	146.9	168.7	146.9	101.5	152	152.3	151.9	165.1	150.0	150.0
¾"	inch	1.0	1.25	5.8	6.64	5.78	4.0	6.0	6.0	5.98	6.5	5.9	5.91
DN25	mm	31.7	41.3	168.7	179.3	164.0	114.3	165.0	164.9	215.9	178.0	160.0	160.0
1"	inch	1.25	1.63	6.64	7.06	6.46	4.5	6.49	6.49	8.5	7.01	6.3	6.3
DN32	mm	41.3	48.4	179.3	189.4	179.3	-----	178.0	178.0	178.0	178.0	180.1	180.0
1¼"	inch	1.6	1.9	7.06	7.46	7.06	-----	7.0	7.0	7.0	7.0	7.1	7.1
DN40	mm	48.4	56.3	189.4	200.3	184.0	140.0	190.0	190.5	241.4	216.1	200.0	200.0
1½"	inch	1.91	2.22	7.46	7.9	7.24	5.5	7.5	7.5	9.5	8.51	7.9	7.9
DN50	mm	56.3	72.6	200.3	232.6	193.5	159.0	216.0	216	292.1	241.0	229.9	230.0
2"	inch	2.22	2.86	7.89	9.16	7.62	6.3	8.5	8.5	11.5	9.5	9.05	9.06
DN65	mm	72.6	83.3	232.6	283.3	232.6	213.0	241.0	241.0	241.0	330.0	230.0	270.0
2½"	inch	2.9	3.28	9.16	11.15	9.16	8.4	9.5	11.1	9.5	13.0	9.06	10.63
DN80	mm	83.3	108.8	283.3	349.0	283.3	215.8	282.0	282.2	356.0	356.0	279.9	310.0
3"	inch	3.28	4.28	11.15	13.7	11.15	8.5	11.1	11.1	14.0	14.0	11.0	12.2
DN100	mm	109.0	123.0	349.0	390.0	349.0	245.4	305.0	305	432.0	432.0	350.0	350.0
4"	inch	4.28	4.84	13.7	15.4	13.7	9.7	12.0	12.0	17.0	17.0	13.8	13.8
DN150	mm	146.0	-----	444.0	420.0	444.0	146.1	403.1	403.1	559.0	559.0	350.0	480.0
6"	inch	5.75	-----	17.5	16.5	17.5	5.8	15.9	15.9	22.0	22.0	13.8	18.9

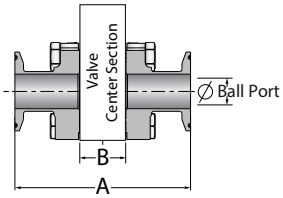
XBW / ETO / ETI / ETD / GR

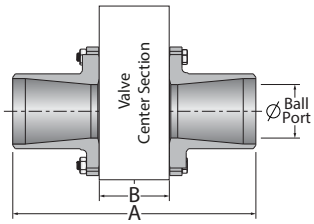


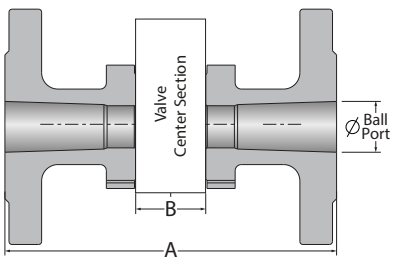
Flanged

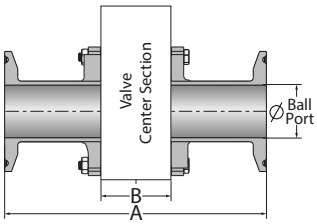


TC









ASME BPE Floating Ball 3 Piece

Valve Dimensions - DIN 11850 sizes

DIN 11850 sizes	Unit	Full port	OD	ID	A ETD	A TCD	B	C	D	H	K	S	W	R TCD	M	N	P	F1	F2	TxL	Weight kg/lb	Kv Cv
DN10	mm	11.15	13.0	10.0	100.0	90.0	20.60	29.0	11.15	46.30	41.50	115.0	69.0	34.0	5.54	3/8" UNF	7.20	-	32.0	M5X6	1.00	9
3/8"	Inch	0.44	0.51	0.39	3.94	3.54	0.81	1.14	0.44	1.82	11.63	4.53	2.72	1.34	0.22		0.28	-	1.26		2.20	10
DN15	mm	14.3	19.0	16.0	110.0	95.0	24.60	36.0	14.3	49.40	44.0	115.0	69.0	34.0	5.54	3/8" UNF	7.20	15.0	34.0	M5X6	1.30	30
1/2"	Inch	0.56	0.75	0.63	4.33	3.74	0.97	1.42	0.56	1.94	1.73	4.53	2.72	1.34	0.22		0.28	0.59	1.34		2.85	35
DN20	mm	20.6	23.0	20.0	120.0	110.0	31.70	36.0	20.6	61.0	44.0	146.0	79.0	34.0	5.54	3/8" UNF	7.20	20.0	36.0	M5X8	2.20	48
3/4"	Inch	0.81	0.91	0.79	4.72	4.33	1.25	1.42	0.81	2.40	1.73	5.75	3.11	1.34	0.22		0.28	0.79	1.42		4.85	56
DN25	mm	25.4	29.0	26.0	180.0	130.0	41.30	43.50	25.4	85.0	44.0	187.0	94.0	50.50	7.54	7/16" UNF	7.20	29.70	29.70	M5X8	2.80	97
1"	Inch	1.0	1.14	1.02	7.09	5.12	1.63	1.71	1.0	3.35	1.73	7.36	3.70	1.99	0.30		0.28	1.17	1.17		6.20	114
DN32	mm	31.8	35.0	32.0	190.0	140.0	48.40	55.50	31.8	99.0	46.0	237.0	99.0	50.50	7.54	7/16" UNF	8.0	35.35	35.35	M6X10	4.40	145
1 1/4"	Inch	1.25	1.38	1.26	7.48	5.51	1.91	2.19	1.25	3.90	1.73	9.33	3.90	1.99	0.30		0.31	1.39	1.39		9.70	170
DN40	mm	38.1	41.0	38.0	200.0	150.0	56.30	48.25	38.1	103.0	46.0	237.0	109.0	50.50	8.71	9/16" UNF	8.0	35.35	35.35	M6X10	8.00	168
1 1/2"	inch	1.50	1.61	1.50	7.87	5.91	2.22	1.90	1.50	4.06	1.73	9.33	4.29	1.99	0.34		0.31	1.39	1.39		17.60	196

DIN 11850 sizes	Unit	Full port	OD	ID	A ETD	A TCD	B	C	D	H	K	S	W	R TCD	M	M-DD	N	P	F1	F2	TxL	Weight kg/lb	Kv Cv
DN50	mm	50.8	53.0	50.0	100.0	90.0	72.70	70.0	50.8	129.30	45.0	401.0	139.0	64.0	-	13.90	M20X2.5	14.60	70.0	49.50	M8X12	12.0	385
2"	inch	2.0	2.09	1.97	3.94	3.54	2.86	2.76	2.0	5.09	1.77	15.79	5.47	2.52	-	0.57		0.57	2.76	1.95		25.0	450
DN65	mm	63.5	70.0	66.0	110.0	95.0	83.40	98.30	63.5	169.20	57.20	401.0	164.0	91.0	18.90	15.90	1"-14	16.70	102.0	100.0	M10X20	19.0	581
2 1/2"	Inch	2.50	2.76	2.60	4.33	3.74	3.28	3.87	2.50	6.66	2.25	15.79	6.46	3.58	0.74	0.63	UNS-2A	0.66	4.02	3.94		41.0	680
DN80	mm	82.6	85.0	81.0	120.0	110.0	112.0	105.50	82.6	184.50	70.0	401.0	199.0	106.0	18.90	15.90	1"-14	16.70	102.0	120.0	M10X20	30.0	1060
3"	inch	3.25	3.35	3.19	4.72	4.33	4.41	4.15	3.25	7.26	2.75	15.79	7.83	4.17	0.74	0.63	UNS-2A	0.66	4.02	4.72		66.0	1240
DN100	mm	100.0	104.0	100.0	180.0	130.0	123.0	179.0	100.0	193.50	61.0	401.0	224.0	119.0	18.90	15.90	1"-14	16.70	102.0	140.0	M10X20	40.0	1402
4"	Inch	3.94	4.09	3.94	7.09	5.12	4.84	7.05	3.94	7.62	2.40	15.79	8.82	4.69	0.74	0.63	UNS-2A	0.66	4.02	5.51		88.0	1640

ASME BPE Floating Ball 3 Piece

Valve Dimensions - ISO 1127 sizes

ISO 1127 sizes	Unit	Full port	OD	ID	A ETD	A TCD	B	C	D	H	K	S	W	R TCD	M	N	P	F		TxL	Weight kg/lb	Kv Cv
DN10	mm	11.15	17.20	14.0	147.0	89.0	24.60	35.30	11.15	67.90	47.0	150.0	54.0	25.0	5.54	3/8" UNF	6.50	F03	36.0	M5X6	1.00	9
3/8"	Inch	0.44	0.68	0.55	5.79	3.50	0.97	1.39	0.44	2.67	1.85	5.91	2.13	0.98	0.22		0.26		1.42		2.20	10
DN15	mm	14.3	21..30	18.10	164.0	118.0	31.70	38.20	14.3	86.0	49.0	187.0	61.0	50.50	7.50	7/16" UNF	5.50	F04	42.0	M5X10	1.75	30
1/2"	Inch	0.56	0.84	0.71	6.46	4.65	1.25	1.50	0.56	3.39	1.93	7.36	2.40	1.99	0.30		0.22		1.65		3.85	35
DN20	mm	20.6	26.90	23.70	168.0	118.0	35.50	43.50	20.6	89.0	49.0	187.0	61.0	50.50	7.50	7/16" UNF	7.20	F04	42.0	M5X10	2.00	48
3/4"	Inch	0.81	1.06	0.90	6.61	4.65	1.40	1.71	0.81	3.50	1.93	7.36	2.40	1.99	0.30		0.28		1.65		4.40	56
DN25	mm	25.4	33.70	29.70	186.0	141.0	50.0	51.50	25.4	105.0	49.0	236.0	80.0	50.50	8.67	9/16" UNF	8.0	F05	50.0	M6X12	4.00	98
1"	Inch	1.0	1.33	1.17	7.32	5.55	1.97	2.03	1.0	4.13	1.93	9.29	3.15	1.99	0.34		0.31		1.97		8.80	114
DN32	mm	31.8	42.40	38.40	200.0	-	56.30	48.20	31.8	100.0	49.0	236.0	91.0	64.0	8.67	9/16" UNF	8.0	F05	50.0	M6X12	5.00	145
1¼"	Inch	1.25	1.67	1.51	7.87	-	2.22	1.90	1.25	3.94	1.93	9.29	3.58	2.52	0.34		0.31		1.97		11.00	170

ISO 1127 sizes	Unit	Full port	OD	ID	A ETD	A TCD	B	C	D	H	K	S	W	R TCD	M	M-DD	Q	N	P	F		TxL	Weight kg/lb	Kv Cv
DN40	mm	38.1	48.30	44.30	223.0	184.0	72.70	70.0	38.1	143.10	45.0	401.0	108.0	64.0	-	13.90	20.0	M20	14.0	F07	70.0	M8X10	9.50	168
1½"	inch	1.50	1.90	1.74	8.78	7.24	2.86	2.76	1.50	5.63	1.77	15.79	4.25	2.52	-	0.55	0.79		0.55		2.76		20.90	196
DN50	mm	50.8	60.30	56.30	250.40	169.10	83.35	98.30	50.8	185.10	57.20	401.0	139.70	77.50	18.90	15.90	22.70	1"-14	16.70	F10	102.0	M10X12	14.00	385
2"	inch	2.0	2.37	2.22	9.86	6.66	3.28	3.87	2.0	7.29	2.25	15.79	5.50	3.05	0.74	0.63	0.89	UNF-2A	0.66		4.02		30.80	450
DN65	mm	63.5	76.10	72.10	302.0	193.0	96.40	105.50	63.5	192.40	70.0	40.10	160.0	91.0	18.90	15.90	22.70	1"-14	16.70	F10	102.0	M10X12	17.70	581
2½"	Inch	2.50	3.0	2.84	11.89	7.60	3.80	4.15	2.50	7.57	2.76	1.58	6.30	3.58	0.74	0.63	0.89	UNF-2A	0.66		4.02		38.94	680
DN80	mm	82.6	88.90	84.30	349.0	236.0	108.80	114.10	82.6	200.0	80.0	600.0	177.0	106.0	18.90	15.90	22.70	1"-14	16.70	F10	102.0	M10X12	26.00	106
3"	Inch	3.25	3.50	3.32	13.74	9.29	4.28	4.49	3.25	7.87	3.15	23.62	6.97	4.17	0.74	0.63	0.89	UNF-2A	0.66		4.02		57.20	1240

Standard	Sizes	Wall thickness (mm)	End Connection (19-22)	End Connection Length
ISO 1127	3/8"-3/4"	1.6	BWI1.6	Short
			ETI1.6	Extended
	1"-2½"	2.0	BWI2.0	Short
			ETI2.0	Extended
	Over 2½"	2.3	BWI2.3	Short
			ETI2.3	Extended

Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0				F	4	7	W	-	6	6	6	6	A	T	G	/	B	W			-				
Size		Features				Series		Design		Body material		Ends material		Ball/Stem material		Seat material		Inner Seal material		Outer Seal material		End connection				Special features		

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
F	Fire safe
B	Full port
Q	Cavity filler seats
I	High purity Class 10000

Series (7-8)	
47	Floating ball 3 piece

Design (9)	
W	Total HermetiX Integrity package
G	Total HermetiX Integrity package - FDA compliant

Body material (11)	
6	S. SteelCF8M
4	C. steel
W	Hastelloy-C22
S	254SMO
D	Duplex
9	Low Temp C. steel
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

Ends material (12)	
6	S. SteelCF8M/CF3M*
4	C. steel
W	Hastelloy-C22
S	254SMO
D	Duplex
9	Low Temp C. steel
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

* CF3M - welded end connection only.

Ball material (13)	
6	S. SteelCF8M/316
W	Hastelloy-C22
S	254SMO
D	Duplex
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

Stem material (14)	
6	S. Steel316
M	High Strength S. Steel
Z	Inconel 718
W	Alloy-C22
S	254SMO A479
A	Alloy-20
D	Duplex A479
K	Super Duplex A479
7	Monel
C	Hastelloy-C276

Seat material (15)	
A	TFM
P	CF PTFE
K	CF PEEK
L	Virgin Peek
U	UHMWPE
C	PCTFE
Y	Delrin
W	PVDF
T	PTFE
R	15% Glass filled PTFE

Inner Seal Material (16)	
T	PTFE
G	Expanded graphite
U	UHMWPE
V	Viton
B	NBR

Outer Seal Material (17)	
G	Expanded graphite
A	TFM
U	UHMWPE

End Connection (19-22)	
Welded	
BW10	Buttweld schd. 10
BW	Buttweld schd. 40
SW	Socket weld
XBW10	Extended buttweld schd. 10
XBW	Extended buttweld schd. 40
XSW	Extended socket weld
BW5	Buttweld schd. 5
BW80	Buttweld schd. 80
BWO*	Buttweld tube OD
BWD	Buttweld DIN 11850
BWI1.6	Buttweld ISO 1127 1.6mm
BWI2.0	Buttweld ISO 1127 2.0mm
BWI2.3	Buttweld ISO 1127 2.3mm
SWO*	Socket weld tube OD
ETO*	Extended tube OD
ETI1.6	Extended buttweld ISO 1127 1.6mm
ETI2.0	Extended buttweld ISO 1127 2.0mm
ETI2.3	Extended buttweld ISO 1127 2.3mm
ETD	Extended buttweld DIN 11850
Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	SAE internal straight thread
MNPT	Male NPT
MBSPT	Male BSPT
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF
Clamp	
LL*	Compression fitting (Imperial) - **No** Nuts & Ferrules
LM*	Compression fitting (metric) - **No** Nuts & Ferrules
LL-NF*	Compression fitting (Imperial) - **with** Nuts & Ferrules
LM-NF*	Compression fitting (metric) - **with** Nuts & Ferrules
TC*	Tri-Clamp
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

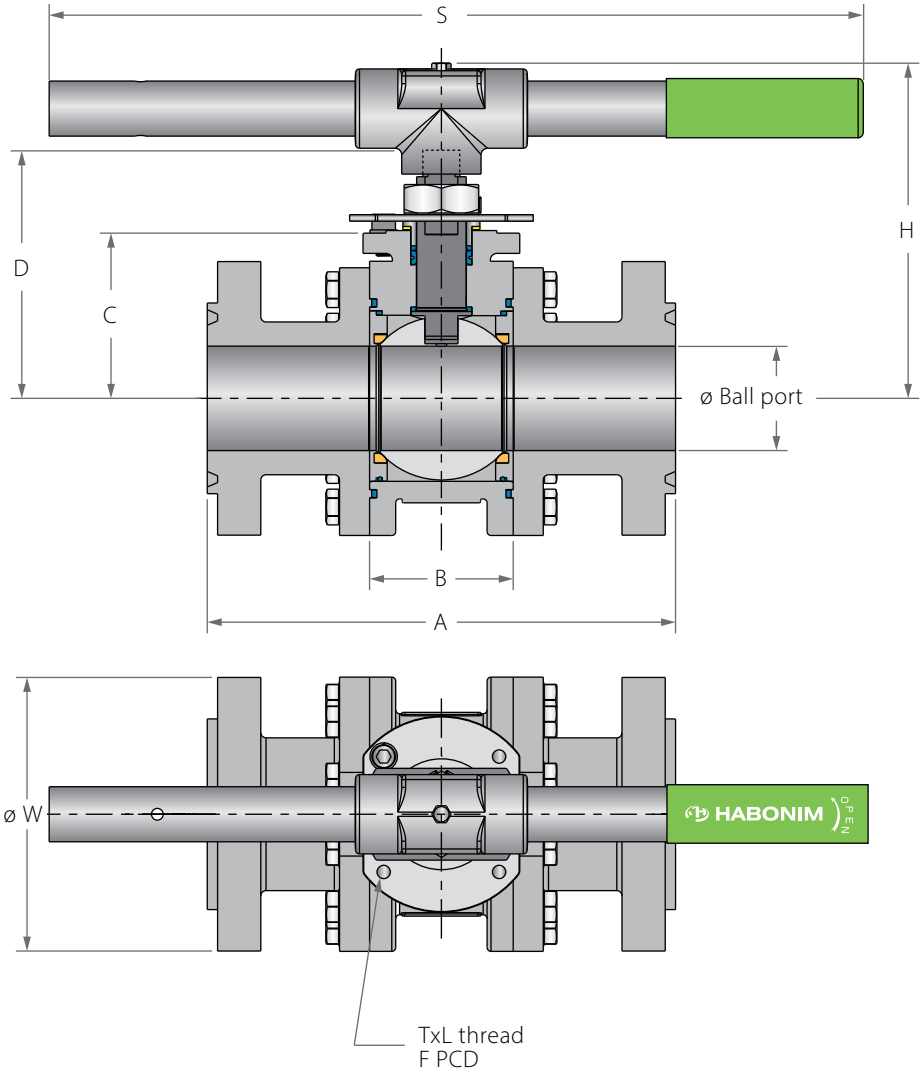
* Std. port Only

** Not available for 1¼" (DN32) Valves

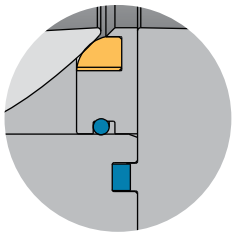
Special Features (24-30)	
P250	Ball with Upstream Relief Hole
SRS	Self Relief Seat
B	Body made from barstock
EP	Electropolished
J2N05	Jacketed valve - number of ports (2), type (NPT) and size (½")
Valve Special Stem Seals	
LAX	FDA Compliant, Stem seal, Virgin Peek thrust and TFM, X shape, gasket
HC	High Cycle service

Floating Ball 3 Piece

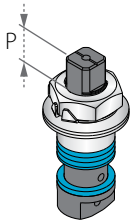
Valve Dimensions

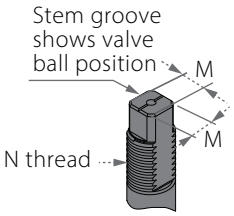


Optional hybrid seat U-shape



Preparation for actuation



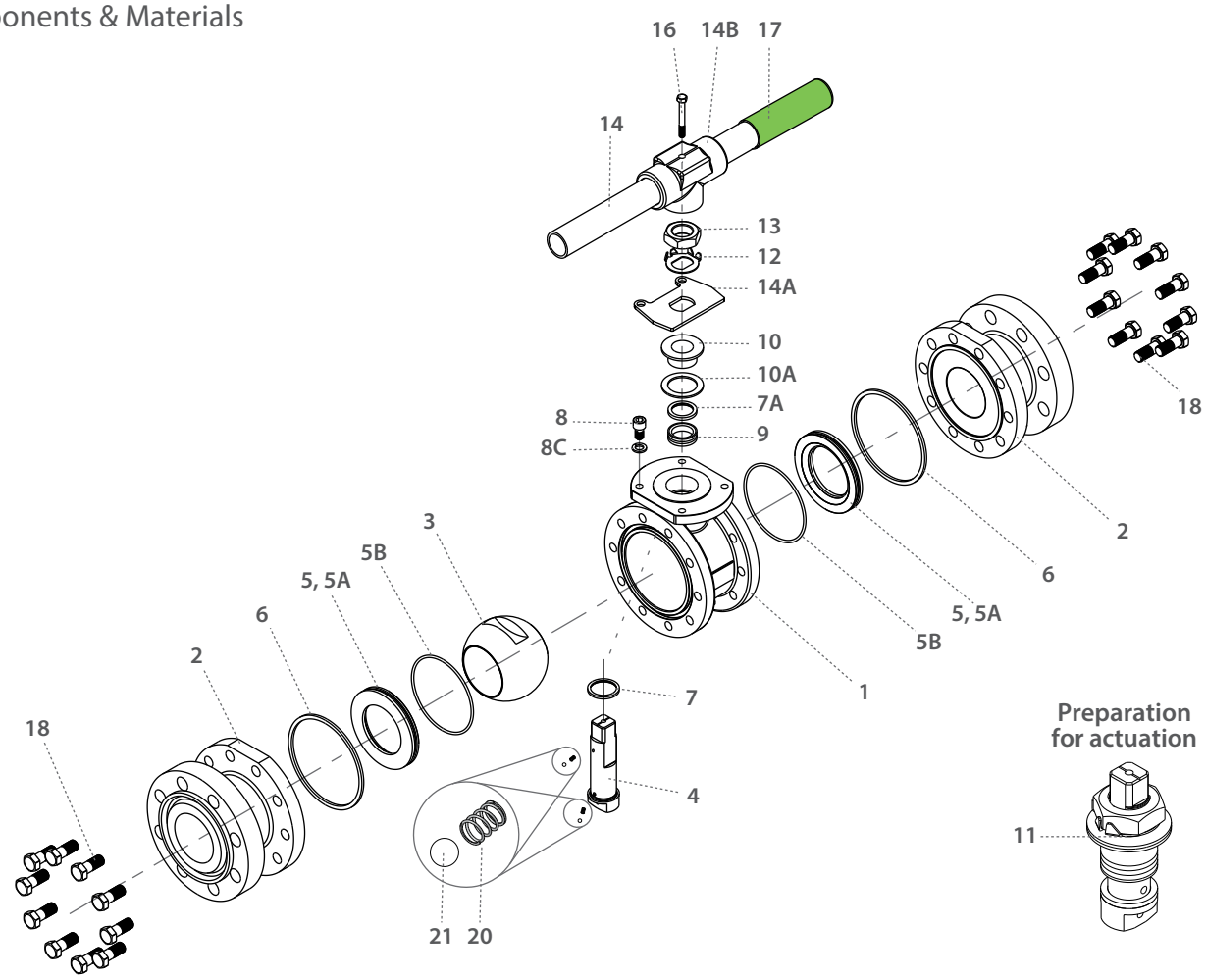


Std. port	Unit	Ball port	A (RF)	A (RTJ)	B	C	D	H	S	W	M	M-DD	N	P	Q	F		TxL	Weight kg/lb	Kv Cv
DN50	mm	51.0	292.10	292.15	75.0	87.50	134.0	174.45	401.0	165.10	18.90	15.90	1"-14	16.70	22.70	F10	102.0	M10x12	14.20	430
2"	inch	2.01	11.50	11.62	2.95	3.44	5.28	6.87	15.79	6.50	0.74	0.63	UNS-2A	0.66	0.89		4.02		31.3 0	499
DN80	mm	80.0	355.60	358.65	110.0	126.50	195.90	256.60	916.0	209.55	28.45	23.75	1½"-12	26.20	35.20	F12	125.0	M12x16	37.00	1000
3"	inch	3.15	14.0	14.12	4.33	4.98	7.71	10.10	36.06	8.25	1.12	0.94	UNF-2A	1.03	1.39		4.92		81.6 0	1160
DN100	mm	100.0	431.80	434.85	135.0	142.40	211.90	273.0	916.0	273.05	28.45	23.75	1½"-12	26.20	35.20	F12	125.0	M12x18	58.00	1830
4"	inch	3.94	17.0	17.12	5.31	5.61	8.34	10.75	36.06	10.75	1.12	0.94	UNF-2A	1.03	1.39		4.92		128.00	2123
DN150	mm	150.0	558.80	561.85	190.0	194.0	307.0	-	-	355.60	35.92	35.92	2"-8	40.0	46.50	F14	140.0	M16x18	126.00	4380
6"	inch	5.91	22.0	22.12	7.48	7.64	12.09	-	-	14.0	1.41	1.41	UN-2A	1.57	1.83		5.51		278.00	5081
DN200	mm	200.0	660.40	663.45	275.0	245.0	400.0	-	-	419.10	45.90	45.90	2¾"-8	50.0	55.0	F16	165.0	M20x28	314.00	8070
8"	inch	7.87	26.0	26.12	10.83	9.65	15.75	-	-	16.50	1.81	1.81	UN-2A	1.97	2.17		6.50		692.20	9361

(-) Due to high valve torque, pipe handle cannot be used. A manual gear or automation means should be used to operate the valve.

Floating Ball 3 Piece

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat Insert	Acc. Ordering Code	2
5A*	Seat Housing	S. Steel	2
5B*	Seat Seal	Graphite, PTFE	2
6*	Outer seal	Graphite, PTFE, Viton and NBR	2
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14**	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	20-24-32
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

** Gear operator should be used for size 6" DN150 and above (handle components are not included)

Floating Ball 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0			F	B	2	6	W	-	6	6	6	6	F	T	G	/	X	B	W		-	K	1	1	0
Size		Features				Series		Design		Body/Ends material		Ball/Stem material		Seat material	Inner Seal material	Outer Seal material		End connection					Special features			

Size (1-2)		
Code	inch	mm
20	2"	50
30	3"	80
40	4"	100
60	6"	150
80	8"	200

Features (3-6)	
B	Full port
F	Fire safe
O	Clean assembly for O2 service
M	Ammonia service
K	Chlorine service

Series (7-8)	
26	Floating ball 3 piece

Design (9)	
W	HermetiX Fire - Safe

Body/Ends material (11-12)	
6	S. Steel CF8M
4	C. steel A216 WCB/A105
9	C. steel A352 LCB

Ball material (13)	
6	S. Steel316

Stem material (14)	
6	S. Steel316
M	High Strength S. Steel
Z	Inconel 718

Seat material (15)	
F	Hybrid Seat (info in special features)

Inner Seal Material (16)	
T	PTFE
G	Expanded graphite
V	Viton
B	NBR

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End Connection (19-22)	
Welded	
XBW	Extended buttweld schd. 40
XBW80	Extended buttweld schd. 80
Flanged	
600	ASME B16.5 #600 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF

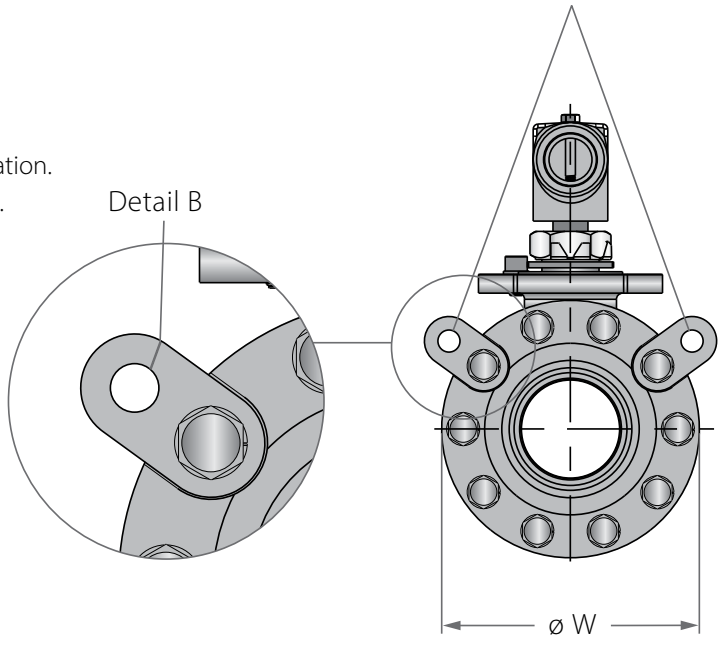
Special Features (24-30)	
RTJ	Ring Type Joint
P250	Ball with Upstream Relief Hole
Valve Special Stem Seals	
HC	High Cycle service
LAX	FDA Compliant, Stem seal, Virgin Peek thrust and TFM, X shape, gasket

Hybrid Seats (24-27)	
Insert material	
K	CF PEEK
P	CF PTFE
W	PVDF
Seat Configuration	
1	Hybrid seats on upstream and downstream
Bi-Directional Hybrid Seats	
1	Round
Seal Type	
0	U+Viton
6	L+PTFE
1	U+NBR
3	U+Low Temp. NBR
5	L+PTFE+Graphite

Lifting Device

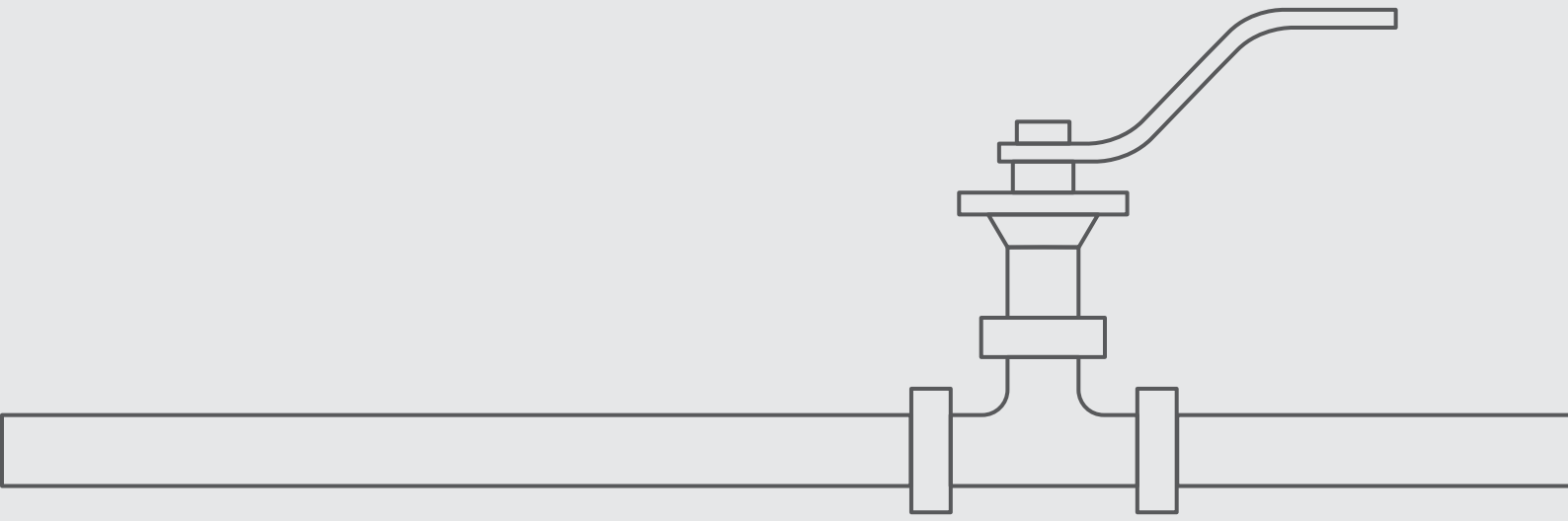
The 26 Series is equipped with a lifting device to ease installation.
The maximum allowable load is indicated in the below table.

Std. port	Unit	Weight
DN50	kg	1000
2"	lb	2205
DN80	kg	3000
3"	lb	6614
DN100	kg	4400
4"	lb	9700
DN150	kg	5800
6"	lb	12787
DN200	kg	5800
8"	lb	12787



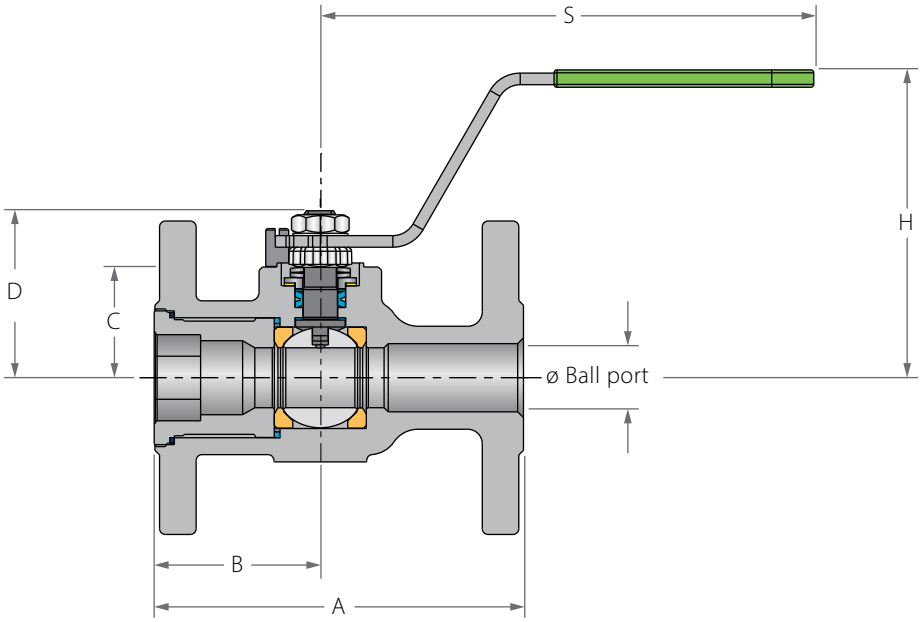
FLOATING BALL

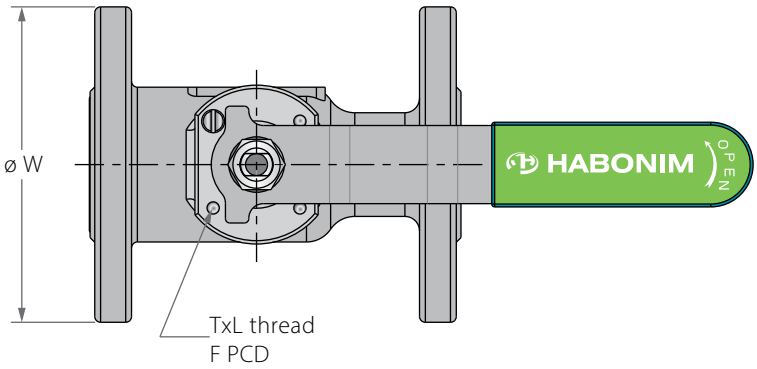
FLANGED



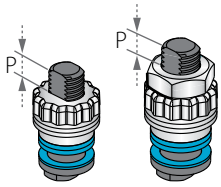
Floating Ball Flanged

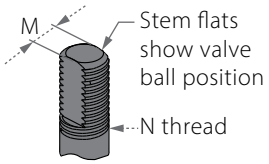
Valve Dimensions





Preparation for actuation

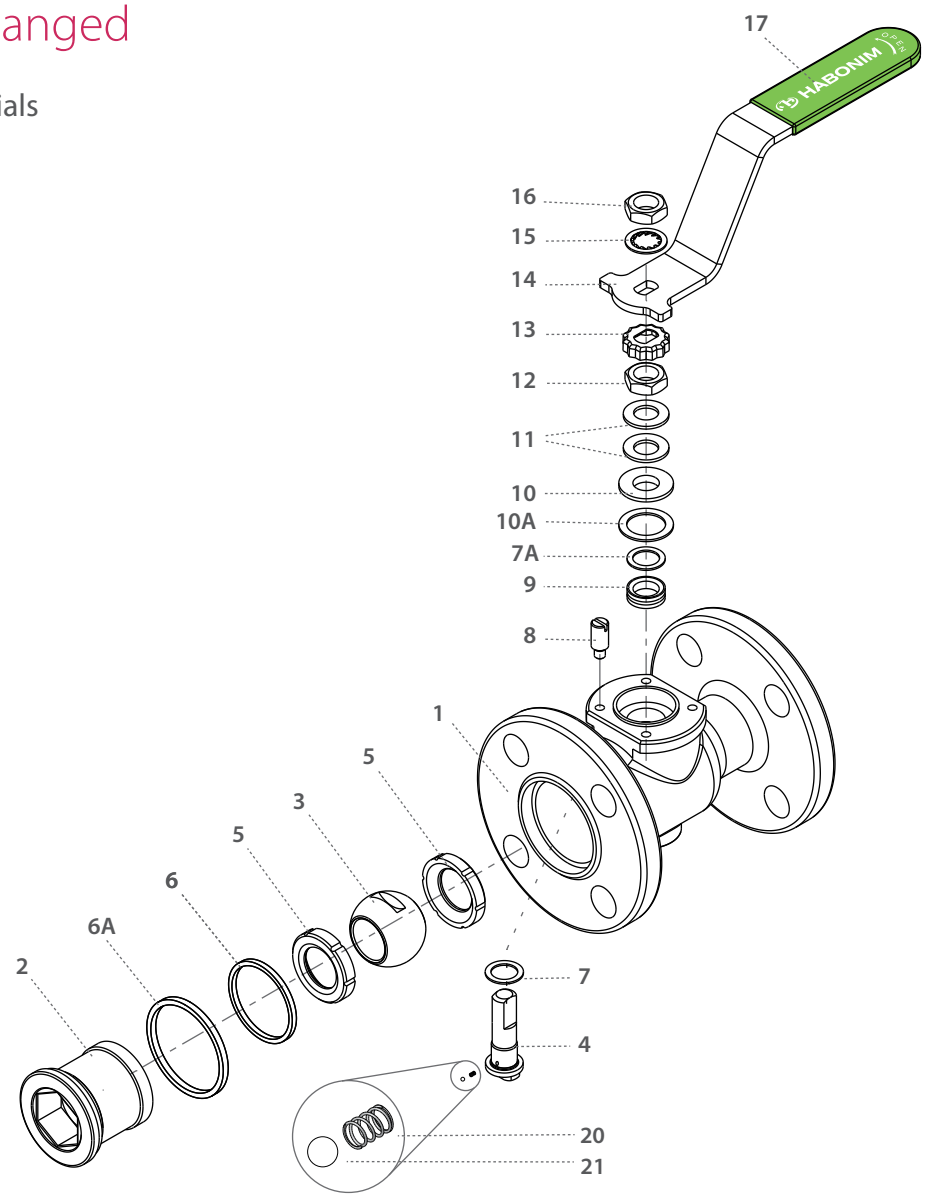




Std. port	Unit	Ball port	A		B	C	D	H	S	W		M	N	P	F		TxL	Weight kg/lb		Kv Cv
			150	300						150	300							150	300	
DN15	mm	11.15	108.0	140	46.0	29.0	38.0	92.0	151.0	88.90	95.25	5.54	⅜ - UNF	6.65	F03	36.0	M5x10	1.70	2.40	6.9
½"	inch	0.44	4.25	5.51	1.81	1.14	1.50	3.62	5.94	3.50	3.75	0.22		0.26		1.42		3.80	5.30	8.0
DN20	mm	14.30	117.0	152.0	49.0	31.40	40.30	94.0	151.0	98.55	163.07	5.54	⅜ - UNF	6.65	F03	36.0	M5x10	2.30	3.30	10
¾"	inch	0.56	4.61	6.0	1.93	1.24	1.59	3.70	5.94	3.88	6.42	0.22		0.26		1.42		5.10	7.30	12
DN25	mm	20.60	127.0	165.0	57.0	38.20	55.60	103.50	170.0	107.95	123.95	7.54	7/16 - UNF	7.40	F04	42.0	M5x10	3.10	4.60	28
1"	inch	0.81	5.0	6.50	2.25	1.50	2.19	4.07	6.69	4.25	4.88	0.30		0.29		1.65		7.30	10.20	32
DN40	mm	31.80	165.0	190.0	62.0	43.60	73.10	119.20	220.50	127.0	155.52	8.71	9/16 - UNF	8.50	F05	50.0	M6x12	5.50	8.70	69
1½"	inch	1.25	6.50	7.50	2.44	1.72	2.88	4.70	8.68	5.0	6.10	0.34		0.33		1.97		12.20	19.30	80
DN50	mm	38.20	178.0	216.0	68.0	48.30	77.80	123.90	220.50	152.40	165.10	8.71	9/16 - UNF	8.50	F05	50.0	M6x12	8.10	10.80	102
2"	inch	1.50	7.0	8.50	2.67	1.90	3.06	4.88	8.68	6.0	6.50	0.34		0.33		1.97		18.00	24.00	118

Floating Ball Flanged

Components & Materials



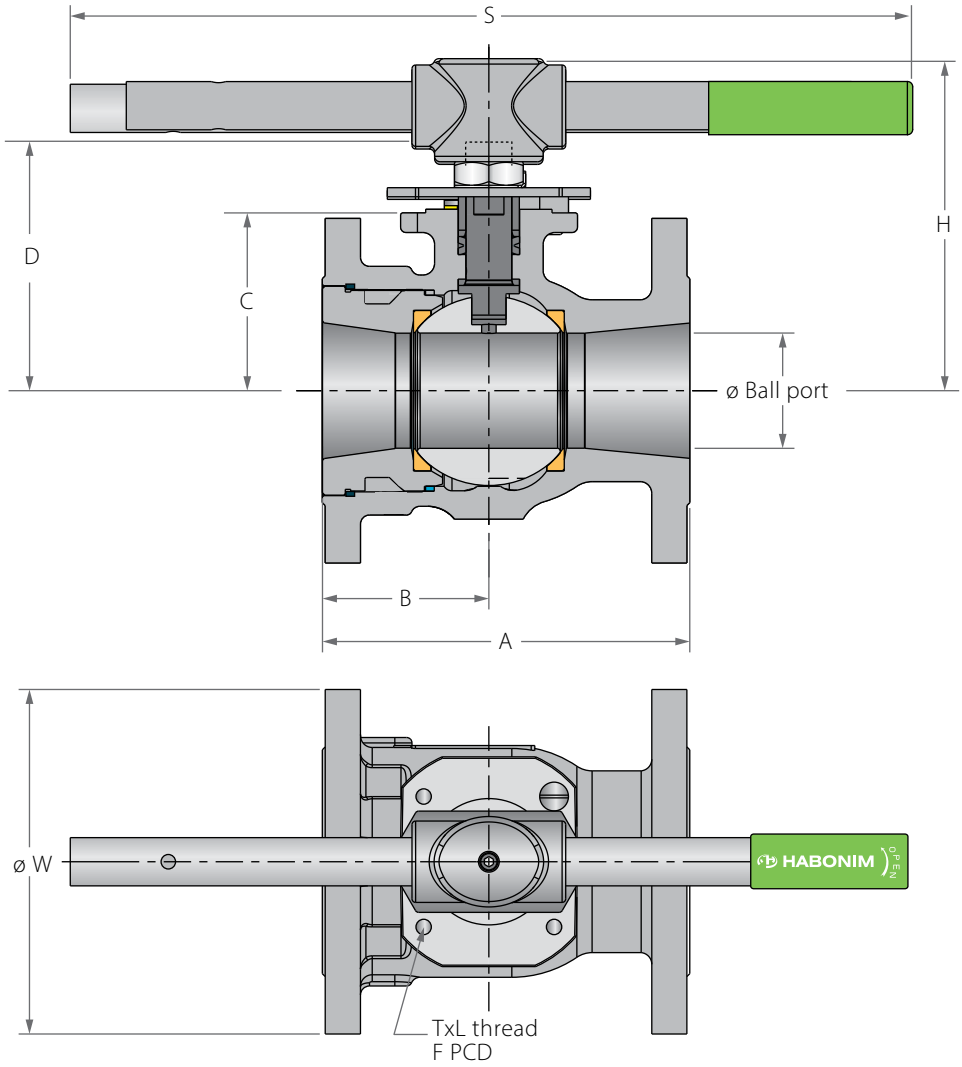
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	VIRGIN PEEK, PCTFE (KEL-F)	1
7A*	Anti-Abrasion Ring	VIRGIN PEEK, PCTFE (KEL-F)	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

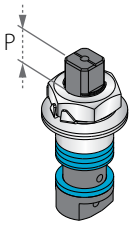
* Maintenance kit components

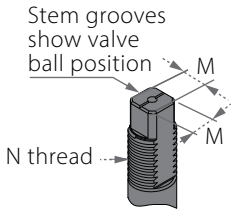
Floating Ball Flanged

Valve Dimensions



Preparation for actuation

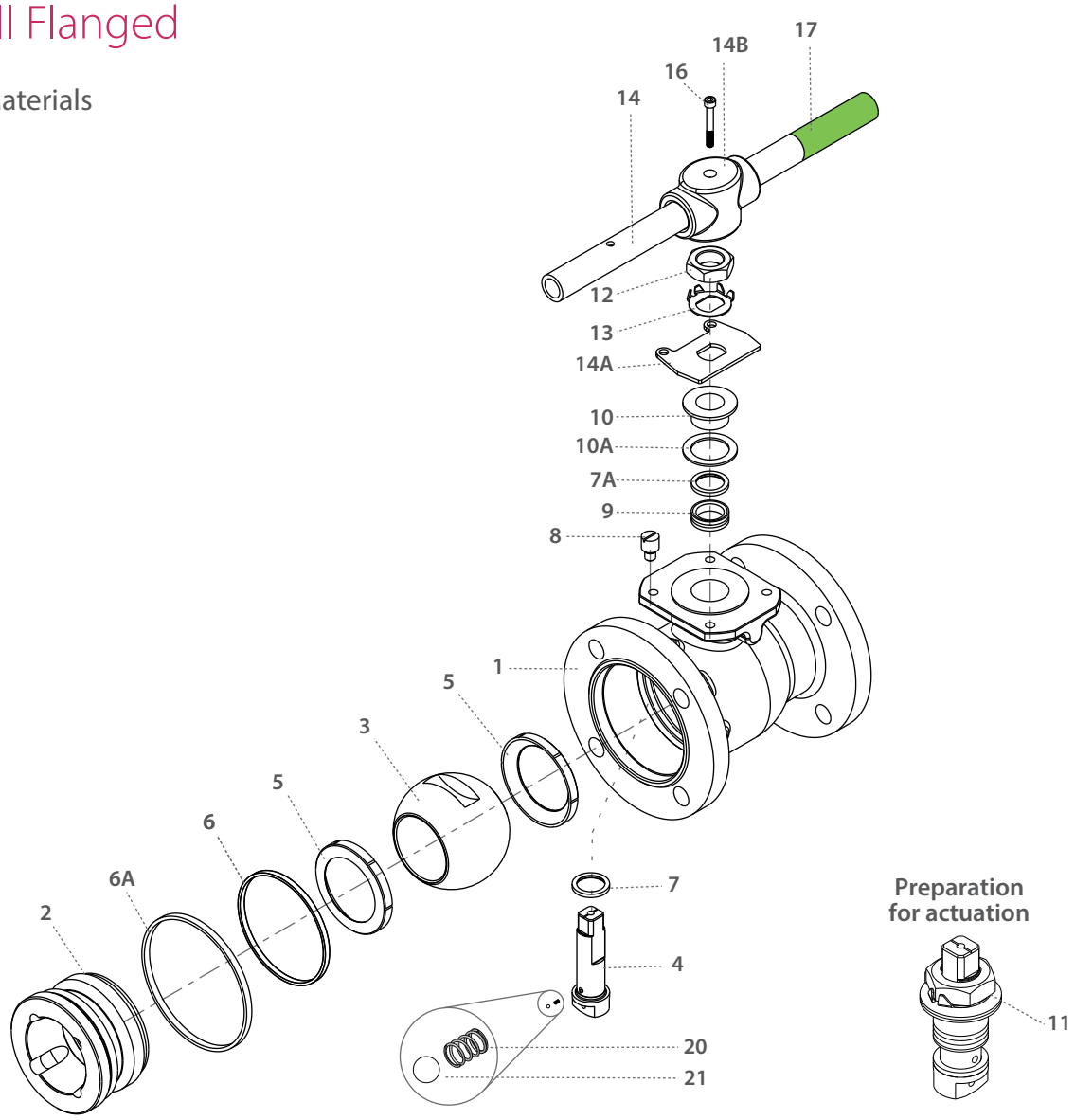




Std. port	Unit	Ball port	A		B	C	D	H	S	W		M	M-DD	N	P	F		TxL	Weight kg/lb		Kv
			150	300						150	300								150	300	Cv
DN80	mm	63.50	203.0	284.0	92.0	98.40	145.0	185.10	400.0	190.50	209.55	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	18.00	22.70	300
3"	inch	2.50	8.0	11.18	3.62	3.88	5.72	7.28	15.75	7.50	8.25	0.74	0.63		0.66		4.02		40.00	50.40	348
DN100	mm	82.60	229.0	305.0	102.0	114.10	161.0	201.0	610.0	228.60	254.0	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	28.20	36.30	615
4"	inch	3.25	9.0	12.0	4.0	4.49	6.34	7.91	24.01	9.0	10.0	0.74	0.63		0.66		4.02		62.80	80.60	713
DN150	mm	111.10	267.0	403.20	108.0	157.40	226.0	285.90	916.0	279.40	317.50	28.45	23.75	1½"-12 UNF-2A	26.20	F12	125.0	M12x20	41.00	69.00	872
6"	inch	4.38	10.50	15.88	4.25	6.20	8.91	11.25	36.08	11.0	12.50	1.12	0.94		1.03		4.92		91.00	153.00	1012
DN200	mm	144.40	292.0	419.0	163.50	185.20	254.0	313.60	916.0	342.90	381.0	28.45	23.75	1½"-12 UNF-2A	26.20	F12	125.0	M12x20	82.00	105.00	1552
8"	inch	5.68	11.50	16.50	5.37	7.30	10.0	12.34	36.08	13.50	15.0	1.12	0.94		1.03		4.92		182.00	233.00	1800

Floating Ball Flanged

Components & Materials



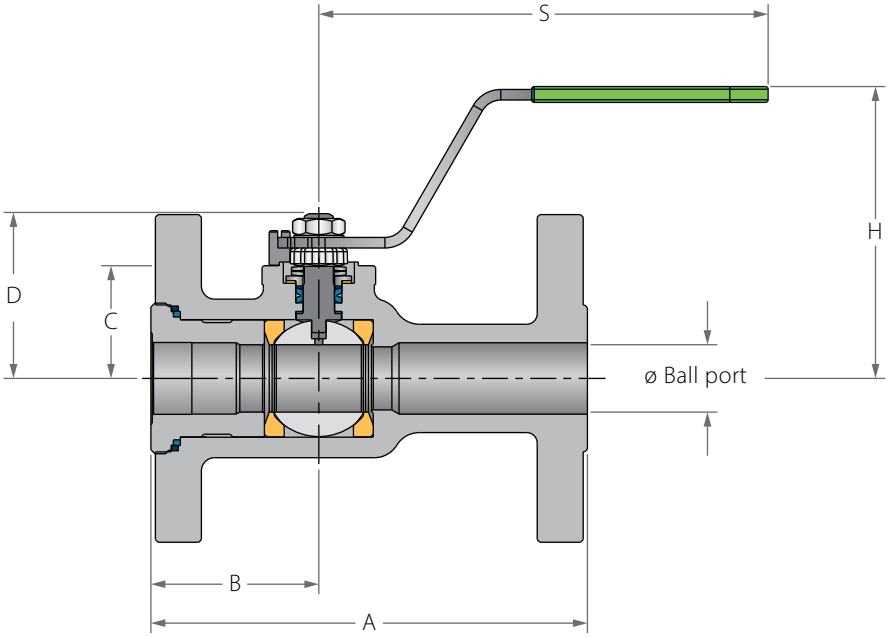
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	VIRGIN PEEK, PCTFE (KEL-F)	1
7A*	Anti-Abrasion Ring	VIRGIN PEEK, PCTFE (KEL-F)	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

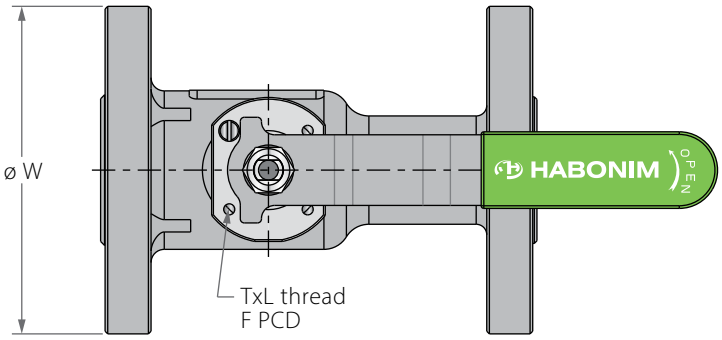
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	A240 304	1
14	Handle	C. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

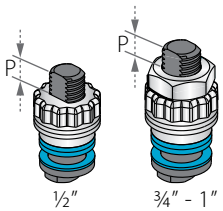
Floating Ball Flanged

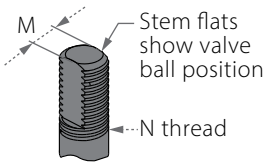
Valve Dimensions





Preparation for actuation



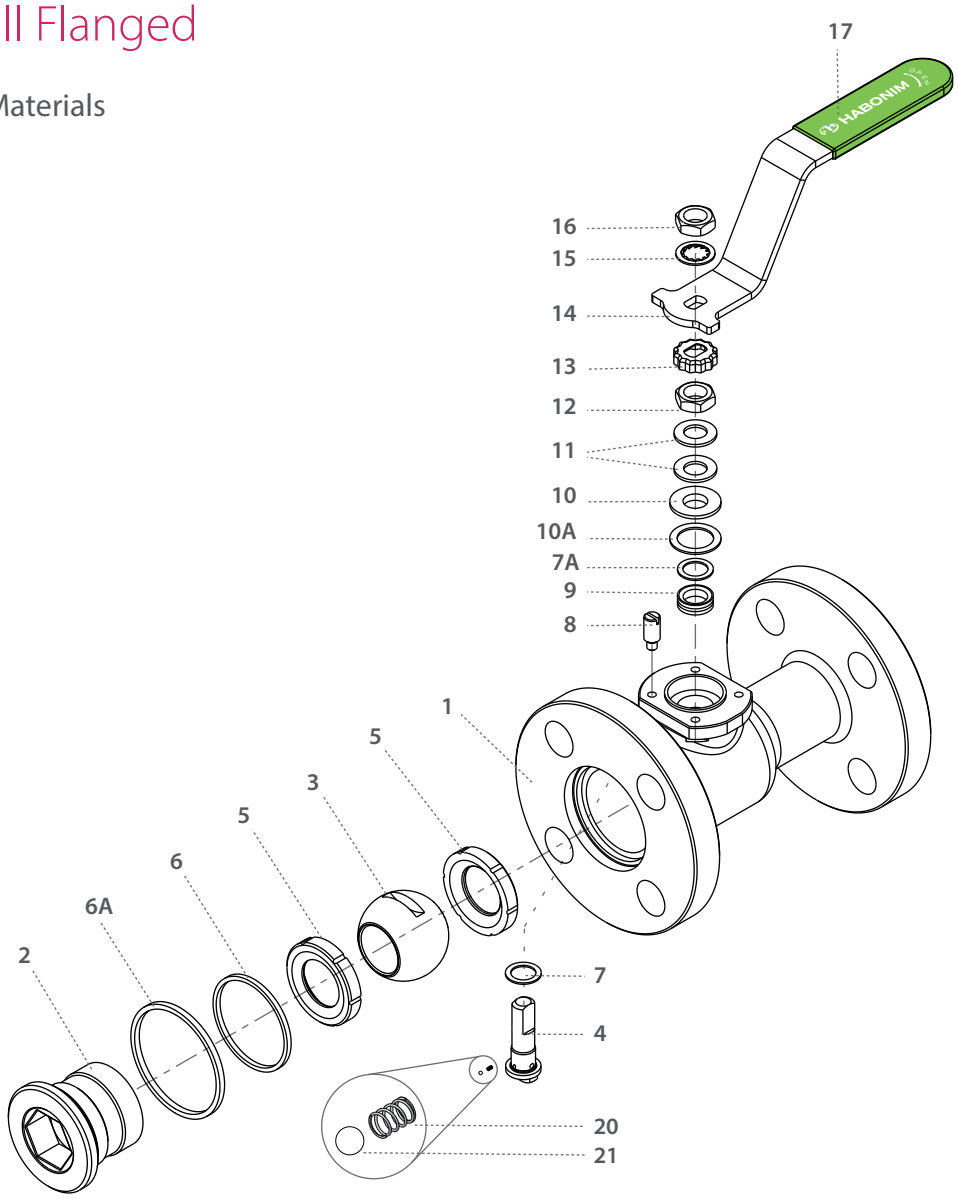


73 74																				
Full port	Unit	Ball port	A		B	C	D	H	S	W		M	N	P	F		TxL	Weight kg/lb		Kv
			150	300						150	300							150	300	Cv
DN15	mm	14.3	108.0	140.0	47.0	31.40	40.5	94.0	151.0	89.0	95.0	5.54	1"-14	6.65	F03	36	M5x10	1.8	2.3	28
½"	inch	0.56	4.25	5.51	1.85	1.25	1.59	3.70	5.95	3.50	3.74	0.22	UNF-2A"	0.26		1.42		4	5.1	32
DN20	mm	20.6	117.0	152.0	57.0	38.20	55.6	103.5	170.0	98.0	117.0	7.54	1"-14	7.4	F04	42	M5x10	2.2	3.3	46
¾"	inch	0.81	4.61	5.98	2.24	1.50	2.19	4.08	6.69	3.86	4.61	0.30	UNF-2A"	0.29		1.65		4.8	7.3	53
DN25	mm	25.4	127.0	165.0	62.0	42.70	60.3	108.0	170.0	108.0	124	7.54	1"-14	7.4	F04	42	M5x10	3.2	4.6	80
1"	inch	1.0	5.0	6.50	2.44	1.68	2.37	4.25	6.69	4.25	4.88	0.30	UNF-2A"	0.29		1.65		7	10.1	93

78																			
Full port	Unit	Ball port	A		B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb		Kv
			F1	F4													F1	F4	Cv
DN15	mm	14.3	130.0	115.0	48.0	31.50	40.5	98.6	151.0	95.0	5.54	1"-14	6.65	F03	36	M5x10	2.2	2.1	28
½"	inch	0.56	5.12	4.53	1.89	1.24	1.59	3.88	5.95	3.74	0.22	UNF-2A"	0.26		1.42		4.8	4.6	32
DN20	mm	20.6	150	120.0	58.0	38.30	56.5	105.0	170.0	105.0	7.54	1"-14	7.4	F04	42	M5x10	3.2	3	46
¾"	inch	0.81	5.91	4.72	2.28	1.51	2.22	4.13	6.69	4.13	0.30	UNF-2A"	0.29		1.65		7	6.6	53
DN25	mm	25.4	16.0.0	125.0	63.5	41.80	61.0	108.0	170.0	115.0	7.54	1"-14	7.4	F04	42	M5x10	4.2	4	80
1"	inch	1.0	6.30	4.92	2.50	1.65	2.40	4.25	6.69	4.53	0.30	UNF-2A"	0.29		1.65		9.2	8.8	93

Floating Ball Flanged

Components & Materials



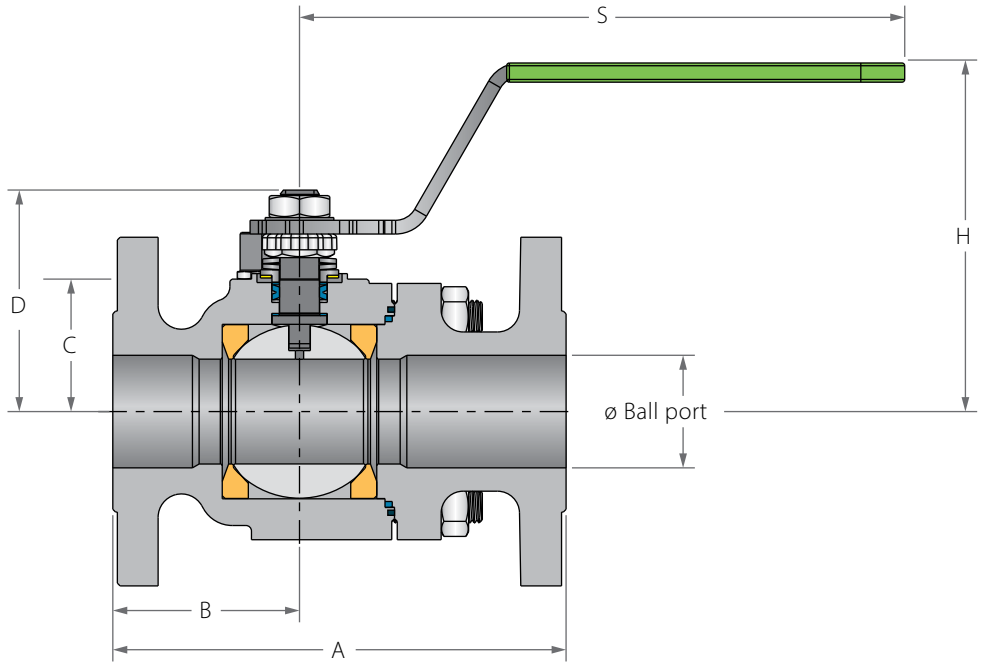
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Insert	A351 CF8M, A216 WCB, A351 CN7M, A494	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	VIRGIN PEEK, PCTFE (KEL-F)	1
7A*	Anti-Abrasion Ring	VIRGIN PEEK, PCTFE (KEL-F)	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

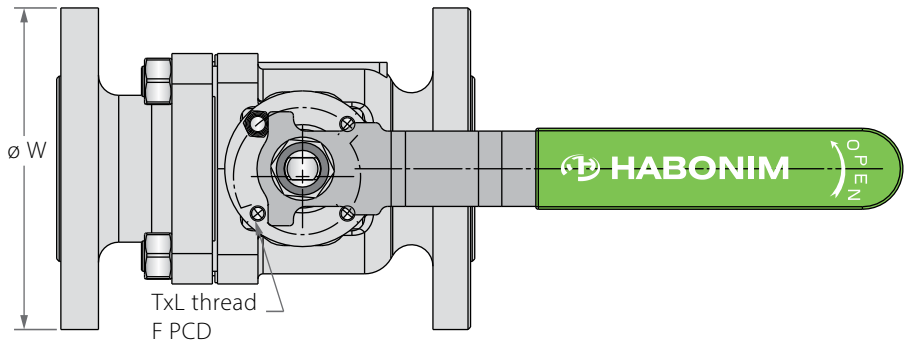
Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

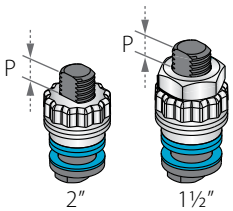
Floating Ball Flanged

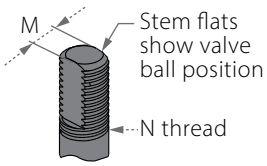
Valve Dimensions





Preparation for actuation



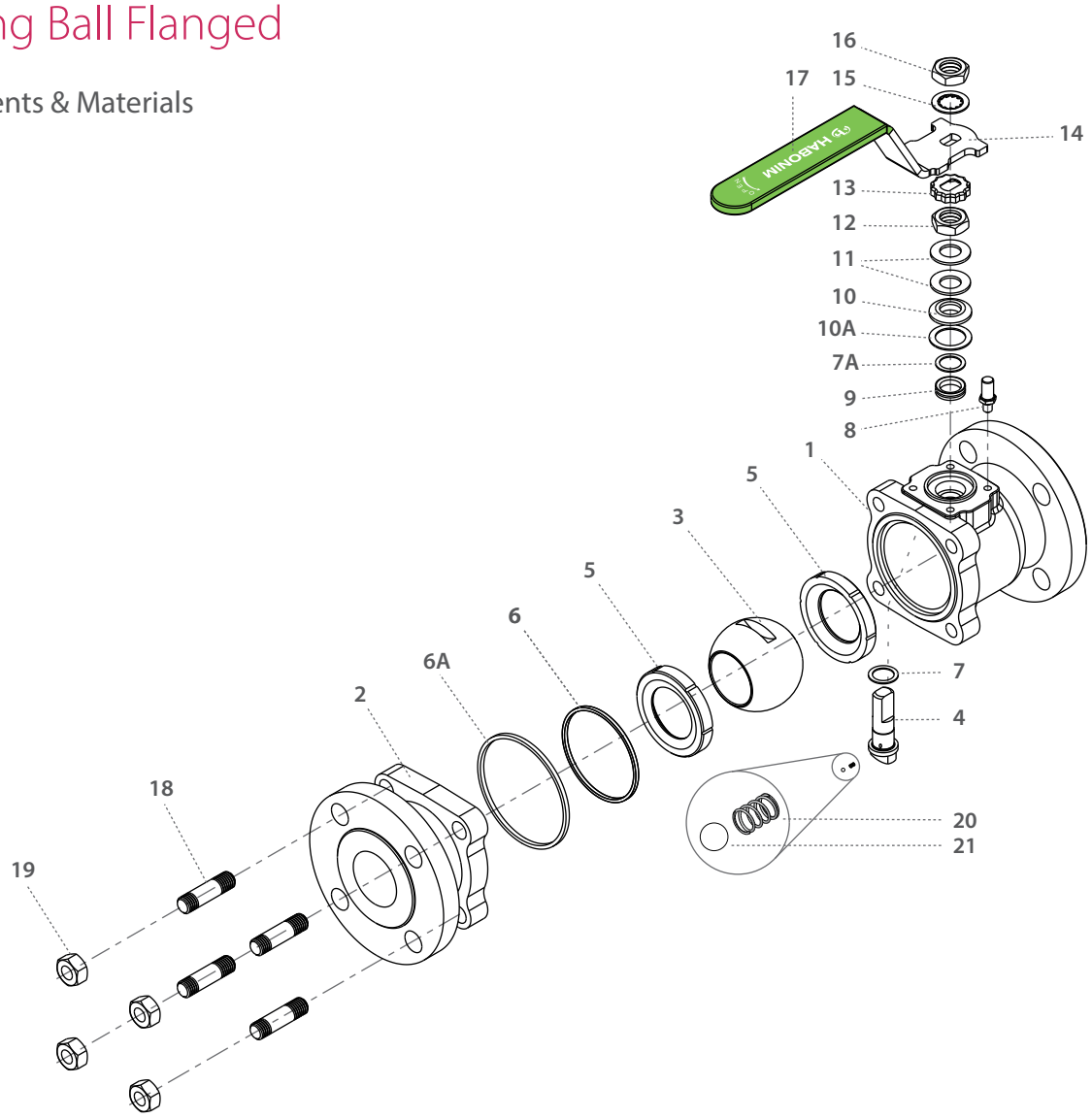


73 74																				
Full port	Unit	Ball port	A		B		C	D	H	S	W		M	N	P	F		TxL	Weight kg/lb		Kv
			150	300	150	300					150	300							150	300	Cv
DN32	mm	31.8	140.0	178.0	59.0	-	49.0	73.0	120.5	220.1	115.0	135.0	8.71	5/16" UNF	8.5	F05	50	M6x12	-	-	-
1¼"	inch	1.25	5.51	7.0	23.22	-	1.92	2.87	4.74	8.66	4.53	5.31	0.34		0.33		1.97		-	-	-
DN40	mm	38.1	165.0	190.0	6.8.0	80.4	48.30	77.8	124.0	220.1	12.07	156.0	8.71	5/16" UNF	8.5	F05	50	M6x12	6.6	9.8	220
1½"	inch	1.50	6.50	7.50	26.76	31.65	1.90	3.06	4.88	8.66	5.0	6.14	0.34		0.33		1.97		14.5	21.5	255
DN50	mm	50.0	178.0	216.0	69.1	75.2	70.0	88.0	134.2	220.1	152.0	165.0	8.71	5/16" UNF	13.5	F07	70	M8x12	13	15	430
2"	inch	2.0	7.0	8.50	27.20	29.61	2.75	3.46	5.28	8.66	5.98	6.50	0.34		0.53		2.75		28.6	33	499

78																			
Full port	Unit	Ball port	A		B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb		Kv
			F1	F4													F1	F4	Cv
DN32	mm	31.8	180.0	130.0	5.06	49.0	7.03	121.4	220.1	140.0	8.71	5/16" UNF	8.5	F05	50	M6x12	-	-	-
1¼"	inch	1.25	7.10	5.11	2.20	1.92	2.87	4.78	8.66	5.51	0.34		0.33		1.97		-	-	-
DN40	mm	38.1	200.0	140.0	65.9	48.30	77.8	124.0	220.1	150.0	8.71	5/16" UNF	8.5	F05	50	M6x12	10.9	10.3	220
1½"	inch	1.50	7.87	5.51	2.59	1.90	30.60	4.88	8.66	5.91	0.34		0.33		1.97		24	22.7	255
DN50	mm	50.0	230.0	150.0	60.7	78.0	119.0	137.3	220.1	165.0	8.71	5/16" UNF	13.5	F07	70	M8x12	15	13	430
2"	inch	2.0	9.06	5.91	2.39	30.70	4.69	5.41	8.66	6.50	0.34		0.53		2.75		33	28.6	499

Floating Ball Flanged

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	VIRGIN PEEK, PCTFE (KEL-F)	1
7A*	Anti-Abrasion Ring	VIRGIN PEEK, PCTFE (KEL-F)	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1

Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	4
19	Body Nuts	S. Steel	4
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

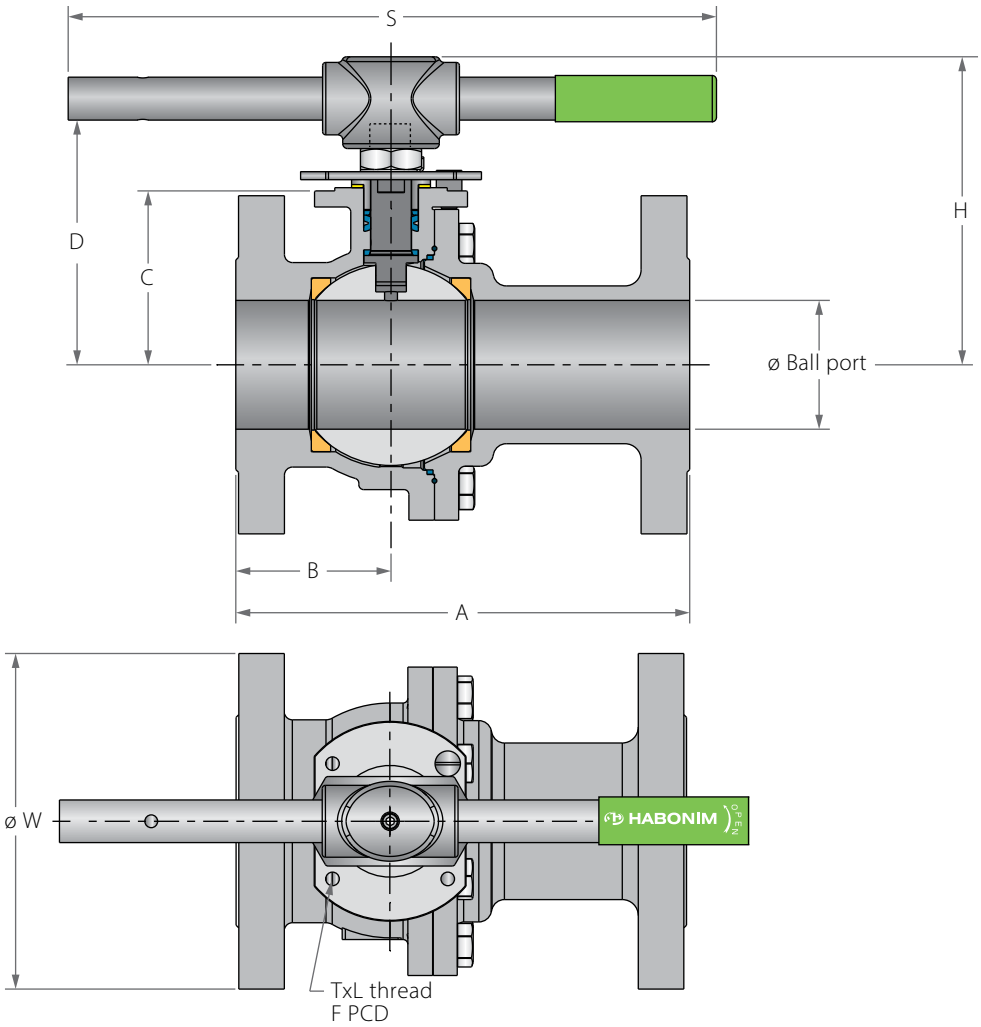
* Maintenance kit components

73 74 2½"-8" | DN65-DN200 | CLASS 150/300

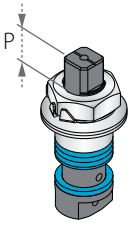
77 3"-8" | DN80-DN200 | PN 16 78 2½" | DN65 | PN40

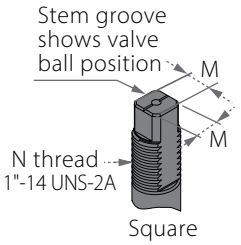
Floating Ball Flanged

Valve Dimensions



Preparation for actuation





73 74 2½"-8"																							
Full port	Unit	Ball port	A		B		C	D	H	S	W		M	M-DD	N	P	F		TxL	Weight kg/lb		Kv
			150	300	150	300					150	300								150	300	Cv
DN65	mm	65.0	190.0	241.0	83.0	-	119.0	165.5	194.8	400.0	180.0	190.0	18.9	15.9	1"-14	16.7	F10	102	M10x20	-	-	-
2½"	inch	2.56	7.48	9.48	3.26	-	4.76	6.51	7.67	15.75	7.08	7.48	0.74	0.63	UNS-2A	0.66		4.02		-	-	-
DN80	mm	80.0	203.0	282.5	77.5	96.4	108.0	154.6	194.8	400.0	191.0	210.0	18.9	15.9	1"-14	16.7	F10	102	M10x20	22	28.2	1111
3"	inch	3.20	7.99	11.12	3.05	3.80	4.25	6.09	7.67	15.75	7.52	8.27	0.74	0.63	UNS-2A	0.66		4.02		48.5	62.2	1300
DN100	mm	100.0	228.5	304.8	84.5	104.5	124.0	170.5	211.0	610.0	230.0	254.0	18.9	15.9	1"-14	16.7	F10	102	M10x20	39	44.5	2051
4"	inch	3.94	9.0	12.0	3.33	4.11	4.88	6.69	8.31	24.02	9.06	10.0	0.74	0.63	UNS-2A	0.66		4.02		86	98.1	2400
DN150	mm	150.0	394.0	403.5	163.5	174.5	179.0	248.5	308.0	916.0	279.4	328.0	28.45	23.75	1½"-12	26.2	F12	125	M12x20	82	100	4615
6"	inch	5.91	15.51	15.89	6.44	6.87	7.05	9.78	12.13	36.06	11.0	12.91	1.12	0.94	UNS-2A	1.03		4.92		180.8	220.5	5400
DN200	mm	200.0	457.2	502.0	242.5	241.0	241.0	353.7	-	-	460.0	460.0	35.92	35.92	2"-8	37.5	F14	140	M16x240	190	225	7949
8"	inch	7.87	18.0	19.76	9.55	9.49	9.49	13.92	-	-	18.11	18.11	1.41	1.41	UNS-2A	1.48		5.51		418.9	496	9300

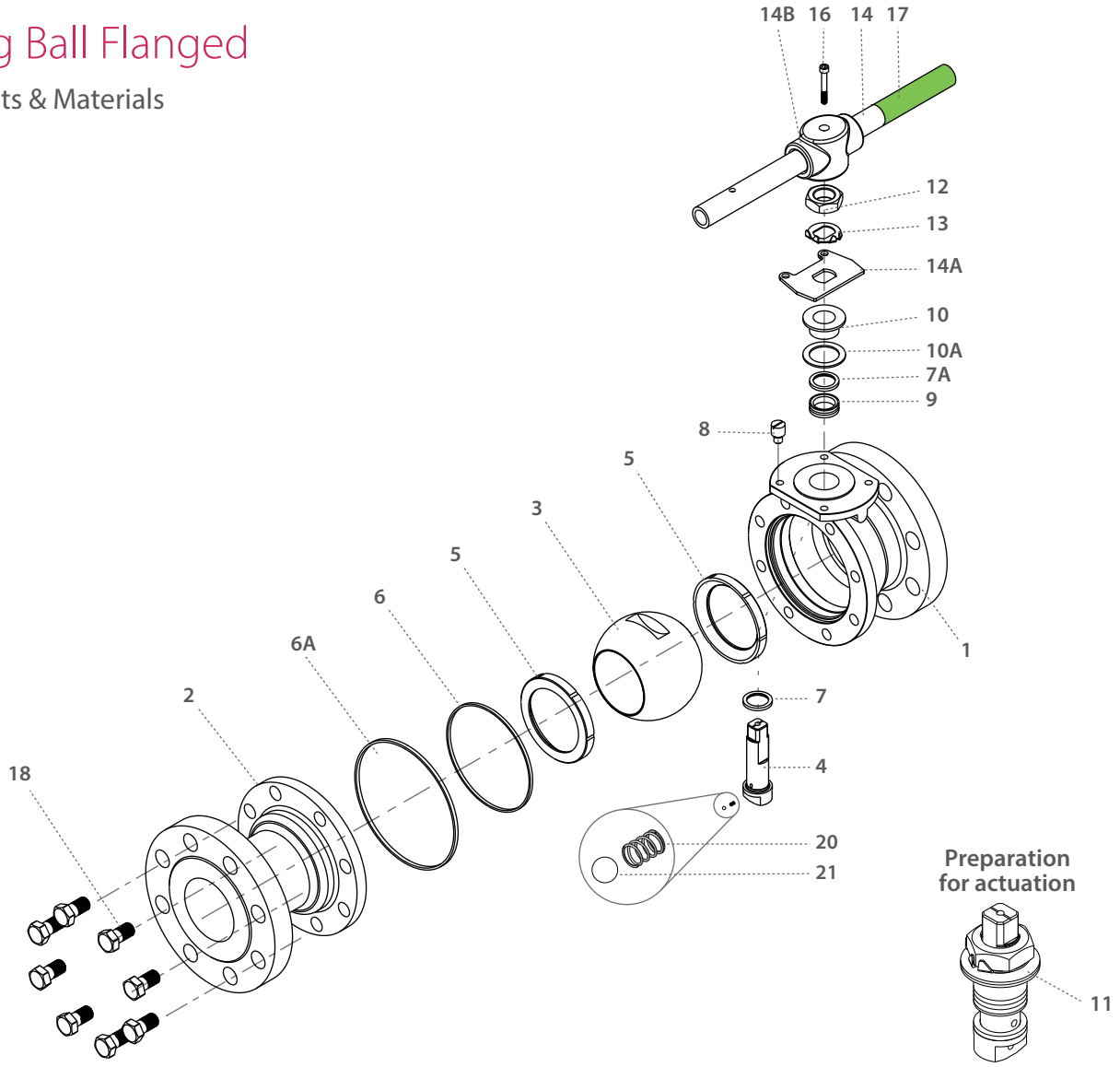
78 2½" 77 3"-8"																						
Full port	Unit	Ball port	A_16/40		B		C_16/40	D_16/40	H	S	W_16/40	M	M-DD	N	P	F		TxL	Weight kg/lb		Kv
			F5/F1	F4	16	40													F5	F4	Cv
DN65	mm	65.0	-	170.0	83.0	70.0	119.0	165.5	194.8	400.0	185.0	18.9	15.9	1"-14	16.7	F10	102	M10X20	-	-	-
2½"	inch	2.56	-	6.69	3.26	2.75	4.68	6.51	7.67	15.75	7.28	0.74	0.63	UNS-2A	0.66		4.02		-	-	-
DN80	mm	80.0	-	180.0	77.5	-	108.0	162.0	194.8	400.0	200.0	18.9	15.9	1"-14	16.7	F10	102	M10X20	-	24	1111
3"	inch	3.20	-	7.09	3.05	-	4.25	6.40	7.67	15.75	7.87	0.74	0.63	UNS-2A	0.66		4.02		-	52.8	1300
DN100	mm	100.0	-	190.0	84.5	-	132.0	186.0	211.0	610.0	225.0	18.9	15.9	1"-14	16.7	F10	102	M10X20	-	30	2051
4"	inch	3.94	-	7.48	3.33	-	5.20	7.32	8.31	24.02	8.86	0.74	0.63	UNS-2A	0.66		4.02		-	66	2400
DN150	mm	150.0	350.0	-	163.5	-	178.0	236.0	308.0	916.0	328.0	28.45	23.75	1½"-12	26.2	F12	125	M12X20	63	-	4615
6"	inch	5.91	13.78	-	6.44	-	7.01	9.29	12.13	36.06	12.91	1.12	0.94	UNS-2A	1.03		4.92		139	-	5400
DN200	mm	200.0	400.0	-	242.5	-	226.0	286.0	-	-	395.0	35.92	35.92	2"-8	37.5	F14	140	M16X24	97	-	7949
8"	inch	7.87	15.75	-	9.55	-	8.91	11.26	-	-	15.55	1.41	1.41	UNS-2A	1.48		5.51		213	-	9300

73 74 2½"-8" | DN65-DN200 | CLASS 150/300

77 3"-8" | DN80-DN200 | PN 16 78 2½" | DN65 | PN40

Floating Ball Flanged

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	VIRGIN PEEK, PCTFE (KEL-F)	1
7A*	Anti-Abrasion Ring	VIRGIN PEEK, PCTFE (KEL-F)	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2

Item	Description	Material specification	Qty.
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	A240 304	1
14**	Handle	C. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	8-12
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

** Gear operator should be used for size 8" DN200 (handle components are not included)

Floating Ball Flanged - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0				F	7	3	W	-	6	6	6	6	A	T	G	/	1	5	0		-				
Size		Features				Series		Design		Body/end material		Ball/Stem material		Seat material	Inner Seal material	Outer Seal material		End connection					Special features			

Size (1-2)		
Code	inch	mm
05	½"	15
07	¾"	20
10	1"	25
12*	1¼"	32
15	1½"	40
20	2"	50
25*	2½"	65
30	3"	80
40	4"	100
60	6"	150
80	8"	200

* only for series 73/78

25 - largest size available for series 78

Features (3-6)	
F	Fire safe
N	Control service
O	Clean assembly for O2 service
M	Ammonia service
K	Chlorine service
V	Vacuum service
H*	Hydrogen service

* for material selection - see Hydrogen Service chapter

Series (7-8)	
31	ANSI #150 std. port
32	ANSI #300 std. port
73	ANSI #150 full port
74	ANSI #300 full port
77	DIN PN 16 full port
78	DIN PN 40 full port

Design (9)	
W	Total HermetiX Integrity package
G	Total HermetiX Integrity package - FDA compliant

Body/Ends material (11-12)	
6	S. SteelCF8M/CF3M
4	C. steel
W	Hastelloy-C22
S	254SMO
D	Duplex
9	Low Temp C. steel
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

Ball material (13)	
6	S. SteelCF8M/316
M	High Strength S. Steel
W	Hastelloy-C22
S	254SMO
D	Duplex
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

Stem material (14)	
6	S. Steel316
M	High Strength S. Steel
Z	Inconel 718
W	Alloy-C22
S	254SMO A479
A	Alloy-20
D	Duplex A479
K	Super Duplex A479
7	Monel
C	Hastelloy-C276

Seat material (15)	
A	TFM
P	CF PTFE
K	CF PEEK
L	Virgin Peek
U	UHMWPE
C	PCTFE
Y	Delrin
W	PVDF
T	PTFE
R	15% Glass filled PTFE

Inner Seal Material (16)	
T	PTFE
A	TFM
G	Expanded graphite
U	UHMWPE
V	Viton
B	NBR

Outer Seal (17)	
G	Expanded graphite
A	TFM

End Connection (19-22)	
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF

Special Features (24-30)	
P250	Ball with Upstream Relief Hole
SRS	Self Relief Seat
J2N05	Jacketed valve- number of ports (2), type (NPT) and size (½")
Valve Special Stem Seals	
LAX	FDA Compliant, Stem seal, Virgin Peek thrust and TFM, X shape, gasket
HC	High Cycle service
Face To Face sizes	
F4 *	F4 - DIN 3202-1 RF (½" - 4")
F1 **	F1 - DIN 3202-1 RF (½" - 2")
F5 ***	F5 - DIN 3202-1 RF (6")

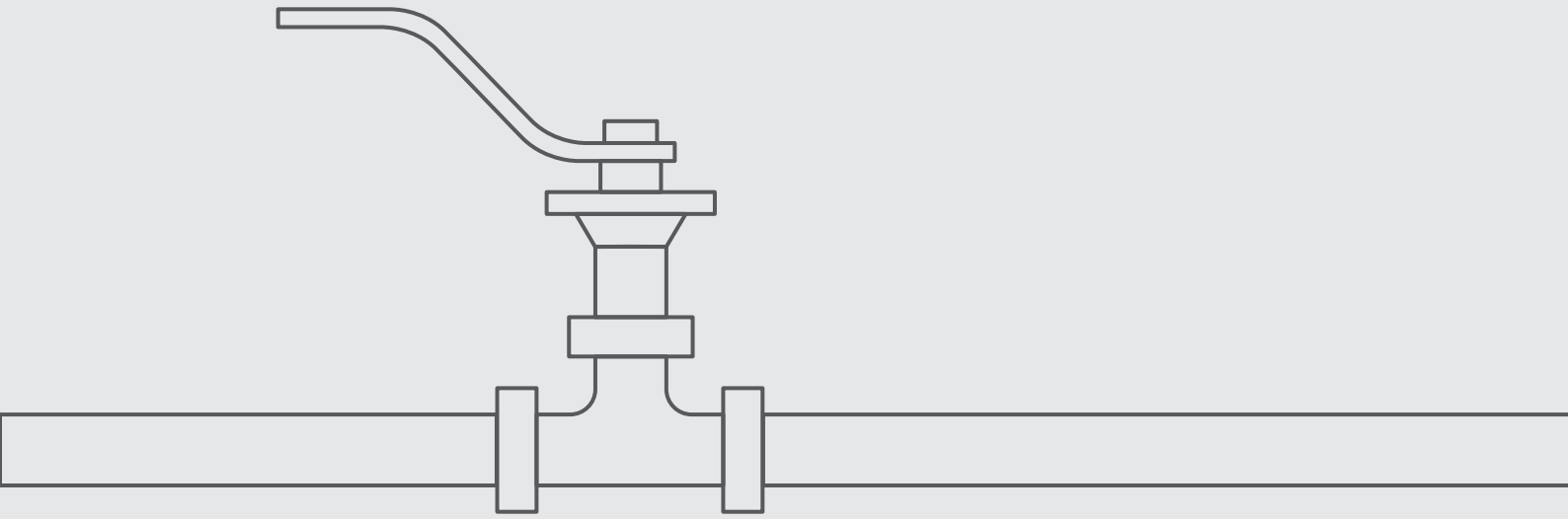
* Standard offer: ½" to 1¼" & 2½" to 4"
** Standard offer: 1½" & 2"
*** Standard offer: 6"

47DS

Industrial Valves

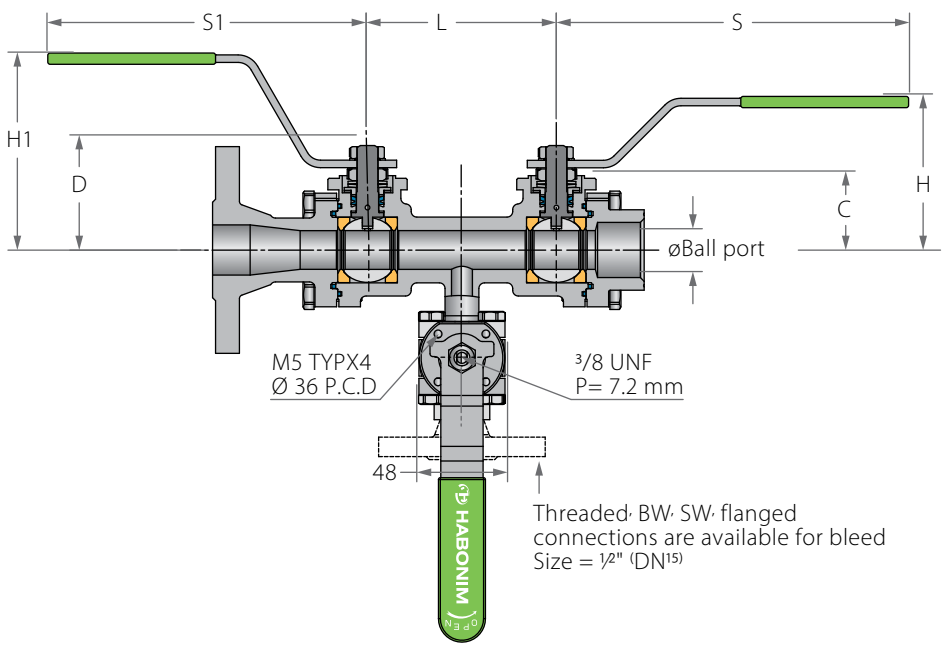
FLOATING BALL

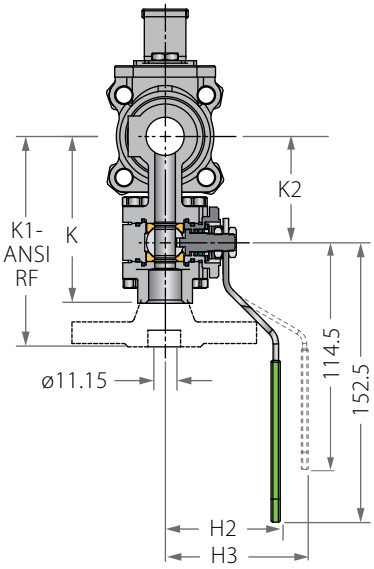
DUAL SAFE / DOUBLE BLOCK & BLEED 3 PIECE

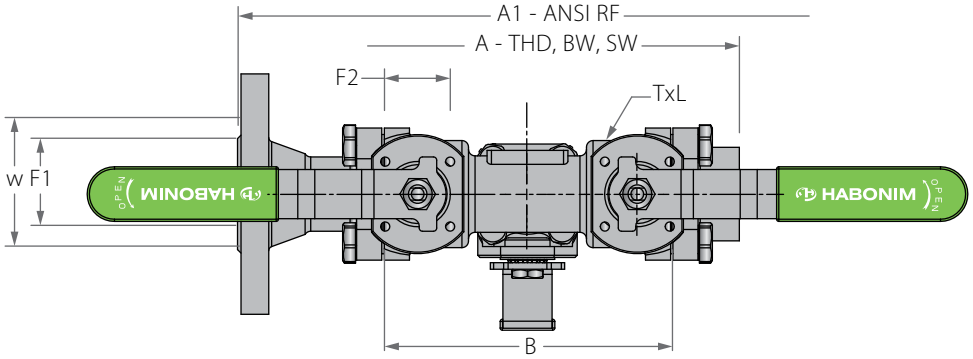


Dual Safe | Double Block & Bleed Floating Ball 3 Piece

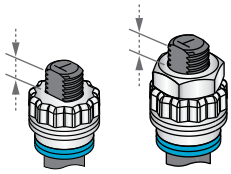
Valve Dimensions





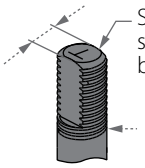


Preparation for actuation



¼"-¾" & 2½" without nut

1" - 2" with nut



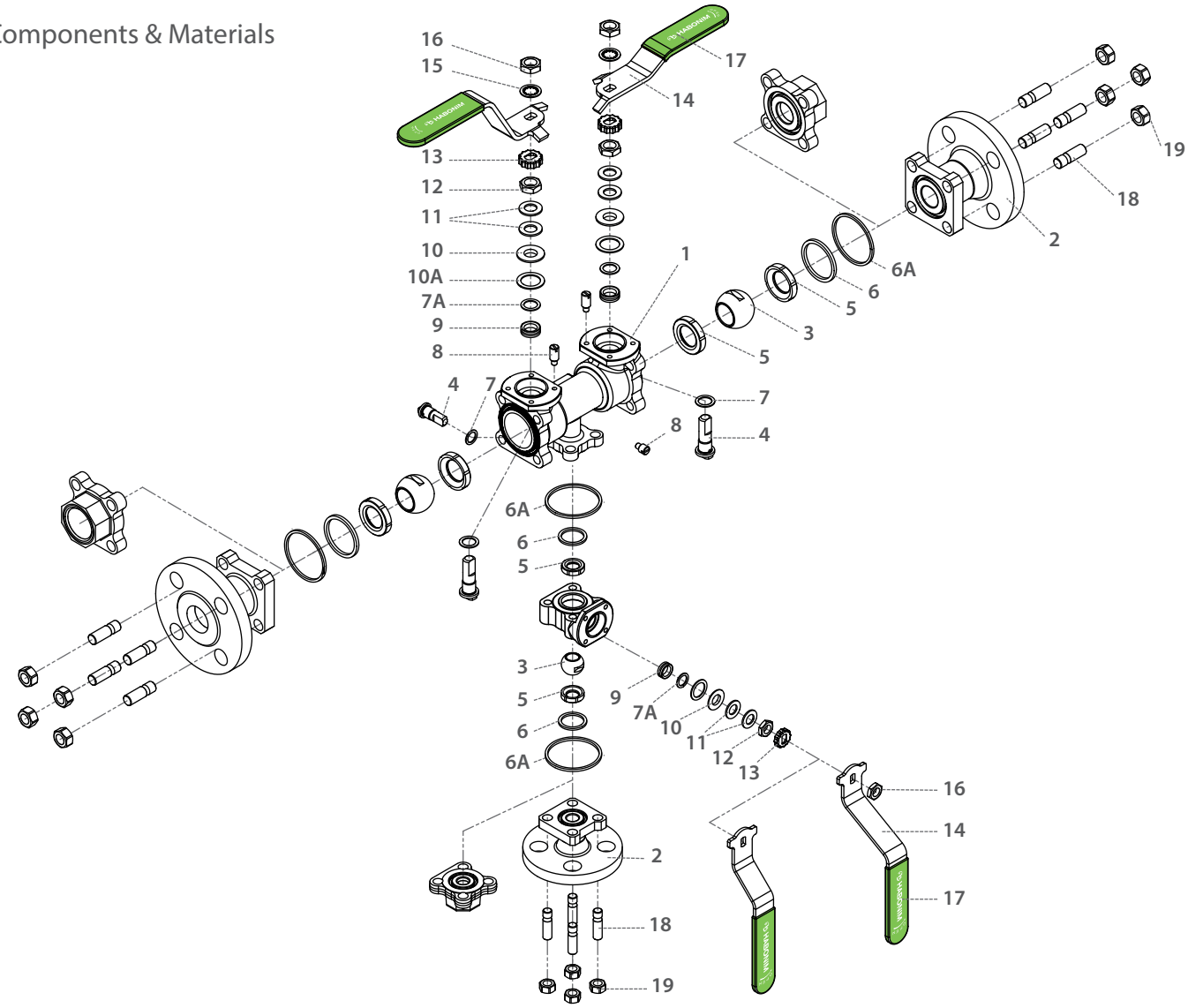
Stem flats show valve ball position

Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball Port	A1- RF	A	B	C	D	H	H1	H2	H3	K	K1	K2	L	S	S1	W	N	P	F		TxL	Kv
																									Cv
DN15	DN8, DN10	mm	11.15	212.6	138.4	93.2	29.0	37.8	91.0	47.0	62.0	92.0	90.3	127.4	57.4	72.6	114.5	152.5	47.0	⅜ UNF	6.65	F03	36.0	M5X10	6.9
½"	¼", ⅜"	inch	0.44	8.4	5.43	3.65	1.14	1.49	3.58	1.85	2.44	3.62	3.54	5.01	2.26	2.85	4.51	6.0	1.84		0.26		1.41		8
DN20	DN15	mm	14.3	234.6	153.2	107.2	31.40	40.3	93.0	49.0	62.0	92.0	86.3	127.0	53.4	82.65	114.5	152.5	53.7	⅜ UNF	6.65	F03	36.0	M5X10	10
¾"	½"	inch	0.56	9.2	6.01	4.2	1.23	1.59	3.66	1.93	2.44	3.62	3.38	5.0	2.1	3.24	4.51	6.0	2.11		0.26		1.41		12
DN25	DN20	mm	20.65	265.5	193.9	131.9	38.15	55.6	106.0	62.0	62.0	92.0	90.3	126	57.4	100.5	146.0	163.0	63.7	7/16 UNF	7.4	F04	42.0	M5X10	28
1"	¾"	inch	0.81	10.4	7.6	5.17	1.50	2.19	4.17	2.44	2.44	3.62	3.54	4.96	2.26	3.94	5.75	6.42	2.50		0.29		1.65		32
DN32	DN25	mm	25.5	278.9	209.3	142.2	42.65	60.2	109.5	90.5	88.0	118.0	92.3	127.2	59.4	100.95	146.0	163.0	71.7	7/16 UNF	7.4	F04	42.0	M5X10	49
1¼"	1"	inch	1.0	11.0	8.21	5.58	1.67	2.37	4.31	3.56	3.46	4.65	3.62	5.0	2.34	3.96	5.75	6.42	2.81		0.29		1.65		57
DN40	DN32	mm	31.8	317.8	241.9	176.2	43.55	73.0	121.5	99.6	88.0	118.0	98.3	135.6	65.4	127.85	180.0	259.0	86.7	9/16 UNF	8.5	F05	50.0	M6X12	69
1½"	1¼"	inch	1.25	12.5	9.49	6.91	1.71	2.87	4.78	3.92	3.46	4.65	3.85	5.34	2.57	5.01	7.09	10.2	3.40		0.33		1.96		80
DN50	DN40	mm	38.15	343.9	254.2	184.2	48.25	77.8	125.0	103.0	88.0	118.0	104.3	149.2	71.4	127.9	180.0	259.0	96.9	9/16 UNF	8.5	F05	50.0	M6X12	102
2"	1½"	inch	1.5	13.6	9.97	7.22	1.89	3.06	4.95	4.06	3.46	4.65	4.09	5.87	2.81	5.02	7.09	10.2	3.80		0.33		1.96		118
DN65	DN50	mm	51.05	397.6	314.6	229.2	70.0	88.1	138.0	116.0	88.0	118.0	111.3	152.8	78.4	156.54	180.0	259.0	108.0	9/16 UNF	13.5	F07	70.0	M8X12	208
2½"	2"	inch	2.01	15.6	12.34	8.99	2.75	3.47	5.43	4.57	3.46	4.65	4.36	6.01	3.08	6.14	7.09	10.2	4.24		0.53		2.75		241

Dual Safe | Double Block & Bleed Floating Ball 3 Piece

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	2
2	Ends	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	3
4	Stem	Acc. Ordering Code	3
5*	Seat	Acc. Ordering Code	6
6*	Body Seal	Acc. Ordering Code	4
6A*	Outer Seal	Acc. Ordering Code	4
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	3
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	3
8	Stop Pin	S. Steel	3
9*	Stem Seal	CF PTFE, TFM, Graphite	3
10	Follower	S. Steel	3
10A*	Slide Bearing	S. Steel	3

Item	Description	Material specifications	Qty.
11	Disc Spring	S. Steel	6
12	Stem Nut	S. Steel	3
13	Locking Clip	S. Steel	3
14	Handle	S. Steel	3
15	Serrated Washer	S. Steel	3
16	Handle Nut	S. Steel	3
17	Sleeve	PVC	3
18	Body Bolt	S. Steel	12
19	Body Nut	S. Steel	12
20	Anti-Static Spring	S. Steel	3
21	Anti-Static Plunger	S. Steel	3
23	Tag (not shown)	S. Steel	1

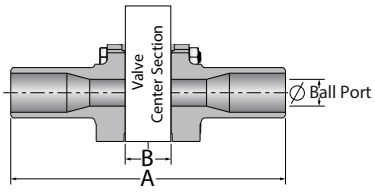
* Maintenance kit components

47DS

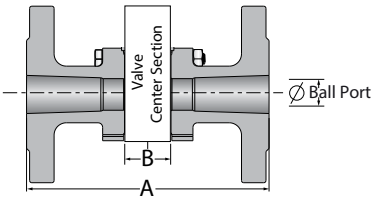
Face To Face Sizes

Valve Size	Unit	B		A-XBW / ETI / ETD / GR	A-ETO		A-Flanged CLASS 150+300		A-Flanged CLASS 600		A-Flanged DIN		A-TC
		Std. port	Full port	Std. port	Full port	Std. port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Full port
DN10	mm	93.2	93.2	213.2	215.6	181.2							
⅜"	inch	3.7	3.7	8.4	8.5	7.1							
DN15	mm	93.2	107.2	213.2	229.6	209.6	212.6	222.6	237.6	222.6	202.6	212.6	161.4
½"	inch	3.7	4.2	8.4	9.0	8.3	8.4	8.7	9.4	8.7	8.0	8.3	6.4
DN20	mm	107.2	132.2	229.6	269.2	229.6	234.6	252.5	234.6	252.5	232.6	250.5	184.2
¾"	inch	4.2	5.2	9.0	10.6	9.0	9.2	9.9	9.2	9.9	9.1	9.9	7.3
DN25	mm	132.2	142.2	269.2	280.2	264.6	265.5	265.9	316.5	265.9	260.5	260.9	214.8
1"	inch	5.2	5.6	10.6	11.0	10.4	10.4	10.5	12.5	10.5	10.3	10.3	8.5
DN32	mm	142.2	176.2	280.2	317.2	280.2	278.9	305.8	278.9	305.8	280.9	307.8	
1¼"	inch	5.6	6.9	11.0	12.5	11.0	11.0	12.0	11.0	12.0	11.1	12.1	
DN40	mm	176.2	184.2	317.2	328.2	311.8	317.8	317.9	368.8	317.9	327.8	327.9	267.6
1½"	inch	6.9	7.3	12.5	12.9	12.3	12.5	12.6	14.5	12.6	12.9	13.0	10.5
DN50	mm	184.2	229.2	328.2	389.2	321.4	343.9	372.6	419.8	372.6	357.9	386.6	286.8
2"	inch	7.3	9.0	12.9	15.3	12.7	13.6	14.6	16.5	14.6	14.1	15.2	11.3
DN65	mm	229.2		389.2		379.2	397.6		397.6		446.6		369.6
2½"	inch	9.0		15.3		14.9	15.6		15.6		17.6		14.6

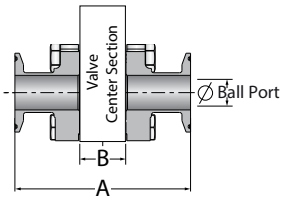
XBW / ETO / ETI / ETD / GR

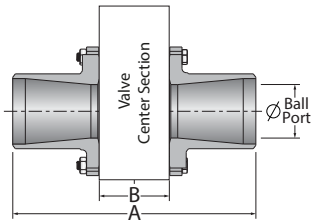


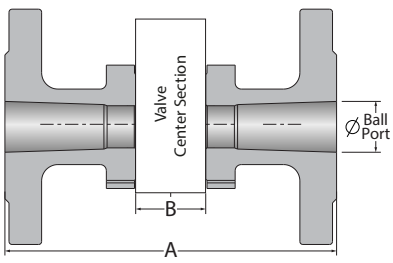
Flanged

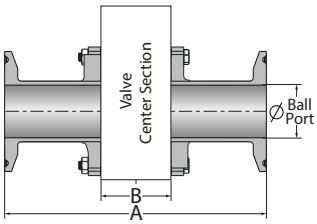


TC









47DS

Dual Safe | Double Block & Bleed - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
2	0				F	**4**	**7**	W	-	6	6	6	M	A	T	G	/	1	5	0		-	**D**	**S**	0	5
Size		Features				Series		Design		Body/end material		Ball/Stem material		Seat material		Inner Seal material		Outer Seal material		End connection			Special features			

Size (1-2)

Code	inch	mm
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25*	2½"	65

* Std. port only

Features (3-6)

F	Fire safe
B	Full port
I	High purity Class 10000
H*	Hydrogen service

* for material selection - see Hydrogen Service chapter

Series (7-8)

47	Floating ball 3 piece

Design (9)

W	Total HermetiX Integrity package
G	Total HermetiX Integrity package - FDA compliant

Body material (11)

6	S. Steel
4	C. steel A216 WCB/ A105

End material(12)

6	S. Steel
4	C. steel A216 WCB/ A105

Ball material (13)

6	S. Steel 316
M	High Strength S. Steel

Stem material (14)

M	High Strength S. Steel
6	S. Steel

Seat material (15)

A	TFM
U	UHMWPE
T	PTFE
P	CF PTFE
C	PCTFE
K	CF PEEK
L	Virgin Peek
Y	Delrin
W	PVDF
R	15% Glass filled PTFE

Inner Seal Material (16)

T	PTFE
A	TFM
U	UHMWPE
V	Viton
B	NBR
G	Expanded graphite

Outer Seal (17)

G	Expanded graphite
A	TFM

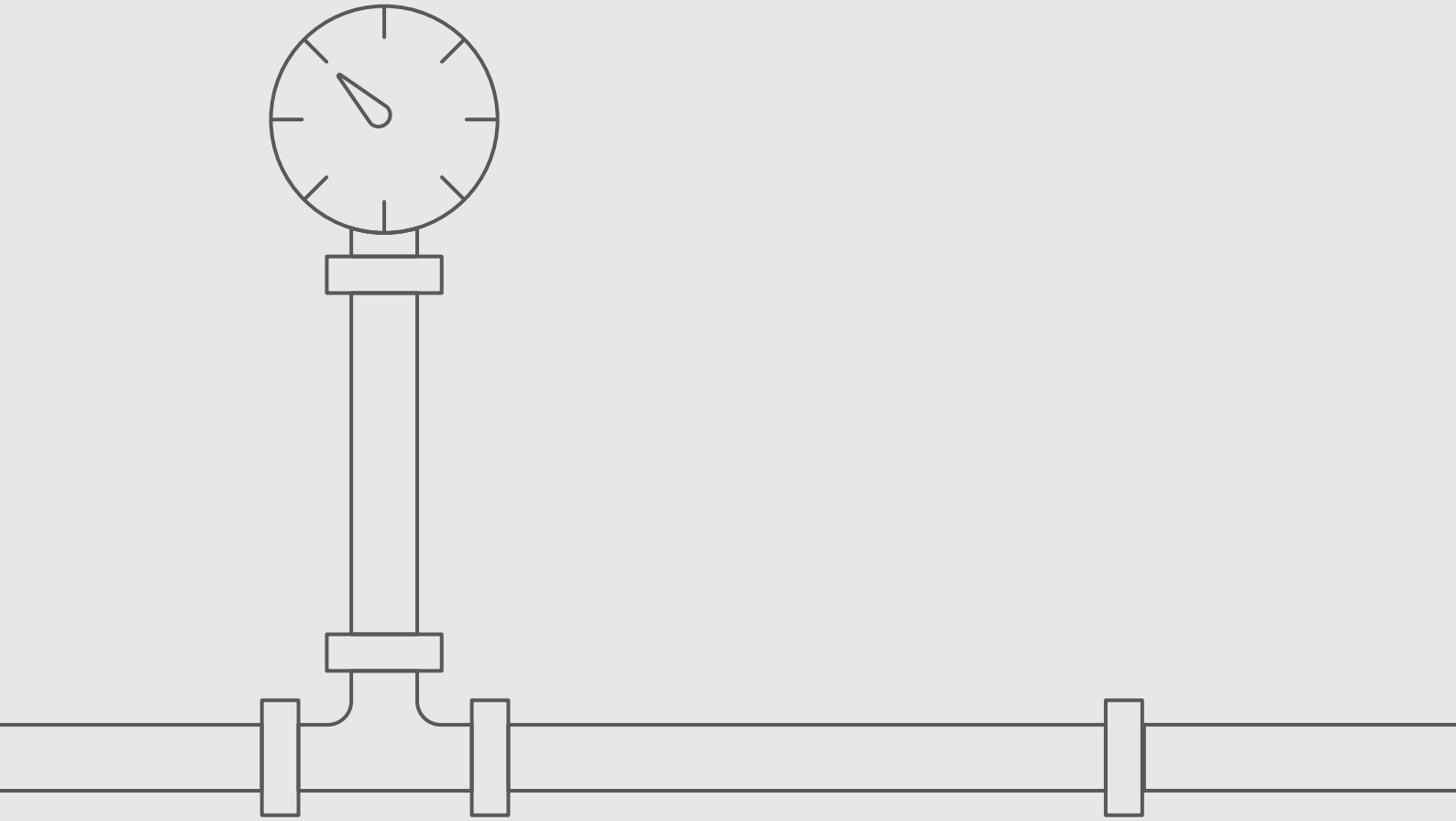
End Connection (19-22)

Welded	
BW10	Buttweld schd. 10
BW	Buttweld schd. 40
SW	Socket weld
XBW10	Extended buttweld schd. 10
XBW	Extended buttweld schd. 40
XSW	Extended socket weld
BW5	Buttweld schd. 5
BW80	Buttweld schd. 80
BWO*	Buttweld tube OD
BWD	Buttweld DIN 11850
BWI1.6	buttweld ISO 1127 1.6mm
BWI2.0	buttweld ISO 1127 2.0mm
BWI2.3	buttweld ISO 1127 2.3mm
SWO*	Socket weld tube OD
ETO*	Extended tube OD
ETI1.6	Extended buttweld ISO 1127 1.6mm
ETI2.0	Extended buttweld ISO 1127 2.0mm
ETI2.3	Extended buttweld ISO 1127 2.3mm
ETD	Extended buttweld DIN 11850
Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	SAE internal straight thread
MNPT	Male NPT
MBSPT	Male BSPT
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF
Clamp	
LL*	Compression fitting (Imperial) - **No** Nuts & Ferrules
LM*	Compression fitting (metric) - **No** Nuts & Ferrules
LL-NF*	Compression fitting (Imperial) - **with** Nuts & Ferrules
LM-NF*	Compression fitting (metric) - **with** Nuts & Ferrules
TC*	Tri-Clamp
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

* Std. port only
** Not available for 1¼" (DN32) Valves

Special Features (24-30)

Dual Safe Features	
DS	Dual Safe with Ball Valve Bleed
DSN	Dual Safe with Needle Valve Bleed
Bleed Connection Size	
05	½" (DN15)
02	¼" (DN8)
03	⅜" (DN10)
Bleed Connection	
Blank	The same as the line connection
N	NPT
D	DIN3852
B	BSPT
BW	BW

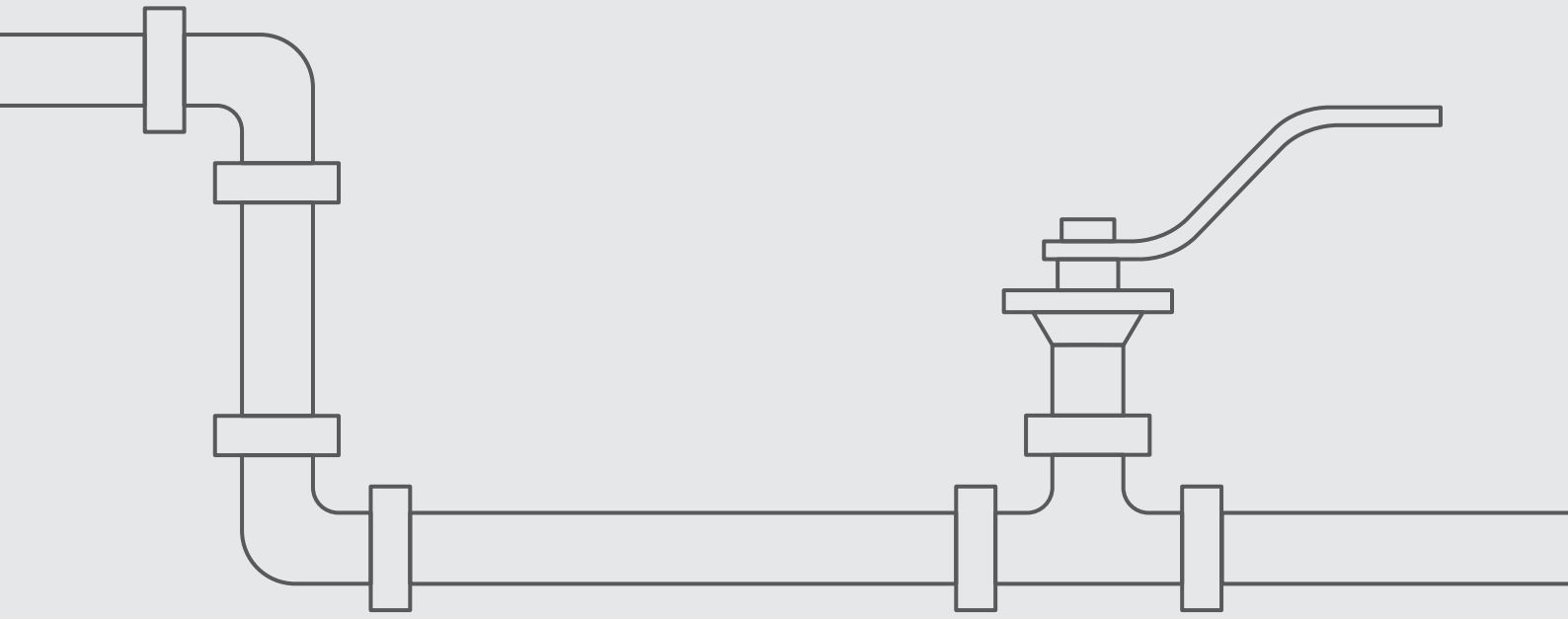


73DS 74DS 77DS 78DS

Industrial Valves

FLOATING BALL

DUAL SAFE / DOUBLE BLOCK & BLEED FLANGED

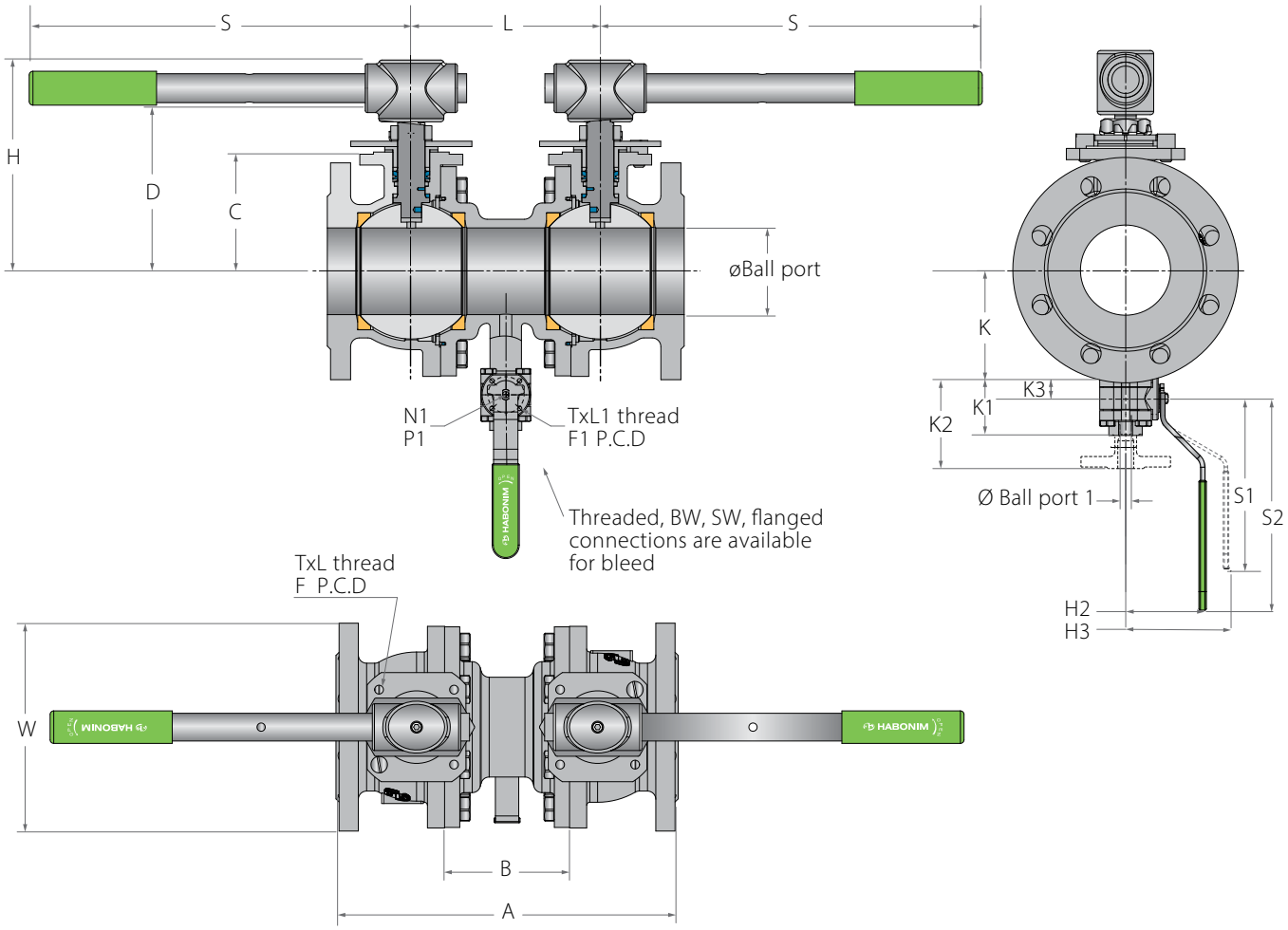


73DS 74DS 77DS 78DS

2½"-6" | DN65-DN150
CLASS 150/300/PN 16

Dual Safe | Double Block & Bleed Floating Ball Flanged

Valve Dimensions



Bore dimensions

Full port	Unit	Ball Port	A			B	C_73/74	D_73/74	H	K	L	S	W		W_16/40	N	P	F		TxL	Kv
			150	300	PN								150	300							Cv
DN65	mm	65.0	375	400.5	349.0	155.0	119.0	165.5	184.5	90.0	209.0	288.1	180.0	190.0	185.0	1"-14 UNF-2A"	16.7	F10	102.0	M10X20	6.9
2 1/2"	inch	2.55	14.71	15.71	13.69	6.08	4.67	6.49	7.24	3.53	8.2	11.30	7.08	7.48	7.28		0.65		4.0		8
DN80	mm	80.0	369	406.8	369.0	160.0	108.0	154.5	194.9	95.0	214.0	350.0	191.0	210.0	200.0	1"-14 UNF-2A"	16.7	F10	102.0	M10X20	10
3"	inch	3.14	14.47	15.95	14.47	6.27	4.24	6.06	7.64	3.73	8.39	13.73	7.52	8.27	7.87		0.65		4.0		12
DN100	mm	100.0	442.0	482.0	442.0	215.0	124.0	170.5	210.9	115.0	273.0	350.0	230.0	2.54	225.0	1"-14 UNF-2A"	16.7	F10	102.0	M10X20	28
4"	inch	3.92	17.33	18.9	17.33	8.43	4.86	6.69	8.27	4.51	10.71	13.73	9.06	10.0	8.86		0.65		4.0		32
DN150	mm	150.0	681.0	703.2	681.0	280.0	179.0	248.4	302.2	165.0	354.0	846.5	279.4	328.0	328.0	1½"-12 UNF-1A"	26.2	F12	125.0	M16X30	49
6"	inch	5.88	26.71	27.58	26.71	10.98	7.02	9.74	11.85	6.47	13.88	33.20	11.0	12.91	12.91		1.03		4.90		57

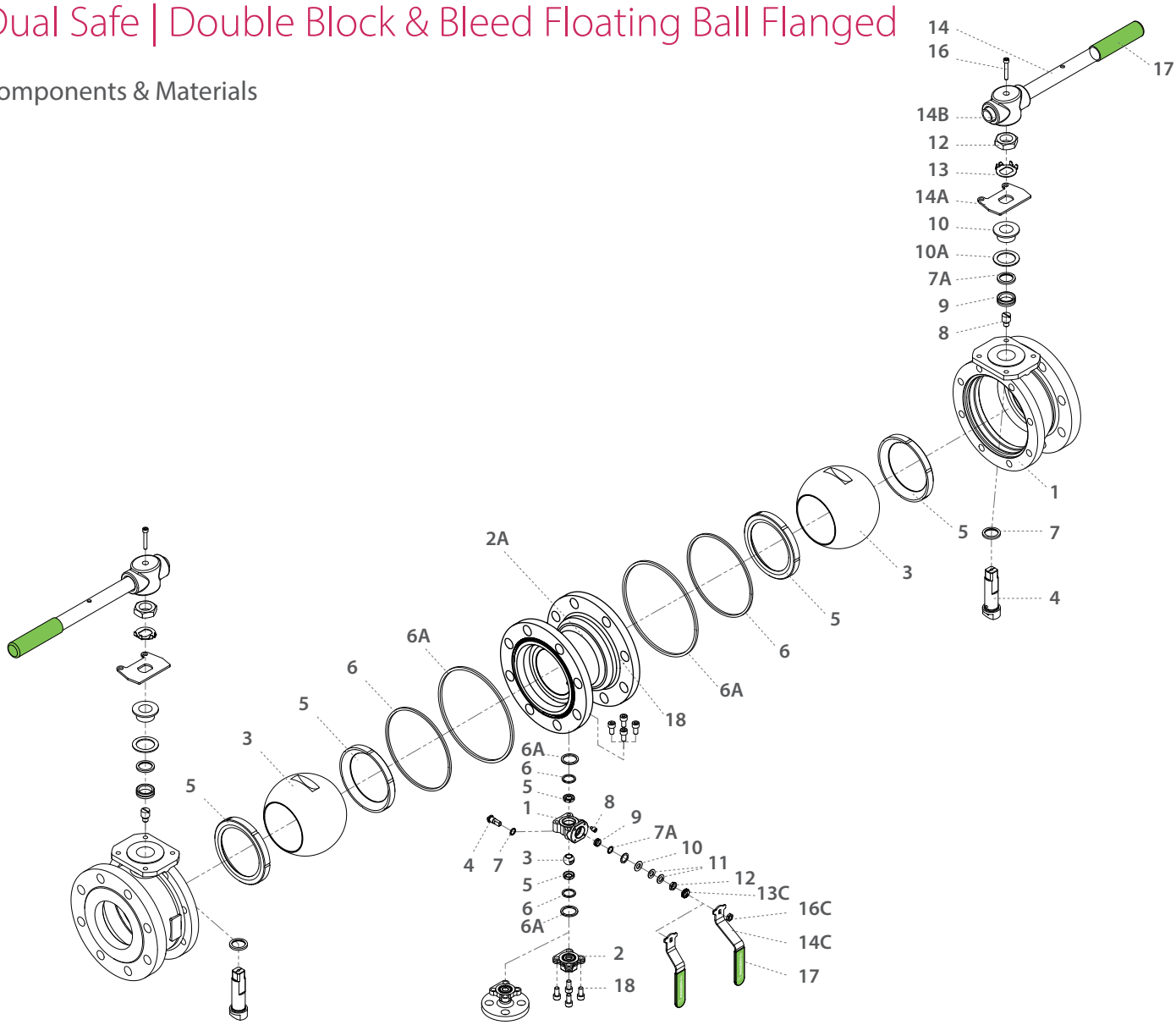
Bleed dimensions

Full port	Unit	Ball Port 1	K1	K2	K3	S1	S2	H2	H3	N1	P1	F1		TxL
DN20	mm	17.5	57.15	98.15	21.9	114.5	152.5	93.0	49.0	⅜ UNF	6.65	F03	36.0	M5X10
3/4"	inch	0.69	2.24	3.85	0.86	4.51	6.0	3.66	1.93		0.26		1.41	
DN25	mm	23.5	74.85	110.75	28.2	146.0	163.0	106.0	62.0	⅞ UNF	7.4	F04	42.0	M5X10
1"	inch	0.92	2.94	4.34	1.11	5.75	6.42	4.17	2.44		0.29		1.65	

73DS 74DS 77DS 78DS 2½"-6" | DN65-DN150 CLASS 150/300/PN 16

Dual Safe | Double Block & Bleed Floating Ball Flanged

Components & Materials



Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	3
2	Ends	Acc. Ordering Code	1
2A	Connection Spool	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	3
4	Stem	Acc. Ordering Code	3
5*	Seat	Acc. Ordering Code	6
6*	Body Seal	Acc. Ordering Code	4
6A*	Outer Seal	Acc. Ordering Code	4
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	3
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	3
8	Stop Pin	S. Steel	3
9*	Stem Seal	CF PTFE, TFM, Graphite	3
10	Follower	S. Steel	3
10A*	Slide Bearing	TF316	3
11	Disc Spring	S. Steel	2

Item	Description	Material specifications	Qty.
12	Stem Nut	S. Steel	3
13	Tab Lock Washer	S. Steel	2
13C	Locking Clip	S. Steel	1
14	Handle	S. Steel	2
14C	Handle	S. Steel	1
14A	Stop Plate	S. Steel	2
14B	Wrench Head	S. Steel	2
16	Wrench Bolt	S. Steel	2
16C	Handle Nut	S. Steel	1
17	Sleeve	PVC	3
18	Body Bolt	S. Steel	24-32
20	Anti-Static Spring	S. Steel	3
21	Anti-Static Plunger	S. Steel	3
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

Dual Safe | Double Block & Bleed - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0			F	**B**	7	3	W	-	6	6	6	M	A	T	G	/	1	5	0		-	**D**	**S**	1	0
Size		Features				Series		Design		Body/end material		Ball/Stem material		Seat material		Inner Seal material		Outer Seal material		End connection			Special features			

Size (1-2)		
Code	**inch**	**mm**
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
B	Full port
F	Fire safe
I	High purity Class 10000
H*	Hydrogen service

* for material selection - see Hydrogen Service chapter

Series (7-8)	
73	ANSI #150 full port
74	ANSI #300 full port
77	DIN PN 16 full port

Design (9)	
W	Total HermetiX Integrity package
G	Total HermetiX Integrity package - FDA compliant

Body material (11)	
6	S. Steel
4	C. steel A216 WCB/A105

End material (12)	
6	S. Steel
4	C. steel A216 WCB/A105

Ball material (13)	
6	S. Steel 316
M	High Strength S. Steel

Stem material (14)	
M	High Strength S. Steel
6	S. Steel

Seat material (15)	
A	TFM
U	UHMWPE
T	PTFE
P	CF PTFE
C	PCTFE
K	CF PEEK
L	Virgin Peek
Y	Delrin
W	PVDF
R	15% Glass filled PTFE

Inner Seal Material (16)	
T	PTFE
A	TFM
U	UHMWPE
V	Viton
B	NBR
G	Expanded graphite

Outer Seal (17)	
G	Expanded graphite
A	TFM

End Connection (19-22)	
Welded ends	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
PN16	EN1092 PN16 RF

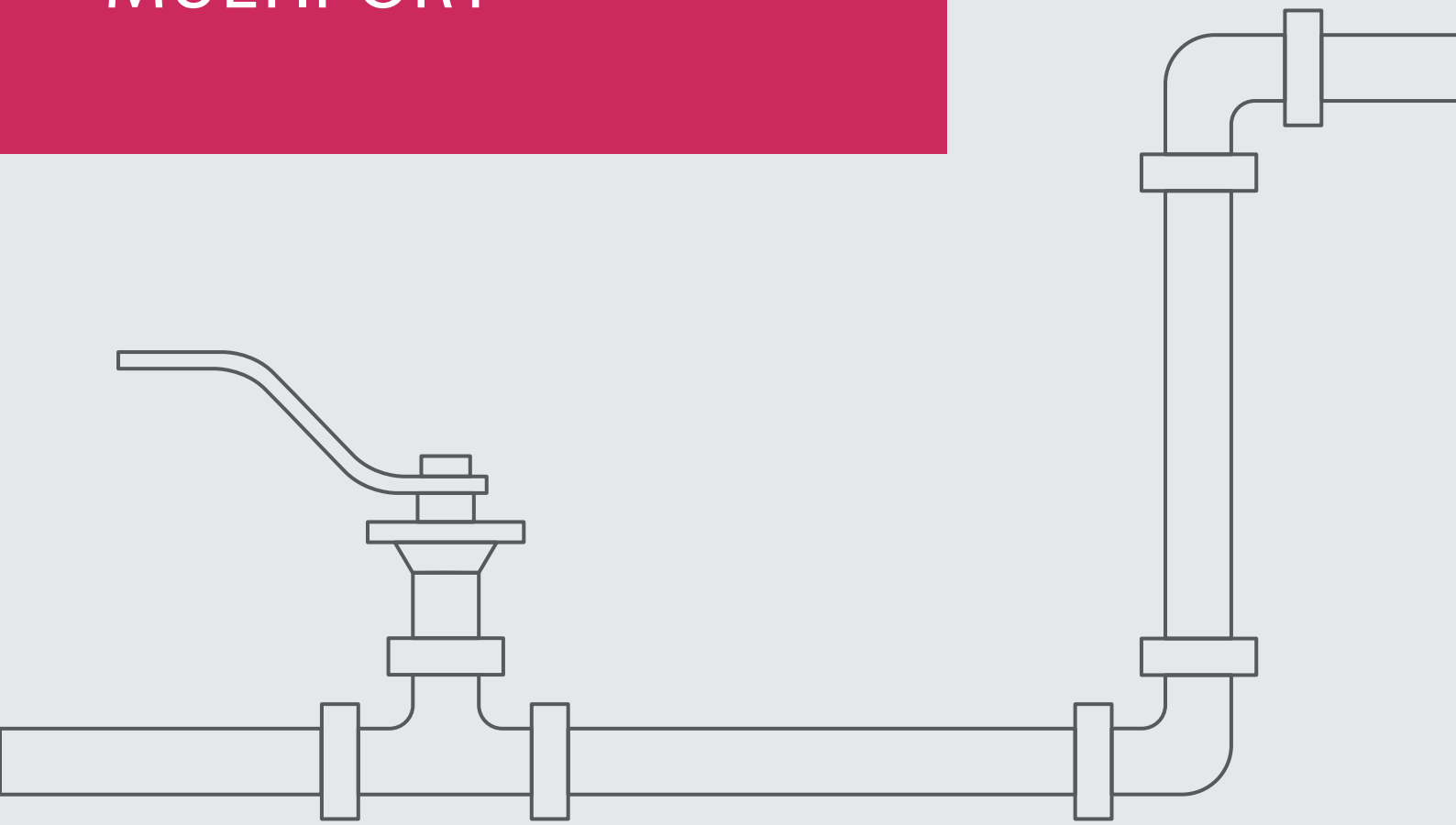
Special Features (24-30)	
Dual Safe Features	
DS	Dual Safe with Ball Valve Bleed
DSN	Dual Safe with Needle Valve Bleed
Bleed Connection Size	
10	1" (DN25)
07	¾" (DN20)
Bleed Connection	
Blank	The same as the line connection
N	NPT
D	DIN3852
B	BSPT
BW	BW

61 62 D61 D62

Industrial Valves

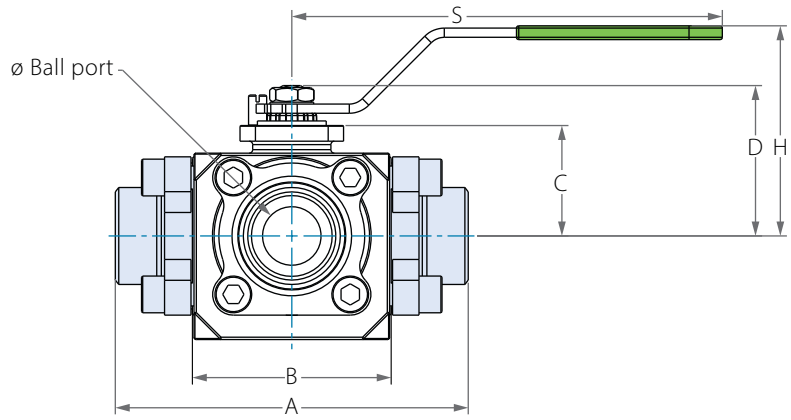
FLOATING BALL

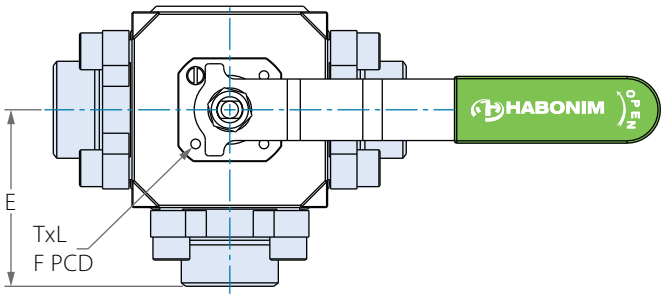
MULTIPORT



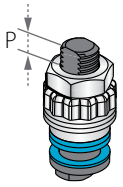
Multiport Floating Ball

Valve Dimensions

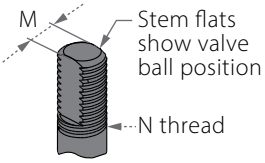




Preparation for actuation



½" - 1½"
with nut



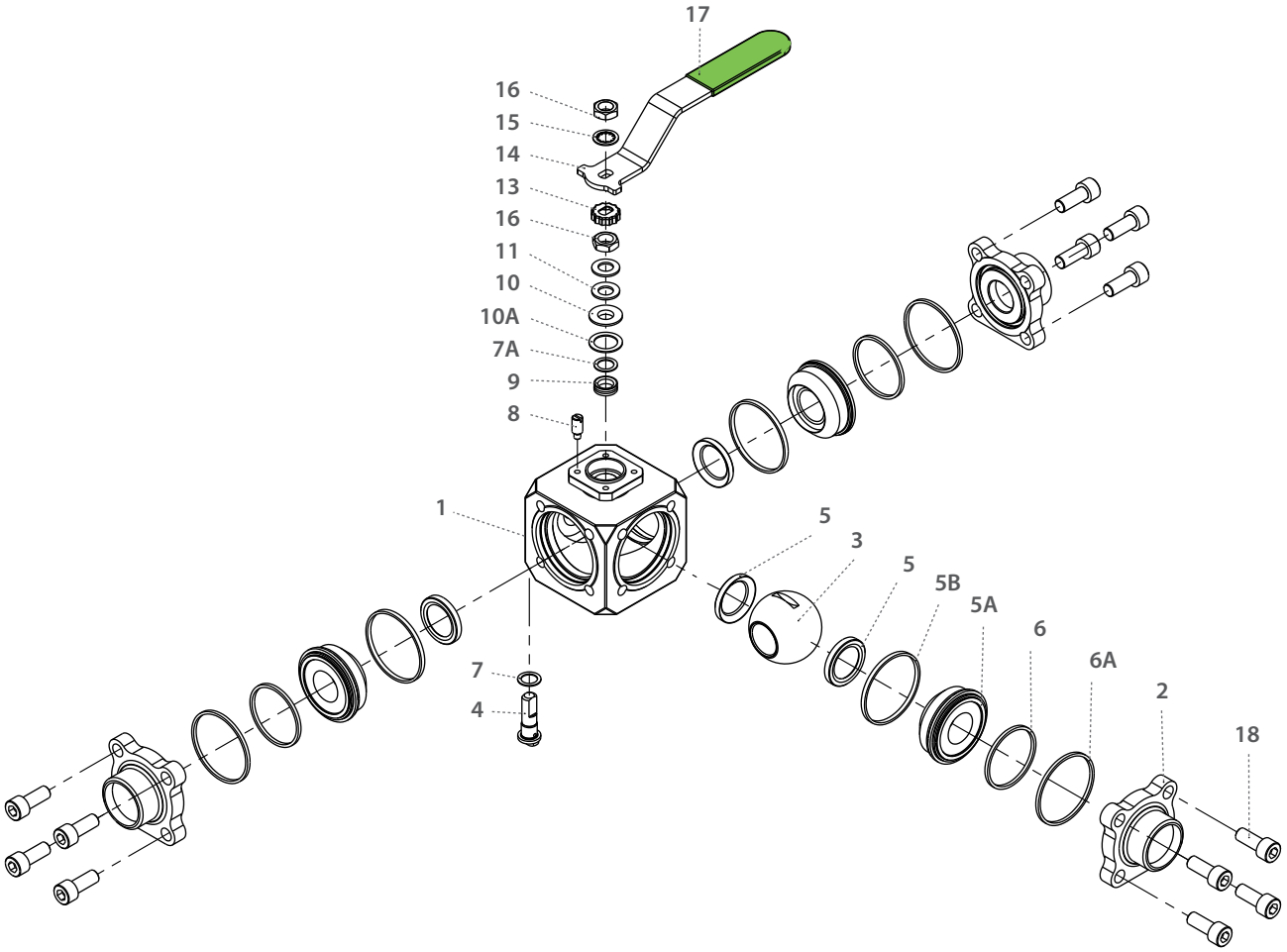
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	E	H	S	M	N	P	TxL	F	PCD	Weight kg/lb
DN20	DN15	mm	14.3	113.0	67.0	38.1	55.6	A/2	80.0	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	2.8
¾"	½"	inch	0.56	4.45	2.64	1.50	2.19		3.15	7.36	0.30		0.23			1.65	6.16
DN25	DN20	mm	20.6	143.6	81.6	43.0	60.5		85.5	187	7.54	7/16" UNF	5.8	M5X8	F04	42.0	4.3
1"	¾"	inch	0.81	5.65	3.21	1.69	2.38		3.37	7.36	0.30		0.23			1.65	9.46
DN32	DN25	mm	25.4	153.4	86.4	48.0	65.5		90.0	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	6.0
1¼"	1"	inch	1.0	6.04	3.40	1.89	2.58		3.54	7.36	0.30		0.23			1.65	13.2
DN40	DN32	mm	31.8	164.0	97.0	49.4	78.9		103.0	237.0	8.71	9/16" UNF	7.8	M6X9	F05	50.0	7.5
1½"	1¼"	inch	1.25	6.46	3.82	1.94	3.11		4.06	9.33	0.34		0.31			1.97	16.5

Valve Size		Flow Coefficients	
mm	inch	KV	CV
DN20	¾"	9	11
DN25	1"	27	31
DN32	1¼"	47	55
DN40	1½"	67	78

Multiport Floating Ball

Components & Materials



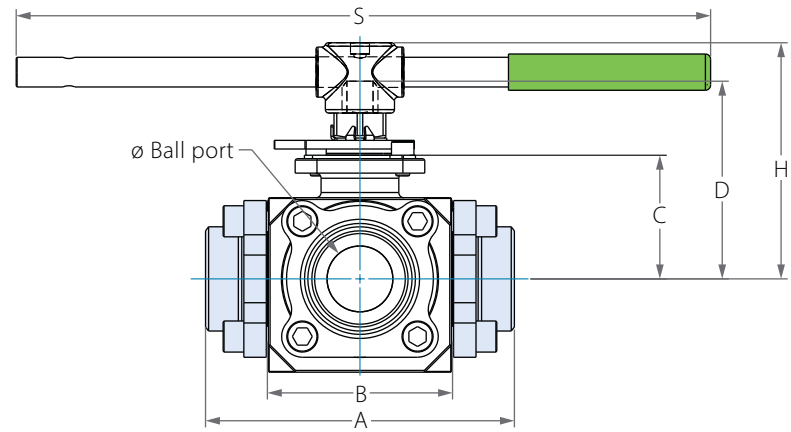
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	See body material	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner Seal	Acc. Ordering Code	5
6A*	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1

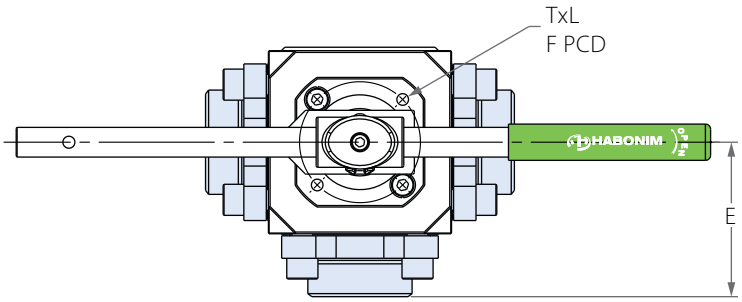
Item	Description	Material specification	Qty.
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
10A*	Slide Braring	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	12

* Maintenance kit components

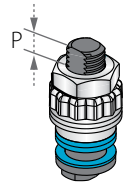
Multiport Floating Ball

Valve Dimensions

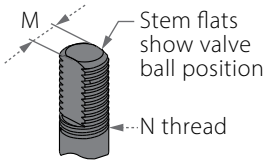




Preparation for actuation



½" - 1½"
with nut

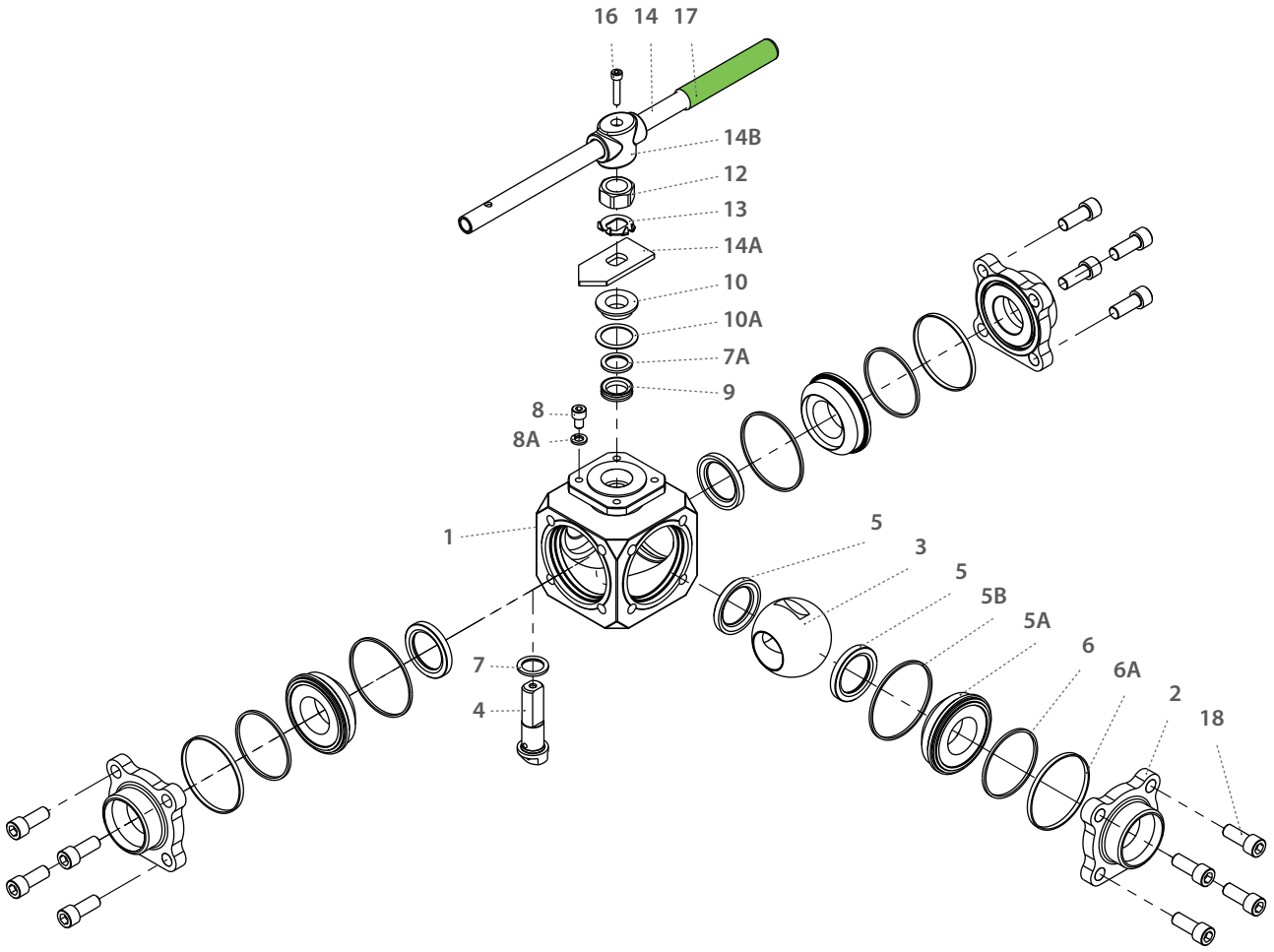


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Ball port	A	B	C	D	E	H	S	M	N	P	TxL	PCD	Weight kg/lb	Kv / Cv
DN50	DN40	38.1	177.2	107.2	69.7	111.3	A/2	140.0	400.0	13.9	M20x2.5	13.5	F07	70.0	11	102
2"	1½"	1.50	6.98	4.22	2.74	4.38		5.51	15.75	0.55		0.53		2.76	24.2	118
DN65	DN50	48.0	210.4	125.0	79.1	120.7		150.0	400.0	13.9	M20x2.5	13.5	F07	70.0	16.5	208
2½"	2"	1.89	8.28	4.92	3.11	4.75		5.91	15.75	0.55		0.53		2.76	36.3	241

Multiport Floating Ball

Components & Materials



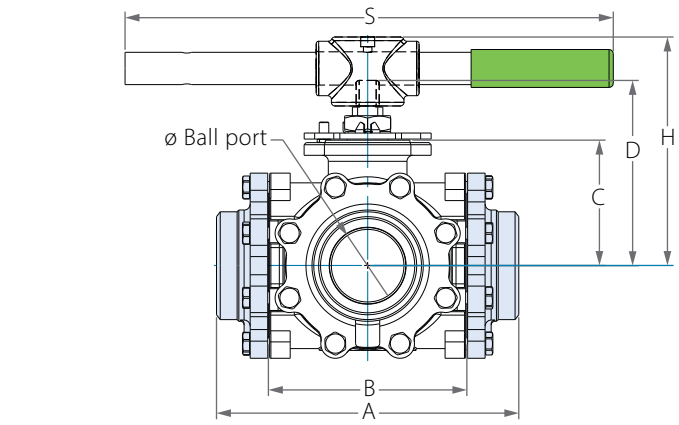
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner Seal	Acc. Ordering Code	5
6A*	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	V. PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	V. PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1

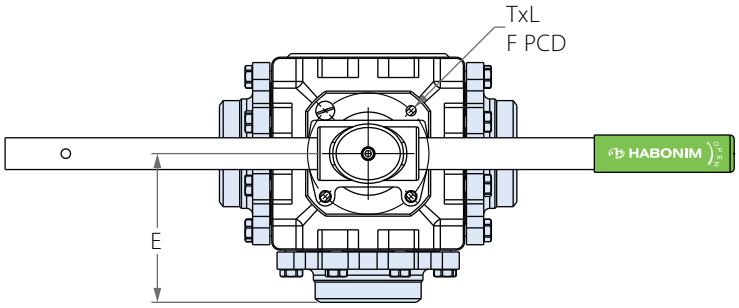
Item	Description	Material specification	Qty.
8A	Spring Washer	S. Steel	1
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
10A*	Slide Braring	S. Steel	1
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Bolt	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	12

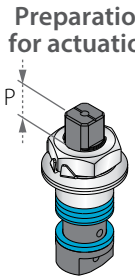
* Maintenance kit components

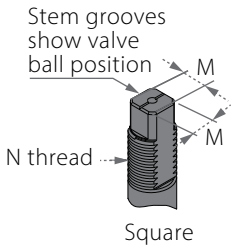
Multiport Floating Ball

Valve Dimensions









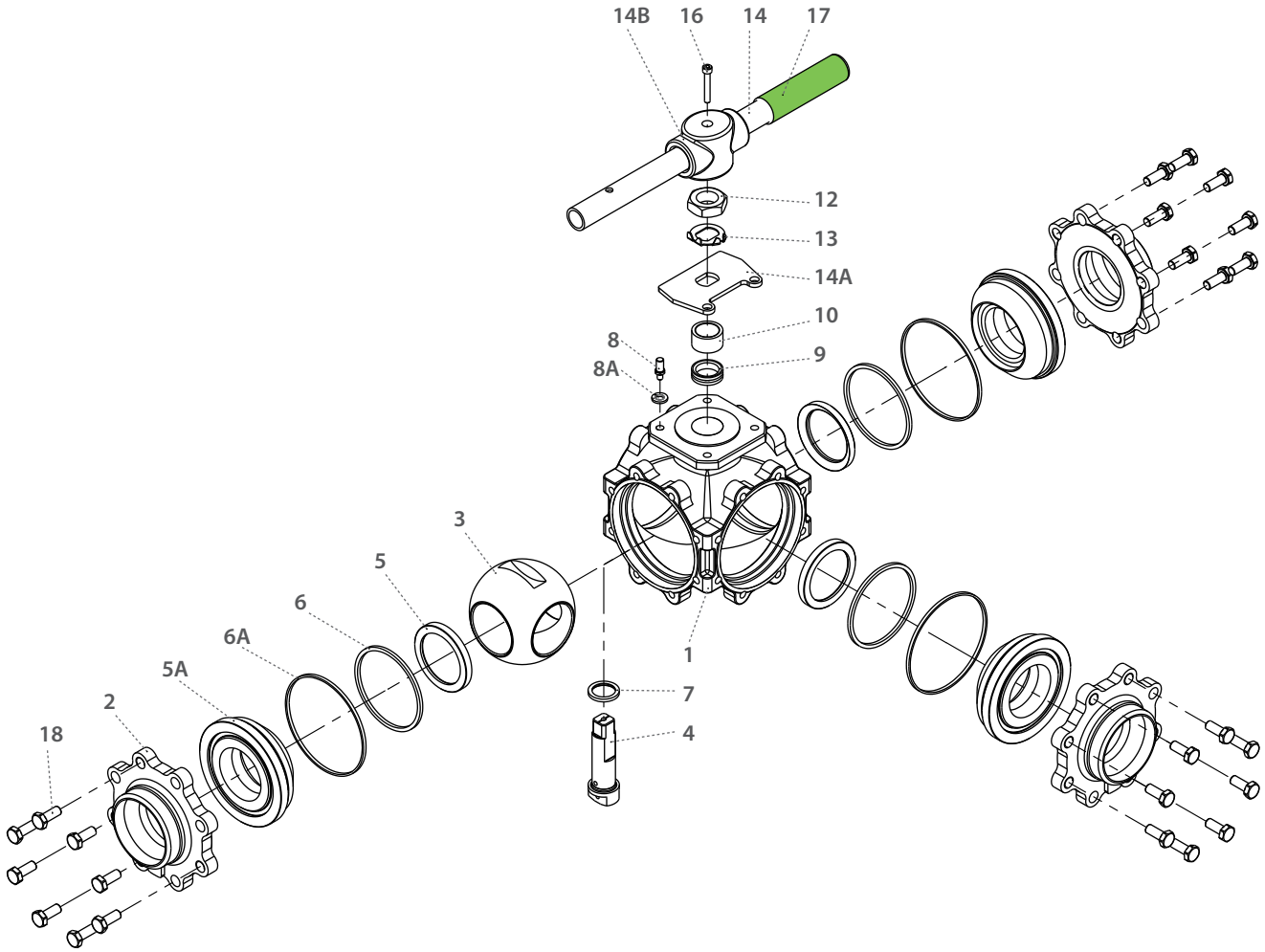
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Unit	Ball port	A	B	C	D	E	H	M	M-DD	N	P	TxL	F	S	Weight kg/lb
DN80	mm	60.0	249.80	164.0	101.75	143.35	A/2	189.0	18.90	15.90	1"-14 UNS-2A	16.70	M10x11	F10	610.0	40
3"	inch	2.36	9.83	6.45	4.01	5.64		7.44	0.74	0.63		0.66			24.02	88.00
DN100	mm	76.0	309.80	205.0	134.50	203.60		264.0	28.45	23.75	1"-14 UNS-2A	26.20	M12x14	F12	920.0	55
4"	inch	2.99	12.19	8.07	5.30	8.02		10.39	1.12	0.93		1.03			36.22	121

Valve Size		Flow Coefficients	
mm	inch	KV	CV
DN80	3"	267	310
DN100	4"	484	562

Multiport Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	4
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
6*	Seat Seal	Acc. Ordering Code	4
6A*	Body Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
8	Stop Bolts	S. Steel	1
8A	Spring Washer	S. Steel	1

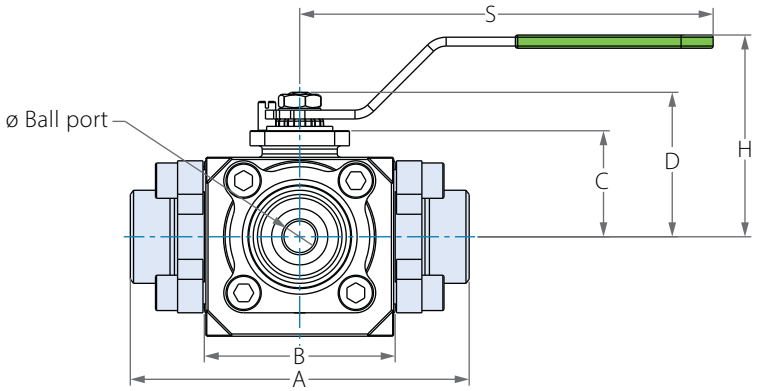
Item	Description	Material specification	Qty.
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Wrench Handle	C.St. Zinc Plate	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	24
23	Tag (not shown)	S. Steel	1

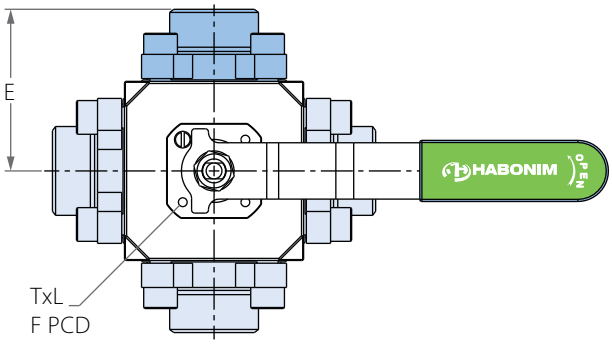
* Maintenance kit components

62W ¾"-1½" | DN20-DN40 | CLASS 600

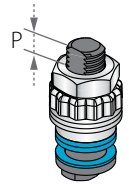
Multiport Floating Ball

Valve Dimensions

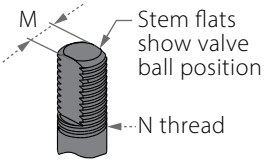




Preparation for actuation



½" - 1½"
with nut



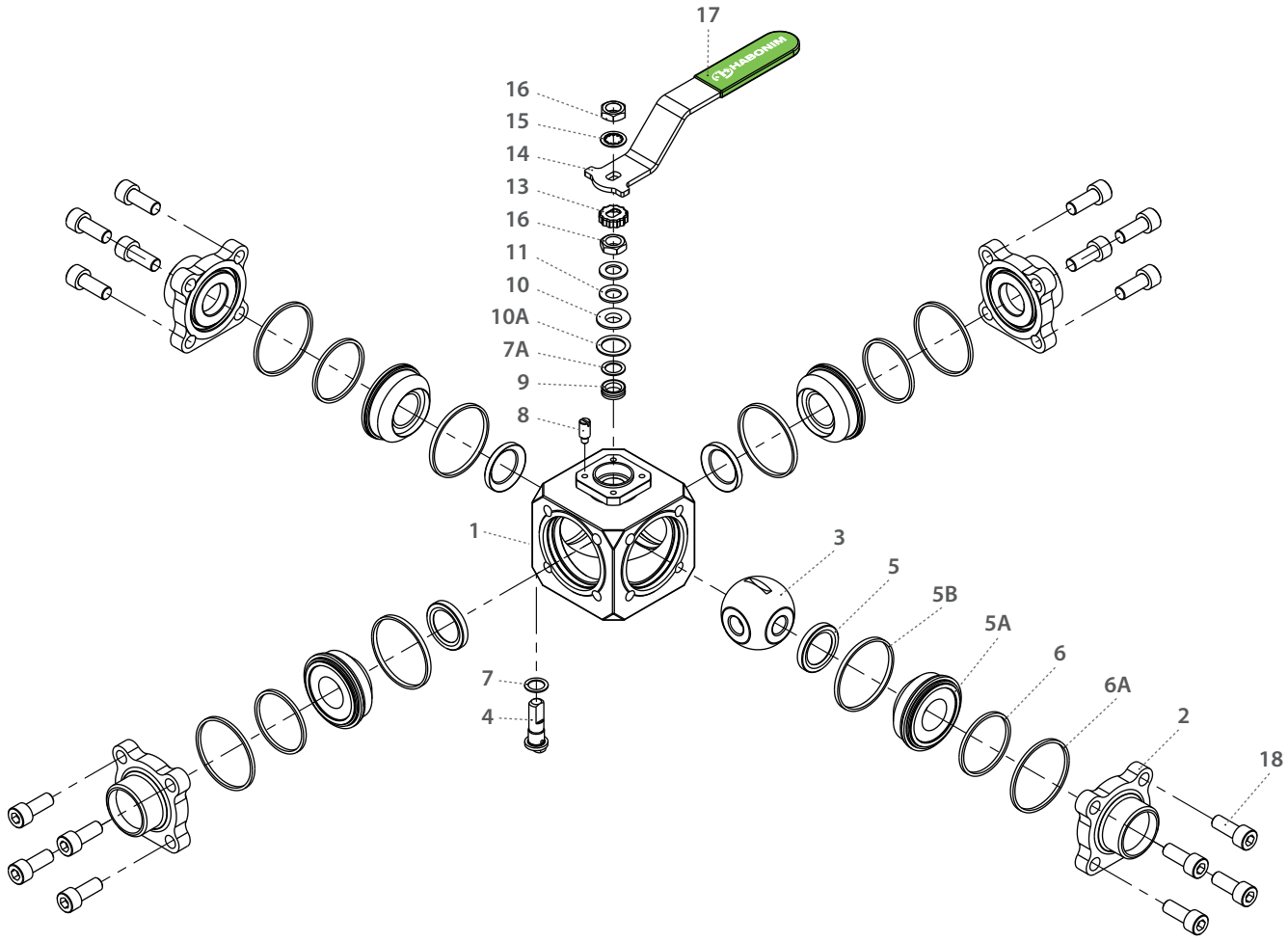
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	E	H	S	M	N	P	TxL	F	PCD	Weight kg/lb
DN20	DN15	mm	14.3	113.0	67.0	38.1	55.6	A/2	80.0	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	2.8
¾"	½"	inch	0.56	4.45	2.64	1.50	2.19		3.15	7.36	0.30		0.23			1.65	6.16
DN25	DN20	mm	20.6	143.6	81.6	43.0	60.5		85.5	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	4.3
1"	¾"	inch	0.81	5.65	3.21	1.69	2.38		3.37	7.36	0.30		0.23			1.65	9.46
DN32	DN25	mm	25.4	153.4	86.4	48.0	65.5		90.0	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	6
1¼"	1"	inch	1.0	6.04	3.40	1.89	2.58		3.54	7.36	0.30		0.23			1.65	13.2
DN40	DN32	mm	31.8	164.0	97.0	49.4	78.9		103.0	237.0	8.71	9/16" UNF	7.8	M6X9	F05	50.0	7.5
1½"	1¼"	inch	1.25	6.46	3.82	1.94	3.11		4.06	9.33	0.34		0.31			1.97	16.5

Valve Size		Flow Coefficients	
mm	inch	KV	CV
DN20	¾"	9	11
DN25	1"	27	31
DN32	1¼"	47	55
DN40	1½"	67	78

Multiport Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	See body material	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner Seal	Acc. Ordering Code	5
6A	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1

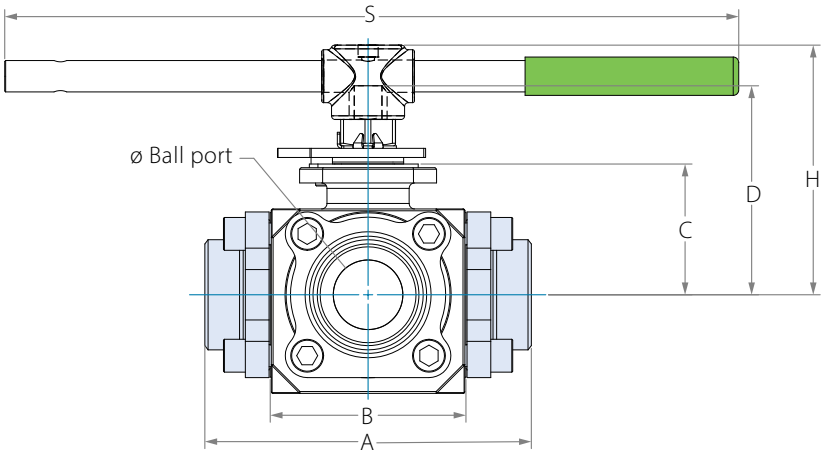
Item	Description	Material specification	Qty.
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
10A	Slide Braring	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16

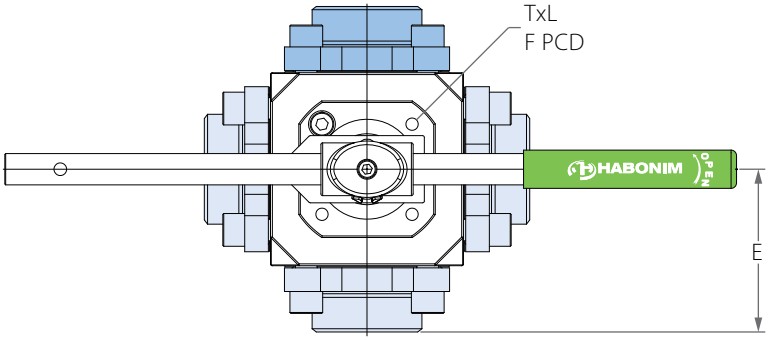
* Maintenance kit components

62W 2"-2½" | DN50-DN65 | CLASS 300

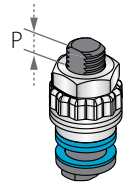
Multiport Floating Ball

Valve Dimensions

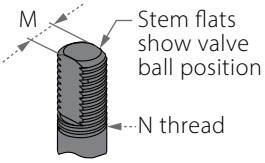




Preparation for actuation



½" - 1½"
with nut

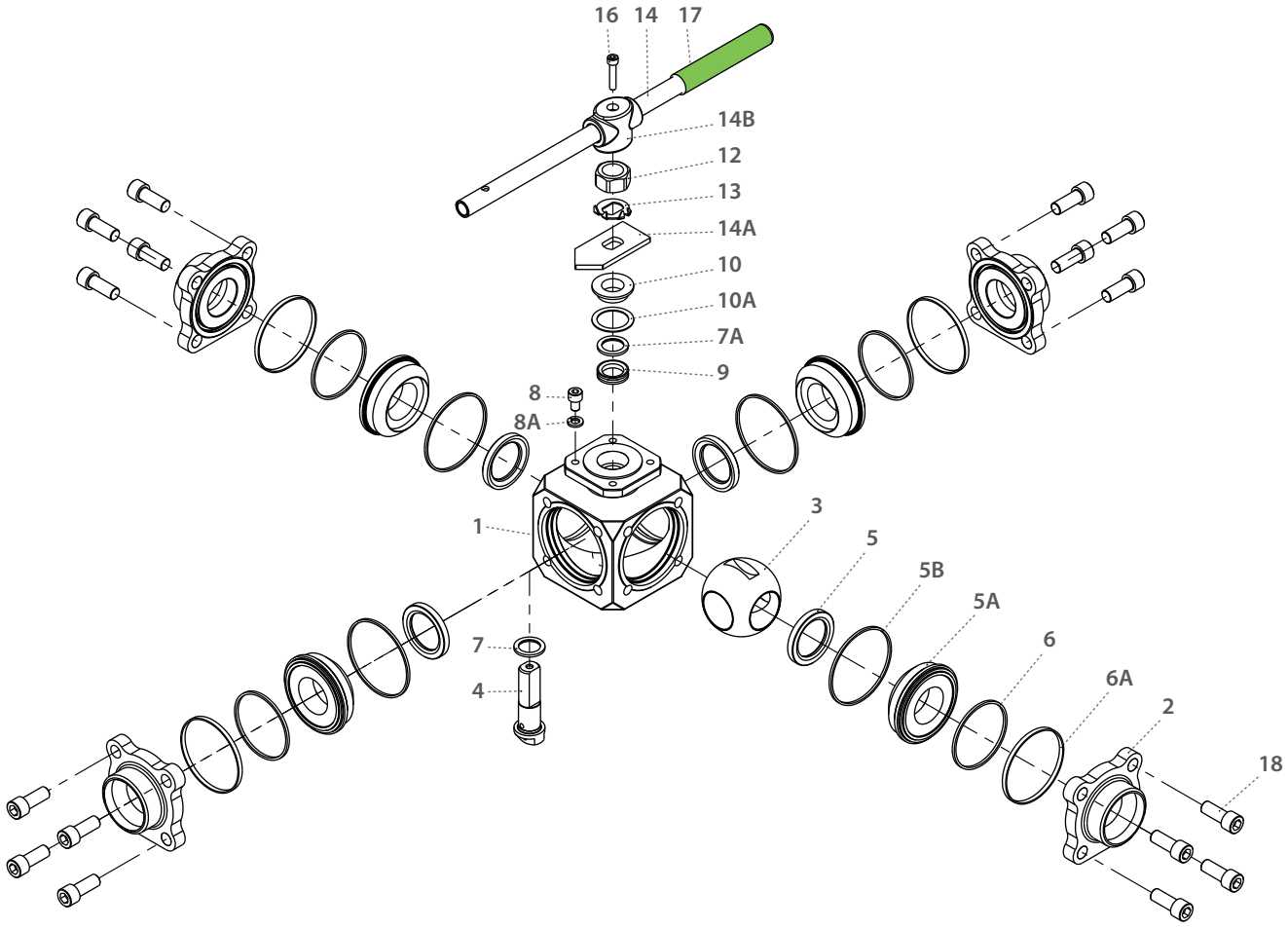


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Ball port	A	B	C	D	E	H	S	M	N	P	TxL	PCD	Weight kg/lb	Kv / Cv
DN50	DN40	38.1	177.2	107.2	69.7	111.3	A/2	140.0	400.0	13.9	M20x2.5	13.5	F07	70.0	11	102
2"	1½"	1.50	6.98	4.22	2.74	4.38		5.51	15.75	0.55		0.53		2.76	24.2	118
DN65	DN50	48.0	210.4	125.0	79.1	120.7		150.0	400.0	13.9	M20x2.5	13.5	F07	70.0	16.5	208
2½"	2"	1.89	8.28	4.92	3.11	4.75		5.91	15.75	0.55		0.53		2.76	36.3	241

Multiport Floating Ball

Components & Materials



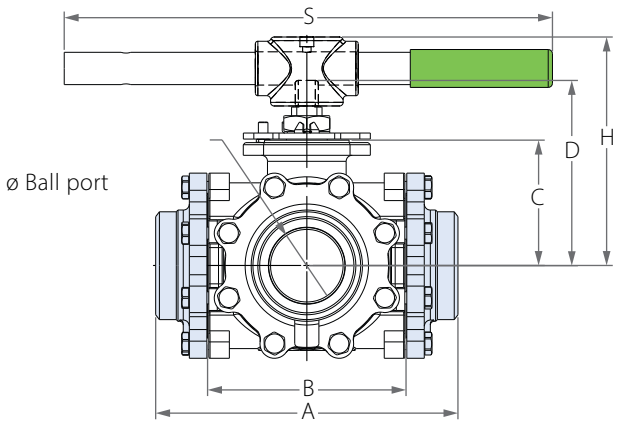
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner Seal	Acc. Ordering Code	5
6A*	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	V. PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	V. PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1

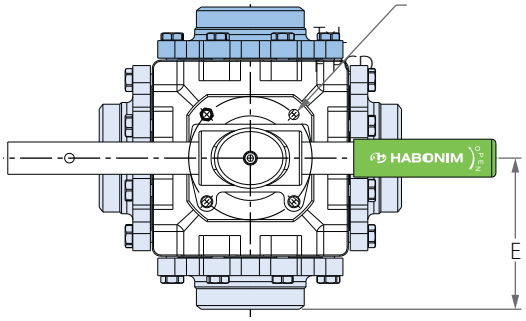
Item	Description	Material specification	Qty.
8A	Spring Washer	S. Steel	1
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
10A*	Slide Braring	S. Steel	1
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Bolt	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16

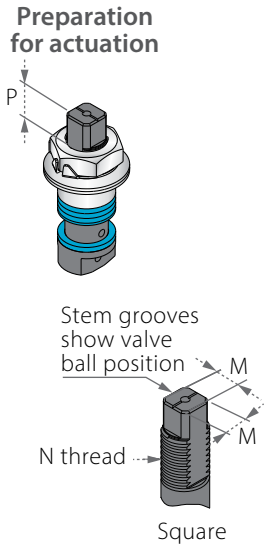
* Maintenance kit components

Multiport Floating Ball

Valve Dimensions







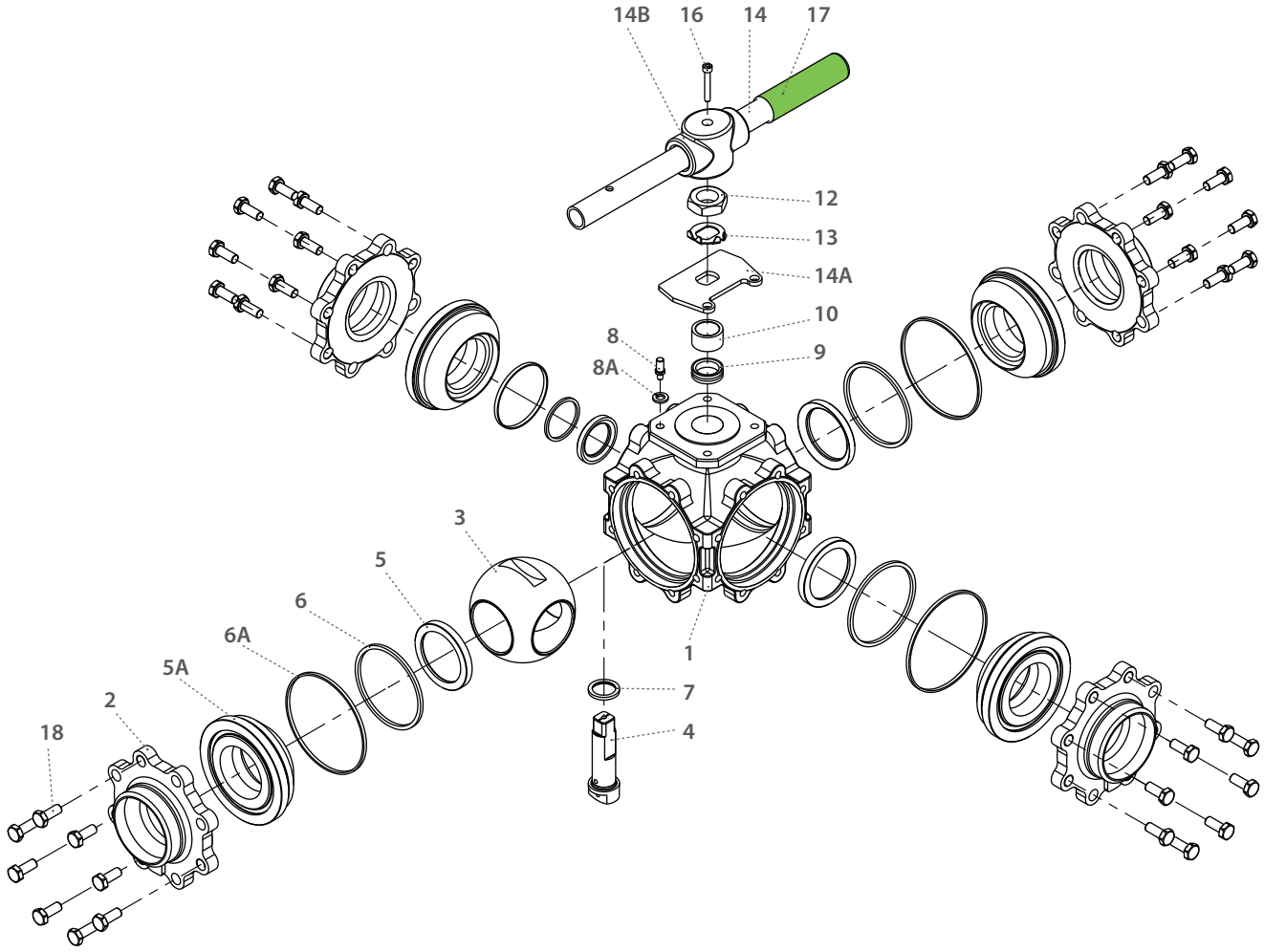
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Unit	Ball port	A	B	C	D	E	H	M	M-DD	N	P	TxL	F	S	Weight kg/lb
DN80	mm	60.0	249.80	164.0	101.75	149.0	A/2	189.0	18.90	15.90	1"-14 UNS-2A	16.70	M10x11	F10	610.0	40
3"	inch	2.36	9.83	6.46	4.01	5.86		7.44	0.74	0.63		0.66			24.02	46
DN100	mm	76.0	309.80	205.0	134.50	168.0		264.0	28.45	23.75	1"-14 UNS-2A	26.20	M12x14	F12	920.0	55
4"	inch	2.99	12.20	8.07	5.30	6.61		10.39	1.12	0.93		1.03			36.22	64

Valve Size		Flow Coefficients	
mm	inch	KV	CV
DN80	3"	267	310
DN100	4"	484	562

Multiport Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	4
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
6*	Seat Seal	Acc. Ordering Code	4
6A*	Body Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
8	Stop Bolt	S. Steel	1
8A	Spring Washer	S. Steel	1

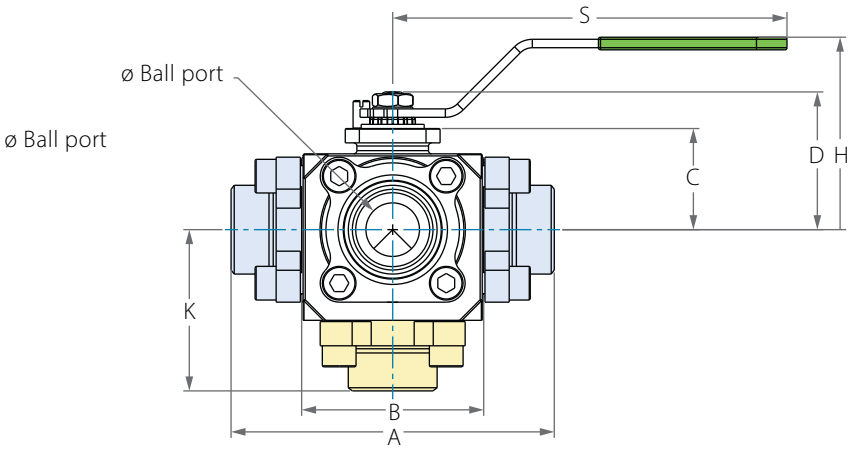
Item	Description	Material specification	Qty.
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Wrench Handle	C.St. Zinc Plate	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	32
23	Tag (not shown)	S. Steel	1

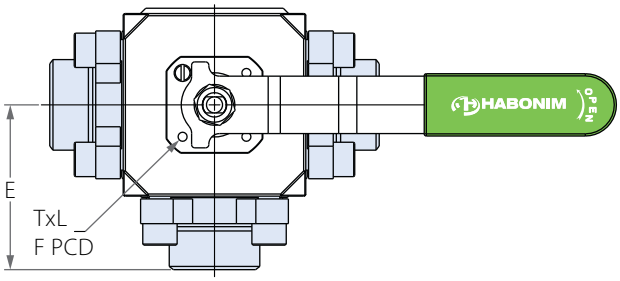
* Maintenance kit components

D61W ¾"-1½" | DN20-DN40 | CLASS 600

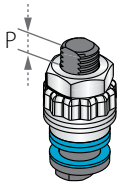
Multiport Floating Ball

Valve Dimensions

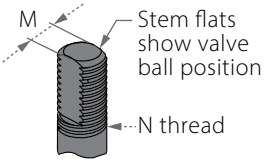




Preparation for actuation



½" - 1½"
with nut



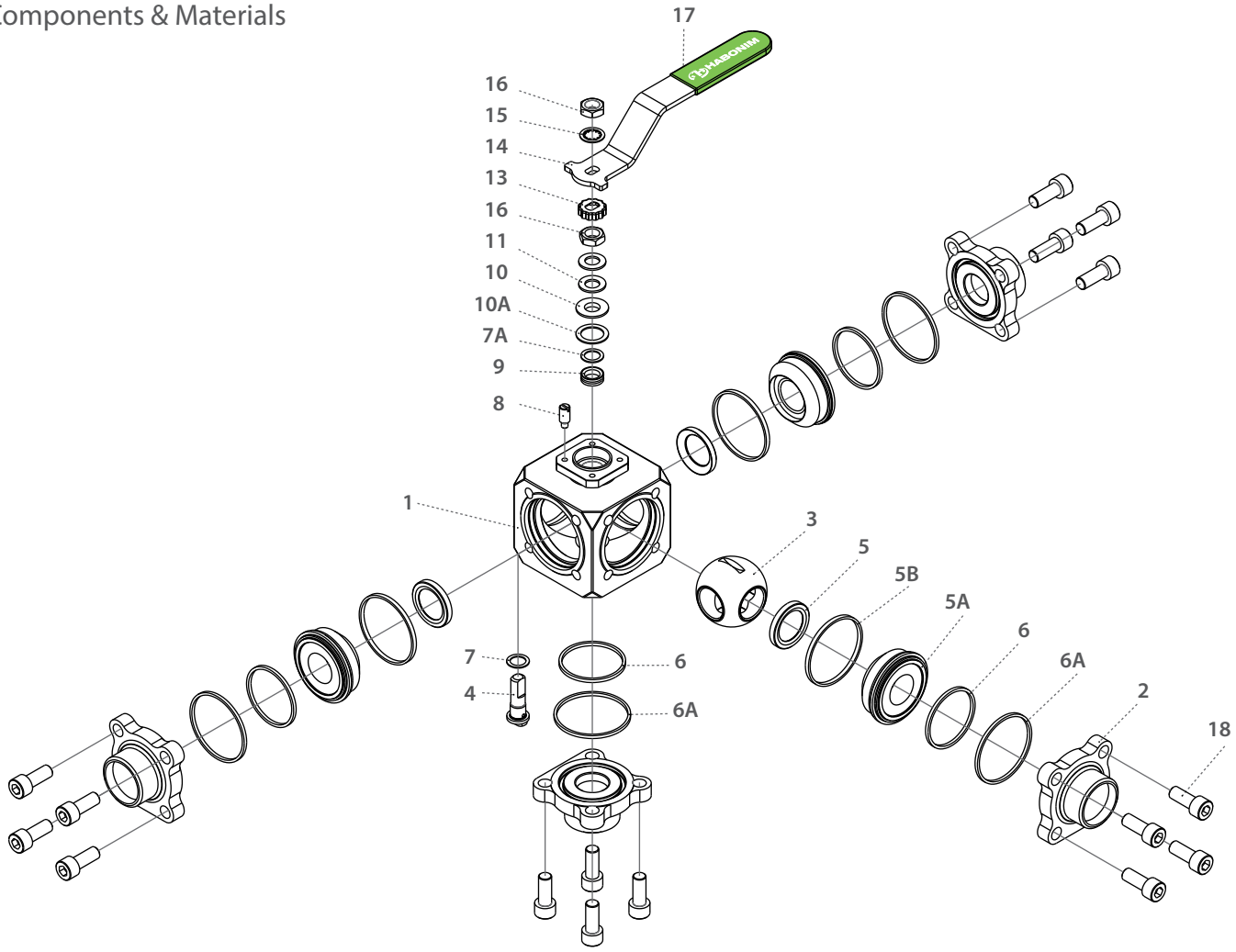
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	E	H	K	S	M	N	P	TxL	F	PCD	Weight kg/lb
DN20	DN15	mm	14.3	113.0	67.0	38.1	55.6	A/2	80.0	52.7	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	2.8
¾"	½"	inch	0.56	4.45	2.64	1.50	2.19		3.15	2.07	7.36	0.30		0.23			1.65	6.16
DN25	DN20	mm	20.6	143.6	81.6	43.0	60.5		85.5	66.2	187	7.54	7/16" UNF	5.8	M5X8	F04	42.0	4.3
1"	¾"	inch	0.81	5.65	3.21	1.69	2.38		3.37	2.61	7.36	0.30		0.23			1.65	9.46
DN32	DN25	mm	25.4	153.4	86.4	48.0	65.5		90.0	76.5	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	6
1¼"	1"	inch	1.0	6.04	3.40	1.89	2.58		3.54	3.01	7.36	0.30		0.23			1.65	13.2
DN40	DN32	mm	31.8	164.0	97.0	49.4	78.9		103	79.5	237.0	8.71	9/16" UNF	7.8	M6X9	F05	50.0	7.5
1½"	1¼"	inch	1.25	6.46	3.82	1.94	3.11		4.06	3.13	9.33	0.34		0.31			1.97	16.5

Valve Size		Flow Coefficients	
mm	inch	KV	CV
DN20	¾"	9	11
DN25	1"	27	31
DN32	1¼"	47	55
DN40	1½"	67	78

Multiport Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	See body material	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner Seal	Acc. Ordering Code	5
6A*	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1

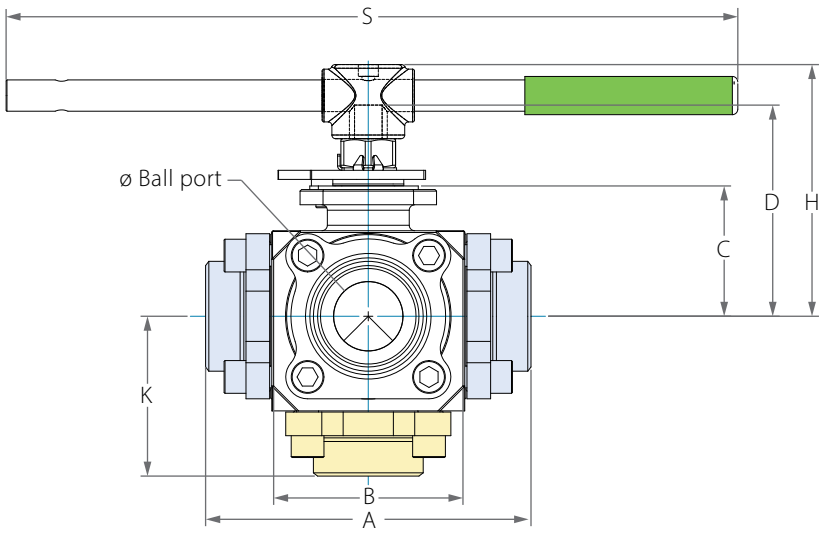
Item	Description	Material specification	Qty.
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
10A*	Slide Braring	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16

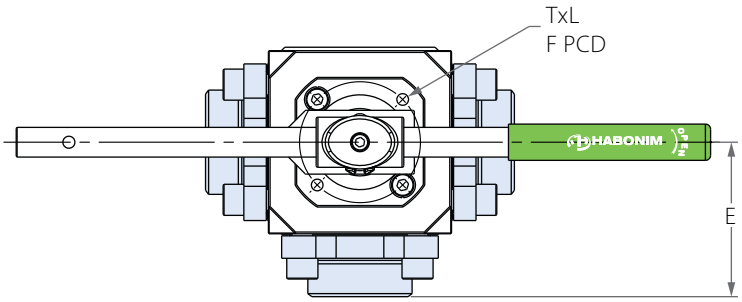
* Maintenance kit components

D61W 2"-2½" | DN50-DN65 | CLASS 300

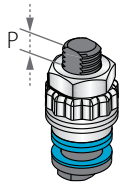
Multiport Floating Ball

Valve Dimensions

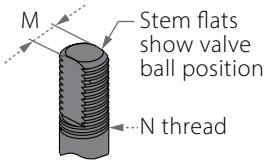




Preparation for actuation



½" - 1½"
with nut

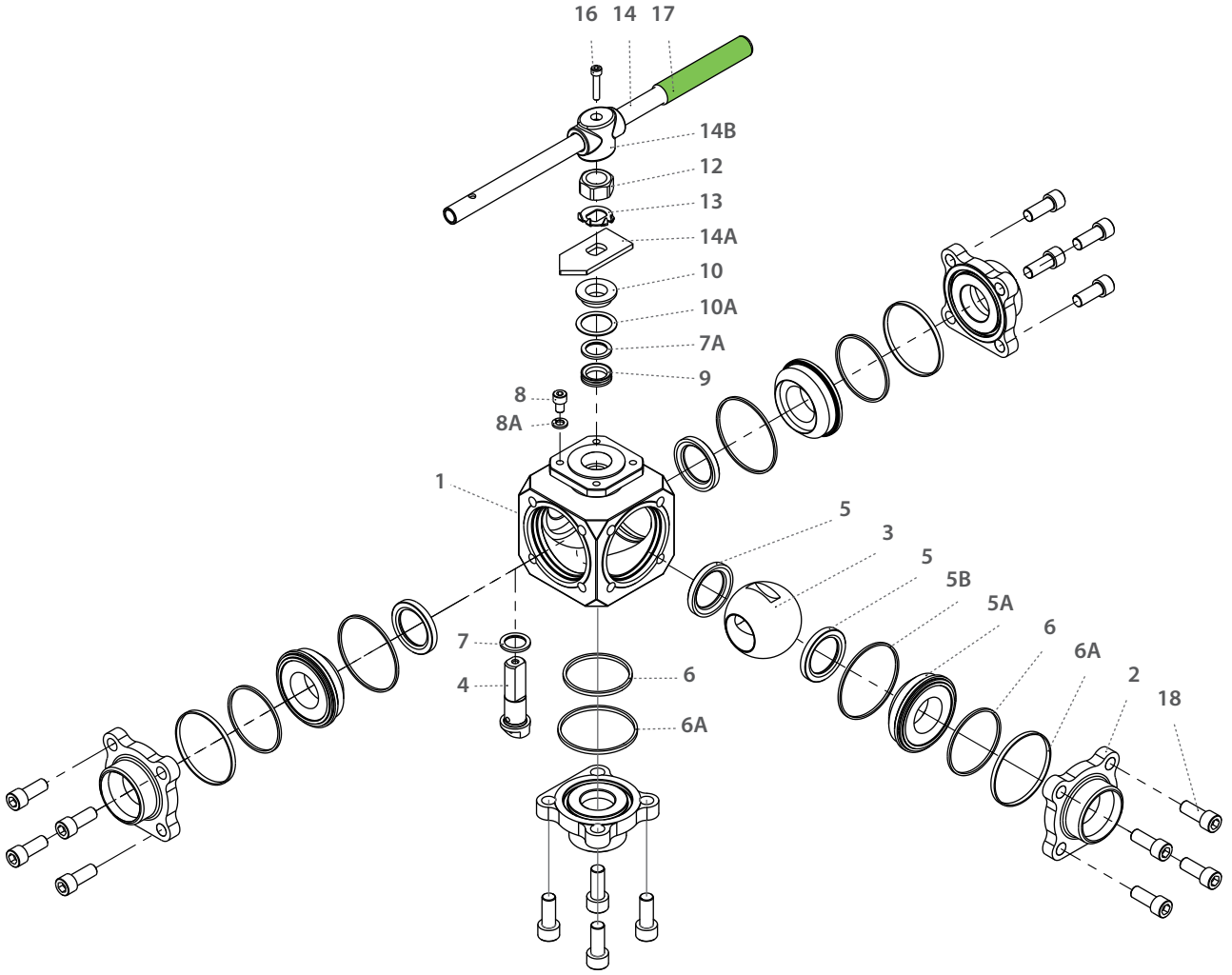


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Ball port	A	B	C	D	E	H	K	S	M	N	P	TxL	PCD	Weight kg/lb	Kv / Cv
DN50	DN40	38.1	177.2	107.2	69.7	111.3	A/2	140.0	35.0	400.0	13.9	M20x2.5	13.5	F07	70.0	11	102
2"	1½"	1.50	6.98	4.22	2.74	4.38		5.51	1.38	15.75	0.55		0.53		2.76	24.2	118
DN65	DN50	48.0	210.4	125.0	79.1	120.7		150.0	100.7	400.0	13.9	M20x2.5	13.5	F07	70.0	16.5	208
2½"	2"	1.89	8.28	4.92	3.11	4.75		5.91	3.96	15.75	0.55		0.53		2.76	36.3	241

Multiport Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner Seal	Acc. Ordering Code	5
6A*	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	V. PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	V. PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1

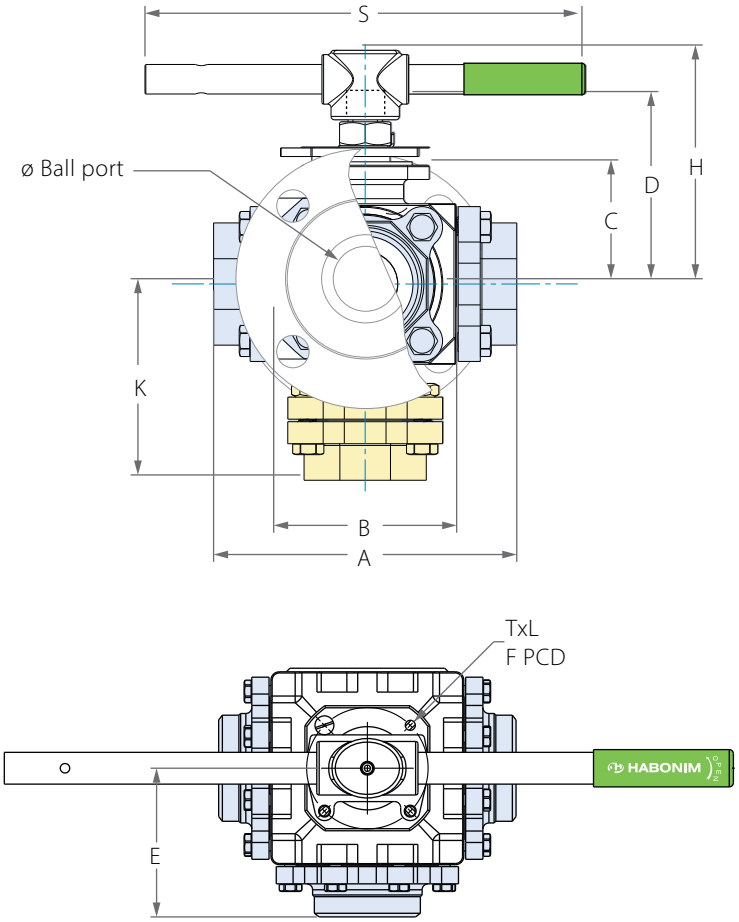
Item	Description	Material specification	Qty.
8A	Spring Washer	S. Steel	1
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
10A*	Slide Braring	S. Steel	1
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Bolt	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	16

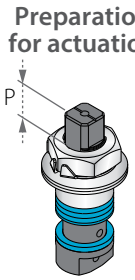
* Maintenance kit components

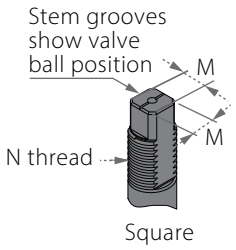
D61X 3"-4" | DN80-DN100 | CLASS 300

Multiport Floating Ball

Valve Dimensions







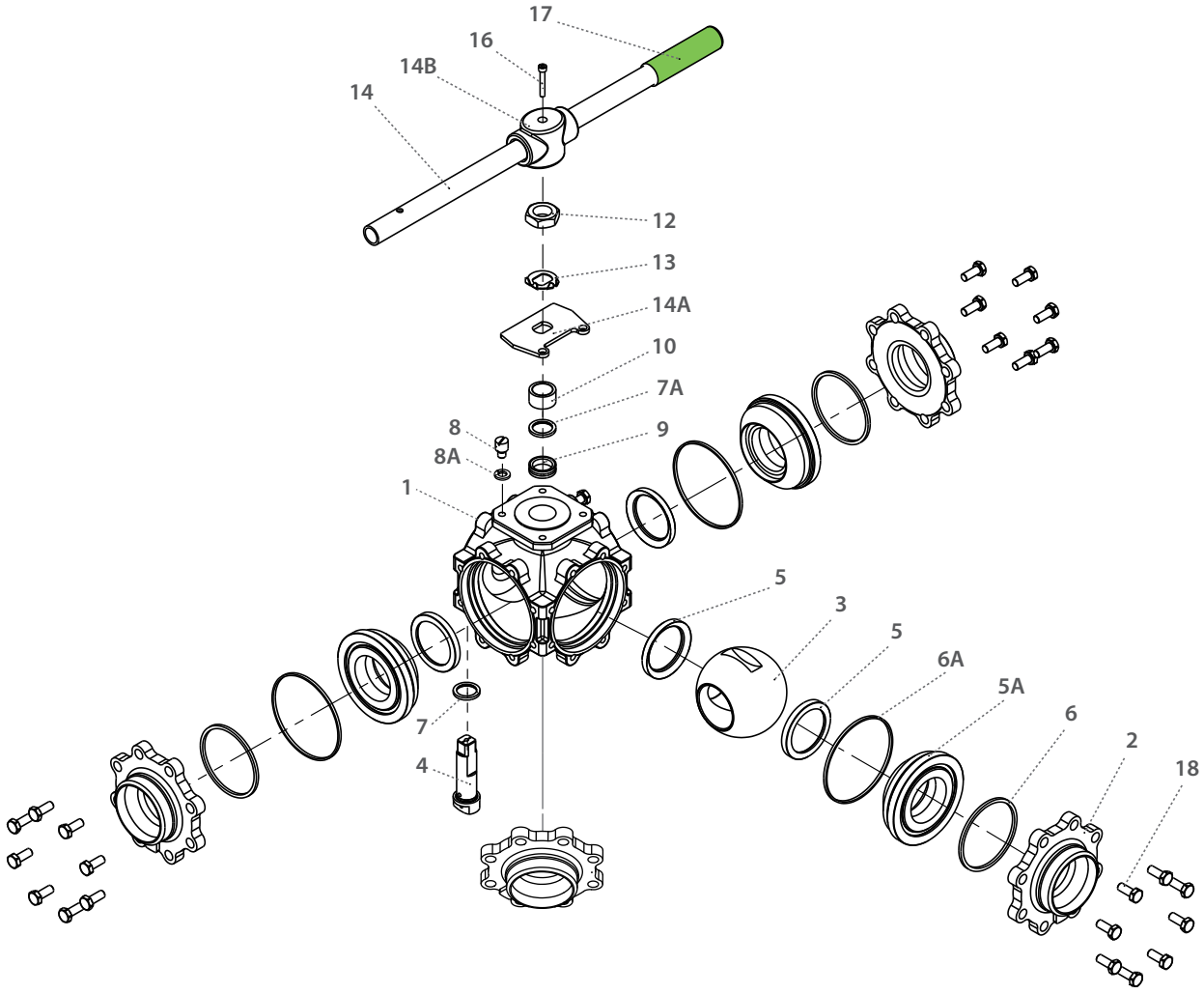
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Unit	Ball port	A	B	C	D	E	K	H	M	M-DD	N	P	TxL	F	S	Weight kg/lb
DN80	mm	60.0	249.80	164.0	101.75	143.35	A/2	149.0	189.0	18.90	15.90	1"-14 UNS-2A	16.70	M10x11	F10	610.0	40
3"	inch	2.36	9.83	6.46	4.01	5.64		5.87	7.44	0.74	0.63		0.66			24.02	88
DN100	mm	76.0	309.80	205.0	134.50	203.60		190.0	264.0	28.45	23.75	1"-14 UNS-2A	26.20	M12x14	F12	920.0	55
4"	inch	2.99	12.20	8.07	5.30	8.02		7.48	10.39	1.12	0.93		1.03			36.22	121

Valve Size		Flow Coefficients	
mm	inch	KV	CV
DN80	3"	267	310
DN100	4"	484	562

Multiport Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	4
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
6*	Seat Seal	Acc. Ordering Code	4
6A*	Body Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
8	Stop Bolts	S. Steel	1
8A	Spring Washer	S. Steel	1

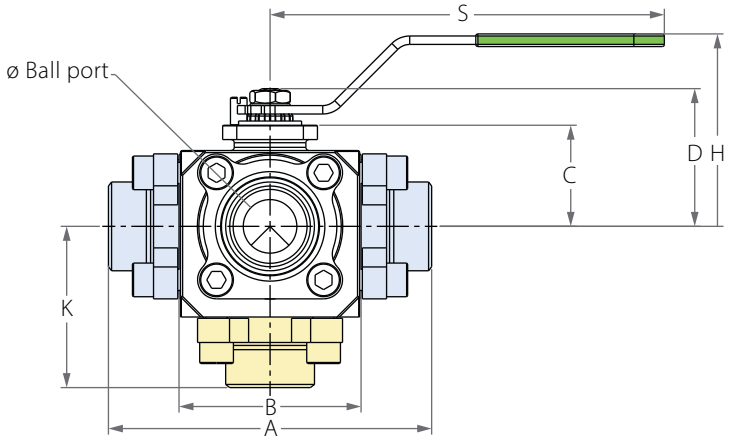
Item	Description	Material specification	Qty.
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Wrench Handle	C.St. Zinc Plate	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	24
23	Tag (not shown)	S. Steel	1

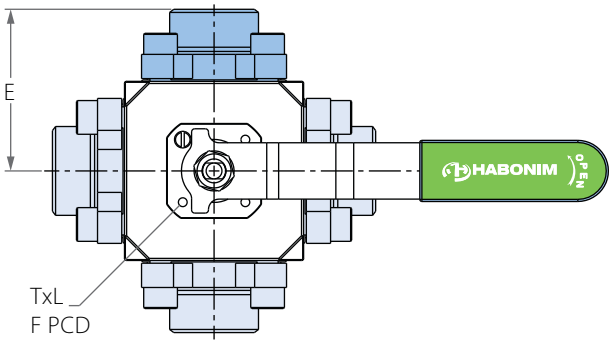
* Maintenance kit components

D62W ¾"-1½" | DN20-DN40 | CLASS 600

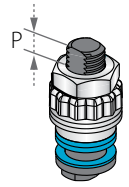
Multiport Floating Ball

Valve Dimensions

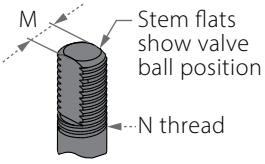




Preparation for actuation



½" - 1½"
with nut



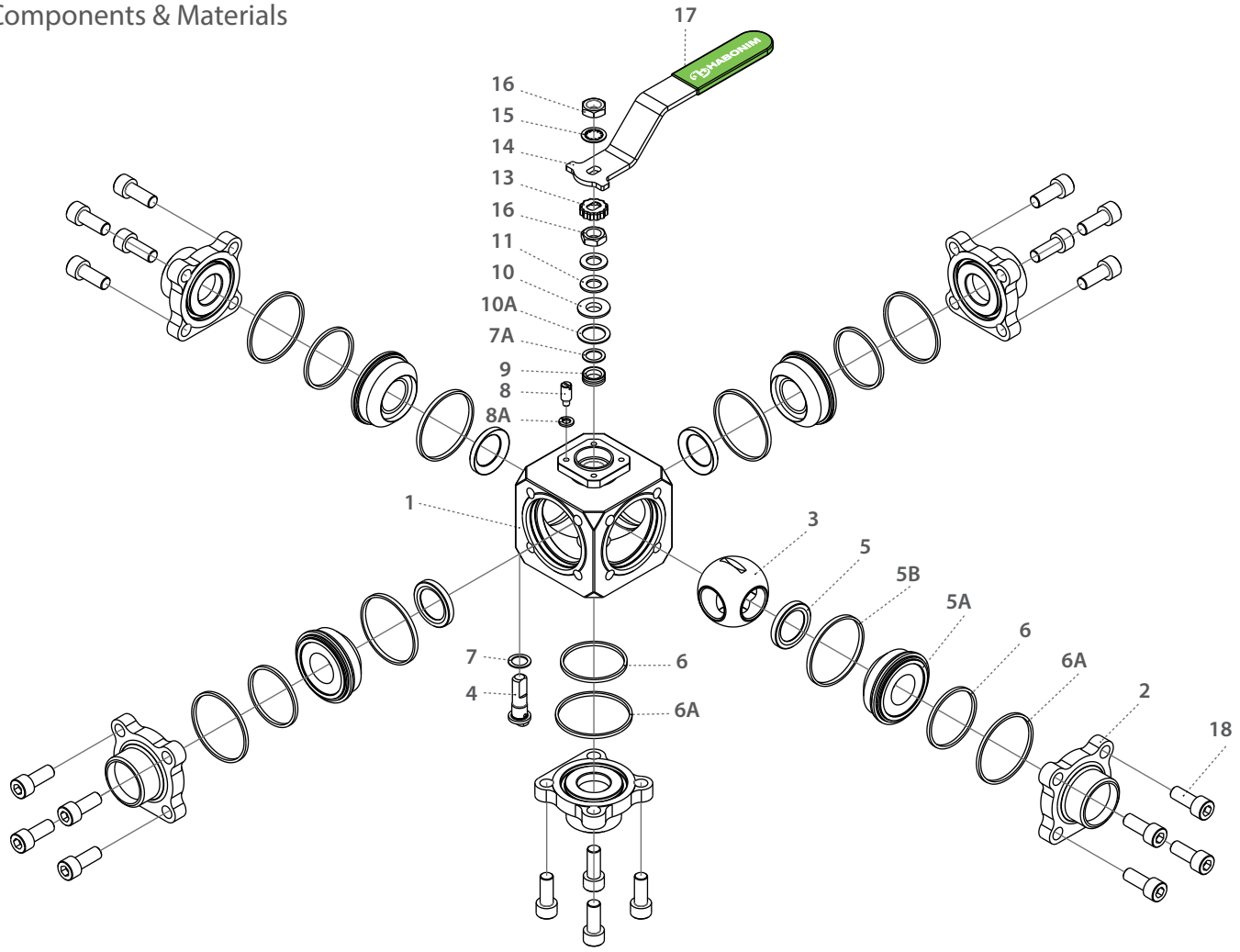
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Unit	Ball port	A	B	C	D	E	H	K	S	M	N	P	TxL	F	PCD	Weight kg/lb
DN20	DN15	mm	14.3	113.0	67.0	38.1	55.6	A/2	80.0	52.7	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	2.8
¾"	½"	inch	0.56	4.45	2.64	1.50	2.19		3.15	2.07	7.36	0.30		0.23			1.65	6.16
DN25	DN20	mm	20.6	143.6	81.6	43.0	60.5		85.5	66.2	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	4.3
1"	¾"	inch	0.81	5.65	3.21	1.69	2.38		3.37	2.61	7.36	0.30		0.23			1.65	9.46
DN32	DN25	mm	25.4	153.4	86.4	48.0	65.5		90.0	76.5	187.0	7.54	7/16" UNF	5.8	M5X8	F04	42.0	6
1¼"	1"	inch	1.0	6.04	3.40	1.89	2.58		3.54	3.01	7.36	0.30		0.23			1.65	13.2
DN40	DN32	mm	31.8	164.0	97.0	49.4	78.9		103.0	79.5	237.0	8.71	9/16" UNF	7.8	M6X9	F05	50.0	7.5
1½"	1¼"	inch	1.25	6.46	3.82	1.94	3.11		4.06	3.13	9.33	0.34		0.31			1.97	16.5

Valve Size		Flow Coefficients	
mm	inch	KV	CV
DN20	¾"	9	11
DN25	1"	27	31
DN32	1¼"	47	55
DN40	1½"	67	78

Multiport Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	See body material	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner Seal	Acc. Ordering Code	5
6A*	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
8A	Spring Washer	S. Steel	1

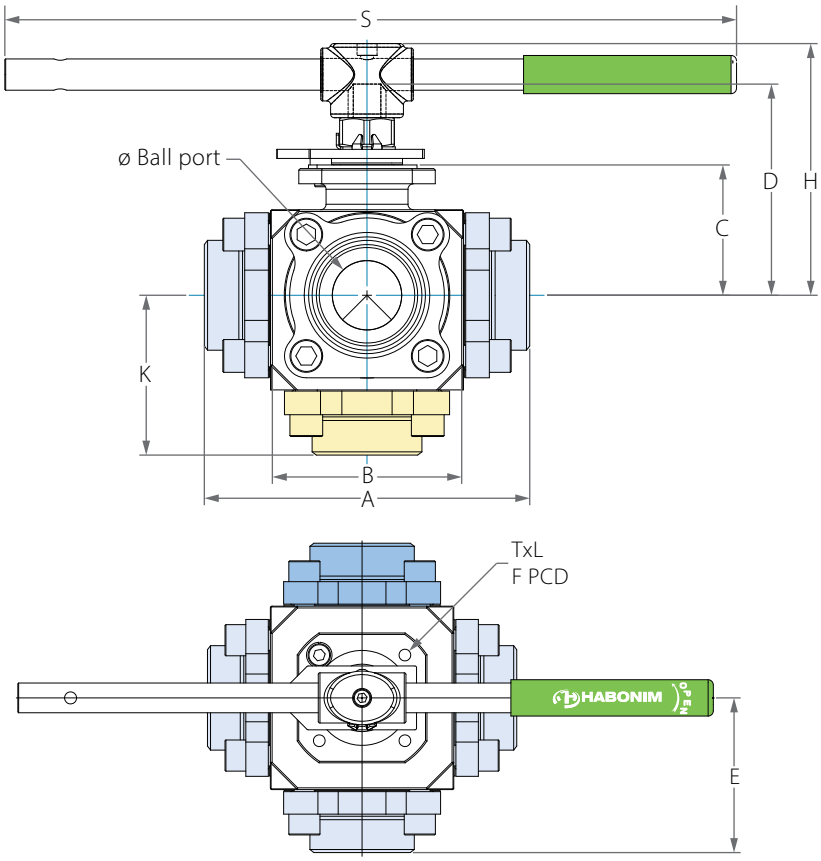
Item	Description	Material specification	Qty.
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
10A*	Slide Braring	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	20

* Maintenance kit components

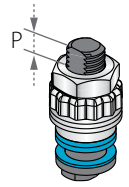
D62W 2"-2½" | DN50-DN65 | CLASS 300

Multiport Floating Ball

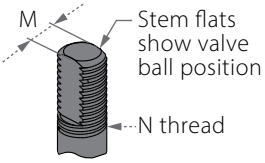
Valve Dimensions



Preparation for actuation



½" - 1½"
with nut

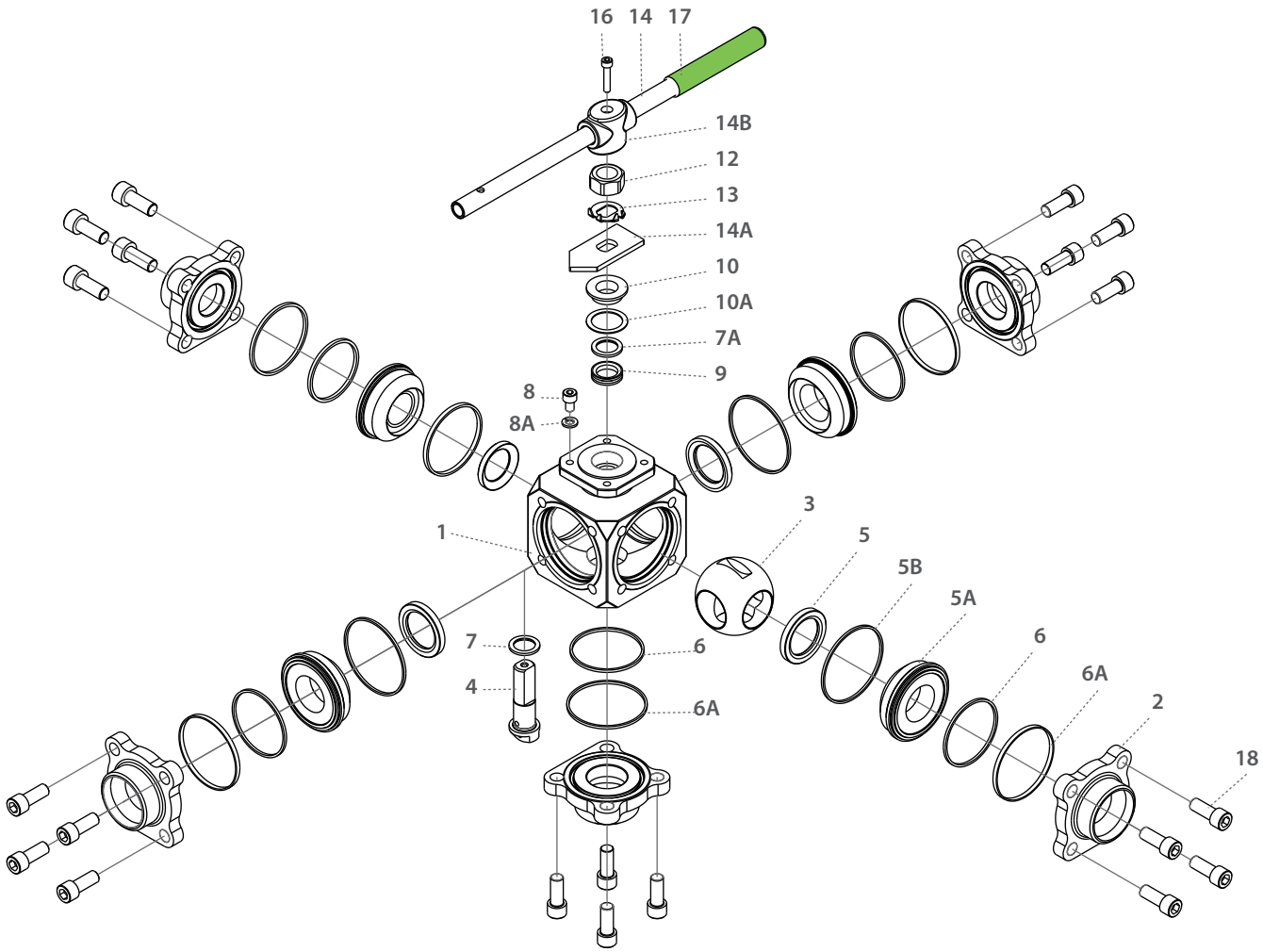


Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Full port	Ball port	A	B	C	D	E	H	K	S	M	N	P	TxL	PCD	Weight kg/lb	Kv / Cv
DN50	DN40	38.1	177.2	107.2	69.7	111.3	A/2	140.0	35.0	400.0	13.9	M20x2.5	13.5	F07	70.0	11	102
2"	1½"	1.50	6.98	4.22	2.74	4.38		5.51	1.38	15.75	0.55		0.53		2.76	24.2	118
DN65	DN50	48.0	210.4	125.0	79.1	120.7		150.0	100.7	400.0	13.9	M20x2.5	13.5	F07	70.0	16.5	208
2½"	2"	1.89	8.28	4.92	3.11	4.75		5.91	3.96	15.75	0.55		0.53		2.76	36.3	241

Multiport Floating Ball

Components & Materials



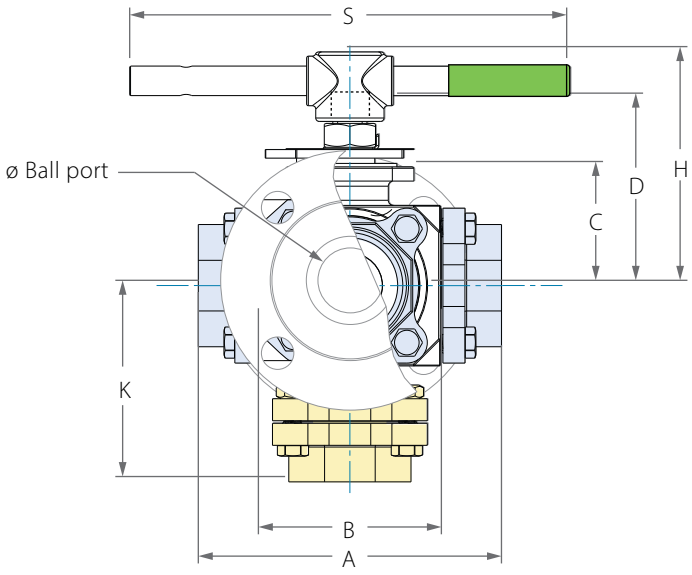
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	5
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
5B*	Seat Seal	Acc. Ordering Code	4
6*	Inner Seal	Acc. Ordering Code	5
6A*	Outer Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	V. PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	V. PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1

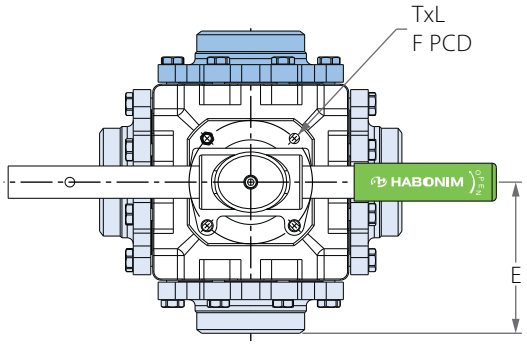
Item	Description	Material specification	Qty.
8A	Spring Washer	S. Steel	1
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
10A*	Slide Braring	S. Steel	1
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Bolt	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. Steel	20

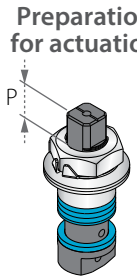
* Maintenance kit components

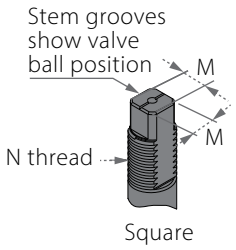
Multiport Floating Ball

Valve Dimensions









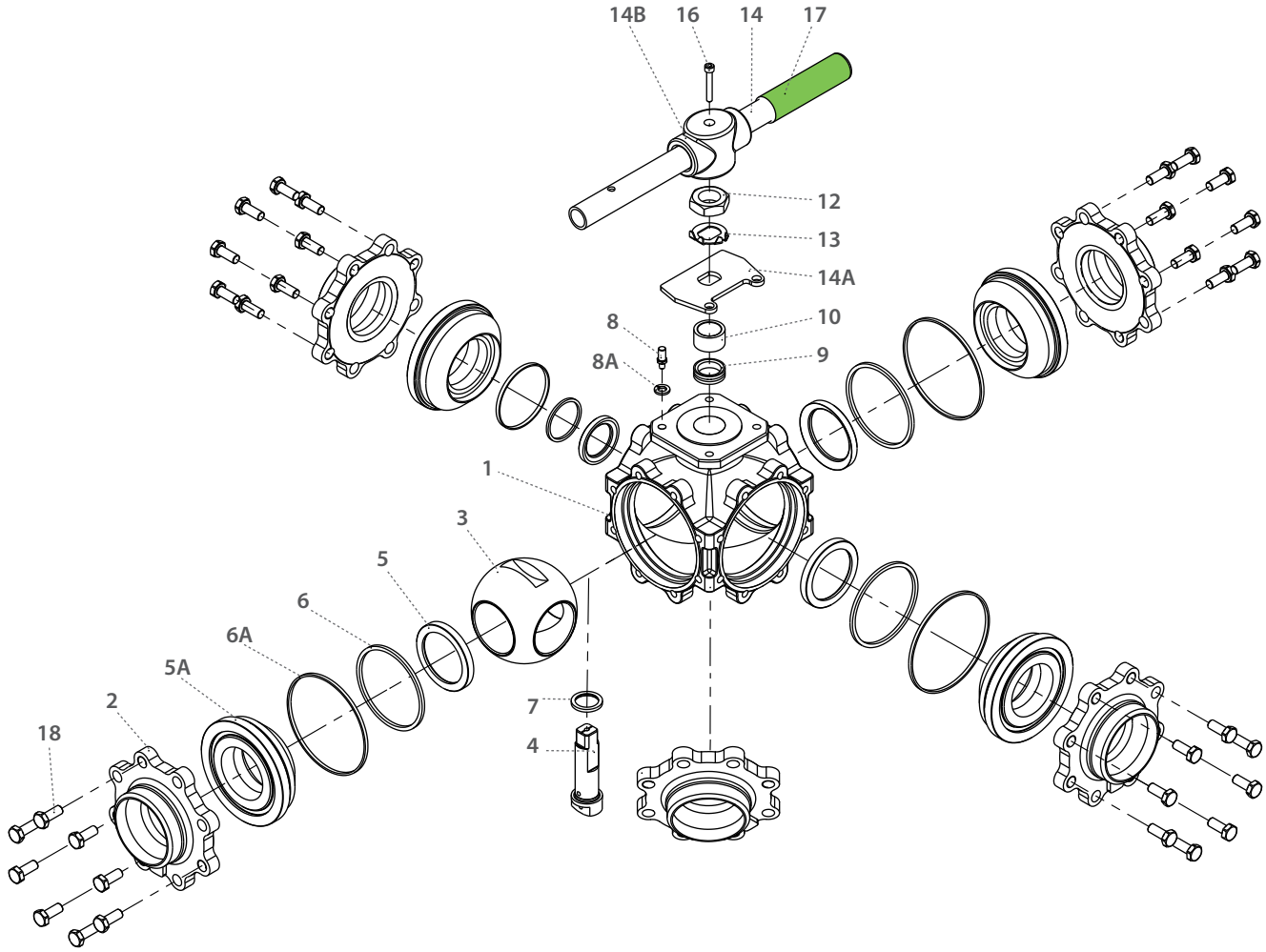
Valve Face To Face sizes are according to Habonim catalog data only, for Extended-weld/Flanged/Tri-clamp end see Face To Face sizes page.

Std. port	Unit	Ball port	A	B	C	D	E	K	H	M	M-DD	N	P	TxL	F	S	Weight kg/lb
DN80	mm	60.0	249.80	164.0	101.75	143.35	A/2	149.0	189.0	18.90	15.90	1"-14 UNS-2A	16.70	M10x11	F10	610.0	40
3"	inch	2.36	9.83	6.46	4.01	5.64		5.87	7.44	0.74	0.63		0.66			24.02	46
DN100	mm	76.0	309.80	205.0	134.50	203.60		190.0	264.0	28.45	23.75	1"-14 UNS-2A	26.20	M12x14	F12	920.0	55
4"	inch	2.99	12.20	8.07	5.30	8.02		7.48	10.39	1.12	0.93		1.03			36.22	64

Valve Size		Flow Coefficients	
mm	inch	KV	CV
DN80	3"	267	310
DN100	4"	484	562

Multiport Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	4
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	4
5A	Support Seat	Acc. Ordering Code	4
6*	Seat Seal	Acc. Ordering Code	4
6A*	Body Seal	Acc. Ordering Code	5
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
8	Stop Bolts	S. Steel	1
8A	Spring Washer	S. Steel	1

Item	Description	Material specification	Qty.
9*	Stem Seal	CF PTFE,TFM	1
10	Follower	S. Steel	1
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Wrench Handle	C.St. Zinc Plate	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	32
23	Tag (not shown)	S. Steel	1

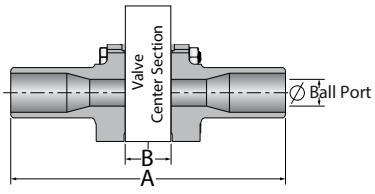
* Maintenance kit components

61 62 D61 D62

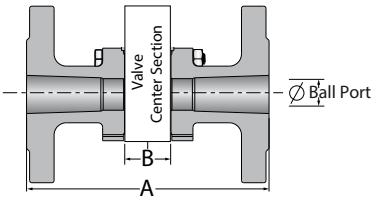
Face To Face Sizes

Valve Size	Unit	B		A-XBW / ETI / ETD / GR		A-ETO	A-Flanged CLASS 150+300		A-Flanged CLASS 600		A-Flanged DIN		A-TC
		Std. port	Full port	Std. port	Full port	Std. port	Std. port	Full port	Std. port	Full port	Std. port	Full port	Full port
DN15	mm		67.0		189.4			182.4		194.4		172.4	
½"	inch		2.64		7.46			7.18		7.65		6.79	
DN20	mm	67.0	81.6	189.4	218.6	189.4	194.4	202.2	194.4	215.0	192.4	200.0	144.0
¾"	inch	2.64	3.21	7.46	8.61	7.46	7.65	7.96	7.65	8.46	7.57	7.87	5.67
DN25	mm	81.6	86.4	218.6	224.4	213.9	214.8	210.2	265.8	223.1	209.8	205.2	164.2
1"	inch	3.21	3.40	8.61	8.83	8.42	8.46	8.28	10.46	8.78	8.26	8.08	6.46
DN32	mm	86.4	97.0	224.4	238.0	224.4	223.1	226.6	223.1	226.6	225.2	228.6	86.4
1¼"	inch	3.40	3.82	8.83	9.37	8.83	8.78	8.92	8.78	8.92	8.87	9.0	3.40
DN40	mm	97.0	107.2	238.0	251.2	232.6	238.6	241.4	290.0	267.0	248.6	251.0	188.4
1½"	inch	3.82	4.22	9.37	9.89	9.16	9.39	9.50	11.42	10.51	9.79	9.88	7.42
DN50	mm	107.2	125.0	251.2	285.0	244.4	266.9	268.2			280.8	282.4	209.8
2"	inch	4.22	4.92	9.89	11.22	9.62	10.51	10.56			11.06	11.12	8.26
DN65	mm	125.0	164.0	285.0	364.0	285.0	293.4	362.6			284.7	350.6	265.4
2½"	inch	4.92	6.46	11.22	14.33	11.22	11.55	14.28			11.21	13.80	10.45
DN80	mm	164.0	205.0	364.0	445.0	364.0	362.7	378.4			360.6	406.2	164.0
3"	inch	6.46	8.07	14.33	17.52	14.33	14.28	14.90			14.20	15.99	6.46
DN100	mm	205.0		445.0		445.0	401.0				446.2		205.0
4"	inch	8.07		17.52		17.52	15.79				17.57		8.07

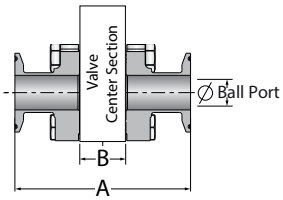
XBW / ETO / ETI / ETD / GR

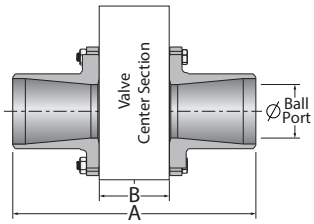


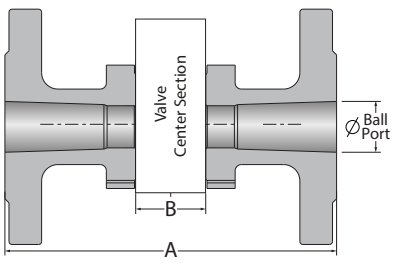
Flanged

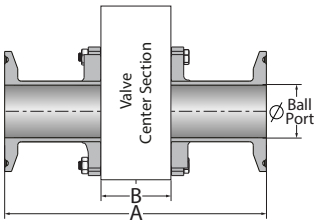


TC









Multiport Floating Ball - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2	0				D	6	1	W	-	6	6	6	6	A	T	A	/	B	W			-	#	0	3	4			
Size		Features				Series		Design		Body/end material		Ball/Stem material		Seat material		Body/seat seal		Outer Seal Material		End connection			Flow pattern code				Special features		

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100

Features (3-6)	
B *	Full port
D	Diverter bottom entry
F	Shell only -fire safe
O	Clean assembly for O2 service
H**	Hydrogen service

* up to 3"
** for material selection - see Hydrogen Service chapter

Series (7-8)	
61	Multiport with three horizontal ports
62	Multiport with four horizontal ports

Design (9)	
W*	Total HermetiX Integrity Package
X**	HermetiX stem seal

* Up to 2½"/2" full bore
** 3" to 4"

Body/Ends material (11-12)	
6	S. SteelCF8M/CF3M*

* CF3M - for welded ends only

Ball material (13)	
6	S. SteelCF8M/316

Stem material (14)	
6	S. Steel316
M	High Strength S. Steel

Seat material (15)	
A	TFM
P	CF PTFE

Body seal (16)	
T	PTFE
G	Expanded graphite
A	TFM

Outer seal material* (17)	
A	TFM
G	Expanded graphite

* Up to 2½"/2" full bore

End Connection (19-22)	
Welded ends	
BW10	Buttweld schd. 10
BW	Buttweld schd. 40
XBW10	Extended buttweld schd. 10
XBW	Extended buttweld schd. 40
BW5	Buttweld schd. 5
BWD	Buttweld DIN 11850
SW	Socket weld
SWO*	Socket weld tube OD
BWO*	Buttweld tube OD
ETO*	Extended tube OD
XSW	Extended socket weld
Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
MNPT	Male NPT
MBSPT	Male BSPT
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	SAE internal straight thread
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
Clamp	
LL*	Compression fitting (Imperial) - **No** Nuts & Ferrules
LM*	Compression fitting (metric) - **No** Nuts & Ferrules
LL-NF*	Compression fitting (Imperial) - **with** Nuts & Ferrules
LM-NF*	Compression fitting (metric) - **with** Nuts & Ferrules
TC*	Tri-Clamp
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

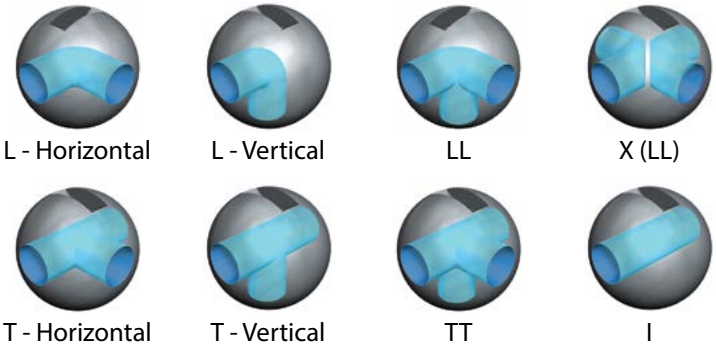
* Std. port only
** Not available for 1¼" (DN32) Valves

Flow pattern code (24-27)	
#001-#028	3 way side entry
#029-#031	3 way bottom entry
#032-#063	4 way side entry
#064-#073	4 way bottom entry
#074-#085	5 way bottom entry

Special Features (28-30)	
EP	Electropolished
G...	Internal surface finish (G24, G32)
Valve Special Stem Seals	
HC	High Cycle service
AAX	FDA compliant stem seal. TFM thrust bearing and X shape gasket
PPX	CF PTFE thrust and X shape gasket
CAX	PCTFE thrust and TFM X shape gasket
CPX	PCTFE thrust and CF PTFE X shape gasket

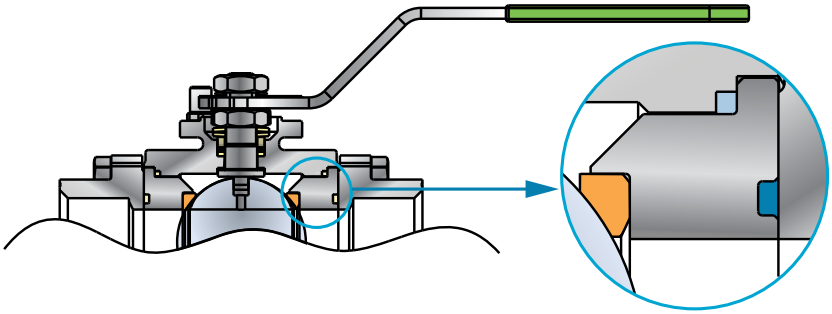
MULTIPORT FLOATING BALL

Ball Types



Seats & body seals

The 61/62 series valves have 4 seats that provide enhanced sealing characteristics. The seats are inserted into a support ring which is sealed with 2 separate body seals - 1 seal between the support ring and the body and the other between the support ring and the end connector. Both body seals are encapsulated and thus provide tighter compression of the seal for higher pressure & temperature fluctuations.

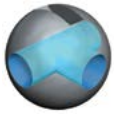


How to Use the Valve Selection

1. Select the valve type
   3 Way Valve - Side Entry



2. Select the ball type
   T - Horizontal



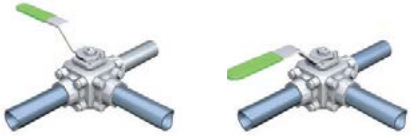
3. Select the rotation angle

90° | 180° | 360°

4. Select the rotation direction (ccw/cw)

CCW ↺ | CW ↻

5. Select the starting position and flow pattern
   Flow is indicated by a blue pipeline



6. Use the flow pattern code number to order the appropriate valve

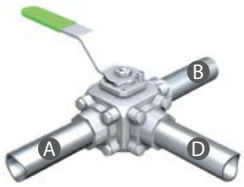
90°	CCW ↺	
	# 001	# 002
Start		

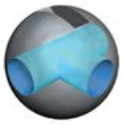
3 Way Valve | Side Entry 61

90°	CCW ↺				CW ↻			
	# 001	# 002	# 003	# 004	# 005	# 006	# 007	# 008
Start								
2nd								

180°	CCW ↺				CW ↻			
	# 009	# 010	# 011	# 012	# 013	# 014	# 015	# 016
Start								
2nd								
3nd								

360°	CCW ↺	CW ↻
	# 017	# 018
Start		
2nd		
3nd		
4nd		





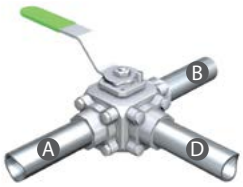
T - Horizontal

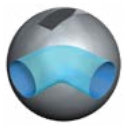
MULTIPORT FLOATING BALL

3 Way Valve | Side Entry 61

90°	CCW ↺			CW ↻		
	# 019	# 020	# 021	# 022	# 023	# 024
Start						
2nd						

180°	CCW ↺		CW ↻	
	# 025	# 026	# 027	# 028
Start				
2nd				
3rd				

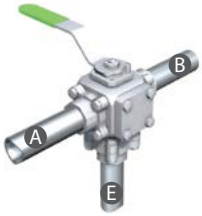


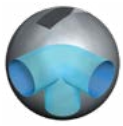


L - Horizontal

3 Way Valve | Bottom Entry D61

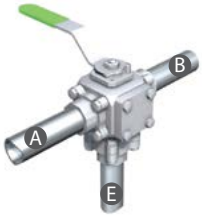
90°	CCW ↺
	# 029
Start	
2nd	

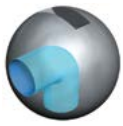




LL

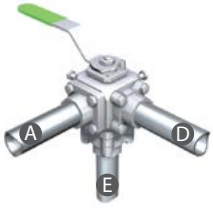
180°	CCW ↺
	# 030
Start	
2nd	
3rd	

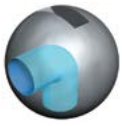




L - Vertical

90°	CCW ↺
	# 031
Start	
2nd	





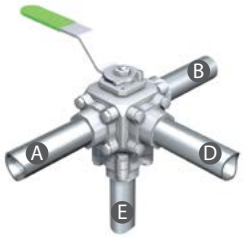
L - Vertical

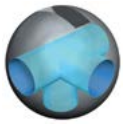
4 Way Valve | Bottom Entry D61

90°	CCW ↺				CW ↻			
	# 032	# 033	# 034	# 035	# 036	# 037	# 038	# 039
Start								
2nd								

180°	CCW ↺				CW ↻			
	# 040	# 041	# 042	# 043	# 044	# 045	# 046	# 047
Start								
2nd								
3nd								

360°	CCW ↺	CW ↻
	# 048	# 049
Start		
2nd		
3nd		
4nd		




TT

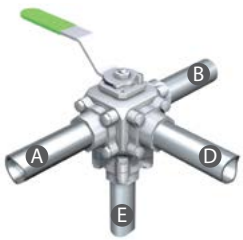
MULTIPORT FLOATING BALL

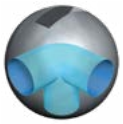
4 Way Valve | Bottom Entry D61

90°	CW ↻
	# 050
Start	
2nd	

180°	CCW ↺				CW ↻			
	# 051	# 052	# 053	# 054	# 055	# 056	# 057	# 058
Start								
2nd								
3nd								

360°	CCW ↺	CW ↻
	# 059	# 060
Start		
2nd		
3nd		
4nd		

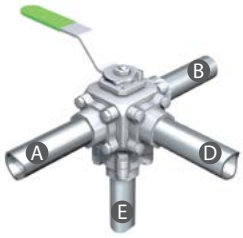


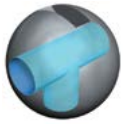


LL

4 Way Valve | Bottom Entry D61

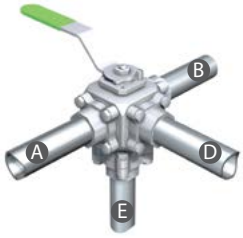
90°	CCW ↺
	# 061
Start	
2nd	

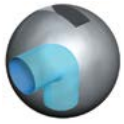




T - Vertical

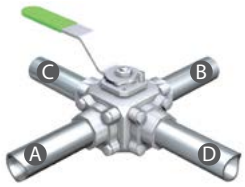
360°	CCW ↺	CW ↻
	# 062	# 063
Start		
2nd		
3rd		
4nd		

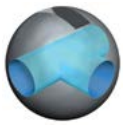




L - Vertical

4 Way Valve | Side Entry 62





T - Horizontal

90°	CCW ↺	CW ↻
	# 064	# 065
Start		
2nd		

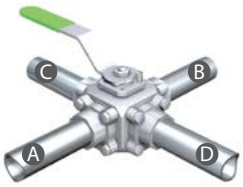
180° 2 positions	CW ↻
	# 066
Start	
2nd	

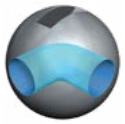
180° 3 positions	CCW ↺	CW ↻
	# 067	# 068
Start		
2nd		
3rd		

MULTIPORT FLOATING BALL

4 Way Valve | Side Entry 62

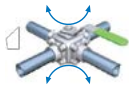
180°	CCW ↺
	# 069
Start	
2nd	

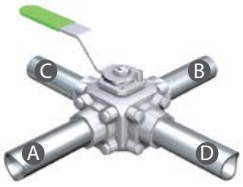




L - Horizontal

360°	CCW ↺	CW ↻
	# 070	# 071
Start		
2nd		
3rd		
4nd		

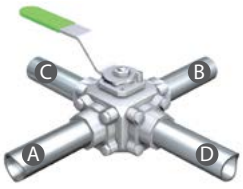
90°	CCW ↺
	# 072
Start	
2nd	

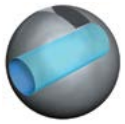




X (LL)

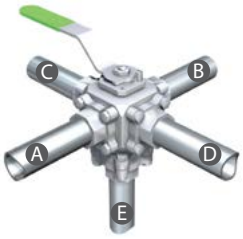
90°	CCW ↺
	# 073
Start	
2nd	



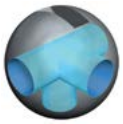


I

5 Way Valve - Bottom Entry D62



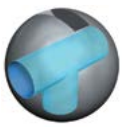
90°	CCW ↺ # 074	CW ↻ # 075
Start		
2nd		


TT - Horizontal

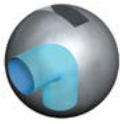
180°	CCW ↺ # 076	CW ↻ # 077
Start		
2nd		
3nd		

360°	CCW ↺ # 078	CW ↻ # 079
Start		
2nd		
3nd		
4nd		

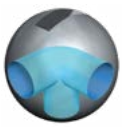
90°	CCW ↺ # 080
Start	
2nd	


T - Vertical

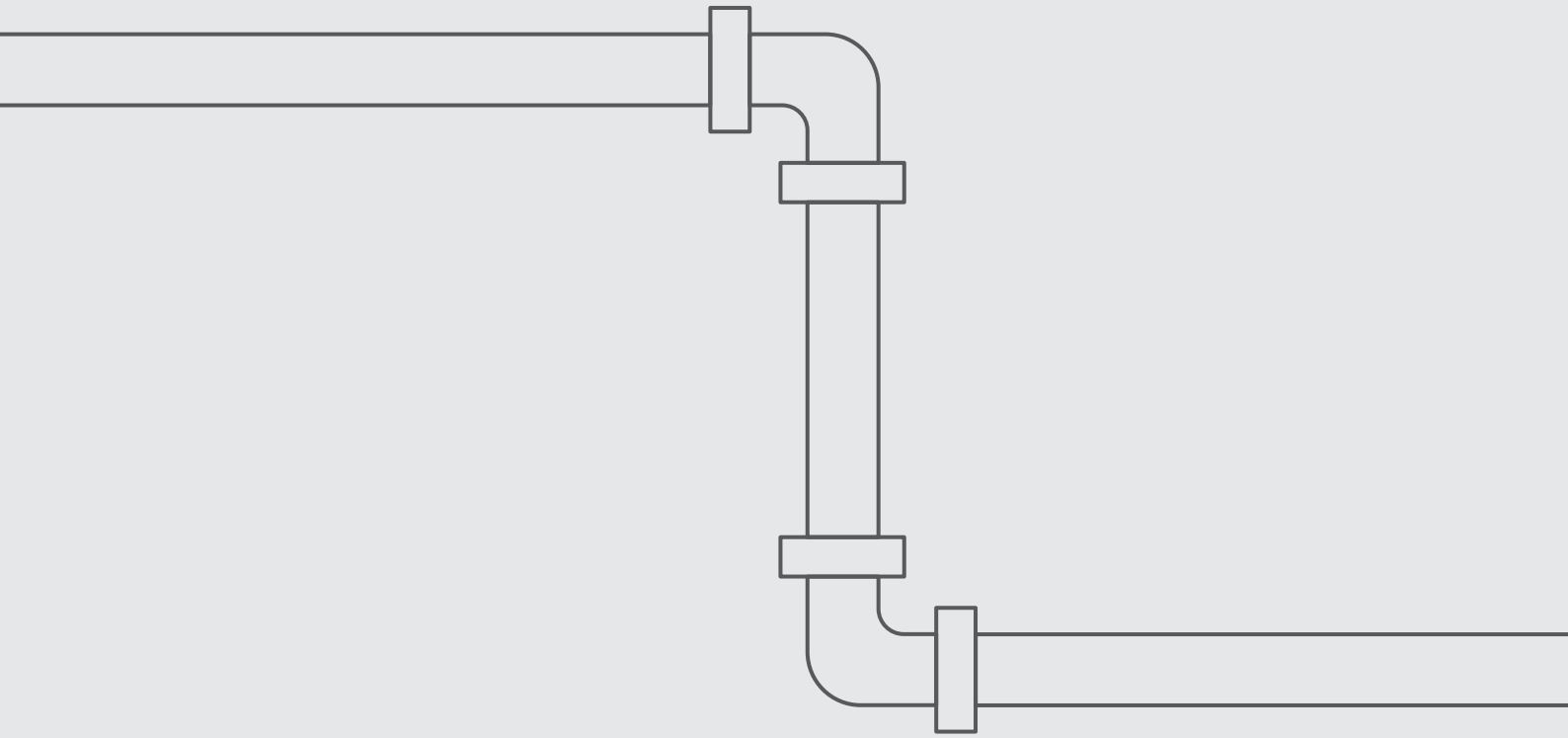
360°	CCW ↺ # 081	CW ↻ # 082
Start		
2nd		
3nd		
4nd		


L - Vertical

180° 2 positions	CCW ↺ # 083
Start	
2nd	


LL

360°	CCW ↺ # 084	CW ↻ # 085
Start		
2nd		
3nd		
4nd		

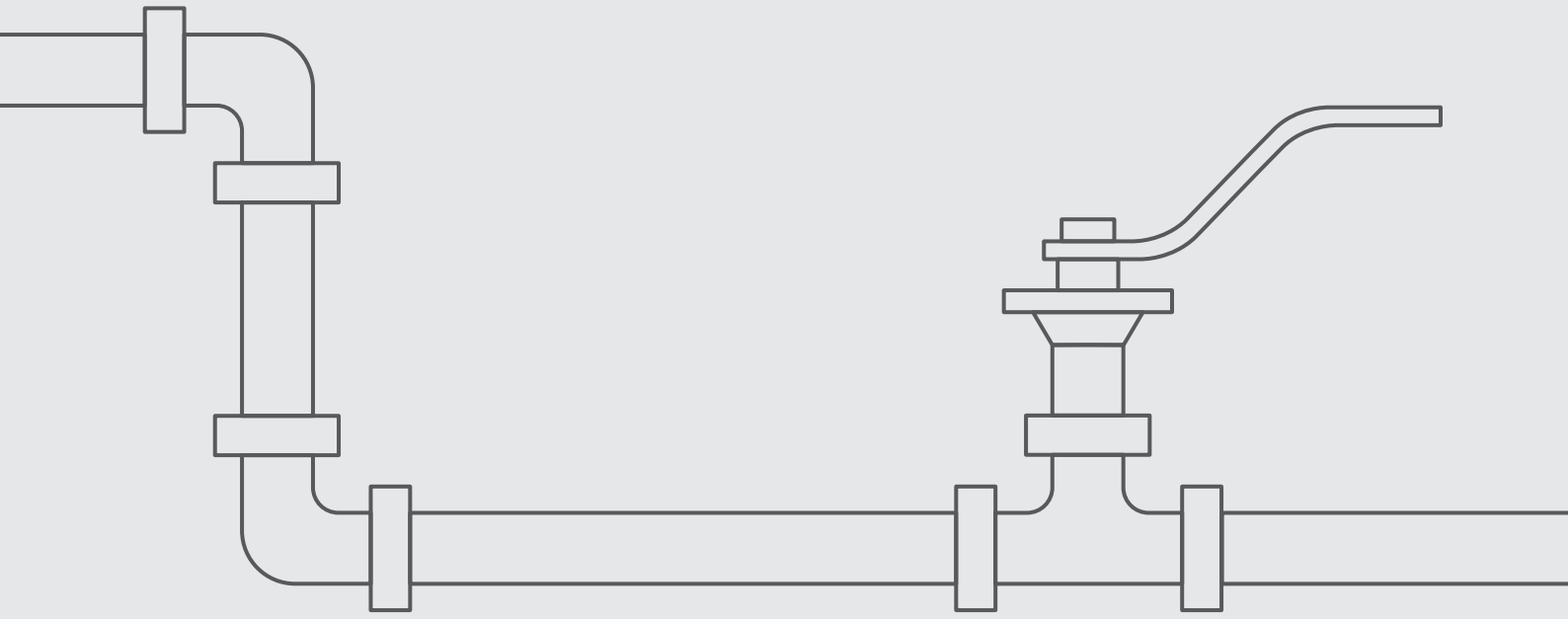


D47 S47

Industrial Valves

FLOATING BALL

DIVERTER
SIDE ENTRY
3 PIECE



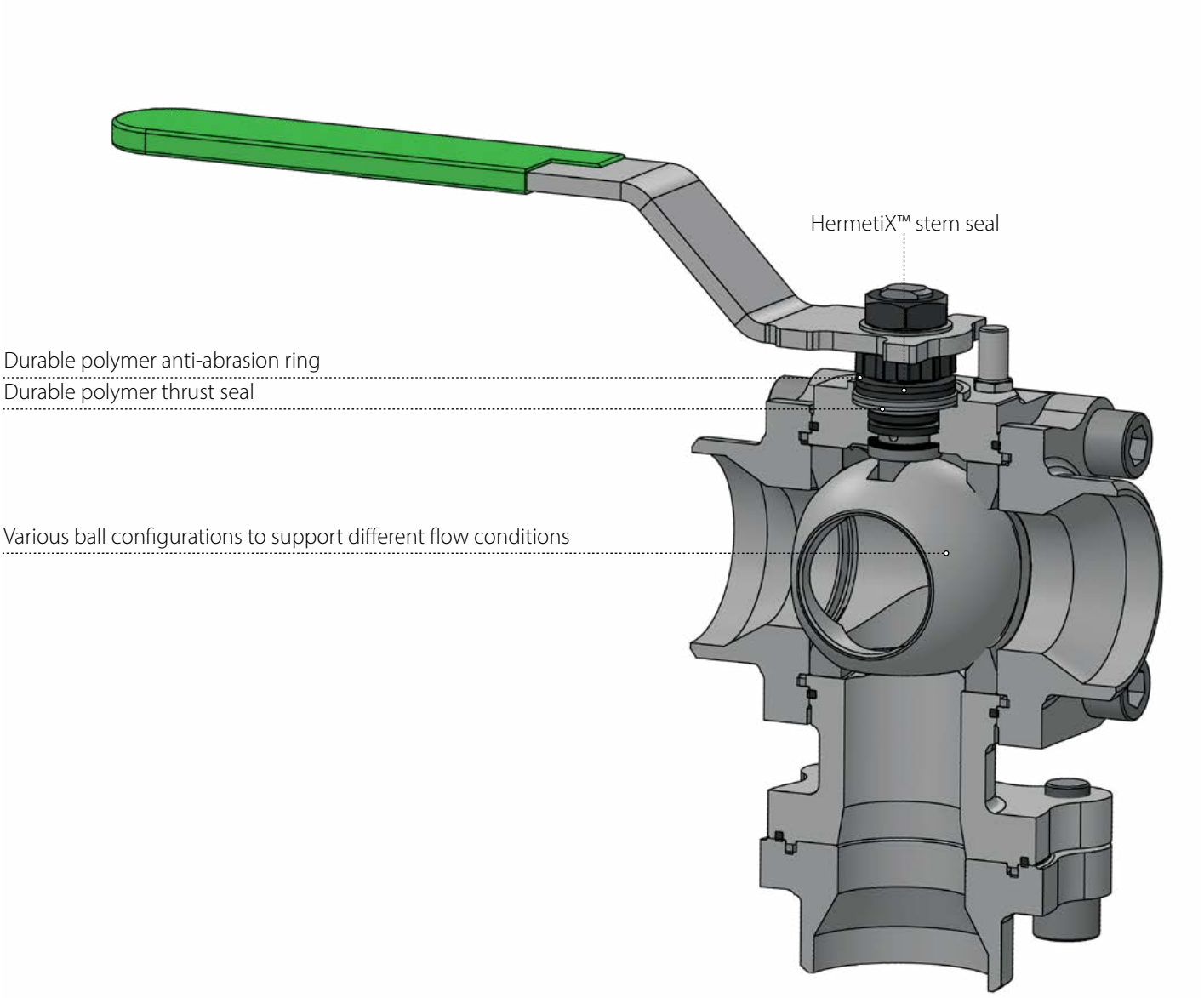
D47 S47

Diverter | Side Entry

Design features

Body

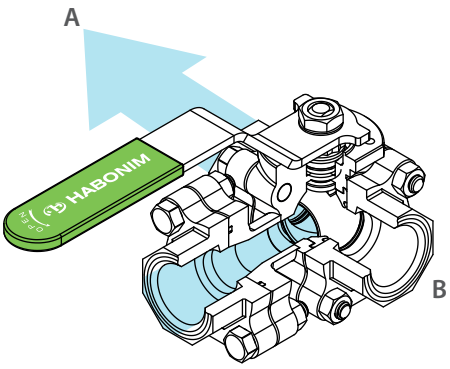
- Three piece design
- Forged or cast body
- Full compliance with ASME B16.34 (wall thickness)
- Easy in-line serviceable with swing-out body
- Large range of end connections for full or standard port valves
- Rugged top mounting platform compliant with ISO 5211 for easy mounting of actuator and other accessories

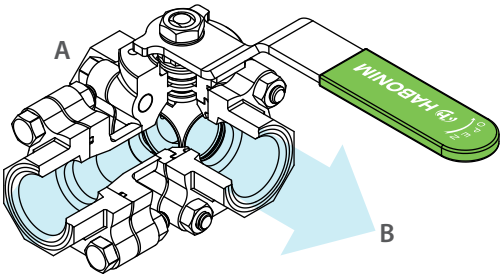


D47 S47

Side Entry - S47

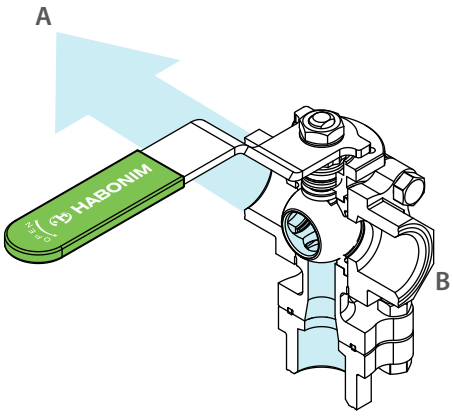
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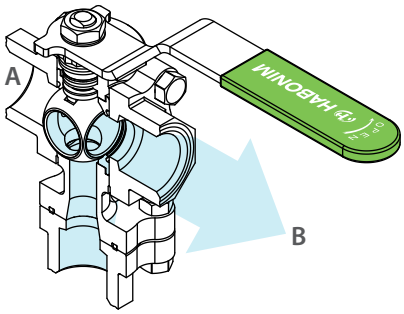




Bottom Entry - D47

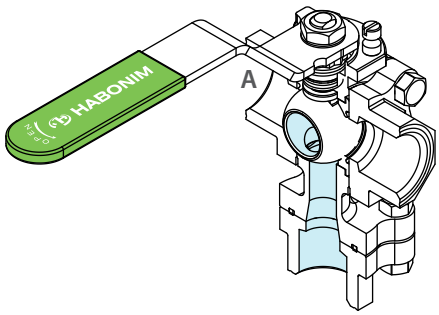
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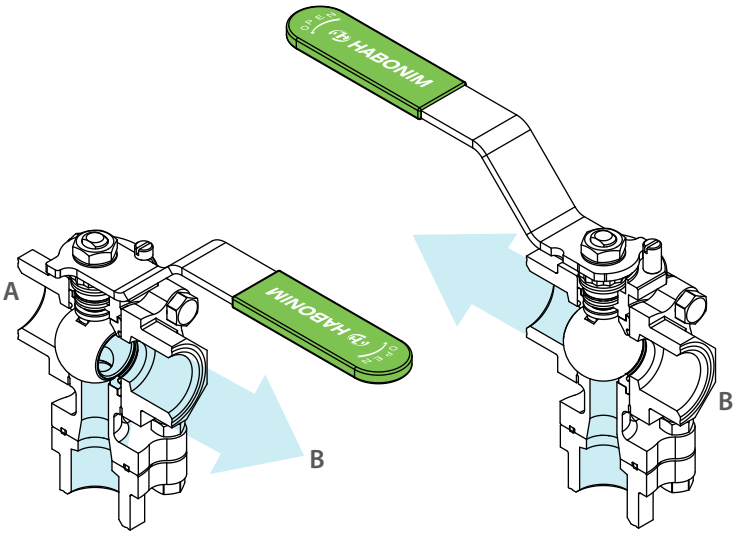




Bottom Entry - D47

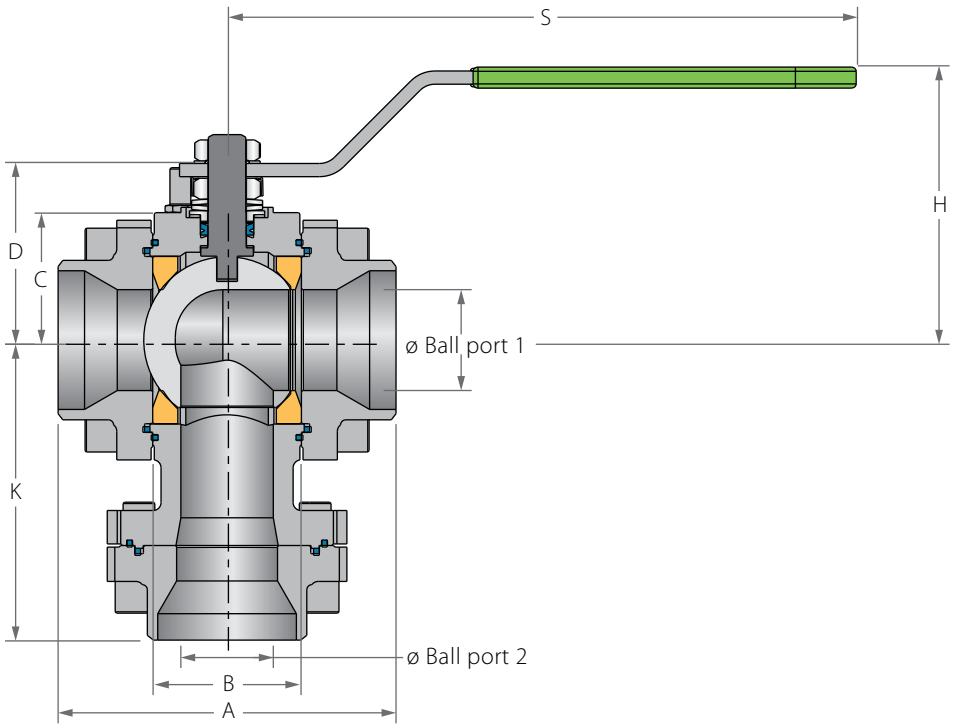
Rotation: 180°

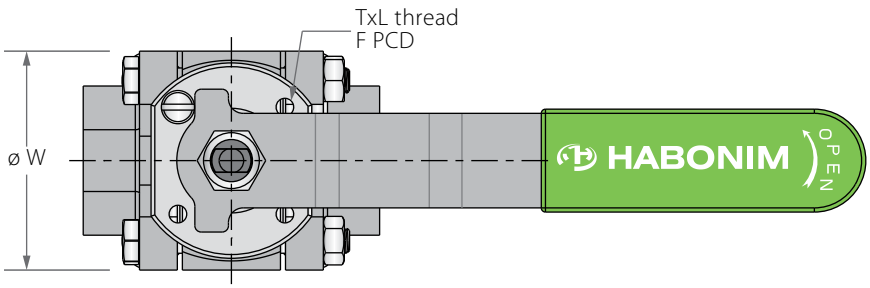




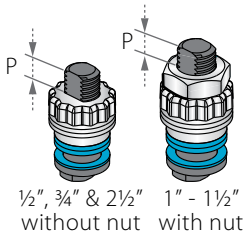
Diverter Floating Ball 3 Piece

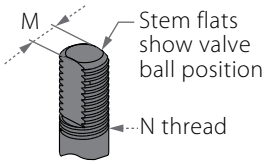
Valve Dimensions





Preparation for actuation

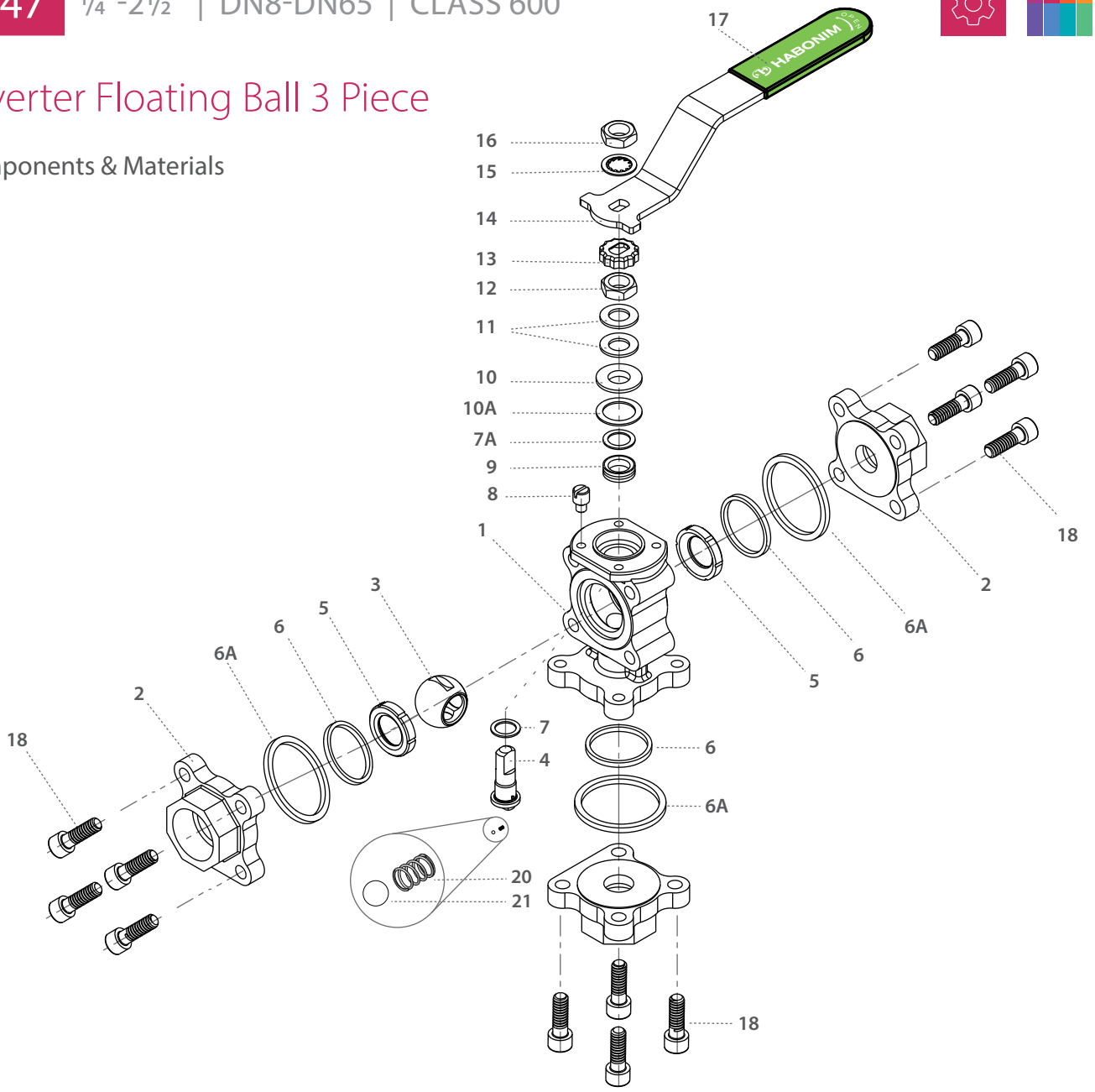




Std. port	Full port	Unit	Ball port1	Ball port2	A	B	C	D	H	K	S	W	M	N	P	F		TxL	Weight kg/lb	Kv / Cv
	DN8	mm	10.50	9.50	66.0	20.60	29.0	37.90	61.50	65.4	150.0	47.0	5.54	⅜ UNF	6.65	F03	36.0	M5X10	1.00	2.4
	¼"	inch	0.41	0.37	2.60	0.81	1.14	1.49	2.42	2.57	5.91	1.85	0.22		0.26		1.42		2.20	2.8
DN15	DN10	mm	10.50	9.50	66.0	20.60	29.0	37.90	61.50	65.4	150.0	47.0	5.54	⅜ UNF	6.65	F03	36.0	M5X10	1.00	2.8
½"	⅜"	inch	0.41	0.37	2.60	0.81	1.14	1.49	2.42	2.57	5.91	1.85	0.22		0.26		1.42		2.20	3.3
DN20	DN15	mm	14.30	11.90	70.60	24.50	31.40	40.30	63.90	70.6	150.0	53.70	5.54	⅜ UNF	6.65	F03	36.0	M5X10	1.20	4
¾"	½"	inch	0.56	0.47	2.78	0.97	1.24	1.59	2.52	2.78	5.91	2.11	0.22		0.26		1.42		2.64	5
DN25	DN20	mm	20.60	15.90	93.70	31.70	38.10	55.60	79.40	119.0	187.0	63.70	7.54	7/16 UNF	7.40	F04	42.0	M5X10	2.40	8
1"	¾"	inch	0.81	0.63	3.69	1.25	1.50	2.19	3.13	3.46	7.36	2.51	0.30		0.29		1.65		5.29	9
DN32	DN25	mm	25.40	20.50	108.0	41.30	42.70	60.20	84.10	97.0	187.0	71.70	7.54	7/16 UNF	7.40	F04	42.0	M5X10	4.00	16
1¼"	1"	inch	1.0	0.81	4.25	1.62	1.68	2.37	3.31	3.81	7.36	2.82	0.30		0.29		1.65		8.82	19
DN40	DN32	mm	31.80	26.60	115.50	48.40	43.60	73.0	97.0	105.50	237.0	86.70	8.71	9/16 UNF	8.50	F05	50.0	M6X12	5.50	40
1½"	1¼"	inch	1.25	1.05	4.55	1.91	1.72	2.87	3.82	4.15	9.33	3.41	0.34		0.33		1.97		12.12	46
DN50	DN40	mm	38.10	35.0	128.0	56.30	48.30	77.80	101.80	113.5	237.0	96.90	8.71	9/16 UNF	8.50	F05	50.0	M6X12	6.90	42
2"	1½"	inch	1.50	1.38	5.04	2.22	1.90	3.06	4.01	4.47	9.33	3.82	0.34		0.33		1.97		15.21	49
DN65	DN50	mm	50.80	48.0	158.0	72.60	70.0	88.10	115.10	132.70	237.0	108.0	8.71	9/16 UNF	13.50	F07	70.0	M8X12	14.45	96
2½"	2"	inch	2.0	1.89	6.22	2.86	2.76	3.47	4.53	5.22	9.33	4.25	0.34		0.53		2.76		31.85	111

Diverter Floating Ball 3 Piece

Components & Materials



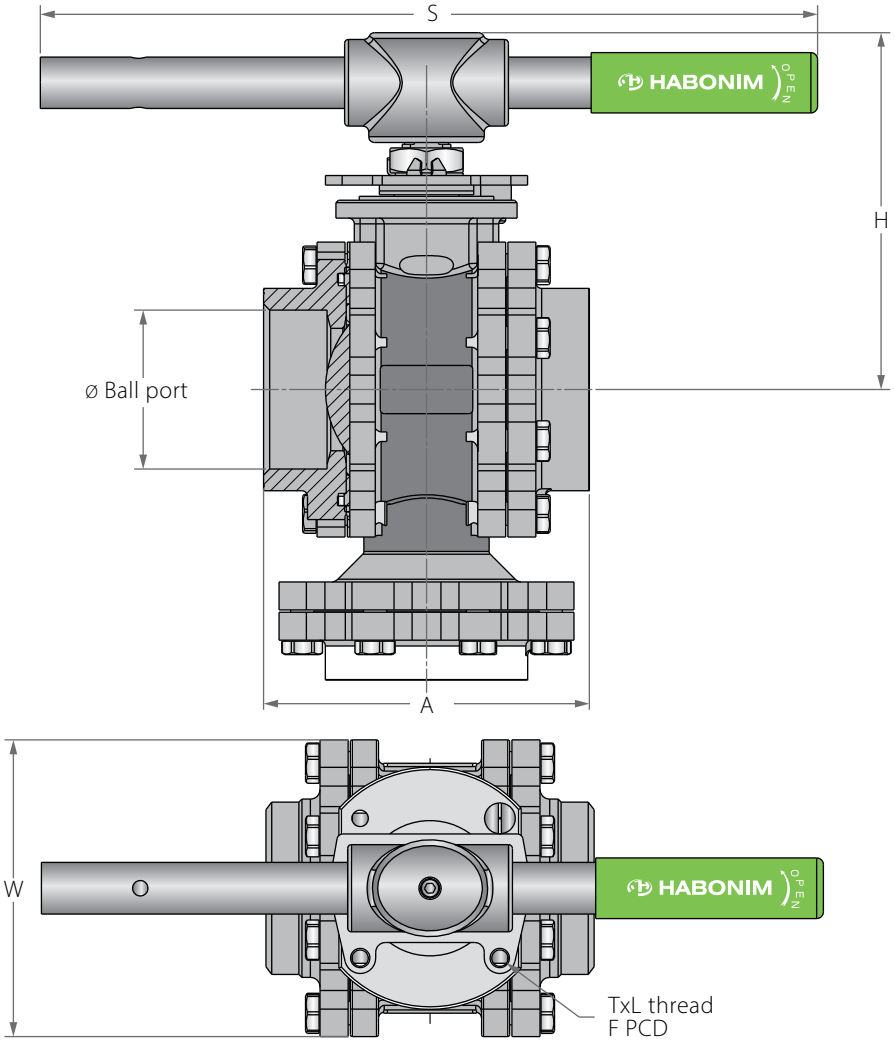
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	Acc. Ordering Code	3
6A*	Outer Seal	Acc. Ordering Code	3
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	12
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

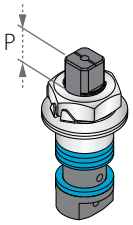
* Maintenance kit components

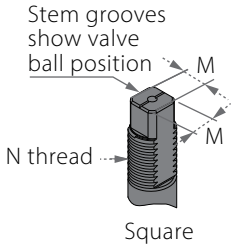
Diverter Floating Ball 3 Piece

Valve Dimensions



Preparation for actuation

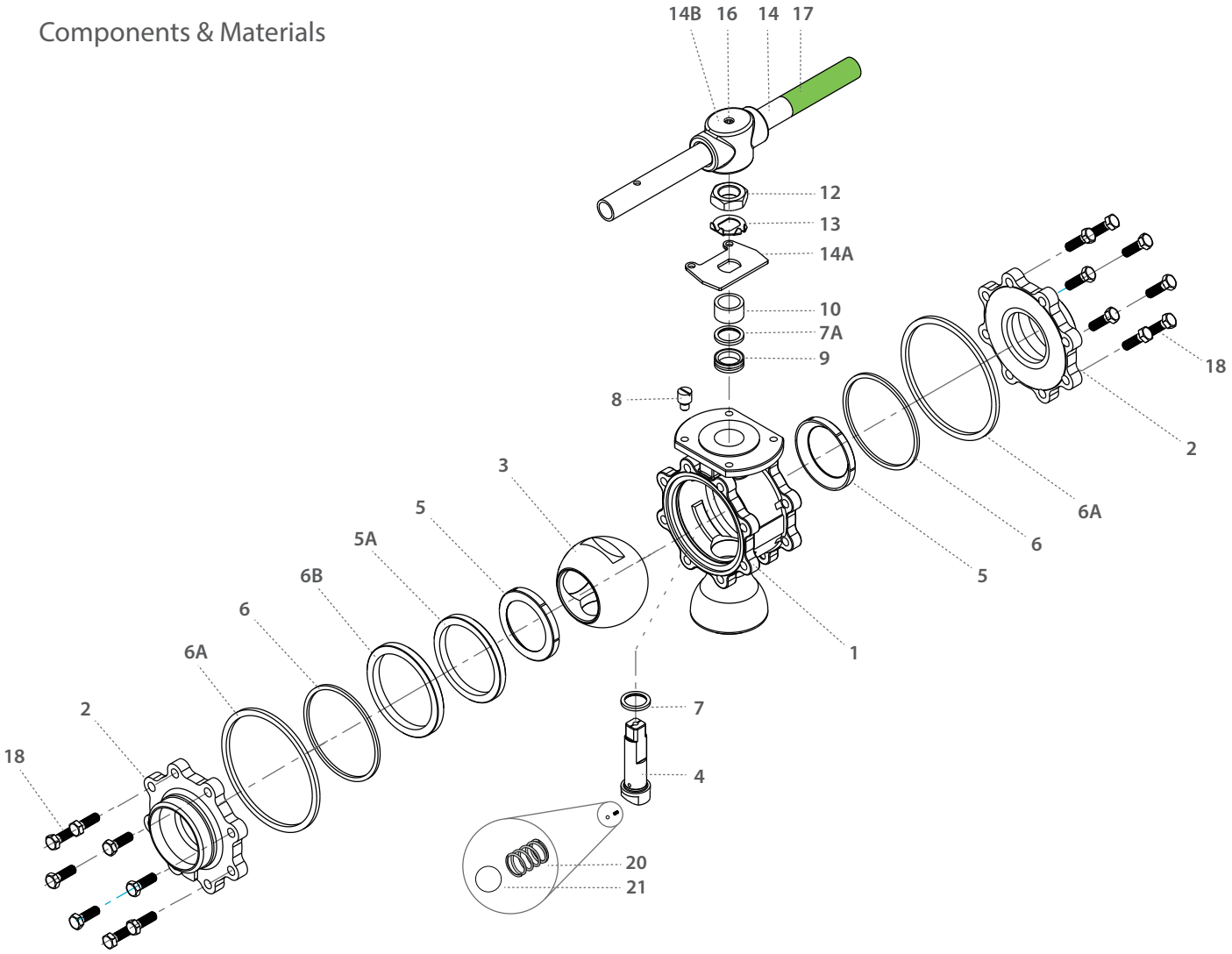




Std. port	Full port	Unit	Ball port 1	Ball port 2	A	B	C	D	H	K	S	W	M	N	P	F		TxL	Weight kg/lb	Kv / Cv
DN80	DN65	mm	63.75	80.50	169.0	83.3	98.3	144.9	185.0	163.0	400.0	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	18.00	129
3"	2½"	inch	2.51	3.17	6.65	3.28	3.87	5.70	7.28	6.42	15.75	0.74	0.63		0.66		4.02		39.67	150
DN100	DN80	mm	80.0	63.25	214.0	108.8	114.1	160.7	200.0	183.0	600.0	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	28.20	182
4"	3"	inch	3.15	2.49	8.43	4.28	4.49	6.33	7.87	7.20	23.62	0.74	0.63		0.66		4.02		62.15	211
	DN100	mm	92.0	67.0	239.0	123.0	124.0	170.5	211.0	200.0	600.0	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	36.00	334
	4"	inch	3.62	2.64	9.41	4.84	4.88	6.71	8.31	7.87	23.62	0.74	0.63		0.66		4.02		79.34	388
DN150		mm	111.35	77.90	346.0	146.0	157.0	226.0	286.0	212.0	916.0	28.45	23.75	1½"-12 UNF-2A	26.20	F12	125.0	M12x20	41.00	437
6"		inch	4.38	3.07	13.62	5.75	6.18	8.90	11.26	8.35	36.06	1.12	0.94		1.03		4.92		90.36	507

Diverter Floating Ball 3 Piece

Components & Materials



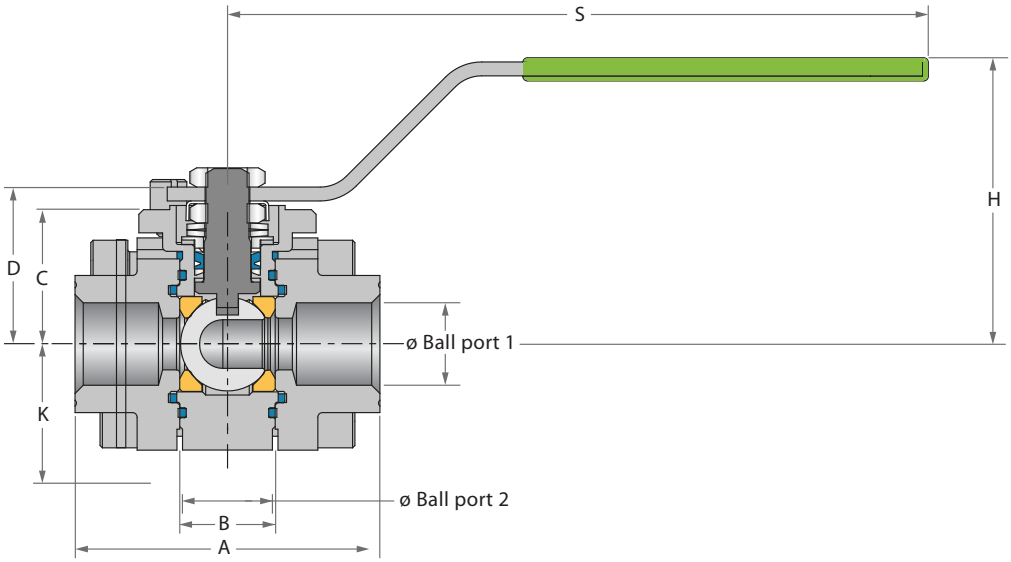
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
6B	Support Ring	S. Steel	1
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

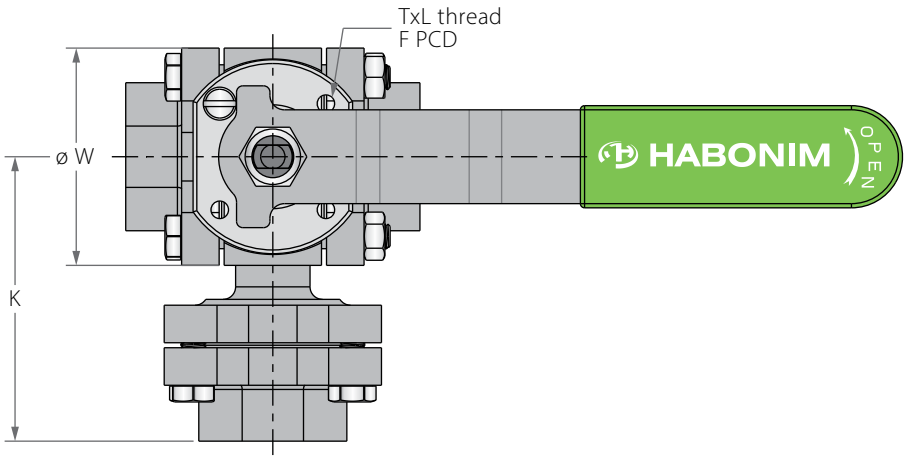
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	16
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

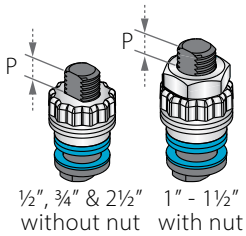
Side Entry Floating Ball 3 Piece

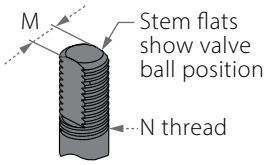
Valve Dimensions





Preparation for actuation

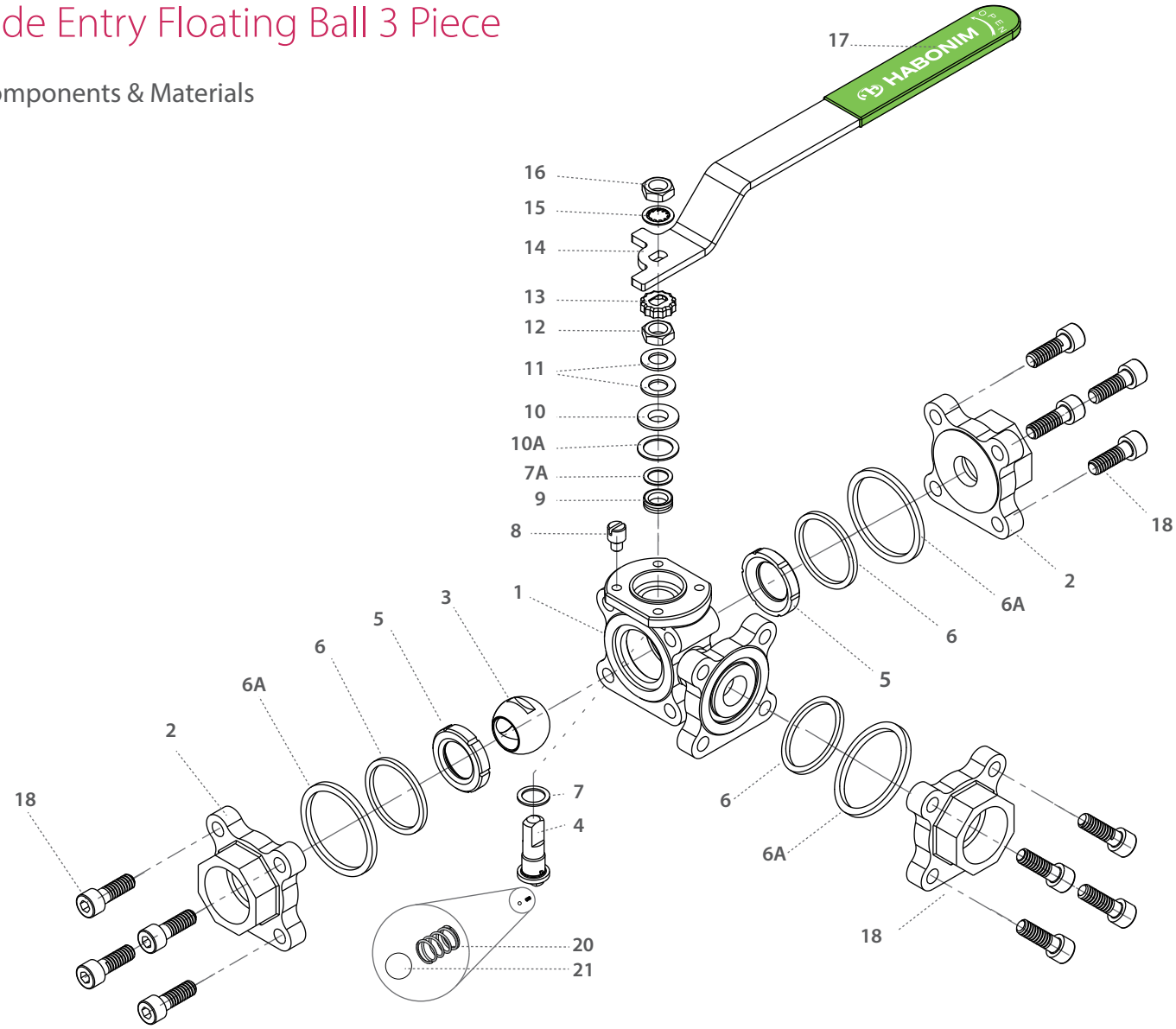




Std. port	Full port	Unit	Ball port1	Ball port2	A	B	C	D	H	K	S	W	M	N	P	F		TxL	Weight kg/lb	Kv / Cv
	DN8	mm	10.50	9.50	66.0	20.60	29.0	37.90	61.50	88.20	150.0	47.0	5.54	⅜ UNF	6.65	F03	36.0	M5X10	1.00	2.4
	¼"	inch	0.41	0.37	2.60	0.81	1.14	1.49	2.42	3.48	5.91	1.85	0.22		0.26		1.42		2.20	2.8
DN15	DN10	mm	10.50	9.50	66.0	20.60	29.0	37.90	61.50	88.20	150.0	47.0	5.54	⅜ UNF	6.65	F03	36.0	M5X10	1.00	2.8
½"	⅜"	inch	0.41	0.37	2.60	0.81	1.14	1.49	2.42	3.48	5.91	1.85	0.22		0.26		1.42		2.20	3.3
DN20	DN15	mm	14.30	11.90	70.60	24.50	31.40	40.30	63.90	93.70	150.0	53.70	5.54	⅜ UNF	6.65	F03	36.0	M5X10	1.20	4
¾"	½"	inch	0.56	0.47	2.78	0.97	1.24	1.59	2.52	3.68	5.91	2.11	0.22		0.26		1.42		2.64	5
DN25	DN20	mm	20.60	15.90	93.70	31.70	38.10	55.60	79.40	119.0	187.0	63.70	7.54	7/16 UNF	7.40	F04	42.0	M5X10	2.40	8
1"	¾"	inch	0.81	0.63	3.69	1.25	1.50	2.19	3.13	4.68	7.36	2.51	0.30		0.29		1.65		5.29	9
DN32	DN25	mm	25.40	20.50	108.0	41.30	42.70	60.20	84.10	130.15	187.0	71.70	7.54	7/16 UNF	7.40	F04	42.0	M5X10	4.00	16
1¼"	1"	inch	1.0	0.81	4.25	1.62	1.68	2.37	3.31	5.13	7.36	2.82	0.30		0.29		1.65		8.82	19
DN40	DN32	mm	31.80	26.60	115.50	48.40	43.60	73.0	97.0	139.05	237.0	86.70	8.71	9/16 UNF	8.50	F05	50.0	M6X12	5.50	40
1½"	1¼"	inch	1.25	1.05	4.55	1.91	1.72	2.87	3.82	5.47	9.33	3.41	0.34		0.33		1.97		12.12	46
DN50	DN40	mm	38.10	35.0	128.0	56.30	48.30	77.80	101.80	149.45	237.0	96.90	8.71	9/16 UNF	8.50	F05	50.0	M6X12	6.90	42
2"	1½"	inch	1.50	1.38	5.04	2.22	1.90	3.06	4.01	5.88	9.33	3.82	0.34		0.33		1.97		15.21	49
DN65	DN50	mm	50.80	48.0	158.0	72.60	70.0	88.10	115.10	175.40	237.0	108.0	8.71	9/16 UNF	13.50	F07	70.0	M8X12	14.45	96
2½"	2"	inch	2.0	1.89	6.22	2.86	2.76	3.47	4.53	6.90	9.33	4.25	0.34		0.53		2.76		31.85	111

Side Entry Floating Ball 3 Piece

Components & Materials



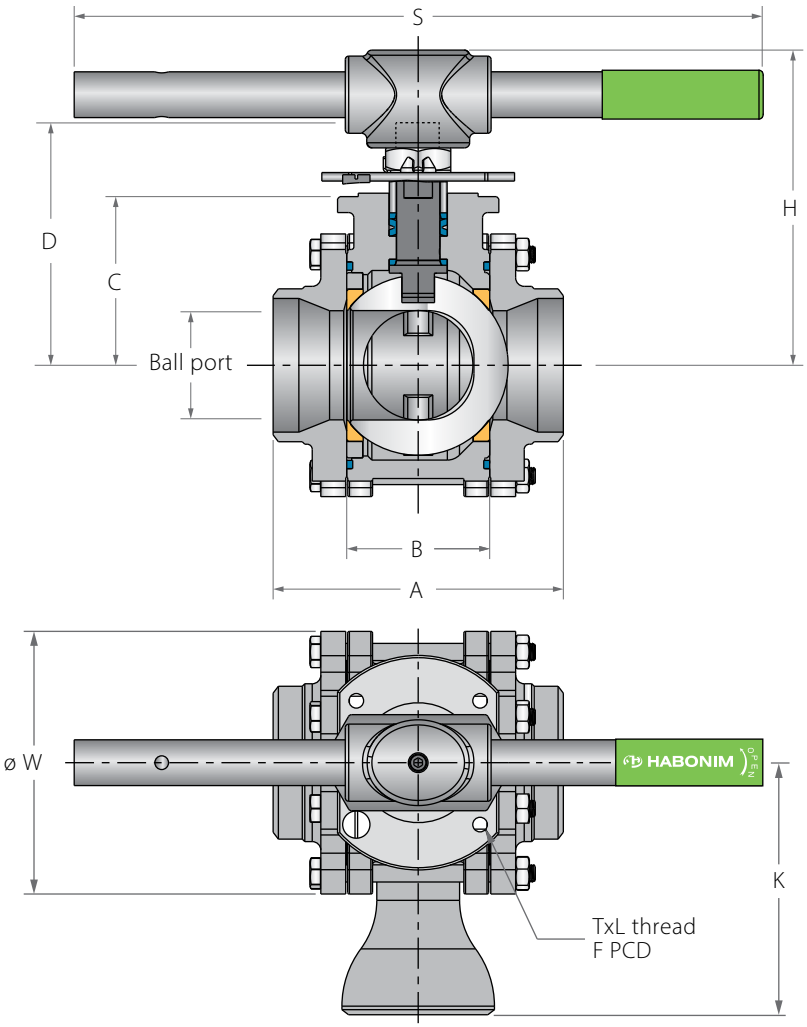
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	3
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	Acc. Ordering Code	3
6A*	Outer Seal	Acc. Ordering Code	3
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	4
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

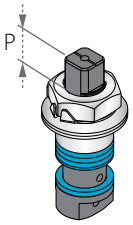
* Maintenance kit components

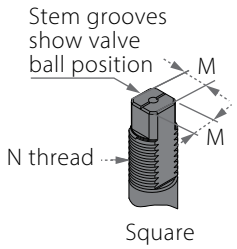
Side Entry Floating Ball 3 Piece

Valve Dimensions



Preparation for actuation

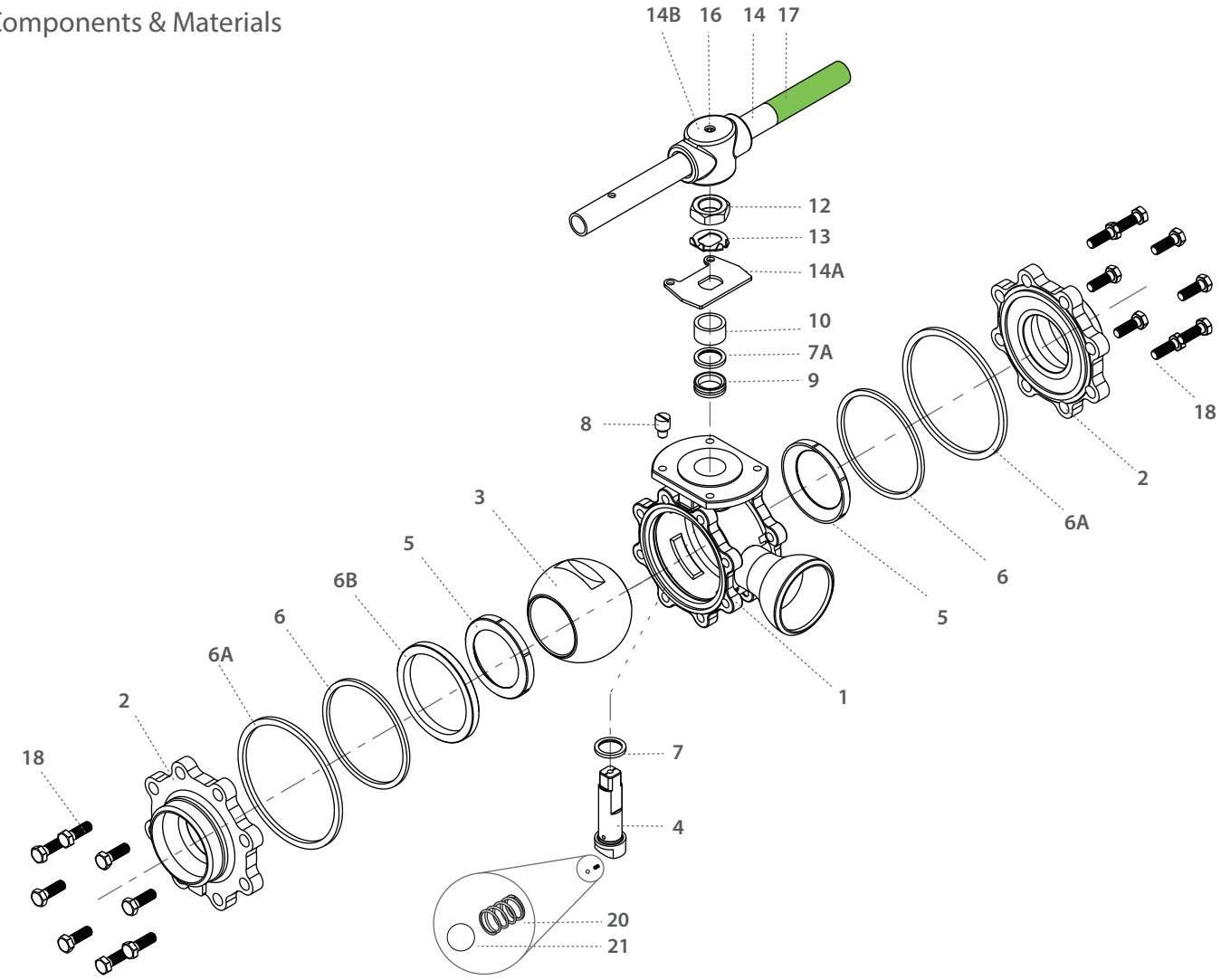




Std. port	Full port	Unit	Ball port 1	Ball port 2	A	B	C	D	H	K	S	W	M	N	P	F		TxL	Weight kg/lb	Kv / Cv
DN80	DN65	mm	63.75	80.50	169.0	83.3	98.3	144.9	185.0	163.0	400.0	140.0	18.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	18.00	129
3"	2½"	inch	2.51	3.17	6.65	3.28	3.87	5.70	7.28	6.42	15.75	5.50	0.74		0.66		4.02		39.67	150
DN100	DN80	mm	80.0	63.25	214	108.8	114.1	160.7	200.0	183.0	600.0	177.0	18.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	28.20	182
4"	3"	inch	3.15	2.49	8.43	4.28	4.49	6.33	7.87	7.20	23.62	6.97	0.74		0.66		4.02		62.15	211
	DN100	mm	92.0	67.0	239.0	123.0	124.0	170.5	211.0	200.0	600.0	217.0	18.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	36.00	334
	4"	inch	3.62	2.64	9.41	4.84	4.88	6.71	8.31	7.87	23.62	8.54	0.74		0.66		4.02		79.34	388
DN150		mm	111.35	77.90	346.0	146.0	157.0	226.0	286.0	212.0	916.0	266.0	28.45	1½"-12 UNF-2A	26.20	F12	125.0	M12x20	41.00	437
6"		inch	4.38	3.07	13.62	5.75	6.18	8.90	11.26	8.35	36.06	10.47	1.12		1.03		4.92		90.36	507

Side Entry Floating Ball 3 Piece

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	Acc. Ordering Code	1
6A*	Outer Seal	Acc. Ordering Code	2
6B	Support Ring	Acc. Ordering Code	2
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	Acc. Ordering Code	1
9*	Stem Seal	CF PTFE, TFM, Graphite	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
20	Antistatic Spring	S. Steel	2
21	Antistatic Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

D47 S47

Diverter | Side Entry 3 Piece - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	.	.	30
6	0				D	4	7	W	-	6	6	6	6	A	T	G	/	B	W	1	0	9	0					
Size		Features				Series		Design		Body/end material		Ball/Stem material		Seat material		Inner Seal material		Outer Seal material		End connection			Rotation			Special features		

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100
60	6"	150

Features (3-6)	
D	Diverter bottom entry
S	3 piece Side entry
B	Full port
O	Clean assembly for O2 service
K	Chlorine service
F	Shell only - fire safe
H*	Hydrogen service

* for material selection - see Hydrogen Service chapter

Series (7-8)	
D47	3 piece bottom entry
S47	3 piece side entry

Design (9)	
W	Total HermetiX Integrity package

Body/Ends material (11-12)	
6	S. SteelCF8M/CF3M*
1	Bronze
4	C. steel A216 WCB/A105
9	C. steel A352 LCB
7	Monel
A	Alloy-20
W	Alloy-C22
D	Duplex A479
K	Super Duplex A479
S	254SMO A479

* CF3M - for welded ends only.

Ball material (13)	
6	S. SteelCF8M/316
W	Hastelloy-C22
S	254SMO
D	Duplex
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

Stem material (14)	
6	S. Steel316
M	High Strength S. Steel
Z	Inconel 718
W	Alloy-C22
S	254SMO A479
A	Alloy-20
D	Duplex A479
K	Super Duplex A479
7	Monel
C	Hastelloy-C276

Seat material (15)	
A	TFM(3)
U	UHMWPE
T	PTFE(3)
P	CF PTFE(3)
C	PCTFE
K	CF PEEK
L	Virgin Peek
Y	Delrin
W	PVDF
R	15% Glass filled PTFE

Inner Seal Material (16)	
T	PTFE
A	TFM
U	UHMWPE
V	Viton
B	NBR
G	Expanded graphite

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End Connection (19-22)	
Welded ends	
BW10	Buttweld schd. 10
BW	Buttweld schd. 40
SW	Socket weld
XBW10	Extended buttweld schd. 10
XBW	Extended buttweld schd. 40
XSW	Extended socket weld
BW5	Buttweld schd. 5
BW80	Buttweld schd. 80
BWO*	Buttweld tube OD
BWD	Buttweld DIN 11850
BWI1.6	Buttweld ISO 1127 1.6mm
BWI2.0	Buttweld ISO 1127 2.0mm
BWI2.3	Buttweld ISO 1127 2.3mm
SWO*	Socket weld tube OD
ETO*	Extended tube OD
ETI1.6	Extended buttweld ISO 1127 1.6mm
ETI2.0	Extended buttweld ISO 1127 2.0mm
ETI2.3	Extended buttweld ISO 1127 2.3mm
ETD	Extended buttweld DIN 11850
Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	SAE internal straight thread
MNPT	Male NPT
MBSPT	Male BSPT
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF
Clamp	
LL*	Compression fitting (Imperial) - **No** Nuts & Ferrules
LM*	Compression fitting (metric) - **No** Nuts & Ferrules
LL-NF*	Compression fitting (Imperial) - **with** Nuts & Ferrules
LM-NF*	Compression fitting (metric) - **with** Nuts & Ferrules
TC*	Tri-Clamp
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)

* Std. port only
** Not available for 1¼" (DN32) Valves

Rotation (23 -25)	
90	90 degrees rotation
180	180 degrees rotation applicable for bottom entry diverter valve L

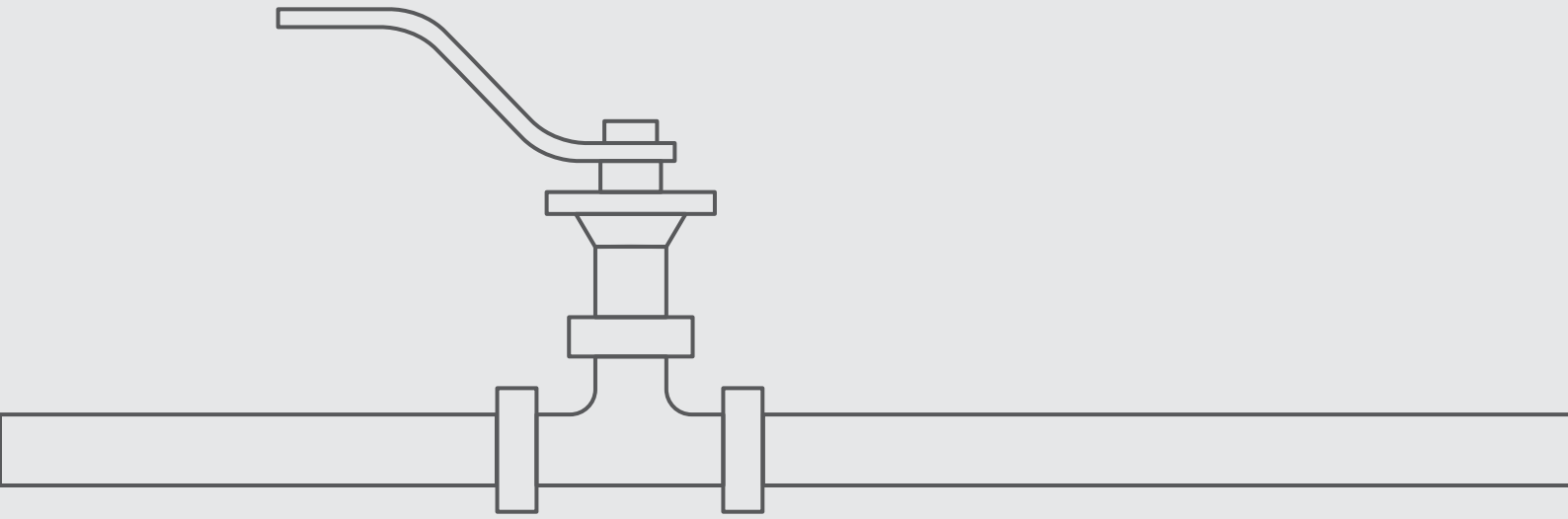
Special Features (24-30)	
B	Body made from rolled bar
EP	Electropolished
WR	DD stem
G...	Internal surface finish (G24, G32)
Valve Special Stem Seals	
AAX	FDA compliant stem seal. TFM thrust bearing and X shape gasket
PPX	CF PTFE thrust and X shape gasket
CAX	PCTFE thrust and TFM X shape gasket
CPX	PCTFE thrust and CF PTFE X shape gasket
HC	High Cycle service

D31 S31 D32 S32

Industrial Valves

FLOATING BALL

DIVERTER
SIDE ENTRY
FLANGED

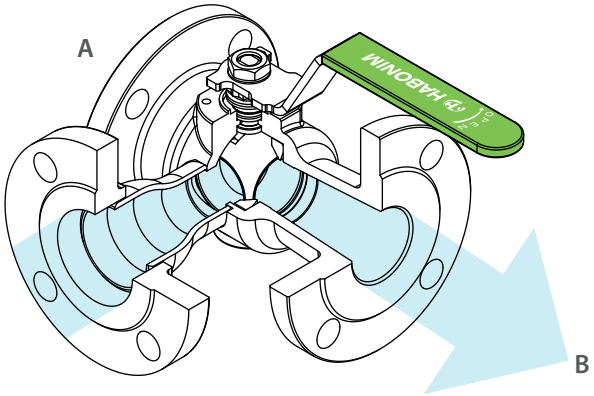


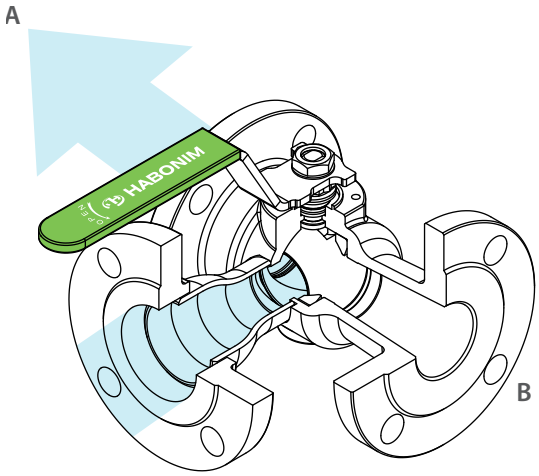


D31 S31 D32 S32

Side Entry - S31, S32

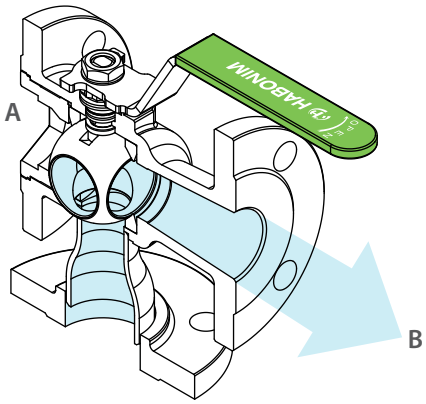
Rotation: 90°

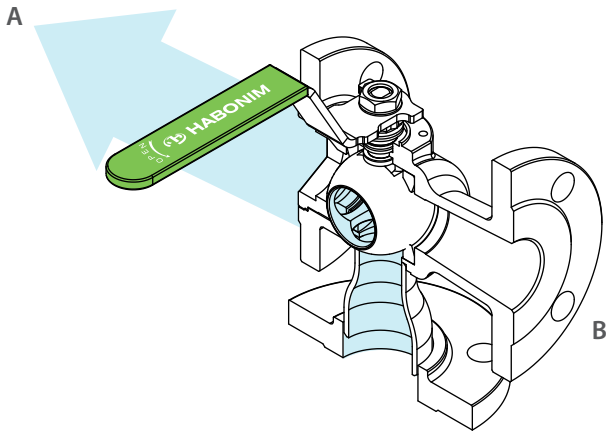




Bottom Entry - D31, D32

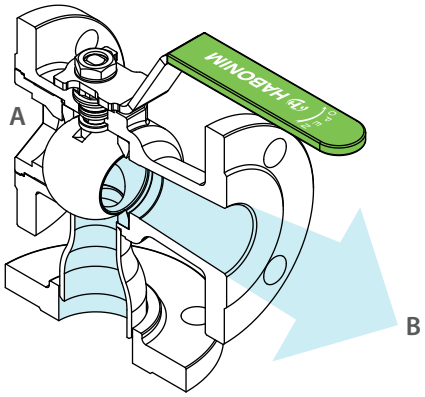
Rotation: 90°

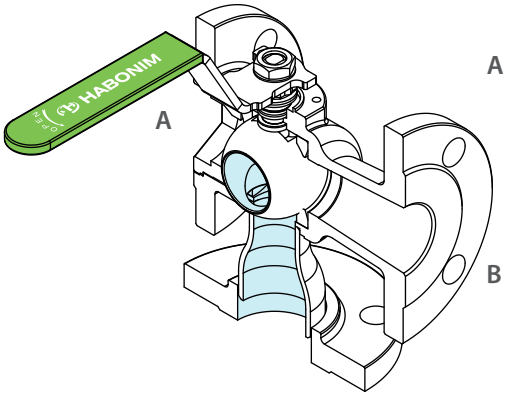


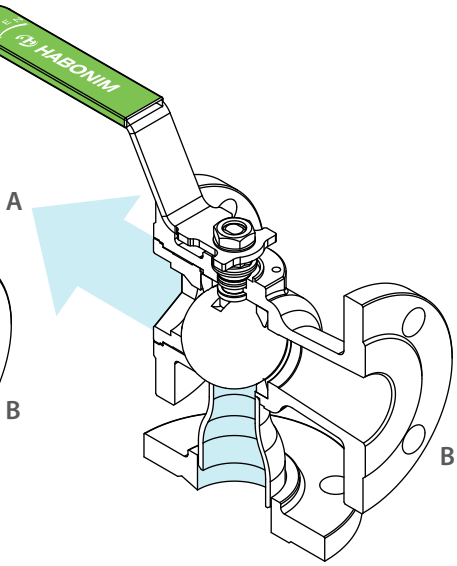


Bottom Entry - D31, D32

Rotation: 180°



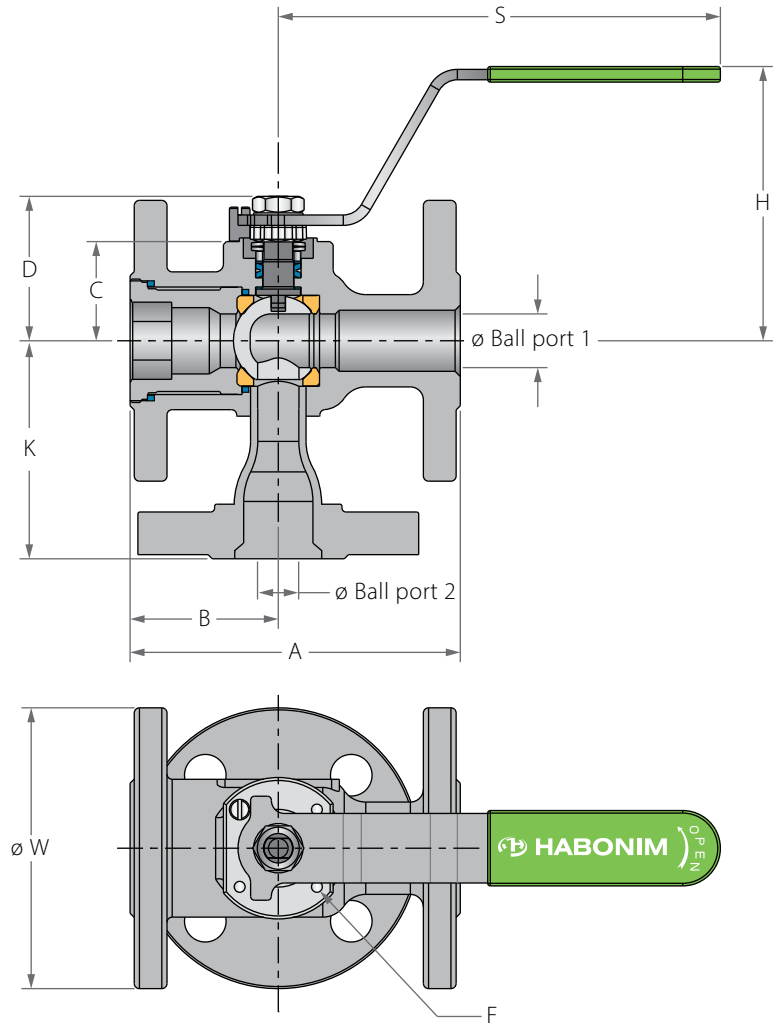




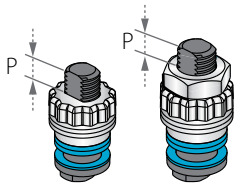
D31 D32 ½"-2" | DN15-DN50 | CLASS 150/300

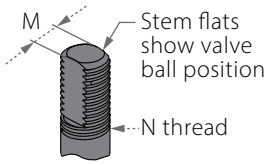
Diverter Floating Ball Flanged

Valve Dimensions



Preparation for actuation

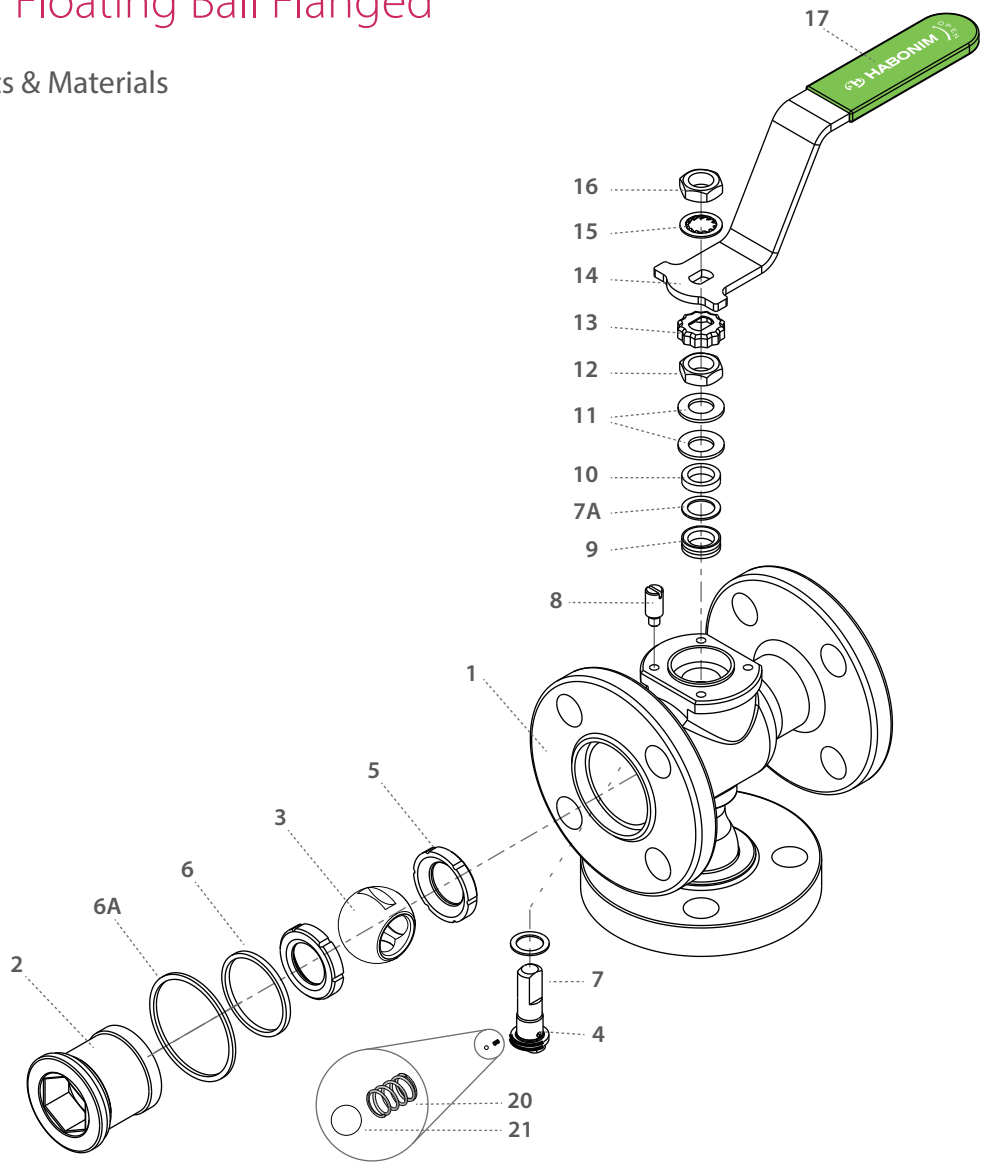




Std. port	Unit	Ball port1	Ball port2	A		B	C	D	H	K		S	W		M	N	P	F		Weight kg/lb		Kv
				150	300					150	300		150	300						150	300	Cv
DN15	mm	10.5	9.5	108.0	140.0	46.0	29.0	38.0	92.0	85.5	84.5	151.0	88.90	95.25	5.54	⅜ UNF	6.65	F03	36.0	1.7	2.4	2.8
½"	inch	0.41	0.37	4.25	5.50	1.81	1.14	1.50	3.62	3.4	3.3	5.94	3.50	3.75	0.22		0.26		1.42	3.8	5.3	3.3
DN20	mm	14.3	11.9	117.0	152.0	49.0	31.40	40.30	94.0	77.5		151.0	98.55	163.07	5.54	⅜ UNF	6.65	F03	36.0	2.3	3.3	4
¾"	inch	0.56	0.47	4.61	6.0	1.93	1.24	1.59	3.70	3.0		5.94	3.88	6.42	0.22		0.26		1.42	5.1	7.3	5
DN25	mm	20.6	15.9	127.0	165.0	57.0	38.20	55.60	103.50	83.9	109.2	170.0	107.95	123.95	7.54	7/16 UNF	7.40	F04	42.0	3.1	4.6	8
1"	inch	0.81	0.63	5.0	6.50	2.25	1.50	2.19	4.07	3.3	4.3	6.69	4.25	4.88	0.30		0.29		1.65	7.3	10.2	9
DN40	mm	31.8	26.6	165.0	190.0	62.0	43.60	73.10	119.20	101.6	161.0	220.50	127.0	155.52	8.71	9/16 UNF	8.50	F05	50.0	5.5	8.7	40
1½"	inch	1.25	1.05	6.50	7.50	2.44	1.72	2.88	4.70	4.0	6.3	8.68	5.0	6.10	0.34		0.33		1.97	12.2	19.3	46
DN50	mm	38.1	35.0	178.0	216.0	68.0	48.30	77.80	123.90	127.8		220.50	152.40	165.10	8.71	9/16 UNF	8.50	F05	50.0	8.1	10.8	42
2"	inch	1.5	1.38	7.0	8.50	2.67	1.90	3.06	4.88	5.0	5.12	8.68	6.0	6.50	0.34		0.33		1.97	18	24	49

Diverter Floating Ball Flanged

Components & Materials



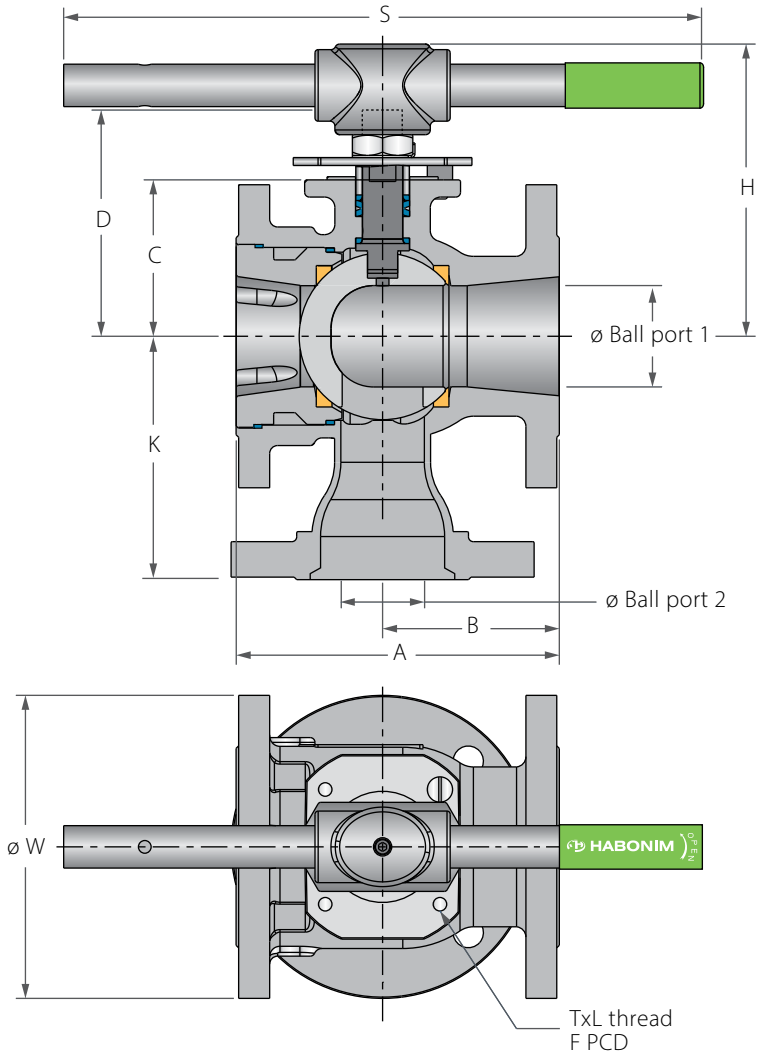
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	PTFE	1
6A	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

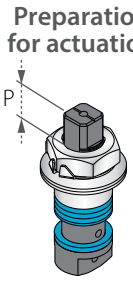
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

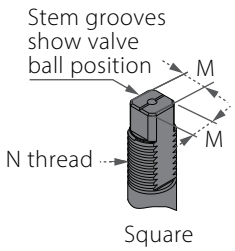
* Maintenance kit components

Diverter Floating Ball Flanged

Valve Dimensions



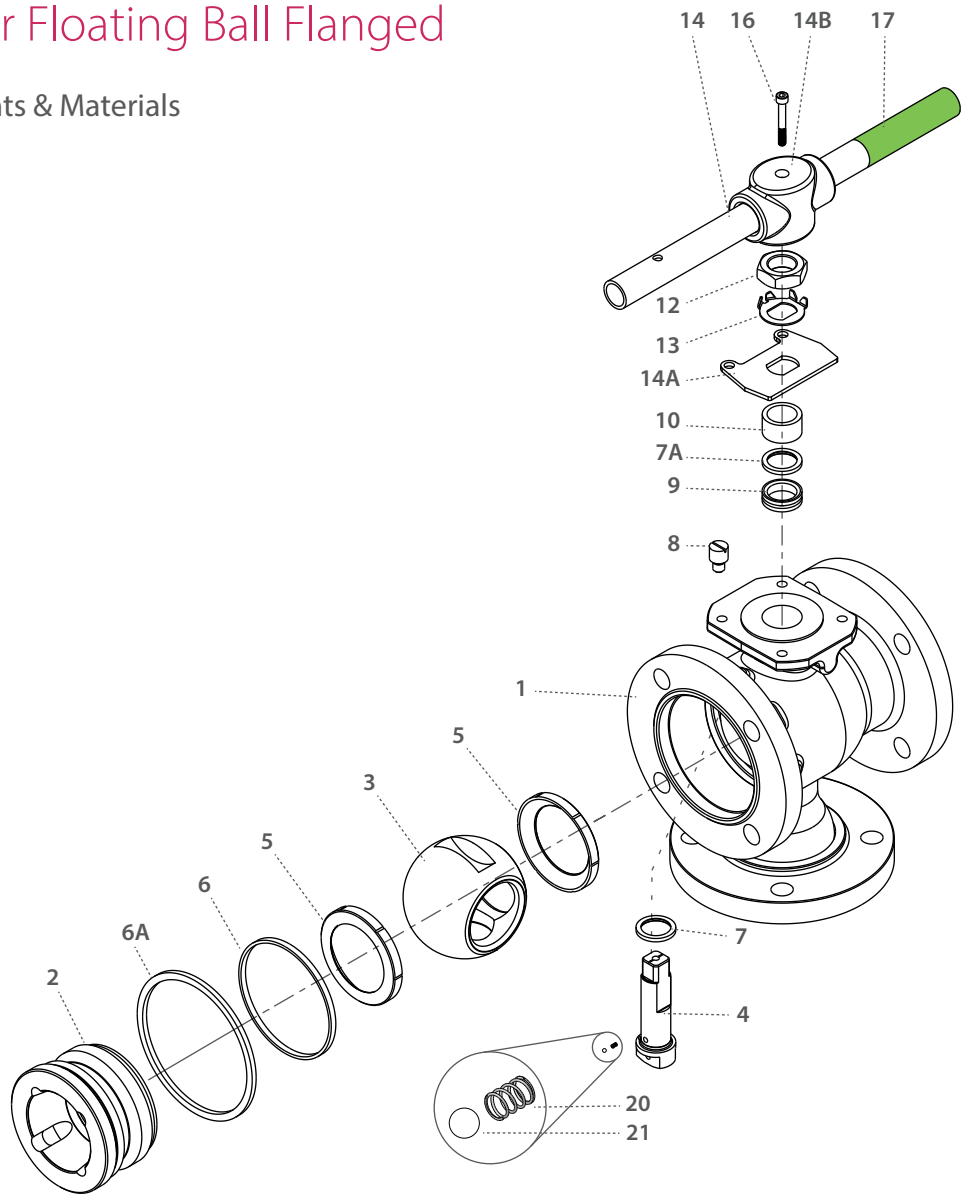




Std. port	Unit	Ball port1	Ball port2	A		B	C	D	H	K		S	W		M	M-DD	N	P	F		TxL	Weight kg/lb		Kv
				150	300					150	300		150	300								150	300	Cv
DN80	mm	63.50	50.0	203.0	284.0	92.0	98.40	145.0	185.10	153.0	160.0	400.0	190.50	209.55	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	18.00	22.70	129
3"	inch	2.50	1.97	8.0	11.18	3.62	3.88	5.72	7.28	6.02	6.3	15.75	7.50	8.25	0.74	0.63		0.66		4.02		40.00	50.40	150
DN100	mm	82.60	63.0	229.0	305.0	102.0	114.10	161.0	201.0	185.0		610.0	228.60	254.0	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	28.20	36.30	182
4"	inch	3.25	2.48	9.0	12.0	4.0	4.49	6.34	7.91	7.28		24.01	9.0	10.0	0.74	0.63		0.66		4.02		62.80	80.60	211
DN150	mm	111.10	78.0	267.0	403.20	108.0	157.40	226.0	285.90	250.0		916.0	279.40	317.50	28.45	23.75	1½"-12 UNF-2A	26.20	F12	125.0	M12x20	41.00	69.00	437
6"	inch	4.38	3.07	10.50	15.88	4.25	6.20	8.91	11.25	9.84		36.08	11.0	12.50	1.12	0.94		1.03		4.92		91.00	153.00	507
DN200	mm	144.40	98.0	292.0	419.0	163.50	185.20	254.0	313.60	300.0		916.0	342.90	381.0	28.45	23.75	1½"-12 UNF-2A	26.20	F12	125.0	M12x20	82.00	105.00	698
8"	inch	5.68	3.86	11.50	16.50	5.37	7.30	10.0	12.34	11.81		36.08	13.50	15.0	1.12	0.94		1.03		4.92		182.00	233.00	810

Diverter Floating Ball Flanged

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE (KEL-F)	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE (KEL-F)	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

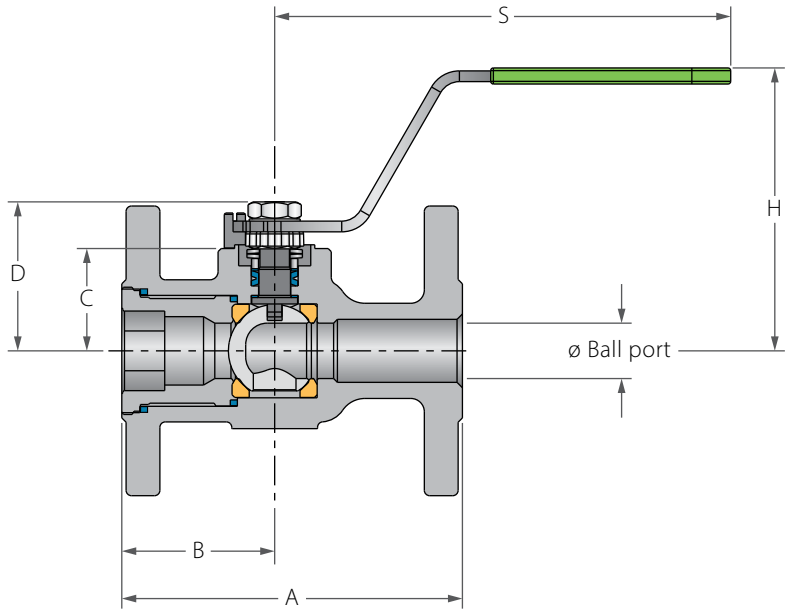
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1

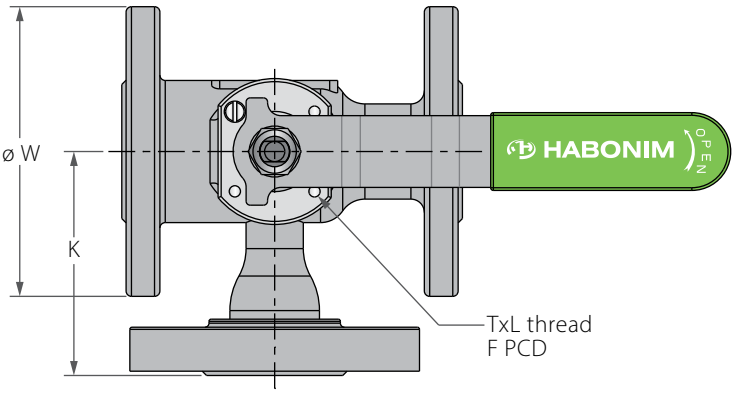
* Maintenance kit components

S31 S32 ½"-2" | DN15-DN50 | CLASS 150/300

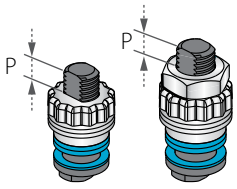
Side Entry Floating Ball Flanged

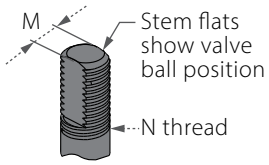
Valve Dimensions





Preparation for actuation

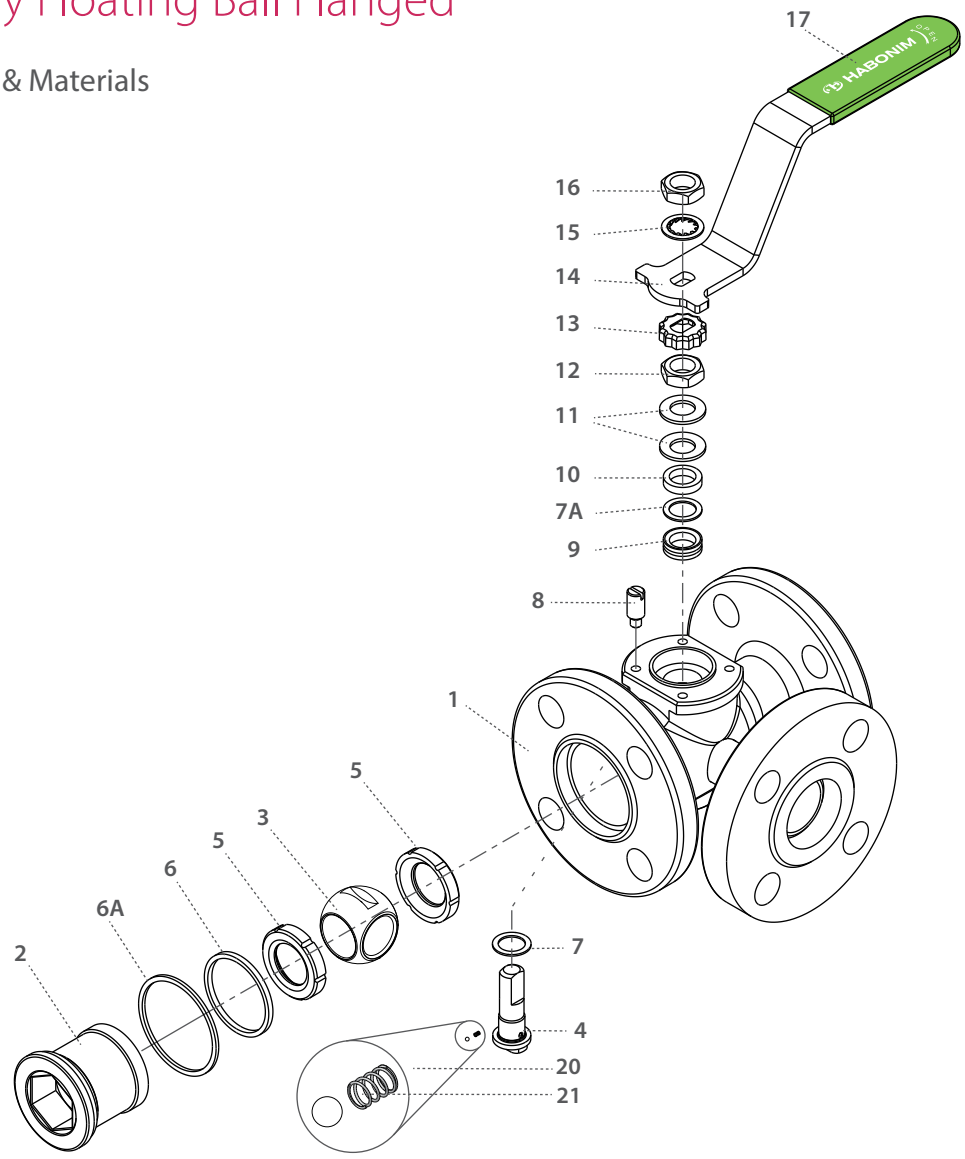




Std. port	Unit	Ball port1	Ball port2	A		B	C	D	H	K		S	W		M	N	P	F		Weight kg/lb		Kv
				150	300					150	300		150	300						150	300	Cv
DN15	mm	13.50	11.15	108.0	140.0	46.0	29.0	38.0	92.0	84.5	84.5	151.0	88.90	95.25	5.54	⅜ UNF	6.65	F03	36.0	1.7	2.4	2.8
½"	inch	0.53	0.44	4.25	5.50	1.81	1.14	1.50	3.62	3.33	3.33	5.94	3.50	3.75	0.22		0.26		1.42	3.8	5.3	3.3
DN20	mm	17.50	14.30	117.0	152.0	49.0	31.40	40.30	94.0			151.0	98.55	163.07	5.54	⅜ UNF	6.65	F03	36.0	2.3	3.3	4
¾"	inch	0.69	0.56	4.61	6.0	1.93	1.24	1.59	3.70			5.94	3.88	6.42	0.22		0.26		1.42	5.1	7.3	5
DN25	mm	23.50	20.60	127.0	165.0	57.0	38.20	55.60	103.50	83.5	109.0	170.0	107.95	123.95	7.54	7/16 UNF	7.40	F04	42.0	3.1	4.6	8
1"	inch	0.93	0.81	5.0	6.50	2.25	1.50	2.19	4.07	3.29	4.29	6.69	4.25	4.88	0.30		0.29		1.65	7.3	10.2	9
DN40	mm	39.0	31.80	165.0	190.0	62.0	43.60	73.10	119.20	98.5	161	220.50	127.0	155.52	8.71	9/16 UNF	8.50	F05	50.0	5.5	8.7	40
1½"	inch	1.54	1.25	6.50	7.50	2.44	1.72	2.88	4.70	3.88	6.34	8.68	5.0	6.10	0.34		0.33		1.97	12.2	19.3	46
DN50	mm	48.0	38.20	178.0	216.0	68.0	48.30	77.80	123.90	122.0	129	220.50	152.40	165.10	8.71	9/16 UNF	8.50	F05	50.0	8.1	10.8	42
2"	inch	1.89	1.50	7.0	8.50	2.67	1.90	3.06	4.88	4.8	5.07	8.68	6.0	6.50	0.34		0.33		1.97	18	24	49

Side Entry Floating Ball Flanged

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	1
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

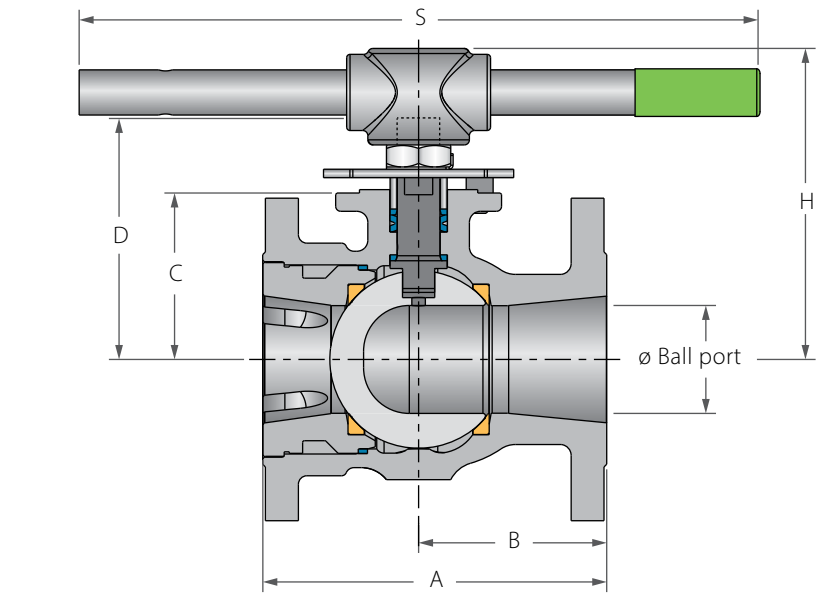
Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	1
21	Anti-Static Plunger	S. Steel	1
23	Tag (not shown)	S. Steel	1

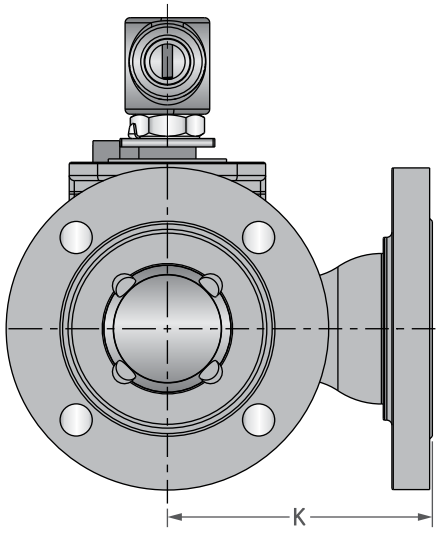
* Maintenance kit components

S31 S32 3"-8" | DN80-DN200 | CLASS 150/300

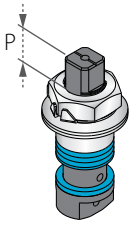
Side Entry Floating Ball Flanged

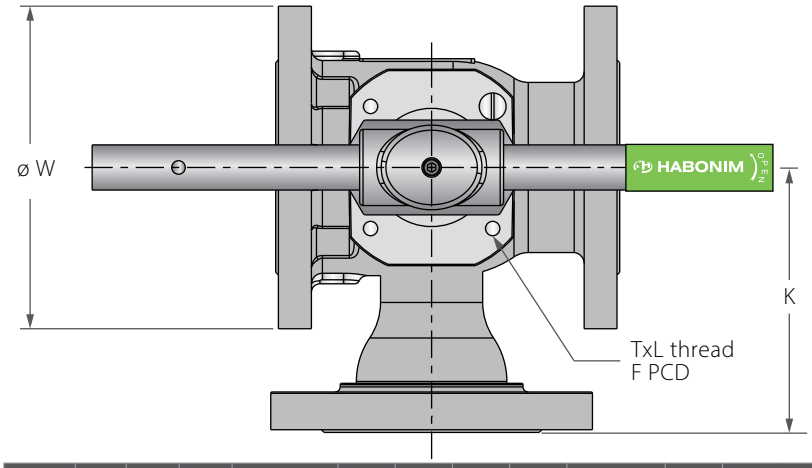
Valve Dimensions

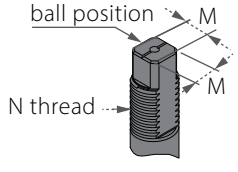




Preparation for actuation





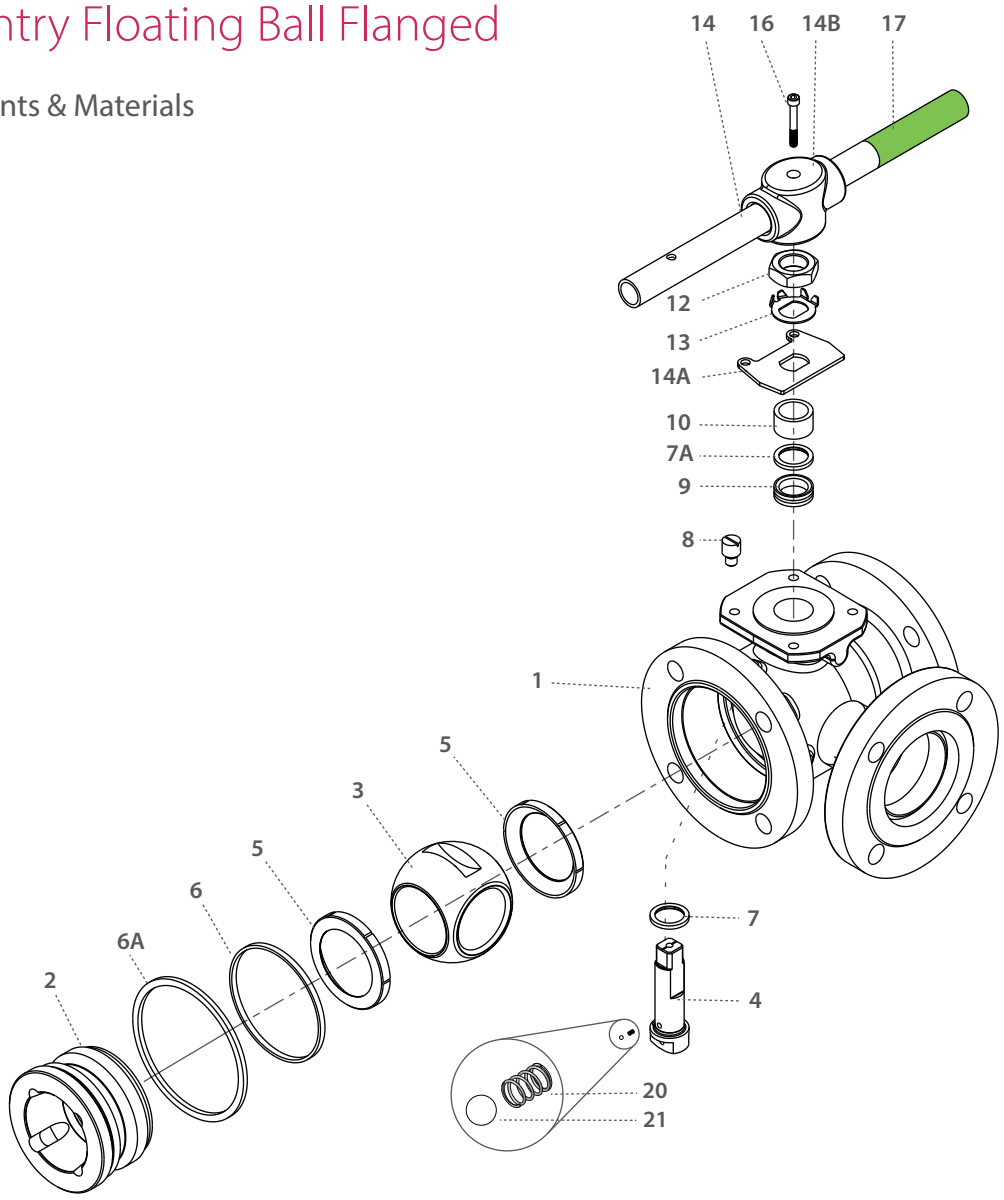


Square

Std. port	Unit	Ball port1	Ball port2	A		B	C	D	H	K		S	W		M	M-DD	N	P	F		TxL	Weight kg/lb		Kv
				150	300					150	300		150	300								150	300	Cv
DN80	mm	63.50	50.0	203.0	284.0	92.0	98.40	145.0	185.10	156.5	160.2	400.0	190.50	209.55	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	18.00	22.70	129
3"	inch	2.50	1.97	8.0	11.18	3.62	3.88	5.72	7.28	6.16	6.31	15.75	7.50	8.25	0.74	0.63		0.66		4.02		40.00	50.40	150
DN100	mm	82.60	63.0	229.0	305.0	102.0	114.10	161.0	201.0	185.6	185	610.0	228.60	254.0	18.90	15.90	1"-14 UNS-2A	16.70	F10	102.0	M10x20	28.20	36.30	182
4"	inch	3.25	2.48	9.0	12.0	4.0	4.49	6.34	7.91	7.31	7.28	24.01	9.0	10.0	0.74	0.63		0.66		4.02		62.80	80.60	211
DN150	mm	111.10	78.0	267.0	403.20	108.0	157.40	226.0	285.90	248		916.0	279.40	317.50	28.45	23.75	1½"-12 UNF-2A	26.20	F12	125.0	M12x20	41.00	69.00	437
6"	inch	4.38	3.07	10.50	15.88	4.25	6.20	8.91	11.25	9.76		36.08	11.0	12.50	1.12	0.94		1.03		4.92		91.00	153.00	507
DN200	mm	144.40	98.0	292.0	419.0	163.50	185.20	254.0	313.60		295	916.0	342.90	381.0	28.45	23.75	1½"-12 UNF-2A	26.20	F12	125.0	M12x20	82.00	105.00	698
8"	inch	5.68	3.86	11.50	16.50	5.37	7.30	10.0	12.34		11.61	36.08	13.50	15.0	1.12	0.94		1.03		4.92		182.00	233.00	810

Side Entry Floating Ball Flanged

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Plug	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Body Seal	PTFE	1
6A*	Outer Seal	Acc. Ordering Code	
7*	Stem Thrust Seal	PEEK, CF PEEK, PCTFE (KEL-F)	1
7A*	Anti-Abrasion Ring	PEEK, CF PEEK, PCTFE (KEL-F)	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1

Item	Description	Material specification	Qty.
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Tab Lock Washer	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
20	Anti-Static Spring	S. Steel	2
21	Anti-Static Plunger	S. Steel	2
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

D31 S31 D32 S32

Diverter I Side Entry Floating Ball Flanged - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	#	26	.	.	30
6	0				D	3	1	W	-	6	6	6	6	A	T	G	/	1	5	0		9	0					
Size		Features				Series		Design		Body/end material		Ball/Stem material		Seat material	Inner Seal material	Outer Seal material		End connection				Rotation			Special features			

Size (1-2)		
Code	inch	mm
05	½"	15
07	¾"	20
10	1"	25
15	1½"	40
20	2"	50
30	3"	80
40	4"	100
60	6"	150
80	8"	200

Features (3-6)	
D	Diverter bottom entry
S	Diverter side entry
O	Clean assembly for O2 service
H*	H Hydrogen service

* for material selection - see Hydrogen Service chapter

Series (7-8)	
31	ANSI #150 flanged bottom entry
31	ANSI #150 flanged side entry
32	ANSI #300 flanged bottom entry
32	ANSI #300 flanged side entry

Design (9)	
W	Total HermetiX Integrity package

Body/Ends material (11-12)	
6	S. SteelCF8M/CF3M*
4	C. steel A216 WCB/A105
D	Duplex A479
K	Super Duplex A479
S	254SMO A479

* CF3M - for welded ends only.

Ball material (13)	
6	S. SteelCF8M/316
M	High Strength S. Steel
S	254SMO
D	Duplex
K	Super Duplex

Stem material (14)	
6	S. Steel316
M	High Strength S. Steel
Z	Inconel 718
D	Duplex A479
K	Super Duplex A479
S	254SMO A479

Seat material (15)	
A	TFM
P	CF PTFE
K	CF PEEK
L	Virgin Peek
U	UHMWPE
C	PCTFE
Y	Delrin
W	PVDF
T	PTFE
R	15% Glass filled PTFE

Inner Seal Material (16)	
T	PTFE
A	TFM
G	Expanded graphite
U	UHMWPE
V	Viton
B	NBR

Outer Seal (17)	
G	Expanded graphite
A	TFM

End Connection (19-22)	
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF

Rotation (23 -25)	
90	90 degrees rotation
180	180 degrees rotation applicable for bottom entry diverter valve L

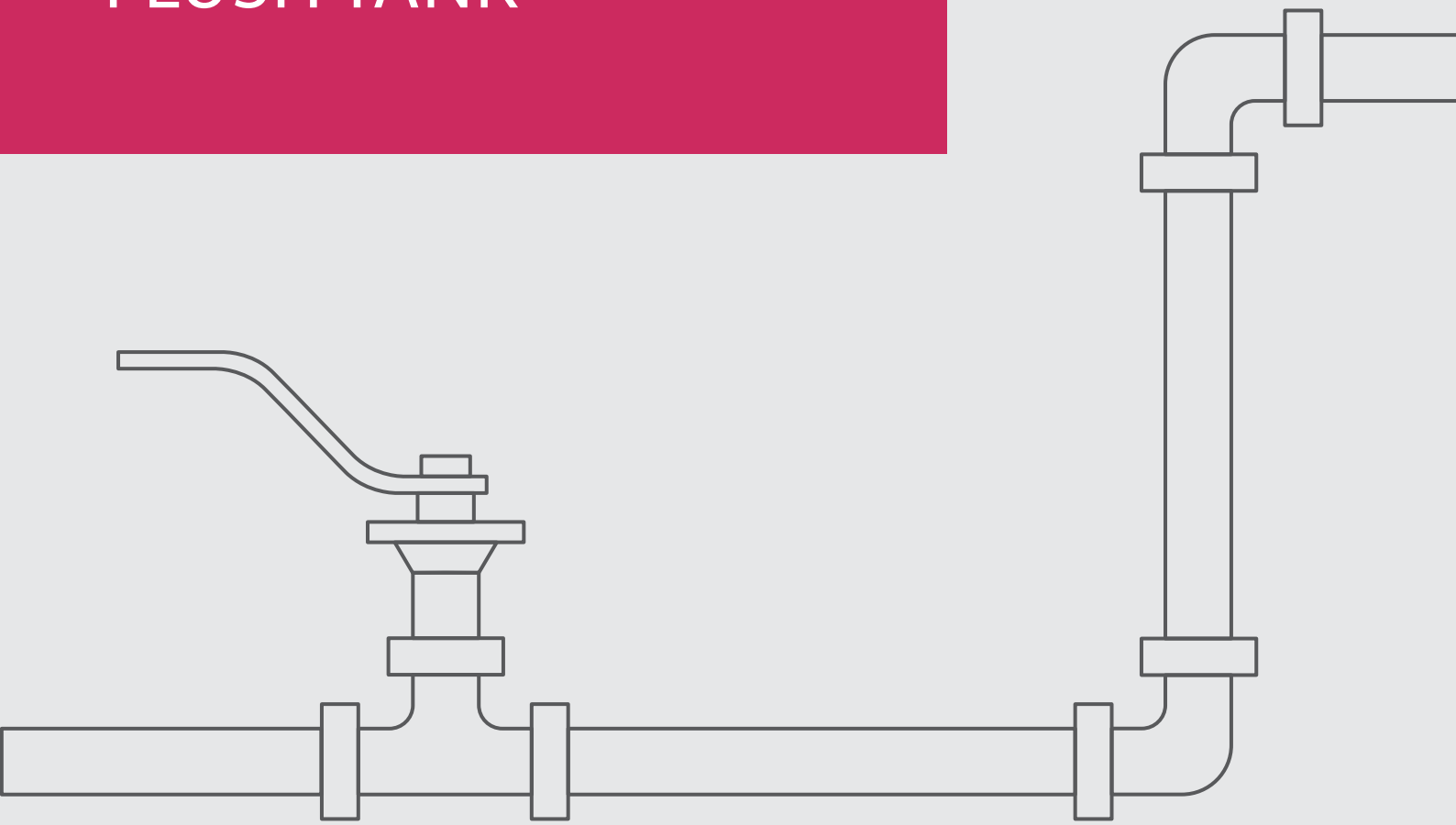
Special Features (24-30)	
Valve Special Stem Seals	
HC	High Cycle service
AAX	FDA compliant stem seal. TFM thrust bearing and X shape gasket
PPX	CF PTFE thrust and X shape gasket
CAX	PCTFE thrust and TFM X shape gasket
CPX	PCTFE thrust and CF PTFE X shape gasket

R47

Industrial Valves

FLOATING BALL

FLUSH TANK



R47

Flush Tank Floating Ball

Introduction

The Habonim Flush Tank series incorporates all the advantages of the 3-piece ball valve 47 series and the TuBore™ 48 series. The innovation of the Flush Tank valve is the geometric design of the pad, which becomes an integral welded part of the customer's tank surface, allowing a smooth flow and preventing media stagnation. The result is a perfect adaptor between reactor and valve body.

The pad is designed for easy installation. It minimizes the diameter of the prepared tank bore, reduces installation time and welding operations and, most importantly, minimizes the stress concentration and tank deformation due to weld over-heating. The Habonim standard flush tank pad fits most tank configurations such as dished, flat, ellipsoidal, jacketed, conical or spherical. For special applications, such as replacing a conventional flush tank valve with a direct flow, higher Cv, quarter-turn flush tank ball valve, Habonim manufactures adaptive plates.

Habonim can also ship the pad independently from the valve, in order to accommodate customer requirements to simplify the vessel construction process.

Design Features

Pad design

- Mirror polished
- Various geometries: dished, flat, ellipsoidal, Jacketed, conical or spherical
- Flush Pipe (FP) – Adaptive pad with the same geometry of the pipe line, designed to provide minimum 'dead volume' in pipe lines, preventing media from stagnating and fully insuring drainage of pipe cavities.

Body

- Minimum dead leg between ball sphere and tank internal surface
- Three-piece design with swing-out body, for easy maintenance
- Top mounting platform compliant with ISO 5211 for easy mounting of actuator and other accessories
- CIP/SIP purge ports ensure complete flush of the valve cavity (optional)
- Steam jacket (optional)
- Streamlined flow ensures full drainage



R47

Flush Tank Floating Ball

Mirror polished pad

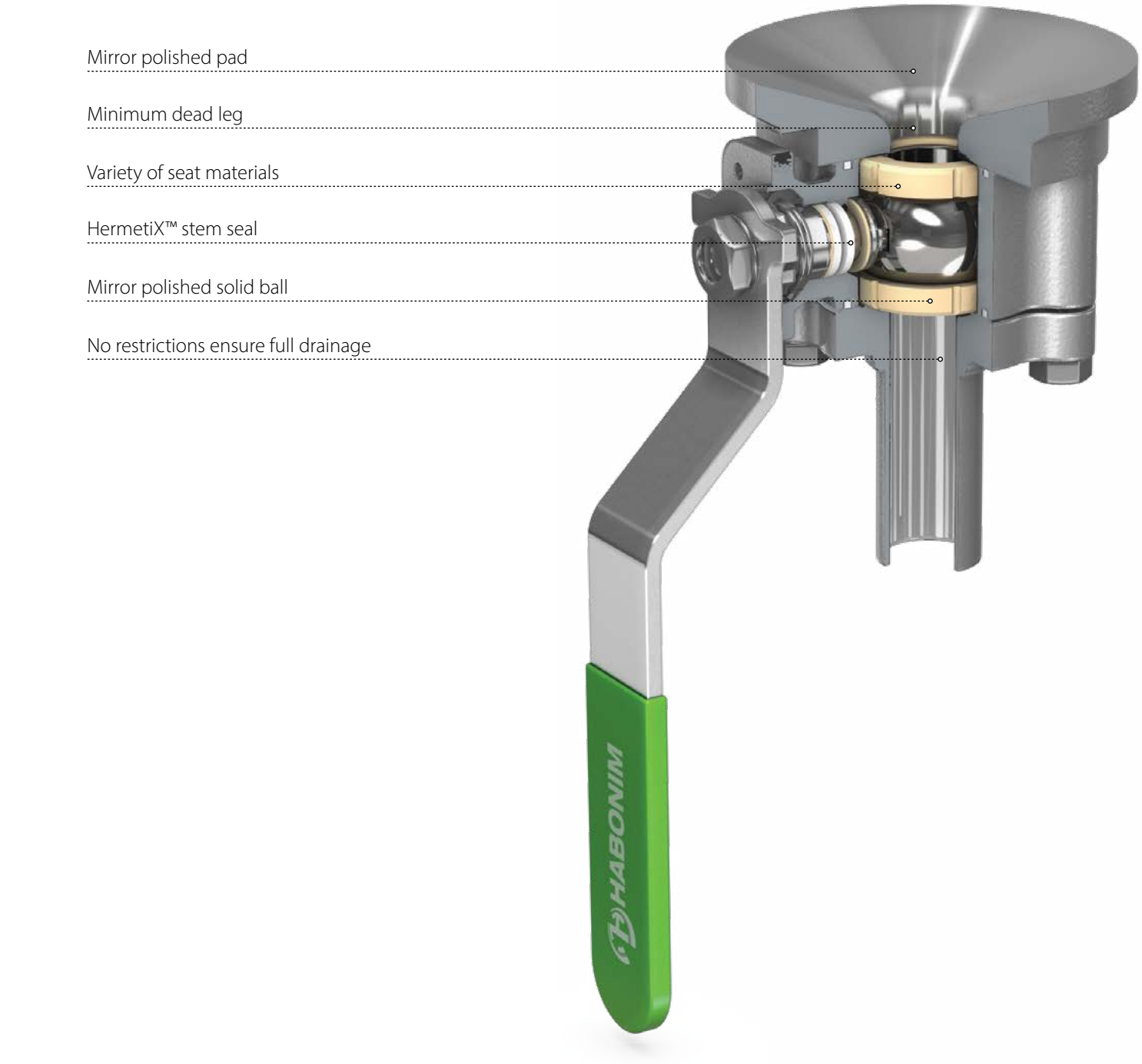
Minimum dead leg

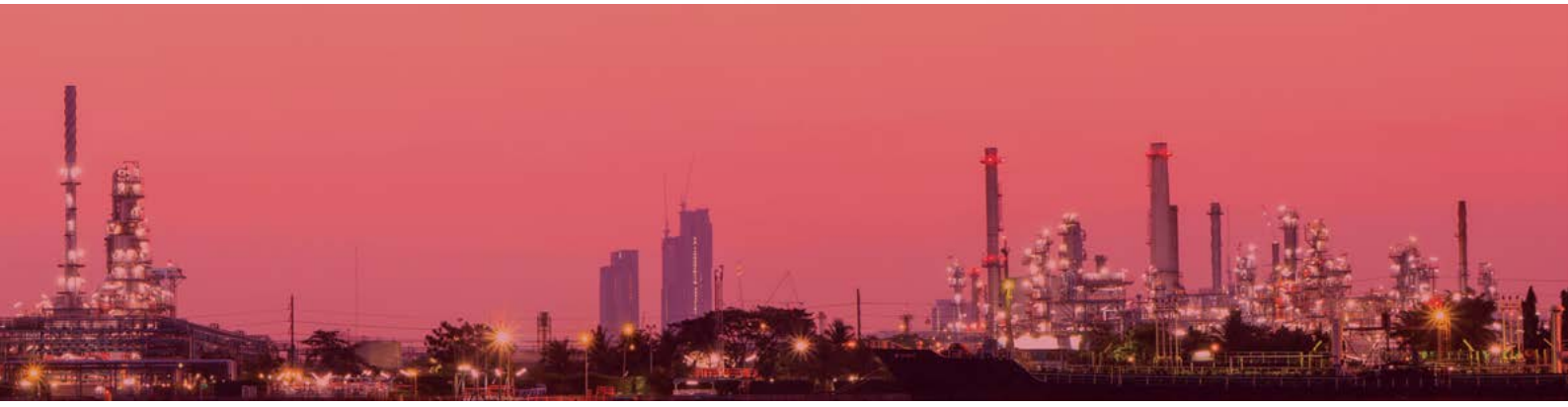
Variety of seat materials

HermetiX™ stem seal

Mirror polished solid ball

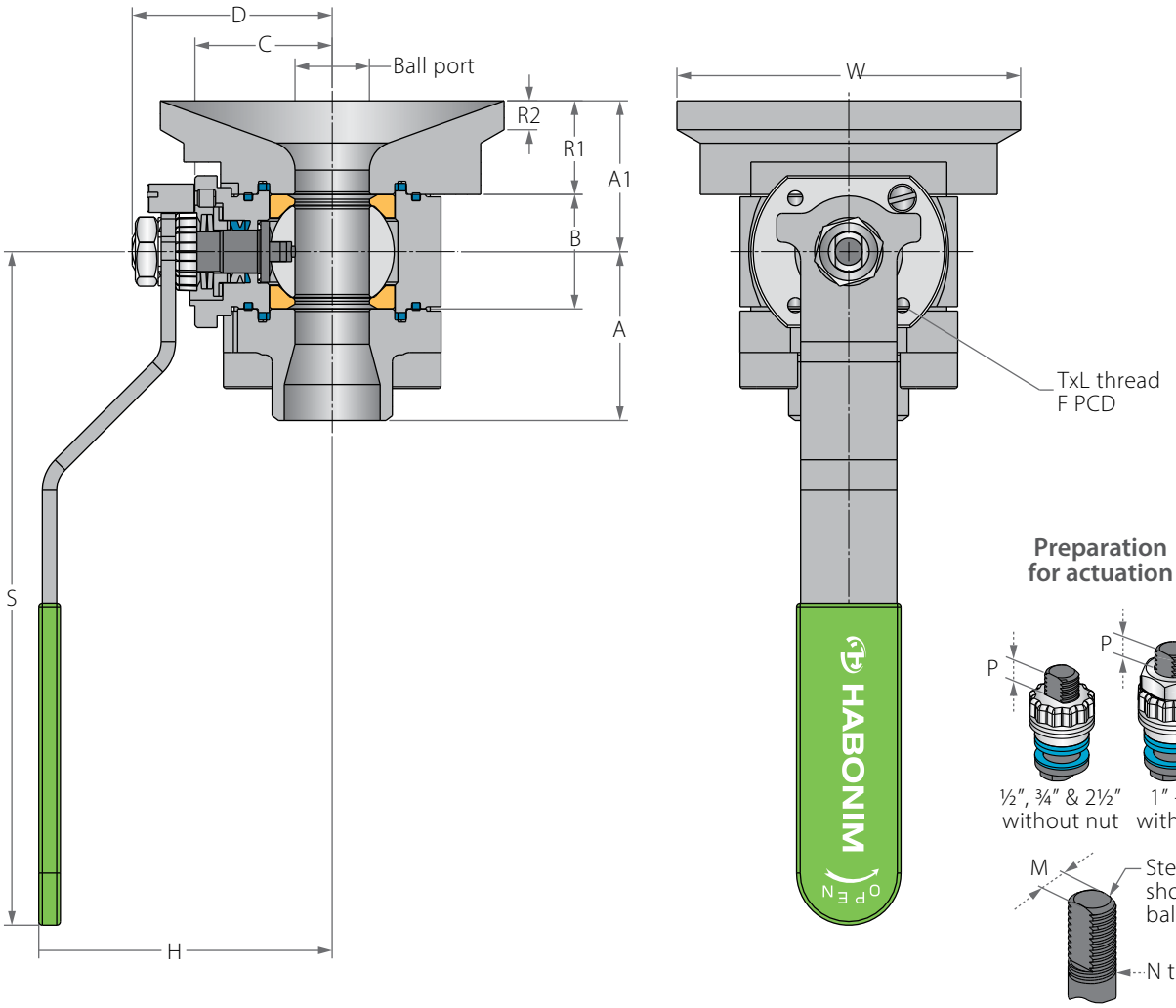
No restrictions ensure full drainage





Flush Tank Floating Ball

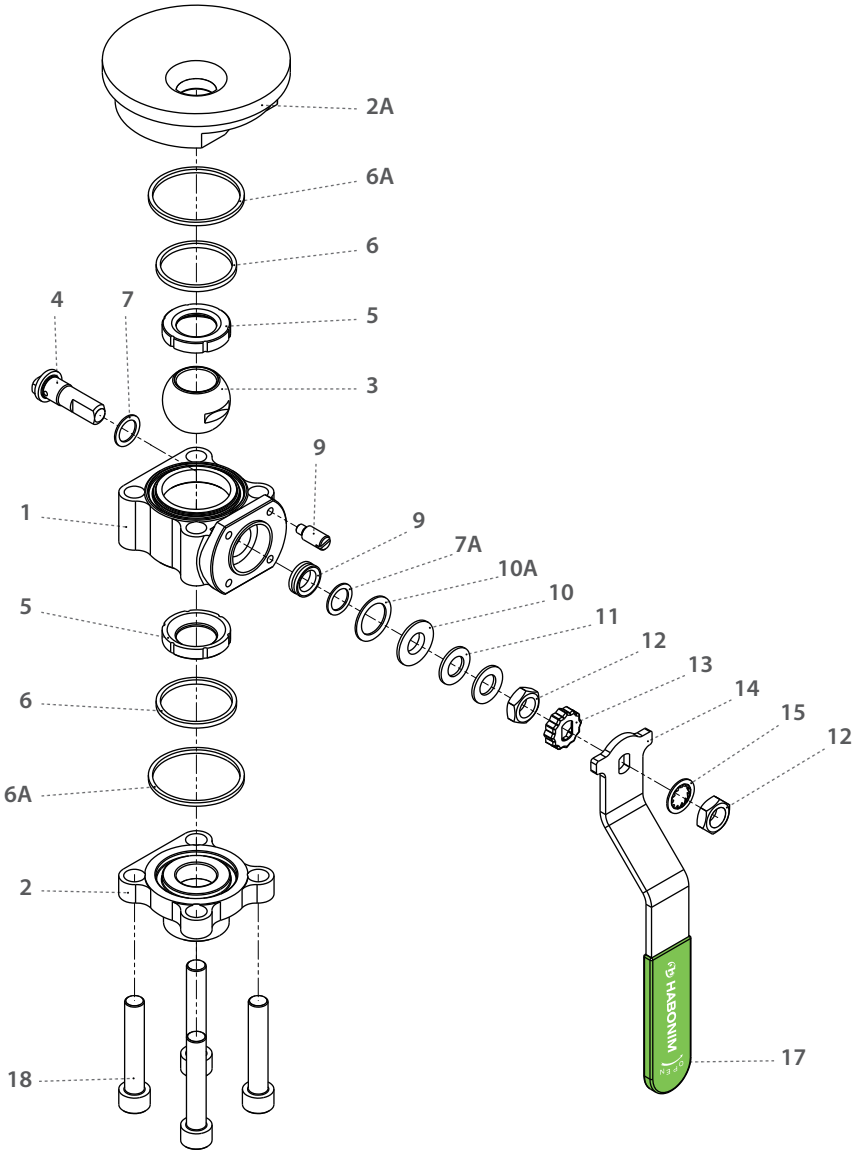
Valve Dimensions



Std. port	Full port	Unit	Ball port	R1	R2	A	A1	B	C	D	H	S	W	M	N	P	F		TxL	Weight kg/lb	Kv
																					Cv
DN15	DN10	mm	11.15	21.0	6.0	33.0	31.30	20.60	29.0	38.70	61.50	150.0	60.0	16.0	⅜	6.65	F03	36.0	M5X10	0.8	6.9
½"	⅜"	inch	0.44	0.83	0.24	1.30	1.24	0.81	1.14	1.52	2.42	5.91	2.36	0.63	UNF	0.26		1.42		1.9	8.0
DN20	DN15	mm	14.30	20.60	6.0	35.30	32.85	24.50	31.40	40.30	63.90	150.0	80.0	5.54	⅜	6.65	F03	36.0	M5X10	1.2	10
¾"	½"	inch	0.56	0.81	0.24	1.39	1.29	0.97	1.24	1.59	2.52	5.91	3.15	0.22	UNF	0.26		1.42		2.6	12
DN25	DN20	mm	20.60	21.50	8.0	46.90	37.35	31.70	38.20	55.60	79.40	187.0	95.50	7.54	7/16	7.40	F04	42.0	M5X10	2.1	28
1"	¾"	inch	0.81	0.85	0.31	1.85	1.47	1.25	1.50	2.19	3.13	7.36	3.76	0.30	UNF	0.29		1.65		4.6	32
DN32	DN25	mm	25.50	24.0	8.0	54.0	45.0	41.25	42.64	60.24	87.0	187.0	108.0	7.54	7/16	7.40	F04	42.0	M5X10	3.2	49
1¼"	1"	inch	1.0	0.94	0.31	2.13	1.77	1.62	1.67	2.37	3.42	7.36	4.25	0.30	UNF	0.29		1.65		7.0	57
DN40	DN32	mm	31.80	27.0	8.0	57.80	51.20	48.40	43.60	73.0	97.0	237.0	113.0	8.71	9/16	8.50	F05	50.0	M6X12	4.5	69
1½"	1"	inch	1.25	1.06	0.31	2.28	2.01	1.91	1.72	2.87	3.82	9.33	4.45	0.34	UNF	0.33		1.97		9.9	80
DN50	DN40	mm	38.10	29.0	10.0	64.0	57.15	56.30	48.30	77.80	101.80	237.0	138.0	8.71	9/16	8.50	F05	50.0	M6X12	5.8	102
2"	1½"	inch	1.50	1.14	0.39	2.52	2.25	2.22	1.90	3.06	4.01	9.33	5.43	0.34	UNF	0.33		1.97		12.8	118
DN65	DN50	mm	50.80	30.0	10.0	79.0	66.30	72.60	70.0	88.10	115.10	237.0	164.0	8.71	9/16	13.50	F07	70.0	M8X12	11.1	208
2½"	2"	inch	2.0	1.18	0.39	3.11	2.61	2.86	2.76	3.47	4.53	9.33	6.46	0.34	UNF	0.53		2.76		24.4	241

Flush Tank Floating Ball

Components & Materials



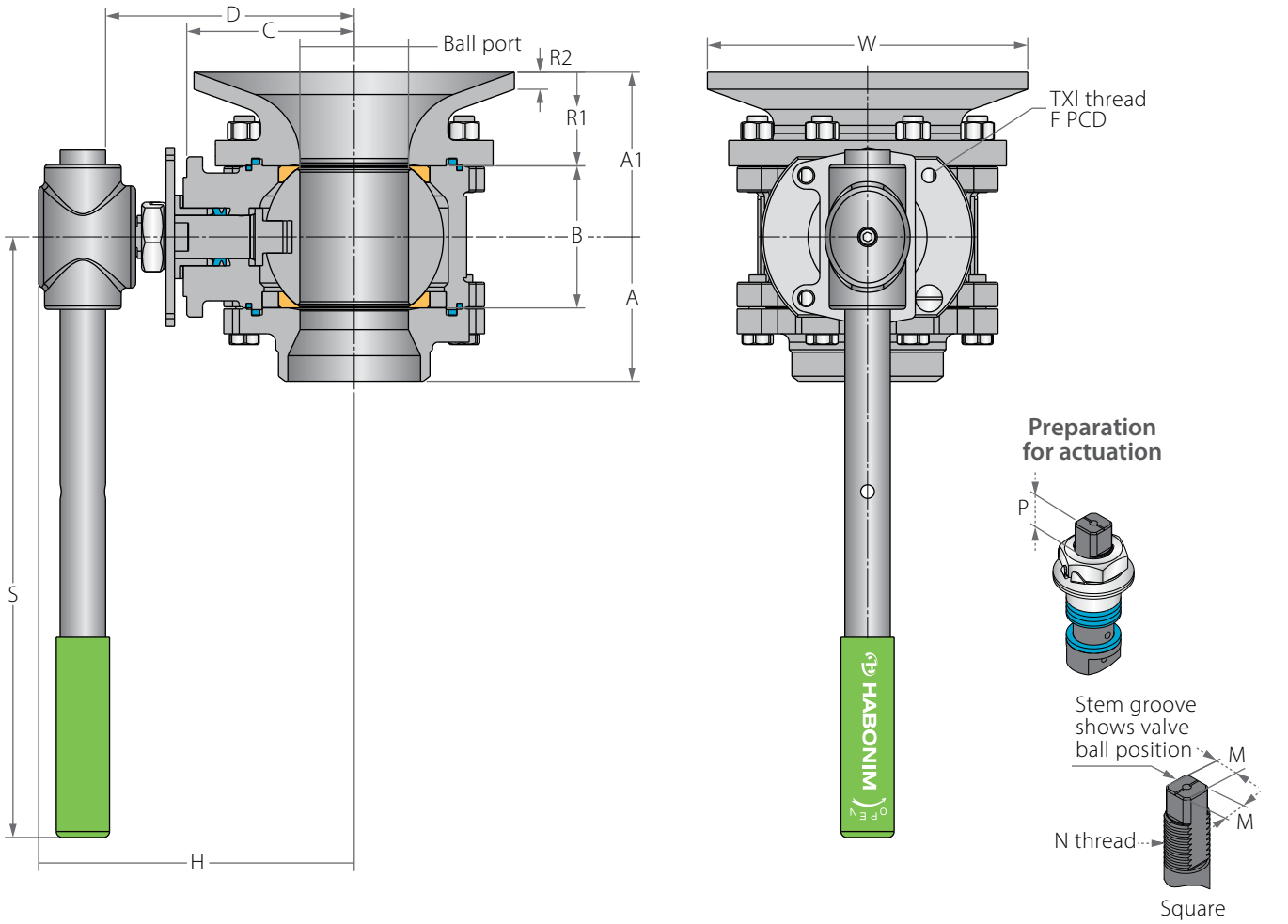
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
2A	FT End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	V. PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	V. PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. steel	1

Item	Description	Material specification	Qty.
9*	Stem Seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Body Bolt	S. Steel	4

* Maintenance kit components

Flush Tank Floating Ball

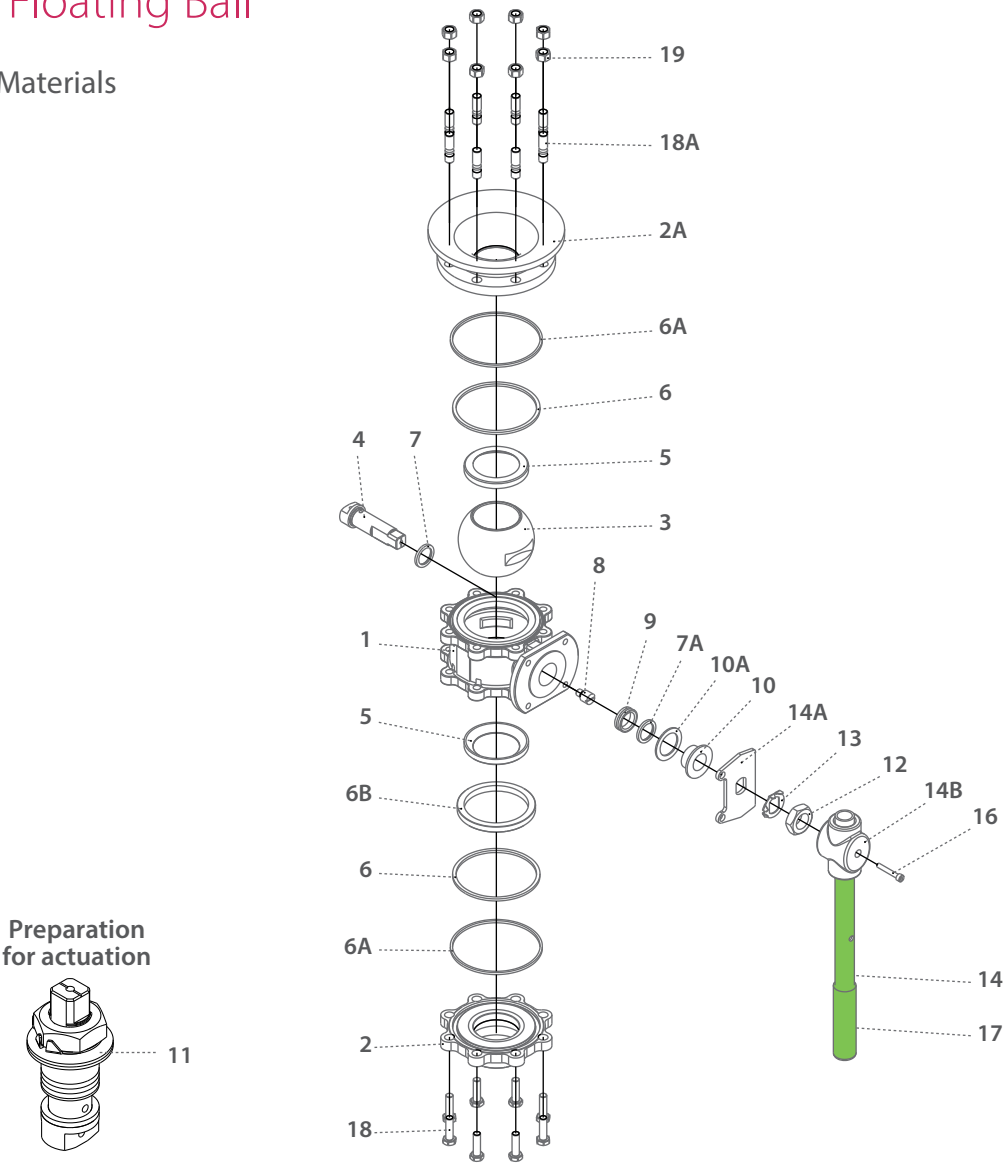
Valve Dimensions



Std. port	Full port	Unit	Ball port	R1	R2	A	A1	B	C	D	H	S	W	M-DD	M	N	P	F		TxL	Weight kg/lb	Kv / Cv
DN80	DN65	mm	63.50	34.0	10.0	84.50	75.65	83.30	98.30	144.90	185.0	400.0	188.0	15.90	18.90	1"-14	16.70	F10	102.0	M10x20	15.5	300
3"	2½"	inch	2.50	1.34	0.39	3.33	2.98	3.28	3.87	5.71	7.29	15.75	7.40	0.63	0.74	UNS-2A	0.66		4.02		34.1	348
DN100	DN80	mm	82.60	38.0	10.0	107.0	92.40	108.80	114.10	160.70	200.0	600.0	226.0	15.90	18.90	1"-14	16.70	F10	102.0	M10x20	26.0	615
4"	3"	inch	3.25	1.50	0.39	4.21	3.64	4.28	4.49	6.33	7.89	23.62	6.97	0.63	0.74	UNS-2A	0.66		4.02		57.2	713
	DN100	mm	100.0	45.0	12.0	119.50	106.50	123.0	124.0	170.50	211.0	600.0	252.0	15.90	18.90	1"-14	16.70	F10	102.0	M10x20	34.0	744
	4" FB	inch	3.94	1.77	0.47	4.70	4.19	4.84	4.88	6.71	8.30	23.62	8.54	0.63	0.74	UNS-2A	0.66		4.02		74.8	863

Flush Tank Floating Ball

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	1
2A	Ft End	Acc. Ordering Code	1
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
6B	Support Ring	S. Steel	1
7*	Stem Thrust Seal	V. PEEK, CF PEEK, PCTFE	1
7A*	Anti-Abrasion Ring	V. PEEK, CF PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	CF PTFE, TFM	1

Item	Description	Material specification	Qty.
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
14A	Stop Plate	S. Steel	1
14B	Wrench Head	S. Steel	1
16	Wrench Bolt	S. Steel	1
17	Sleeve	PVC	1
18	Bolts	S. Steel	8
18A	Body Bolts	S. Steel	8
19	Body Nut	S. Steel	8

* Maintenance kit components

Flush Tank Floating Ball - Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
1	0				R	4	7	W	-	6	6	6	6	A	T	G	/	B	W			-				
Size		Features				Series		Design		Body/end material		Ball/Stem material		Seat material	Inner seal material	Outer seal material		End connection					Special features			

Size (1-2)

Code	inch	mm
05	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50
25	2½"	65
30	3"	80
40	4"	100

Features (3-6)

R	Flush tank
F	Fire safe
B	Full port
O	Clean assembly for O2 service
M	Ammonia service
K	Chlorine service
V	Vacuum service
Q	Cavity filler seats
I	High purity Class 10000

Series (7-8)

47	Floating ball 3 piece

Design (9)

W	Total HermetiX

Body material (11)

6	S. Steel CF8M
4	C. steel
W	Hastelloy-C22
S	254SMO
D	Duplex
9	Low Temp C. steel
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

Ends material (12)

6	S. Steel CF8M/CF3M*
4	C. steel
W	Hastelloy-C22
S	254SMO
D	Duplex
9	Low Temp C. steel
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

* CF3M - for welded ends only.

Ball material (13)

6	S. SteelCF8M/316
W	Hastelloy-C22
S	254SMO
D	Duplex
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hastelloy-C276

Stem material (14)

6	S. Steel316
M	High Strength S. Steel
Z(1)*	Inconel 718
W	Alloy-C22
S	254SMO A479
A	Alloy-20
D	Duplex A479
K	Super Duplex A479
7	Monel
C	Hastelloy-C276

* Stem Only

Seat material (15)

A	TFM
P	CF PTFE
K	CF PEEK
L	Virgin Peek
U	UHMWPE
C	PCTFE
Y	Delrin
W	PVDF
T	PTFE
R	15% Glass filled PTFE

Inner Seal Material (16)

T	PTFE
A	TFM
G	Expanded graphite
U	UHMWPE
V	Viton
B	NBR

Outer Seal Material (17)

G	Expanded graphite
A	TFM
U	UHMWPE

End Connection (19-22)

Welded ends	
BW10	Buttweld schd. 10
BW	Buttweld schd. 40
SW	Socket weld
XBW10	Extended buttweld schd. 10
XBW	Extended buttweld schd. 40
XSW	Extended socket weld
BW5	Buttweld schd. 5
BW80	Buttweld schd. 80
BWO*	Buttweld tube OD
BWD	Buttweld DIN 11850
BWI1.6	buttweld ISO 1127 1.6mm
BWI2.0	buttweld ISO 1127 2.0mm
BWI2.3	buttweld ISO 1127 2.3mm
SWO*	Socket weld tube OD
ETO*	Extended tube OD
ETI1.6	Extended buttweld ISO 1127 1.6mm
ETI2.0	Extended buttweld ISO 1127 2.0mm
ETI2.3	Extended buttweld ISO 1127 2.3mm
ETD	Extended buttweld DIN 11850
Threaded	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPT	EN 10226 - Pipe Taper thread
BSPP	ISO228-1, DIN3852 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
AS5202	SAE internal straight thread
MNPT	Male NPT
MBSPT	Male BSPT
Flanged	
150	ASME B16.5 #150 RF
300	ASME B16.5 #300 RF
600	ASME B16.5 #600 RF
900	ASME B16.5 #900 RF
PN16	EN1092 PN16 RF
PN40	EN1092 PN40 RF
PN63	EN1092 PN63 RF
PN100	EN1092 PN100 RF
PN160	EN1092 PN160 RF
Clamp	
LL*	Compression fitting (Imperial) - **No** Nuts & Ferrules
LM*	Compression fitting (metric) - **No** Nuts & Ferrules
LL-NF*	Compression fitting (Imperial) - **with** Nuts & Ferrules
LM-NF*	Compression fitting (metric) - **with** Nuts & Ferrules
GR**	Grayloc© compatible hub (Grayloc© is a registered trademark of Grayloc Products, L.L.C.)
TC*	Tri-Clamp

* Std. port only
** Not available for 1¼" (DN32) Valves

Special Features (24-30)

P250	Ball with Upstream Relief Hole
SRS	Self Relief Seat - TFM seat only
B	Body made from barstock
EP	Electropolished
J2N05	Jacketed valve - number of ports (2), type (NPT) and size (½")

Valve Special Stem Seals

AAX	FDA compliant stem seal. TFM thrust bearing and X shape gasket
PPX	CF PTFE thrust and X shape gasket
CAX	PCTFE thrust and TFM X shape gasket
CPX	PCTFE thrust and CF PTFE X shape gasket
HC	High Cycle service

SPECIAL USE VALVES

General 432
Hydrogen Service (H) Ball Valves 433
Ammonia Service (M) Ball Valves 455
Oxygen Service (O) Ball Valves 461
Chlorine Service (K) Ball Valves 467
Steam Service (W) Ball Valves 475
Vacuum Service (V) Ball Valves 479

SPECIAL USE VALVES

General

Habonim's Special Use product line valves are subject to the general Habonim valves design, materials, practices, methodologies and certifications – for more information, see Valves General chapter.

Habonim Special Use valves are equipped with the Total HermetiX integrity package for superior sealing, safety and environmental care.

Special use valves are Habonim valves that are specially adapted to be used and serve in applications that have unique requirements on one or more of the valve designs, materials in use, assembly, packing, testing or even certificating. Information on such applications and the valve adaptations are in the following pages. The full valve information is available on each valve series catalog chapter.

Disclaimer & Warning:

It is always the system designer and the end-user responsibility to verify all equipment use in their system is properly selected to ensure safety and integrity of their systems. Habonim offers only general information based on common market knowledge and standard market adaptations for its valves. For each system and use, the system designer and end-user must consider the particular operations conditions, media parameters and any other implication of their system for the proper selection of valves to be used on their solely responsibility.

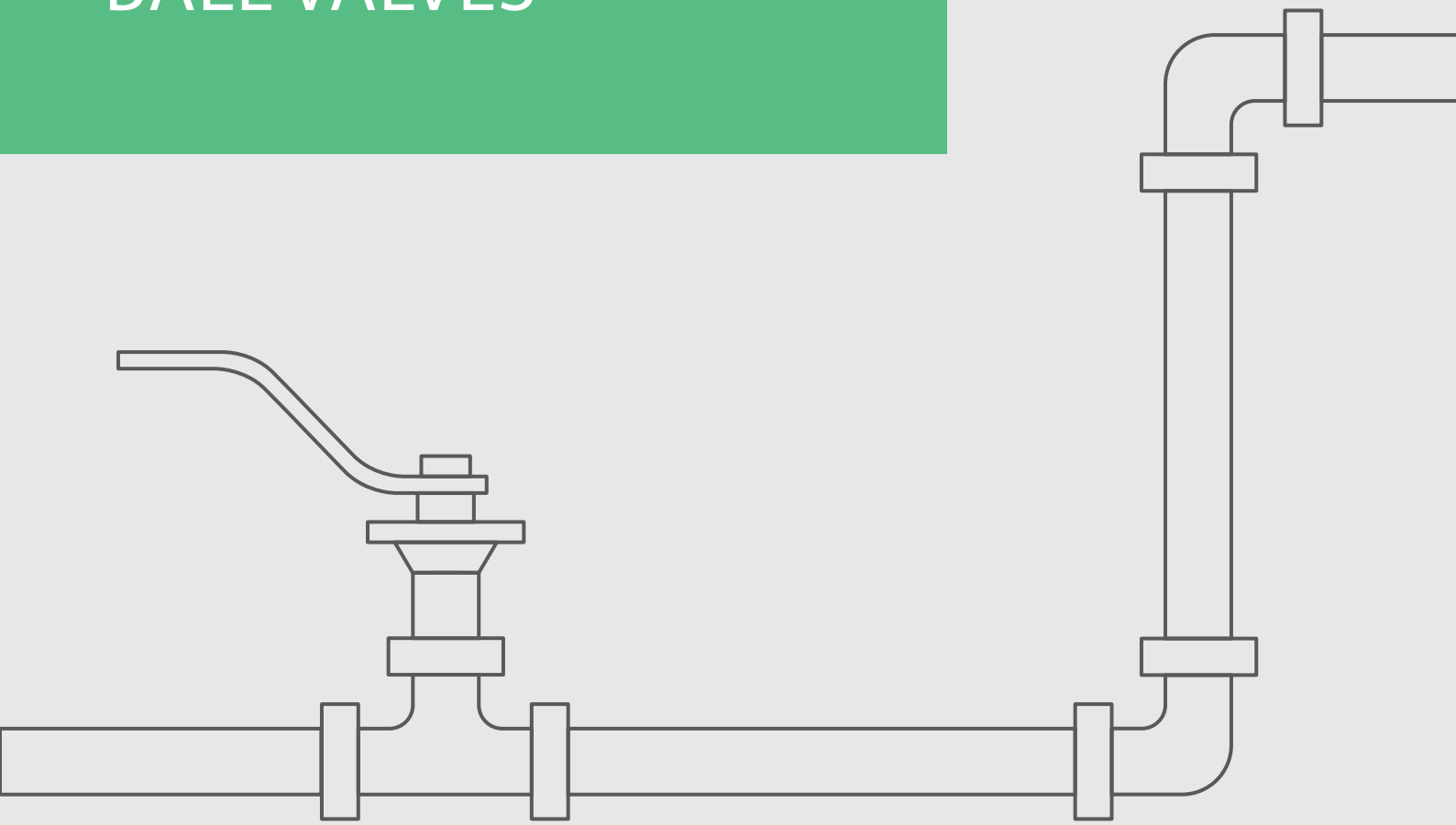


Ammonia Service 12" Double Block and Blead trunnion valve

H

HYDROGEN SERVICE

BALL VALVES



H

Hydrogen Service Ball Valves (H)

Habonim's hydrogen service ball valves are designed and tested to provide safe and durable use within diverse hydrogen applications and address some leading industrial standards. With decades of proven safe and long-lasting use in hydrogen applications Habonim Hydrogen-service ball valves delivers reliability and integrity for industrial demanding applications.

Habonim is offering a full range of ball valves for hydrogen-use based on the legacy products families to cover low to very-high pressures, shut-off or control use, regular, multiport, Double Block & Bleed or custom-made designs, valve automation packages and much more.

Hydrogen

Hydrogen light atomic weight and molecule structure turning hydrogen-use equipment sealing into a challenge requires special designs, mechanisms and expertise. Hydrogen is highly combustion and flammable making leakage prevention an essence for safety and integrity of systems. In addition materials selection should be considered to prevent effects such as Hydrogen Embrittlement (HE).

Design

Habonim Hydrogen-use ball valves incorporate some design elements to best accommodate the hydrogen media:

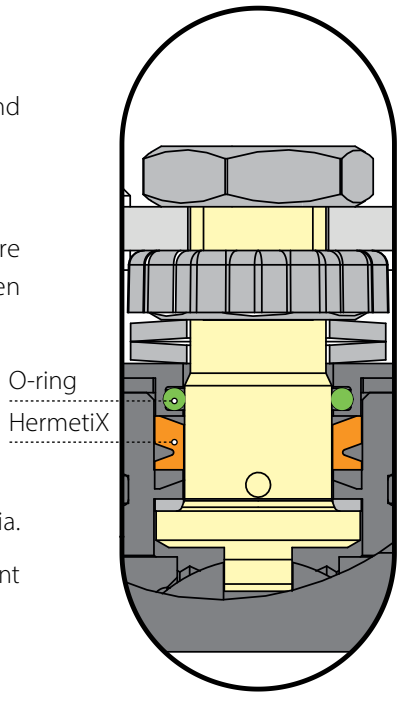
Double Stem Sealing

Habonim HermetiX patented stem seal is used with additional O-ring sealing.

The HermetiX polymeric, non-graphite stem seal design is certified for ISO 15848-1 and API641 fugitive emission prevention standards, tested with He.

An additional O-ring stem seal is added as additional sealing point.

This design has been successfully tested for 100,000 open/close cycles under pressure without any maintenance or seals replacements and well performs in demanding hydrogen applications for decades.



Registered EU Design
015025978-001

Hydrogen-use material compatibility

All material used for the valve constructions are specified for safe use with hydrogen media.

Metallic materials to be used in the valves are selected to withstand the hydrogen embrittlement effects and are compatible for hydrogen use.

Testing & Certifications

Some of the ball valves series are tested or certified for specific standard relevant for hydrogen use such as:

ISO 19880-3:2018 Gaseous hydrogen – fueling stations valve

TPED / TPE – Transportable Pressure Equipment Directive, according to ISO 23826

Marine classification (on demand): DNV GL, LR, BV, ABS, KR, RINA

H

Hydrogen Service Ball Valves (H)

Total HermetiX integrity package

Materials selection for Hydrogen use

Unless explicitly specified in our Ordering Codes for Hydrogen Service, when using our valves for Hydrogen Service (Feature "H") material selection should be:

- Body & ends - Stainless steel.
- Inner seal - HNBR or consult Habonim.

Zero fugitive-emission stem sealing

- HermetiX stem sealing design with zero fugitive emission sealing capability.
- Tested according to ISO 15848-1 and API641 standards.
- Up to 500,000 cycles of operation with no maintenance.
- Field proven for millions of cycles.

Double body sealing

- Body double sealing for superior atmospheric sealing.
- Fugitive emission prevention.

Fire safe

- Design compatible with API 607 and ISO 10497.
- Clean fire-safe construction for no graphite contamination of the media flow.

Inline superior sealing

HABONIM Hydrogen service cleaning

Process of cleaning, assembling and packing that refers to international standarts in partial or in full:

- ASTM A380
- CGA G 4.1
- EN 12300

Quick Selection Table

Total Hermetix™ | **Port:** Standard Port | Full Port | Tube Size

Ordering Code | **End Connections:** Threaded | Coned & Threaded | Flanged | Welded

Temperature: -40°C - +260°C (-40 °F ÷ +500 °F)

Category	Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼ ⅜ ½ ⅝ ¾ 1 1¼ 1½ 2 2½ 3 4 6 8 10 12 14 16 — MWP (ANSI Class)
High Pressure	Trunnion	Threaded body	OC	H99				1,034bar (15,000psi)*
		3 Piece	OC	See High Pressure	TH	Standard Port, Full Port	Coned & Threaded, Flanged, Welded	2500
		3 Piece	OC		TH	Standard Port, Full Port	Coned & Threaded, Flanged, Welded	1500
	Floating	Threaded body	OC	H29	TH	Standard Port, Full Port	Threaded, Coned & Threaded	1,034bar (15,000psi)**
		Threaded body	OC	H25	TH	Standard Port, Full Port	Threaded, Coned & Threaded	550bar (8,000psi)
		Threaded body	OC	H24	TH	Standard Port, Full Port	Threaded, Coned & Threaded, Welded	500bar (7,250psi) / 2500
		Threaded body	OC	H23	TH	Standard Port	Threaded, Coned & Threaded	700bar (10,000psi)
		3 Piece	OC	H21	TH	Full Port	Welded	600bar (8,750psi)
		3 Piece	OC	See Industrial	TH	Standard Port, Full Port	Coned & Threaded, Flanged, Welded	2500 / 1500
Industrial Use	Trunnion	3 Piece	OC		TH	Standard Port, Full Port	Flanged, Welded	900/600/300/150
		2 Piece	OC		TH	Standard Port, Full Port	Flanged	600/300/150
	Floating	3 Piece	OC		TH	Standard Port, Full Port	Threaded, Coned & Threaded, Flanged, Welded	900/600/400/300/150
		2/1 Piece	OC		TH	Standard Port, Full Port	Flanged	300/150/PN40/PN16
		DS (DBB)	OC		TH	Standard Port	Threaded, Flanged	600/300/150/PN16
		Multiport / Diverter	OC		TH	Standard Port, Full Port	Threaded	600/300/150
		Control	OC	See Control	TH	Standard Port, Full Port	Threaded, Coned & Threaded, Flanged, Welded	900/400/300/150/PN40/PN16

* NPT ¾" & 1" is limited to 10,000psi (700bar) | ** with TPED - 700bar (10,000psi)

H99 ¼"-1" | DN8-DN25 | PN1,034 (15,000PSI)

Hydrogen Service High Pressure Trunnion Ball Threaded Body

Technical Information

Operation

Maximum Working pressure 1,034bar (15,000psi).

Working temperature: -40°C up to +85°C (-40°F up to +185°F).

NPT ¾" & 1" MWP is 700bar (10,000psi).

Design

- Threaded body
- Trunnion ball
- Automation-ready with standard ISO 5211 connecting plate
- ISO 15848-01 and API 641 emission standard certificated design
- ISO 10497 and API607 fire-safe standard certificated design
- Double body sealing

Testing & Certifications

- ISO 19880-3:2018 Gaseous hydrogen – fueling stations valve
- 100% shell & inline leak tested
- Marine classification (on demand): DNV GL, LR, BV, ABS, KR, RINA, others

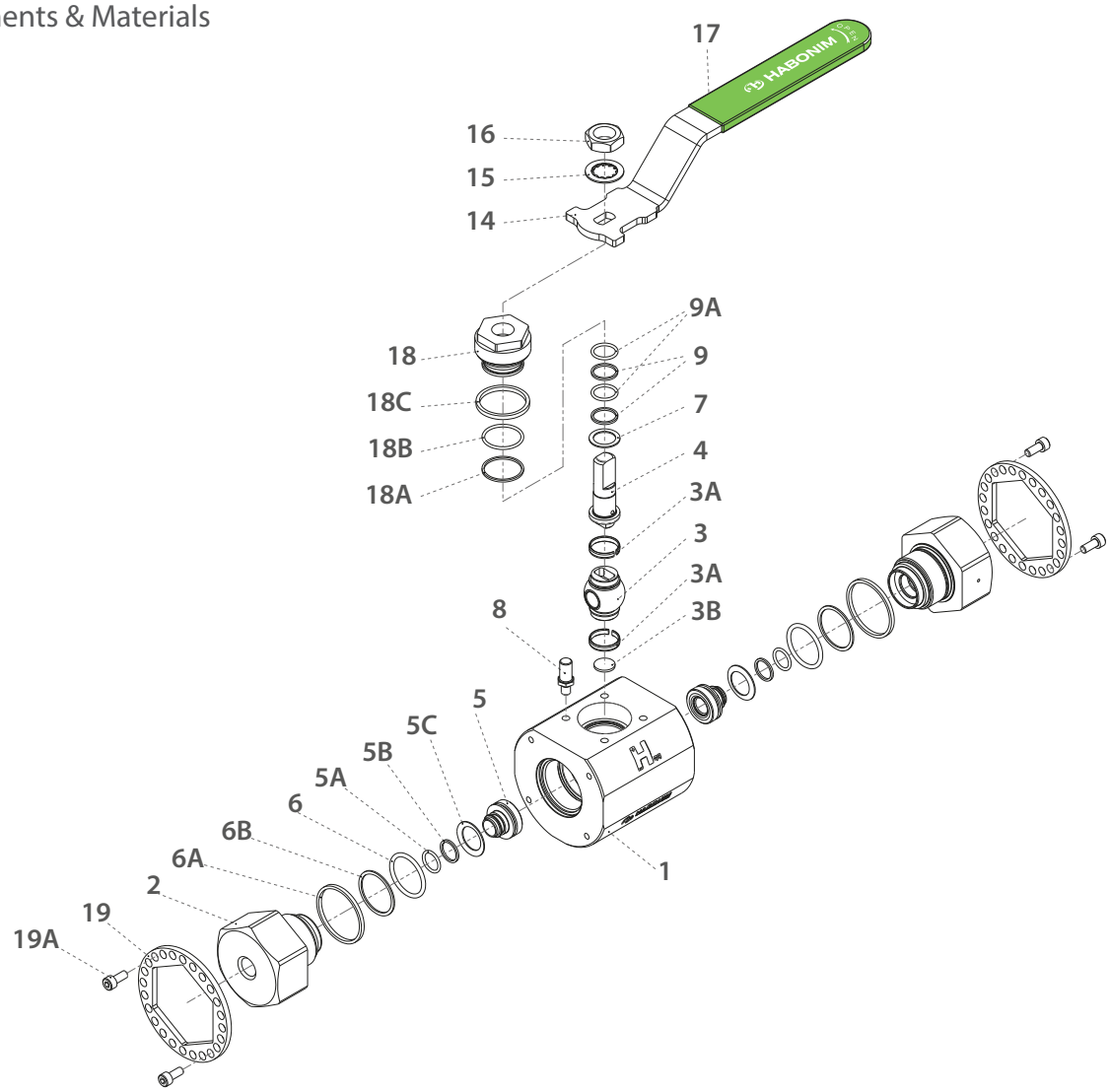
Materials

- Stainless steel body & ends.
- All materials compatible with Hydrogen use.

End Connections

Valve size code	Connection			Orifice mm (in)	Cv	Kv
02	Medium Pressure Coned & Threaded	CTM	¼"	2.8	0.33	0.29
03		CTM	⅜"	5.2	1.17	1.03
06		CTM	9⁄16"	7.9	4.4	3.89
07		CTM	¾"	11.1	21.28	18.83
10		CTM	1"	11.15	9.98	8.84
02	High Pressure Coned & Threaded	CTH	¼"	2.4	0.24	0.21
03		CTH	⅜"	3.2	0.43	0.38
06		CTH	9⁄16"	6.4	2.54	2.25
10		CTH	1"	11.1	22.27	19.71
02	Threaded	NPT/BSPP/DIN3852/BSPT	¼"	7.66	2.62	2.32
03		NPT/BSPP/DIN3852/BSPT	⅜"	10.7	12.51	11.07
05		NPT/BSPP/DIN3852/BSPT	½"	11.15	13.01	11.51

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
3A	Ball	Bearing SS+PTEE	2
3B	Slide Bearing	PTEE	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
5A*	Seat	Acc. Ordering Code	2
5B*	Seat Backup Ring	V. peek	2
5C	Seat Spring	Inconel 718	2
5D*	Seat FS Seal	Graphit	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Graphit	2
6B*	Seal Backup Ring	V. peek	2
7*	Stem Thrust Seal	VIRGEN PEEK, PCTFE	1

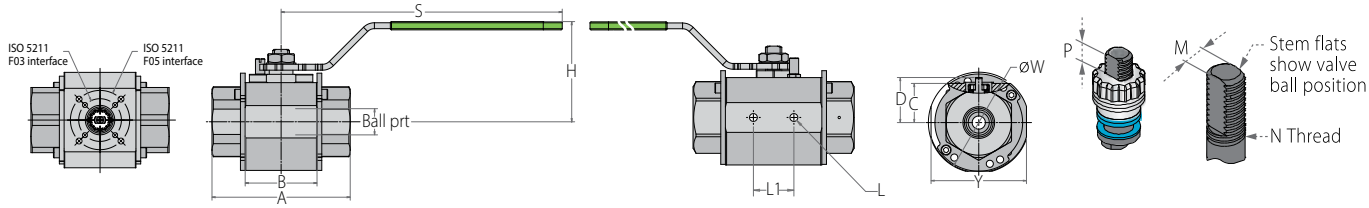
Item	Description	Material specification	Qty.
8	Stop Pin	S. Steel	1
9*	Stem seal	Acc. Ordering Code	2
9A	Stem Backup Ring	V. peek	2
14	Handle	S. Steel	1
15	Serrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
18	Stem Gland	Acc. Ordering Code	1
18A	Gland Seal	Acc. Ordering Code	1
18B	Gland Backup Ring	V. peek	1
18C	Gland FS Seal	S. Steel	1
19	Locking Plate	S. Steel	2
19A	Locking Bolt	S. Steel	4

* Maintenance kit components

H99 ¼"-1" | DN8-DN25 | PN1,034 (15,000PSI)

Hydrogen Service High Pressure Trunnion Ball Threaded Body

Valve Dimensions
ISO 5211 Interface -F05



Full Port	Unit	Ball port	A	B	C	D	H	L	L1	M	N	P	W	S	Y	Weight (Kg /lb)
DN8	mm	11.5	139.4	83.4	34.5	61.7	82.7		35.0	8.7		20.0	85.0	237.0	80.5	5
¼"	inch	0.45	5.49	3.28	1.36	2.43	3.26		1.38	0.34		0.79	3.35	9.33	3.17	11
DN10	mm	11.5	139.4	83.4	34.5	61.7	82.7		35.0	8.7		20.0	85.0	237.0	80.5	5
⅜"	inch	0.45	5.49	3.28	1.36	2.43	3.26		1.38	0.34		0.79	3.35	9.33	3.17	11
DN12	mm	11.5	139.4	83.4	34.5	61.7	82.7		35.0	8.7		20.0	85.0	237.0	80.5	5
½"	inch	0.45	5.49	3.28	1.36	2.43	3.26		1.38	0.34		0.79	3.35	9.33	3.17	11
DN14	mm	11.5	139.4	83.4	34.5	61.7	82.7	M8	35.0	8.7	9⁄16" UNF	20.0	85.0	237.0	80.5	5
9⁄16"	inch	0.45	5.49	3.28	1.36	2.43	3.26		1.38	0.34		0.79	3.35	9.33	3.17	11
DN20	mm	11.5	139.4	83.4	34.5	61.7	82.7		35.0	8.7		20.0	85.0	237.0	80.5	5
¾"	inch	0.45	5.49	3.28	1.36	2.43	3.26		1.38	0.34		0.79	3.35	9.33	3.17	11
DN25	mm	11.5	159.4	83.4	34.5	61.7	82.7		35.0	8.7		20.0	85.0	237.0	80.5	5
1"	inch	0.45	6.28	3.28	1.36	2.43	3.26		1.38	0.34		0.79	3.35	9.33	3.17	11

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
0	3			F	H	9	9		-	3	M	M	S	L	H	G	/	C	T	M		-						
Size		Features				Series		Design		Body/Ends material		Ball/Stem material		Seat feature		Seat insert material		Inner Seal		Outer Seal			End Connection					Special features		

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05 *	½"	13
06	9⁄16"	20
07	¾"	20
10	1"	25

* Not applicable for CTM/CTH

Features (3-6)	
H	Hydrogen use
F	Fire safe

Series (7-8)	
99	HP Trunnion threaded body 3 pcs.

Design (9)	
W	Double body seal

Body/Ends material (11)	
3	S. Steel DIN 1.4435

Ball/Stem material (12-13)	
M	High Strength S. Steel

Seat feature (14)	
S	Single Piston Effect (SPE) (API 6D DBB)

Seat Insert material (15)	
L	Virgin PEEK

Inner Seal material (16)	
H	HNBR
V	Viton
A	TFM

Outer Seal material (17)	
G	Expanded graphite

End connections (19-22)	
Threaded Ends	
CTM	Coned & Threaded Medium pressure
CTH	Coned & Threaded High pressure
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPP	ISO228-1 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
BSPT	EN 10226 - Pipe Taper thread

Special Features (24-30)

Hydrogen Service High Pressure Floating Ball Threaded Body

Technical Information

Operation

Maximum Working pressure 1,034bar (15,000psi), with TPED mark up to 700bar (10,000psi)

Working temperature: -40°C up to +85°C (-40°F up to +185°F).

Design

- Threaded body
- Automation-ready with standard ISO 5211 connecting plate
- Total HermetiX Integrity package with:
  ISO 15848-1 and API 641 emission standard certificated design
  ISO 10497 and API607 fire-safe standard certificated design
  Double body sealing

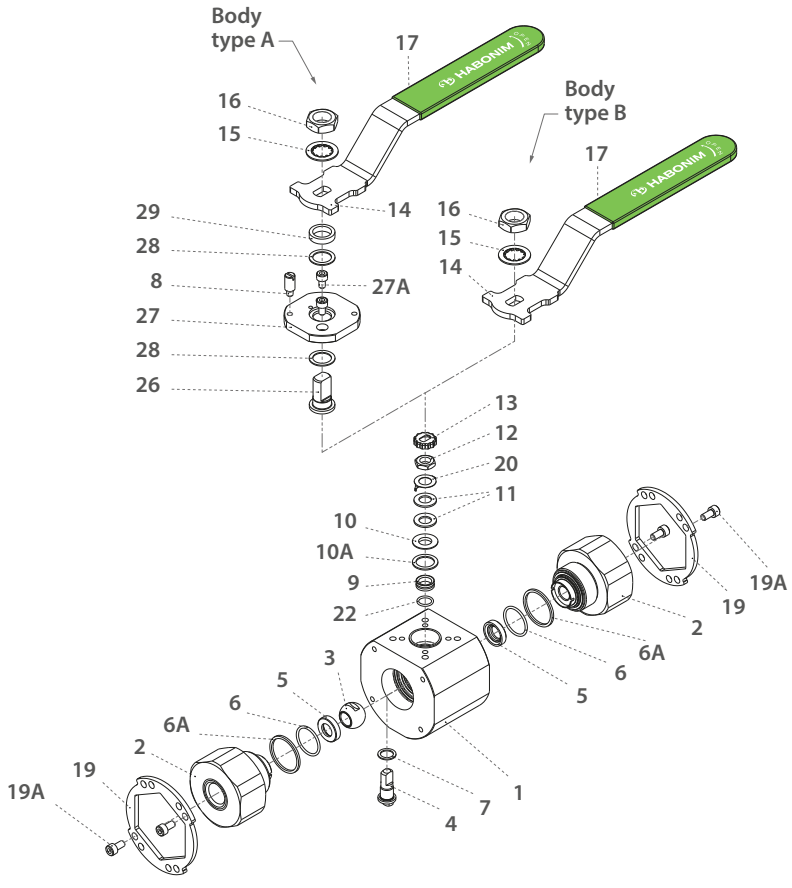
Testing & Certifications

- ISO 19880-3:2018 Gaseous hydrogen – fueling stations valve, Tested up to 700bar (10,000psi) use (internal test with He)
- TPED and TPE certified, according to ISO 23826 (up to 700bar / 10,000psi)
- 100% shell & inline leak tested
- Marine classification (on demand): DNV GL, LR, BV, ABS, KR, RINA, others

Materials

- Stainless steel body & ends.
- All materials compatible with Hydrogen use.

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PEEK, CFPEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9	Stem seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide Bearing	S. Steel	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
15	Shrrated Washer	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
19	Locking Plate	S. Steel	2
19A	Locking Bolt	S. Steel	4
20	Anti static device	S. Steel	1
22*	Stem OR	Acc. to 6	1
26	Adaptor	XM-19	1
27	Adaptor Plate	S. Steel	1
27A	Plate Bolts	S. Steel	2
28	Adaptor bearing	S. Steel	2
29	Adaptor Ring	S. Steel	1

* Maintenance kit components

H29 BODY SIZE A | ¼"-1" | DN8-DN25 | PN1,034 (15,000PSI)

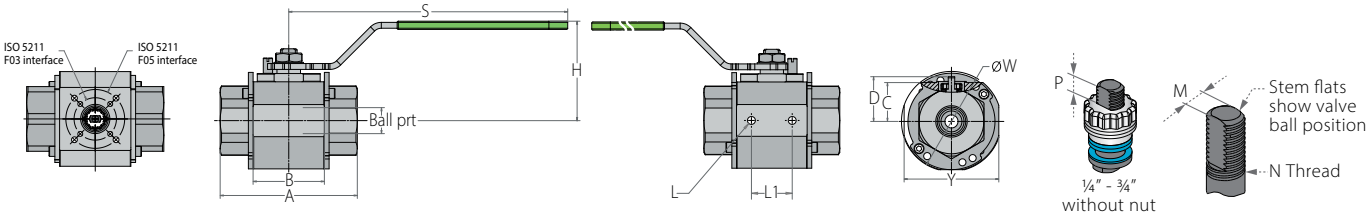
Hydrogen Service High Pressure Floating Ball Threaded Body

End Connections

Valve size code	Connection			Orifice mm (in)	Cv	Kv
02	Medium Pressure Coned & Threaded	CTM	¼"	2.8	0.33	0.29
03		CTM	⅜"	5.2	1.17	1.03
06		CTM	9⁄16"	7.9	4.4	3.89
07		CTM	¾"	11.1	21.28	18.83
10		CTM	1"	11.15	9.98	8.84
02	High Pressure Coned & Threaded	CTH	¼"	2.4	0.24	0.21
03		CTH	⅜"	3.2	0.43	0.38
06		CTH	9⁄16"	6.4	2.54	2.25
10		CTH	1"	11.1	22.27	19.71
02	Threaded	NPT/BSPP/DIN3852/BSPT	¼"	7.66	2.62	2.32
03		NPT/BSPP/DIN3852/BSPT	⅜"	10.7	12.51	11.07
05		NPT/BSPP/DIN3852/BSPT	½"	11.15	12.7	11.24
07		NPT/BSPP/DIN3852/BSPT	¾"	11.15	5.81	5.14

Valve Dimensions

ISO 5211 Interface - F03 / F05



Port	Unit	Ball port	A	B	C	D	H	L	L1	M	N	P	W	S	Y	Weight (Kg /lb)
DN8	mm	11.15	116.6	60.6	33.0	38.0	84.5	M8	35.0	5.5	⅜" UNF	5.5	85.0	237.0	80.5	4
¼"	inch	0.44	4.59	2.39	1.30	1.50	3.33		1.38	0.22		0.22	3.35	9.33	3.17	8.8
DN10	mm	11.15	116.6	60.6	33.0	38.0	84.5		35.0	5.5		5.5	85.0	237.0	80.5	4
⅜"	inch	0.44	4.59	2.39	1.30	1.50	3.33		1.38	0.22		0.22	3.35	9.33	3.17	8.8
DN15	mm	11.15	116.6	60.6	33.0	38.0	84.5		35.0	5.5		5.5	85.0	237.0	80.5	4
½"	inch	0.44	4.59	2.39	1.30	1.50	3.33		1.38	0.22		0.22	3.35	9.33	3.17	8.8
DN14	mm	11.15	116.6	60.6	33.0	38.0	84.5		35.0	5.5		5.5	85.0	237.0	80.5	4
9⁄16"	inch	0.44	4.59	2.39	1.30	1.50	3.33		1.38	0.22		0.22	3.35	9.33	3.17	8.8
DN20	mm	11.15	116.6	60.6	33.0	38.0	84.5		35.0	5.5		5.5	85.0	237.0	80.5	4
¾"	inch	0.44	4.59	2.39	1.30	1.50	3.33		1.38	0.22		0.22	3.35	9.33	3.17	8.8
DN25	mm	11.15	148.6	60.6	33.0	38.0	84.5		35.0	5.5		5.5	85.0	237.0	80.5	4
1"	inch	0.44	5.85	2.39	1.30	1.50	3.33		1.38	0.22		0.22	3.35	9.33	3.17	8.8

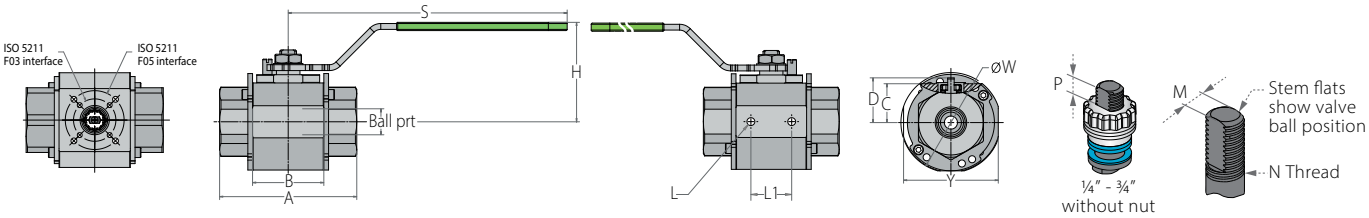
Hydrogen Service High Pressure Floating Ball Threaded body

End Connections

Valve size code	Connection			Orifice mm(in)	Cv	Kv
07	Medium Pressure Coned & Threaded	CTM	¾"	11.1	5.52	4.89
10		CTM	1"	14.3	14.31	12.66
15		CTM	1½"	20.6	54.73	48.44
10	Threaded	NPT/BSPP/DIN3852/BSPT	1"	15.2	9.26	8.19

Valve Dimensions

ISO 5211 Interface -F07



Port	Unit	Ball port	A	B	C	D	H	L	L1	M	N	P	W	S	Y	Weight (Kg /lb)
DN20	mm	20.65	215	115	49.9	68	96	M10	60	8.7	9/16" UNF	13	119	237.13	116	13.5
¾"	inch	0.81	8.46	4.53	1.96	2.68	3.78		2.36	0.34		0.51	4.69	9.34	4.57	29.7
DN25	mm	20.65	215	115	49.9	68	96		60	8.7		13	199	237.13	116	13.5
1"	inch	0.81	8.46	4.53	1.96	2.68	3.78		2.36	0.34		0.51	7.83	9.34	4.57	29.7
DN40	mm	20.65	215	115	49.9	68	96		60	8.7		13	116	237.13	116	13.4
1½"	inch	0.81	8.46	4.53	1.96	2.68	3.78		2.36	0.34		0.51	4.57	9.34	4.57	29.48

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
0	3			F	**H**	**2**	**9**	**W**	-	6	6	M	M	L	H	G	/	C	T	M		-						
Size		Features				Series		Design		Body/Ends material		Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End Connection					Special features					

Size (1-2)

Code	inch	mm
02	¼"	8
03	⅜"	10
05*	½"	13
06	9/16"	15
07	¾"	20
10	1"	25
15	1½"	40

* Not applicable for CTM/CTH

Features (3-6)

H	Hydrogen use
F	Fire safe
	Body size A
B	Body size B (700bar / 10,000psi)

Series (7-8)

29	HP Float 3 piece

Design (9)

W	Total HermetiX Integrity package

Body/Ends material (11-12)

6	S. Steel 316L

Ball material (13)

M	High Strength S. Steel

Stem material (14)

M	High Strength S. Steel

Seat material (15)

L	Virgin PEEK

Inner Seal Material (16)

H	HNBR
V	Viton
A	TFM

Outer Seal Material (17)

G	Expanded graphite
A	TFM

End connections (19-22)

CTM	Coned & Threaded Medium pressure
CTH	Coned & Threaded High pressure
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPP	ISO228-1 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
BSPT	EN 10226 - Pipe Taper thread

Special Features (24-30)

TPED	TPED / TPE
TH	T Handle

H25 ¼"-1½" | DN8-DN40 | PN550 (8,000PSI)

Hydrogen Service High Pressure Floating Ball 3 Piece Threaded-Body

Technical Information

Operation

Maximum Working Pressure: 550bar (8,000psi)
Working temperature: -40°C up to +85°C (-40°F up to +185°F).

Design

- Threaded body
- Automation-ready with standard ISO 5211 connecting plate
- Total HermetiX Integrity package with:
  ISO 15848-1 and API 641 emission standard certificated design
  ISO 10497 and API607 fire-safe standard certificated design
  Double body sealing

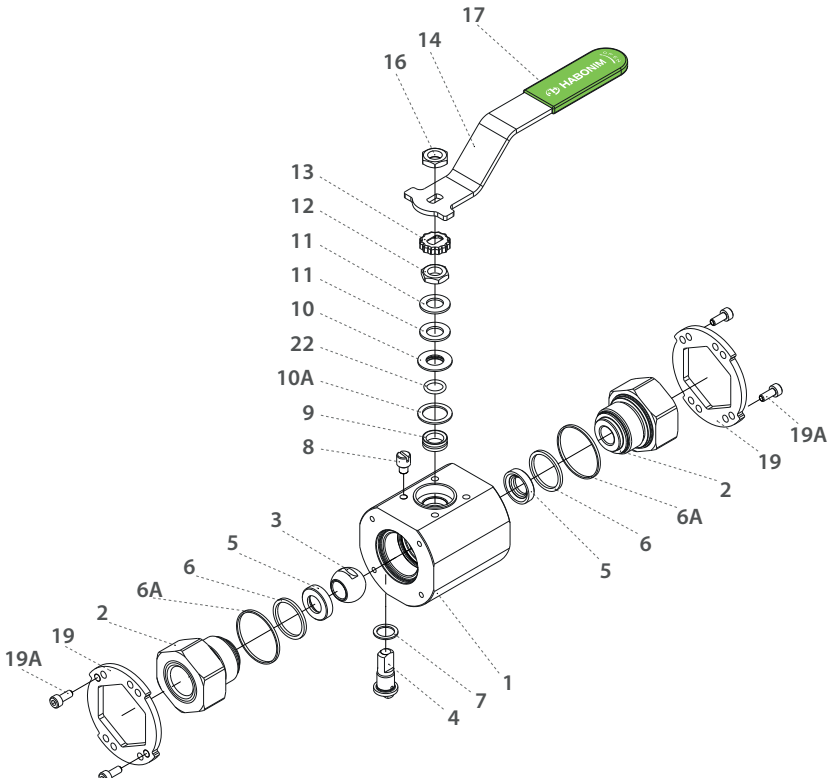
Testing & Certifications

- TPED Certified, according to ISO 23826 up to 550bar (8,000psi) MWP
- 100% shell & inline leak tested
- Marine classification (on demand): DNV GL, LR, BV, ABS, KR, RINA, others

Materials

- Stainless steel body & ends
- All materials compatible with Hydrogen use

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem thrust seal	PEEK, PCTFE	1
8	Stop Pin	S. Steel	1
9*	Stem Seal	PEEK, CFPEEK, PCTFE	1
10	Follower	S. Steel	1
10A*	Slide Bearing	CF PTFE, TFM	1
11	Disc Spring	S. Steel	2
12	Stem Nut	S. Steel	1
13	Locking Clip	S. Steel	1
14	Handle	S. Steel	1
16	Handle Nut	S. Steel	1
17	Sleeve	PVC	1
19	Locking Plate	S. Steel	2
19A	Locking Bolt	S. Steel	4
22*	O-Ring	Acc. to 6	1

* Maintenance kit components

H25 BODY SIZE A | ¼"-¾" | DN8-DN20 | PN550 (8,000PSI)

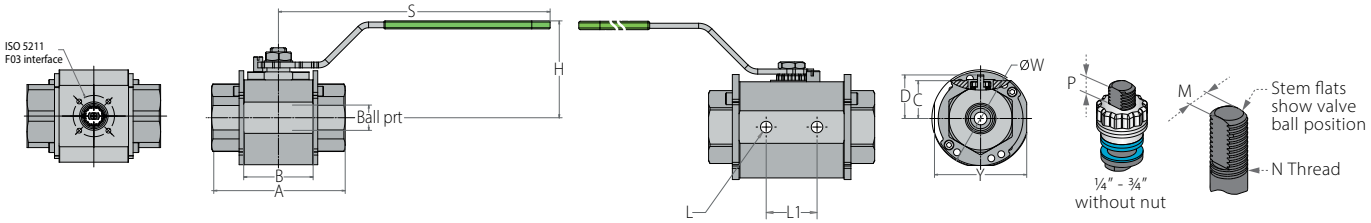
Hydrogen Service High Pressure Floating Ball Threaded Body

End Connections

Valve size code	Connection			Orifice mm (in)	Cv	Kv
02	Medium Pressure Coned & Threaded	CTM	¼"	2.8	0.33	0.29
03		CTM	⅜"	5.2	1.17	1.03
06		CTM	9⁄16"	7.9	4.4	3.89
07		CTM	¾"	11.1	21.28	18.83
02	High Pressure Coned & Threaded	CTH	¼"	2.4	0.24	0.21
03		CTH	⅜"	3.2	0.43	0.38
06		CTH	9⁄16"	6.4	2.54	2.25
02	Threaded	NPT/BSPP/DIN3852/BSPT	¼"	7.66	2.62	2.32
03		NPT/BSPP/DIN3852/BSPT	⅜"	10.7	12.51	11.07
05		NPT/BSPP/DIN3852/BSPT	½"	11.15	12.7	11.24

Valve Dimensions

ISO 5211 Interface -F03



Port	Unit	Ball port	A	B	C	D	H	L	L1	M	N	P	W	S	Y	Weight kg/ib
DN8	mm	11.15	98.0	62.0	26.7	37.9	62.45	M6	30.0	5.5	⅜" UNF	6.6	63.0	150.0	60.0	1.8
¼"	inch	0.44	3.86	2.44	1.05	1.49	2.46		1.18	0.22		0.26	2.48	5.91	2.36	3.96
DN10	mm	11.15	98.0	62.0	26.7	37.9	62.45		30.0	5.5		6.6	63.0	150.0	60.0	1.8
⅜"	inch	0.44	3.86	2.44	1.05	1.49	2.46		1.18	0.22		0.26	2.48	5.91	2.36	3.96
DN15	mm	11.15	98.0	62.0	26.7	37.9	62.45		30.0	5.5		6.6	63.0	150.0	60.0	1.8
½"	inch	0.44	3.86	2.44	1.05	1.49	2.46		1.18	0.22		0.26	2.48	5.91	2.36	3.96
DN14	mm	11.15	98.0	62.0	26.7	37.9	62.45		30.0	5.5		6.6	63.0	150.0	60.0	1.8
9⁄16"	inch	0.44	3.86	2.44	1.05	1.49	2.46		1.18	0.22		0.26	2.48	5.91	2.36	3.96
DN20	mm	11.15	118.0	62.0	26.7	37.9	62.45		30.0	5.5		6.6	63.0	150.0	60.0	1.8
¾"	inch	0.44	4.65	2.44	1.05	1.49	2.46		1.18	0.22		0.26	2.48	5.91	2.36	3.96
DN25	mm	11.15	118.0	62.0	26.7	37.9	62.45		30.0	5.5		6.6	63.0	150.0	60.0	1.8
1"	inch	0.44	4.65	2.44	1.05	1.49	2.46		1.18	0.22		0.26	2.48	5.91	2.36	3.96

H25 BODY SIZE B | ¾"-1½" | DN20-DN40 | PN550 (8,000PSI)

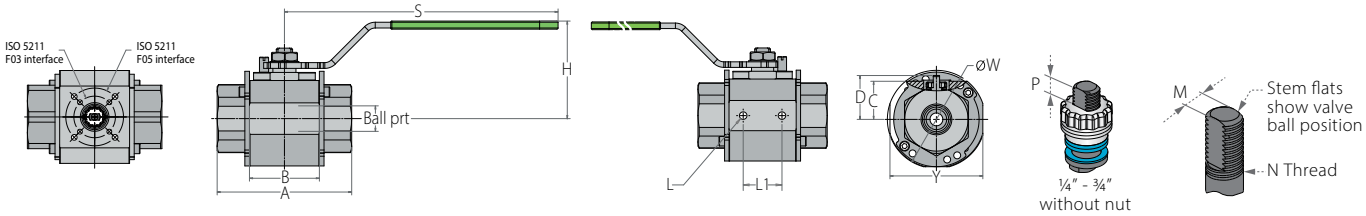
Hydrogen Service High Pressure Floating Ball Threaded Body

End Connections

Valve size code	Connection			Orifice mm (in)	Cv	Kv
07	Medium Pressure Coned & Threaded	CTM	¾"	11.1	5.52	4.89
10		CTM	1"	14.3	14.31	12.66
15		CTM	1½"	20.6	54.73	48.44
07	Threaded	NPT/BSPP/DIN3852/BSPT	¾"	18.88	30.17	26.7
10		NPT/BSPP/DIN3852/BSPT	1"	20.6	71.36	63.15
15		NPT/BSPP/DIN3852/BSPT	1½"	20.6	20.51	18.15

Valve Dimensions

ISO 5211 Interface -F04



Port	Unit	Ball port	A	B	C	D	H	L	L1	M	N	P	W	S	Y	Weight kg/ib
DN20	mm	20.65	168.6	88.6	39.6	55.6	81.5	M10	50.0	7.5	7/16" UNF	11.74	96.0	187.13	92.0	5.9
¾"	inch	0.81	6.64	3.49	1.56	2.19	3.21		1.97	0.30		0.46	3.78	7.37	3.62	12.98
DN25	mm	20.65	168.6	88.6	39.6	55.6	81.5		50.0	7.5		11.74	96.0	187.13	92.0	5.9
1"	inch	0.81	6.64	3.49	1.56	2.19	3.21		1.97	0.30		0.46	3.78	7.37	3.62	12.98
DN40	mm	20.65	188.6	88.6	39.6	55.6	81.5		50.0	7.5		11.74	96.0	187.13	92.0	6.5
1½"	inch	0.81	7.43	3.49	1.56	2.19	3.21		1.97	0.30		0.46	3.78	7.37	3.62	14.3

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
0	3			F	H	2	5	W	-	6	6	M	M	L	H	G	/	C	T	M		-						
Size		Features				Series		Design		Body/Ends material		Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End Connection					Special features					

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
05*	½"	13
06	9/16"	15
07	¾"	20
10	1"	25
15	1½"	40

* Not applicable for CTM/CTH

Features (3-6)	
H	Hydrogen use
F	Fire safe
	Body size A
B	Body size B

Series (7-8)	
25	HP Float 3 piece

Design (9)	
W	Total HermetiX Integrity package

Body/Ends material (11-12)	
6	S. Steel 316L

Ball material (13)	
M	High Strength S. Steel

Stem material (14)	
M	High Strength S. Steel

Seat material (15)	
L	Virgin PEEK

Inner Seal Material (16)	
H	HNBR
V	Viton
A	TFM

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
CTM	Coned & Threaded Medium pressure
CTH	Coned & Threaded High pressure
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPP	ISO228-1 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
BSPT	EN 10226 - Pipe Taper thread

Special Features (24-30)	
TPED	TPED / TPE
TH	T Handle

H24 ¼"-½" | DN8-DN15 | PN500 (7,250PSI)
¾"-1½" | DN20-DN40 | CLASS 2500 PN420 (6,000PSI)

Hydrogen Service High Pressure Floating Ball 3 Piece Threaded-Body

Technical Information

Operation

Maximum Working Pressure:
Size ¼"-½" - 500bar (7,250psi)*
Size ¾"-1½" - Class 2500 414bar (6,000psi)

Working temperature: -60°C up to +200°C (-76°F up to +392°F)

TPED /TPE Valves: -40°C up to 65°C (-40°F up to 149°F).

Design

- Threaded body
- Automation-ready with standard ISO 5211 connecting plate
- Total HermetiX Integrity package with:
  ISO 15848-1 and API 641 emission standard certificated design
  ISO 10497 and API607 fire-safe standard certificated design
  Double body sealing

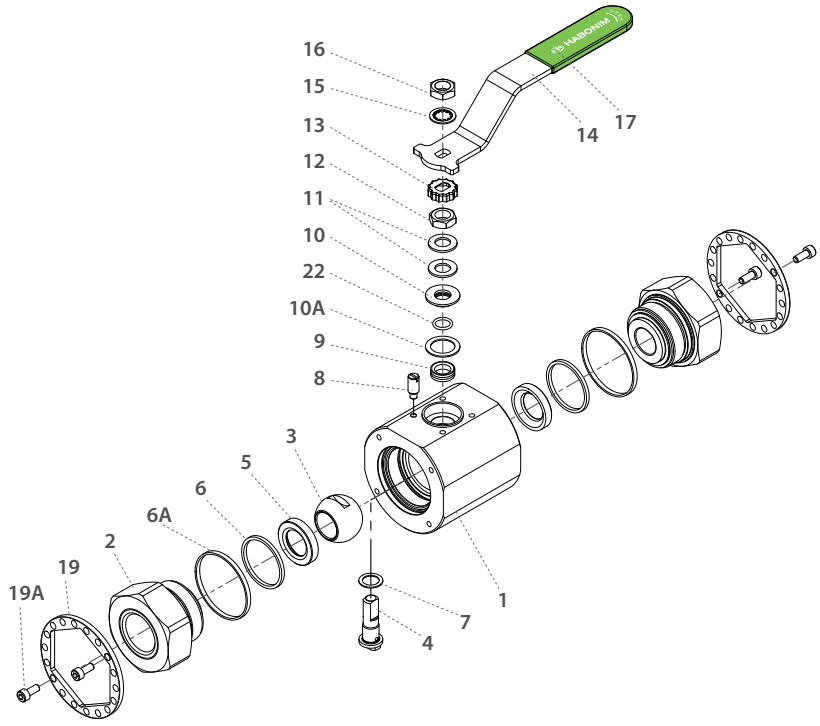
Testing & Certifications

- TPED/TPE , according to ISO 23826:
  ¼"-½" up to 500bar (7,250psi)
  ¾"-1" up to 414bar (6,000psi)
- 100% shell & inline leak tested
- Marine classification (on demand): DNV GL, LR, BV, ABS, KR, RINA, others

Materials

- Stainless steel body & ends
- All materials compatible for Hydrogen use

Components & Materials



* Std. port only

Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	End	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner seal	Acc. Ordering Code	2
6A*	Outer seal	Acc. Ordering Code	2
7*	Stem thrust seal	PEEK, PCTFE	1
8	Stop pin	S. Steel	1
8A	Locking bolt	S. Steel	2
9*	Stem seal	CF PTFE, TFM	1
10	Follower	S. Steel	1
10A*	Slide bearing	S. Steel	1
11	Disc spring	S. Steel	2
12	Stem nut	S. Steel	1
13	Locking clip	S. Steel	1
14	Handle	S. Steel	1
15	Serrated washer	S. Steel	1
16	Handle nut	S. Steel	1
17	Sleeve	PVC	1
22	O-ring	Acc. Ordering Code	1
23	Tag (not shown)	S. Steel	1

* Maintenance kit components

H24

¼"-½" | DN8-DN15 | PN500 (7,250PSI)
¾"-1½" | DN20-DN40 | CLASS 2500 PN420 (6,000PSI)

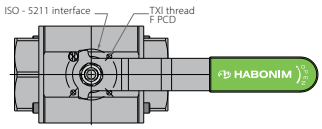
Hydrogen Service High Pressure Floating Ball 3 Piece Threaded-Body

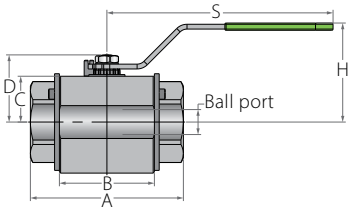
End Connections

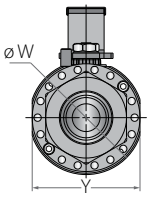
Valve size code	Connection			Orifice mm (in)	Cv	Kv
02	Medium Pressure Coned & Threaded	CTM	¼"	2.8	0.33	0.29
03		CTM	⅜"	5.2	1.17	1.03
06		CTM	9⁄16"	7.9	4.4	3.89
07		CTM	¾"	11.15	21.47	19
10		CTM	1"	14.3	36.34	32.16
15		CTM	1½"	23.8	33.65	29.78
02	High Pressure Coned & Threaded	CTH	¼"	2.4	0.24	0.21
03		CTH	⅜"	3.2	0.43	0.21
06		CTH	9⁄16"	6.4	2.79	0.38
10		CTH	1"	11.15	22.23	2.47
02	Threaded	NPT/BSPP/DIN3852/BSPT	¼"	7.66	2.62	2.32
03		NPT/BSPP/DIN3852/BSPT	⅜"	10.7	12.51	11.07
05		NPT/BSPP/DIN3852/BSPT	½"	11.15	6.88	6.08
05 B		NPT/BSPP/DIN3852/BSPT	½"	13.84	21.95	19.43
07		NPT/BSPP/DIN3852/BSPT	¾"	14.35	21.95	19.43
07 B		NPT/BSPP/DIN3852/BSPT	¾"	18.88	29.3	25.93
10		NPT/BSPP/DIN3852/BSPT	1"	20.6	57.8	51.15
12		NPT/BSPP/DIN3852/BSPT	1¼"	25.5	42.62	37.72
12 B		NPT/BSPP/DIN3852/BSPT	1¼"	29.5	78.65	69.6
15		NPT/BSPP/DIN3852/BSPT	1½"	31.8	92.76	82.09

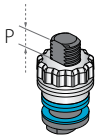
Valve Dimensions

ISO 5211 Interface

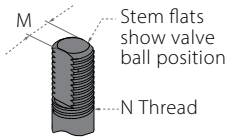








¼" - ¾"
without nut



Std. port	Full port	Unit	Ball port	A	B	C	D	H	M	N	P	W	S	W	ISO PCD	F	weight kg/lb
	DN8	mm	11.15	91.0	45.5	21.50	37.90	42.1	5.54	⅜" UNF	11.1	54.0	179.0			45.0	0.8
	¼"	inch	0.44	3.58	1.79	0.84	1.49	1.66	0.22		0.43	2.12	7.05			1.77	1.76
DN15	DN10	mm	11.15	91.0	45.5	24.50	37.90	42.1	5.54	⅜" UNF	11.1	54.0	179.0	F03	36	45.0	0.8
½"	⅜"	inch	0.44	3.58	1.79	0.84	1.49	1.66	0.22		0.43	2.12	7.05	F03	36	1.77	1.76
DN20	DN15	mm	14.3	104.25	52.12	23.90	40.30	45.0	5.54	⅜" UNF	11.1	62.0	179	F03	36	60.0	1.27
¾"	½"	inch	0.56	4.10	2.05	0.94	1.59	1.77	0.22		0.43	2.44	7.05	F03	36	2.36	2.79
DN25	DN20	mm	20.6	126.6	63.3	37.90	55.60	60.3	7.54	7⁄16" UNF	15.4	84.5	193	F04	42	77.0	2.1
1"	¾"	inch	0.81	4.98	2.49	1.49	2.19	2.37	0.29		0.60	3.32	7.60	F04	42	3.03	4.63
DN32	DN25	mm	25.4	137.25	68.62	42.50	60.2	68.7	7.54	7⁄16" UNF	15.4	93.0	193.0	F04	42	85	2.9
1¼"	1"	inch	1.0	5.40	2.70	1.67	2.37	2.70	0.29		0.60	3.66	7.60	F04	42	3.34	6.39
DN40	DN32	mm	31.8	161.94	80.97	43.55	73.0	81.1	8.7	9⁄16" UNF	19.6	99.0	287.0	F05	50	95.0	4.8
1½"	1¼"	inch	1.25	6.37	3.18	1.71	2.87	3.19	0.34		0.77	3.89	11.30	F05	50	3.74	10.58

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
0	5			F	**H**	**2**	**4**	**W**	-	6	6	M	M	L	H	G	/	N	P	T		-						
Size		Features				Series		Design		Body/Ends material		Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End Connection					Special features					

Size (1-2)			MWP bar (psi)	
Code	inch	mm	414 (6,000)	500 (7,250)
02	¼"	8	+	+
03	⅜"	10	+	+
05	½"	15	Full port	Std. port only
07	¾"	20	+	n/a
10	1"	25	+	n/a
12	1¼"	32	+	n/a
15	1½"	40	Std. port only	n/a

Features (3-6)	
H	Hydrogen Service
F	Fire safe
B	Full port

Series (7-8)	
24	HP Float 3 piece

Design (9)	
W	Total HermetiX Integrity package

Body/Ends material (11-12)	
6	S. Steel 316L

Ball material (13)	
M	High Strength S. Steel

Stem material (14)	
M	High Strength S. Steel

Seat material (15)	
L	Virgin PEEK

Inner Seal Material (16)	
H	HNBR
V	Viton
T	PTFE
G	Expanded graphite

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
Threaded Ends	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPP	ISO228-1 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
CTM	Coned & Threaded Medium pressure
BSPT EN 10226	10226 - Pipe Taper thread
AS5202	AS 5202 on-face gasket sealing threaded connection
MNPT	Male NPT
SAE J1926	SAE J1926
Welded	
XBW80	Extended buttweld ends (sch80)
Clamp	
LL*	Compression fitting (imperial) - **No** nuts & Ferrules
LM*	Compression fitting (metric) - **No** nuts & Ferrules
LL-NF*	Compression fitting (imperial) - **With** nuts & Ferrules
LM-NF*	Compression fitting (metric) - **With** nuts & Ferrules

Special Features (24-30)	
TPED	TPED / TPE
TH	T Handle

* Std. port, sizes ¾" to 1½" only.

H23 ¼"-9/16" | DN8-DN14 | PN700 (10,150PSI)

Hydrogen Service High Pressure Floating Ball Valve

Habonim H23 Hydrogen service valve is specifically designed to provide long life, reliable and durable solution for compressed Hydrogen through the various stages of the hydrogen supply chain. The H23 is the only valve in its orifice scale to have an anti-blowout stem design.

Technical Information

Operation

Maximum Working Pressure: 700bar (10,150psi)
Working temperature: -40°C up to +85°C (-40°F up to +185°F).

Design

- Anti blowout stem design
- Integral locking device for manual version
- Bi-directional
- Threaded body
- AutomationPanel mounting from top and bottom side by rigid screwed connection
- Total HermetiX Integrity package with:
  ISO 15848-1 and API 641 emission standard certificated design
  ISO 10497 and API607 fire-safe standard certificated design
  Double body sealing
- O-ring enhanced stem sealing

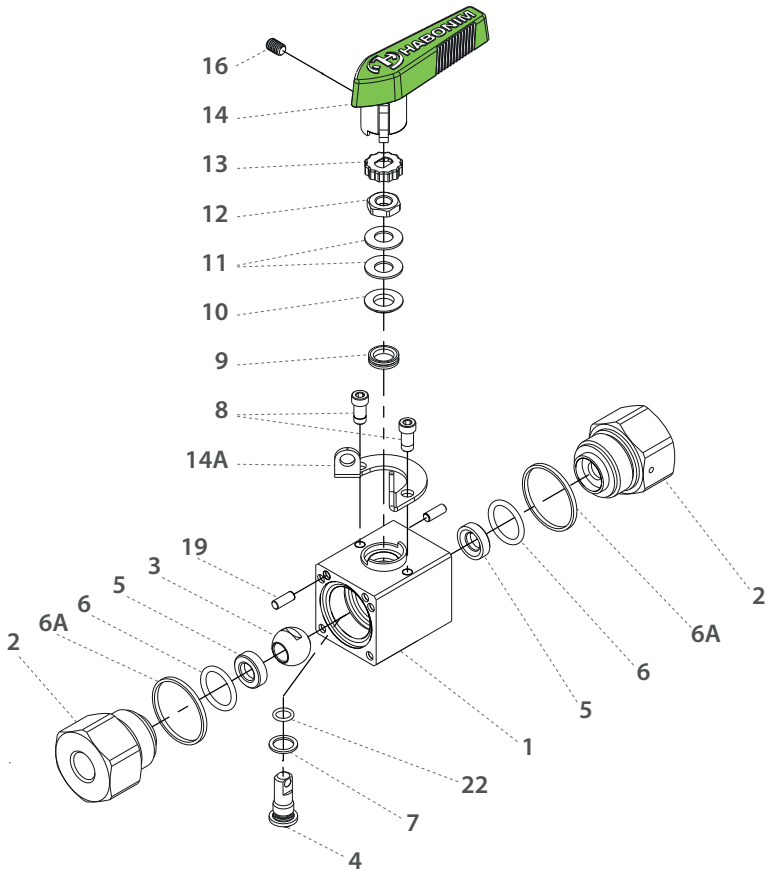
Testing & Certifications

- ATEX IIC
- SIL2(3)
- 100% shell & inline leak tested
- Marine classification (on demand): DNV GL, LR, BV, ABS, KR, RINA, others

Materials

- Stainless steel body & ends
- All materials compatible with Hydrogen use

Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5*	Seat	Acc. Ordering Code	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	PEEK, PCTFE	1
8	Locking Device Screws	S. Steel	2
9*	Stem seal	TFM, CF PTFE	1
10	Follower	S. Steel	1
11	Disc spring	S. Steel	2
12	Stem nut	S. Steel	1
13	Locking clip	S. Steel	1
14	Handle	S. Steel + PA	1
14A	Locking Device Plate	S. Steel	1
16	Handle screw	S. Steel	1
19*	Dowel pin	S. Steel	2
22*	O-Ring	Acc. to 6	1

* Maintenance kit components

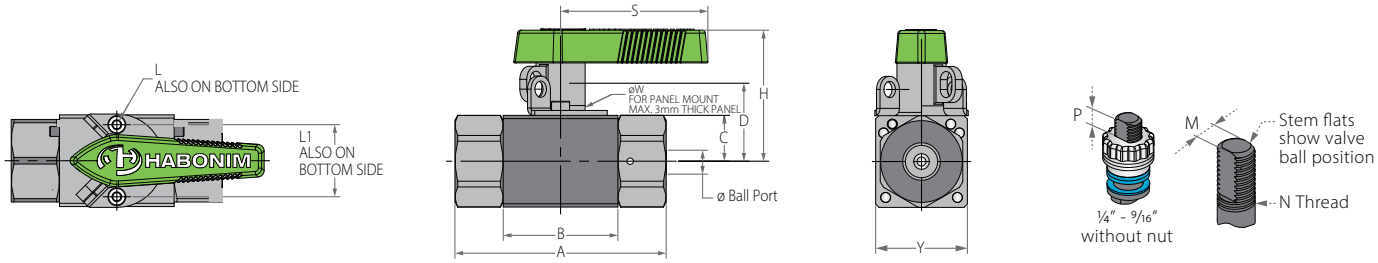
H23 ¼"-9⁄16" | DN8-DN14 | PN700 (10,150PSI)

Hydrogen Service High Pressure Floating Ball Valve

End Connections

Valve size code	Connection			Orifice mm (in)	Cv	Kv
02	Medium Pressure Coned & Threaded	CTM	¼"	2.8 (0.11")	0.38	0.33
03		CTM	⅜"	5.2 (0.2")	1.40	1.21
06		CTM	9⁄16"	7.9 (0.31")	1.96	1.70
02	Threaded	NPT/BSPP/DIN3852/BSPT	¼"	6.35 (0.25")	1.49	1.29

Valve Dimensions



Port	Unit	Ball port	A	B	C	D	H	L	L1	W	M	N	P	S	Y	Weight kg/ib
DN8	mm	6.35	64.5	35.0	14.0	23.8	40.0	M4x7	22.0	16.0	4.0	M6x1.0	4.0	45.0	28.0	0.35
¼"	inch	0.25	2.54	1.38	0.55	0.94	1.57		0.87	0.63	0.16		0.16	1.77	1.10	0.77
DN10	mm	6.35	74.5	35.0	14.0	23.8	40.0		22.0	16.0	4.0		4.0	45.0	28.0	0.40
⅜"	inch	0.25	2.93	1.38	0.55	0.94	1.57		0.87	0.63	0.16		0.16	1.77	1.10	0.88
DN14	mm	6.35	82.5	35.0	14.0	23.8	40.0		22.0	16.0	4.0		4.0	45.0	28.0	0.40
9⁄16"	inch	0.25	3.25	1.38	0.55	0.94	1.57		0.87	0.63	0.16		0.16	1.77	1.10	0.88

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
0	2			F	H	2	3	W	-	6	6	M	M	L	H	G	/	C	T	M		-						
Size		Features				Series		Design		Body/Ends material		Ball material	Stem material	Seat material	Inner Seal	Outer Seal		End Connection					Special features					

Size (1-2)		
Code	inch	mm
02	¼"	8
03	⅜"	10
06	9⁄16"	14

Features (3-6)	
H	Hydrogen use
F	Fire safe

Series (7-8)	
23	HP Float 3 piece

Design (9)	
W	Total HermetiX Integrity package

Body/Ends material (11-12)	
6	S. Steel 316L

Ball material (13)	
M	High Strength S. Steel

Stem material (14)	
M	High Strength S. Steel

Seat material (15)	
L	Virgin PEEK

Inner Seal Material (16)	
H	HNBR
V	Viton
A	TFM

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End connections (19-22)	
CTM	Coned & Threaded medium pressure
NPT*	ASME B1.20.1 - National Pipe Taper Thread
BSPP*	ISO 228-1 - Pipe Parallel Thread
DIN3852*	DIN 3852 - Pipe Parallel Thread
BSPT*	EN 10226 - Pipe Taper Thread

* Available only in size ¼"

H21 BODY SIZE A | ½"-1" | DN15-DN25 | PN600 (8,700PSI)

Hydrogen Service High Pressure Floating Ball Bolted-Body

Technical Information

Operation

Maximum Working Pressure: 600bar (8,700psi)
Working temperature: -40°C up to +85°C (-40°F up to +185°F).

Design

- Bolted body
- Full port
- Automation-ready with standard ISO 5211 connecting plate
- Total HermetiX Integrity package with:
  ISO 15848-1 and API 641 emission standard certificated design
  ISO 10497 and API607 fire-safe standard certificated design
  Double body sealing

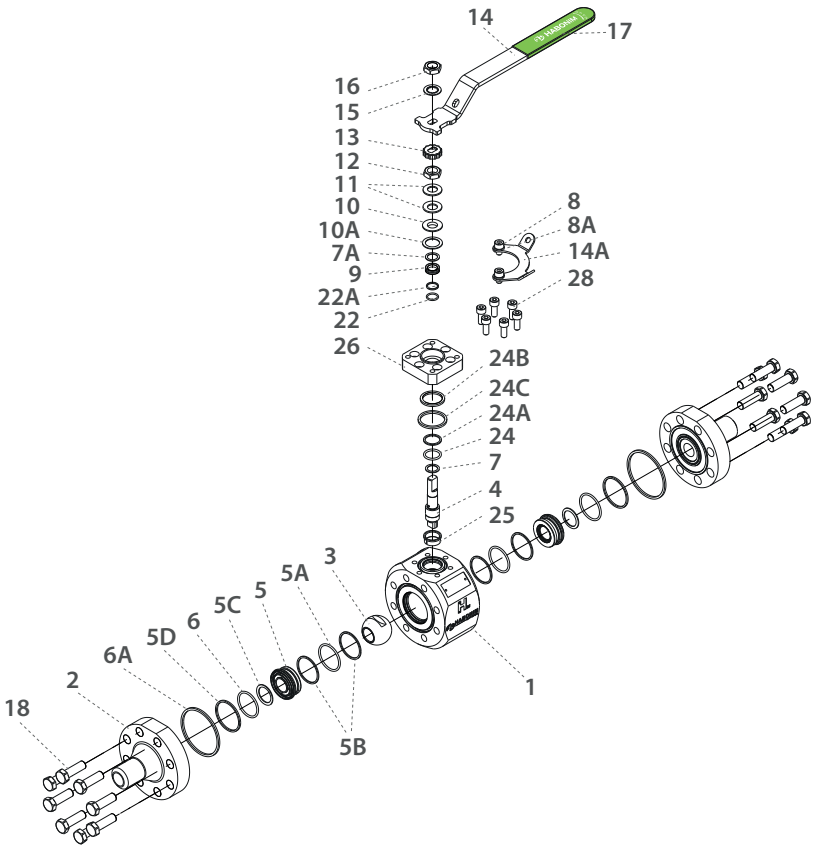
Testing & Certifications

- ATEX IIC
- SIL 2
- 100% shell & inline leak tested
- Marine classification (on demand): DNV GL, LR, BV, ABS, KR, RINA, others

Materials

- Stainless steel body & ends
- All materials compatible for Hydrogen use

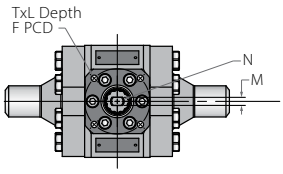
Components & Materials

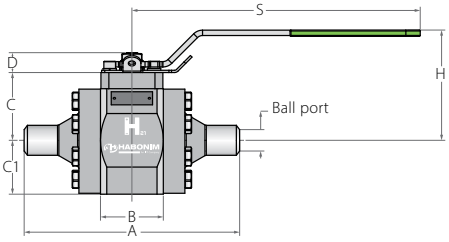


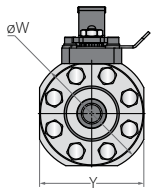
Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5	Seat	Acc. Ordering Code	2
5A*	Seat seal	Acc. Ordering Code	2
5B*	Seat seal Backup	V.Peek, PTFE	4
5C	Seat Spring	Inconel 718	2
5D*	Housing FS Seal	Graphit	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	V. Peek, PCTFE	1
7A*	Anti-Abrasion Ring	V. Peek, PCTFE	1
8	Stop Pin	S. steel	2
8A	Spring Washer	S. steel	2
9	Stem Seal	CF PTFE, TFM	1
10	Follower	S. steel	1
10A*	Slide Bearing	S. steel	1
11	Disc Spring	S. steel	2
12	Stem Nut	S. steel	1
13	Locking Clip	S. steel	1
14	Handle	S. steel	1
14A	Stop Plate	S. steel	1
15	Serrated Washer	S. steel	1
16	Handle Nut	S. steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. steel	16
22*	Stem OR	Acc. Ordering Code	1
22A*	Stem OR Backup	V.Peek, PTFE	1
24*	Bonnet OR	Acc. Ordering Code	1
24A*	Bonnet OR Backup	V.Peek, PTFE	1
24B*	Bonnet Seal	TFM	1
24C*	Bonnet FS Seal	Graphite	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. steel	1
28	Bonnet Bolts	S. steel	6

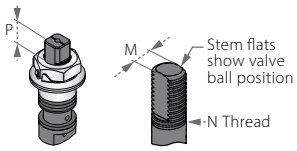
* Maintenance kit component

H21 BODY SIZE A | ½"-1" | DN15-DN25 | PN600 (8,700PSI)







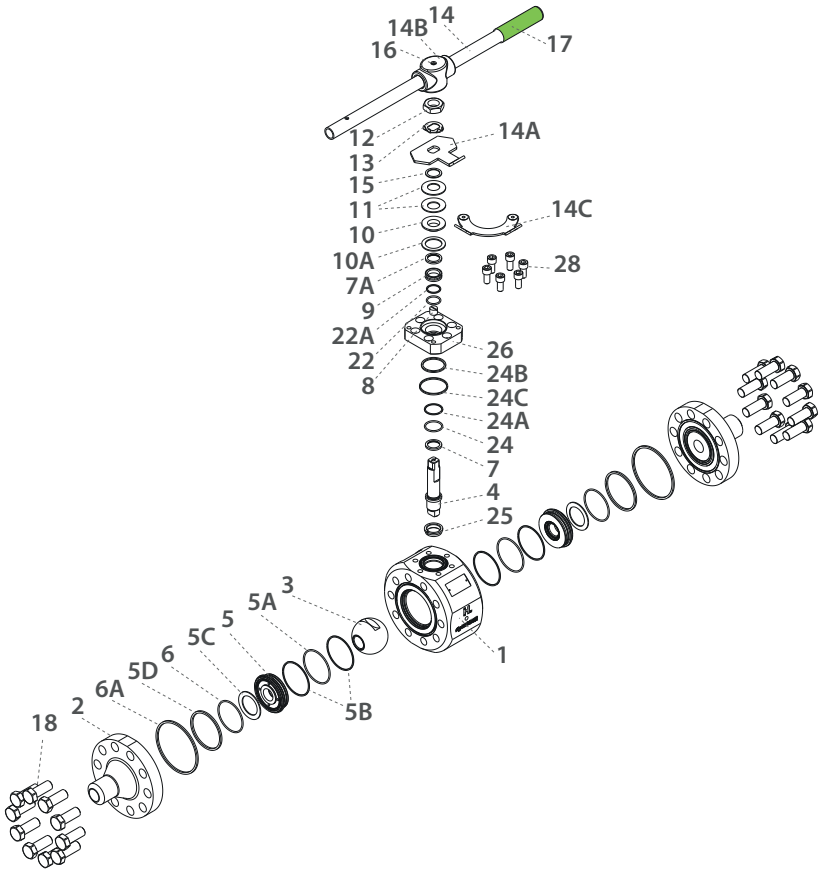


Body Size A

Port	Units	Ball port	A	B	C	C1	D	H	M	N	P	TxL	F PCD	W	S	Y	Weight (Kg /lb)	Kv/Cv
DN15	mm	11.8	240	70	75.5	60	22	124	8.65		15	M8X18	70 (F07)	134	320	120	12	20
½"	inch	0.46	9.45	2.76	2.97	2.36	0.87	4.88	0.34		0.59			5.28	12.60	4.72	26.4	23
DN20	mm	15.6	240	70	75.5	60	22	124	8.65	9⁄16" UNF-2A	15	M8X18	70 (F07)	134	320	120	12	38
¾"	inch	0.61	9.45	2.76	2.97	2.36	0.87	4.88	0.34		0.59			5.28	12.60	4.72	26.4	44
DN25	mm	20.7	240	70	75.5	60	22	124	8.65		15	M8X18	70 (F07)	134	320	120	12	69
1"	inch	0.81	9.45	2.76	2.97	2.36	0.87	4.88	0.34		0.59			5.28	12.60	4.72	26.4	80

Hydrogen Service High Pressure Floating Ball Bolted-Body

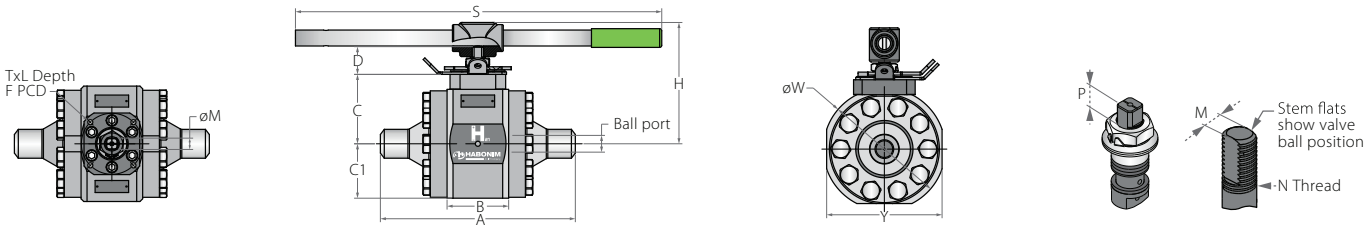
Components & Materials



Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Ends	Acc. Ordering Code	2
3	Ball	Acc. Ordering Code	1
4	Stem	Acc. Ordering Code	1
5	Seat	S. steel + V. peek	2
5A*	Seat Seal	Acc. Ordering Code	2
5B*	Seat Seal Backup	V.Peek, PTFE	4
5C	Seat Spring	Inconel 718	2
5D*	Housing FS Seal	Graphit	2
6*	Inner Seal	Acc. Ordering Code	2
6A*	Outer Seal	Acc. Ordering Code	2
7*	Stem Thrust Seal	V. peek, PCTFE	1
7A*	Anti-abrasion Ring	V. peek, PCTFE	1
8	Stop Pin	S. steel	1
9	Stem Seal	CF PTFE, TFM	1
10	Follower	S. steel	1
10A*	Slide Bearing	S. steel	1
11	Disc Spring	S. steel	2
12	Stem Nut	S. steel	1
13	Locking Clip	S. steel	1
14	Handle	S. steel	1
14A	Stop Plate	S. steel	1
14B	Wrench Head	S. steel	1
14C	Locking Plate	S. steel	1
15	Location Ring	S. steel	1
16	Wrench Bolt	S. steel	1
17	Sleeve	PVC	1
18	Body Bolts	S. steel	20
22*	Stem OR	Acc. Ordering Code	1
22A*	Stem OR Backup	V.Peek, PTFE	1
24*	Bonnet OR	Acc. Ordering Code	1
24A*	Bonnet OR Backup	V.Peek, PTFE	1
24B*	Bonnet Seal	TFM	1
24C*	Bonnet FS Seal	Graphite	1
25*	Stem Bearing	PTFE	1
26	Bonnet	S. steel	1
28	Bonnet Bolts	S. steel	6

* Maintenance kit component

H21 BODY SIZE B | 1¼"-2" | DN32-DN50 | PN600 (8,700PSI)



Body Size B

Port	Units	Ball port	A	B	C	C1	D	H	M	N	P	TxL	F PCD	W	S	Y	Weight (Kg /lb)	Kv/Cv
DN32	mm	22.8	326.0	103.0	116.0	91.0	46.5	203.0	18.9	1-14" UNF	16.0	M10X25	102 (F10)	204.0	610.0	193.0	41	85
1¼"	inch	0.90	12.83	4.06	4.57	3.58	1.83	7.99	0.74		0.63			8.03	24.02	7.60	90.2	98
DN40	mm	28.0	326.0	103.0	116.0	91.0	46.5	20.0	18.9		16.0	M10X25	102 (F10)	204.0	610.0	193.0	41	121
1½"	inch	1.10	12.83	4.06	4.57	3.58	1.83	7.99	0.74		0.63			8.03	24.02	7.60	90.2	140
DN50	mm	38.1	326.0	103.0	116.0	91.0	46.5	203.0	18.9		16.0	M10X25	102 (F10)	204.0	610.0	193.0	41	242
2"	inch	1.50	12.83	4.06	4.57	3.58	1.83	7.99	0.74		0.63			8.03	24.02	7.60	90.2	280

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	30
0	5			F	H	2	1	W	-	6	6	M	M	L	H	G	/	X	B	W	1	6	0	-				
Size		Features				Series		Design		Body/Ends material		Ball material		Stem material		Seat material		Inner Seal		Outer Seal		End Connection						Special features		

Size (1-2)		
Code	inch	mm
05*	½"	15
07	¾"	20
10	1"	25
12	1¼"	32
15	1½"	40
20	2"	50

* Not applicable for CTM/CTH

Features (3-6)	
F	Fire safe
H	Hydrogen use
	Body size A
B	Body size B

Series (7-8)	
21	3 piece design #3500

Design (9)	
W	Total HermetiX Integrity package

Body/Ends material (11-12)	
6	S. Steel 316L
3	S. Steel DIN 1.4435

Ball material (13)	
M	High Strength S. Steel

Stem material (14)	
M	High Strength S. Steel

Seat material (15)	
L	Virgin PEEK

Inner Seal Material (16)	
H	HNBR
V	Viton
E	EPDM

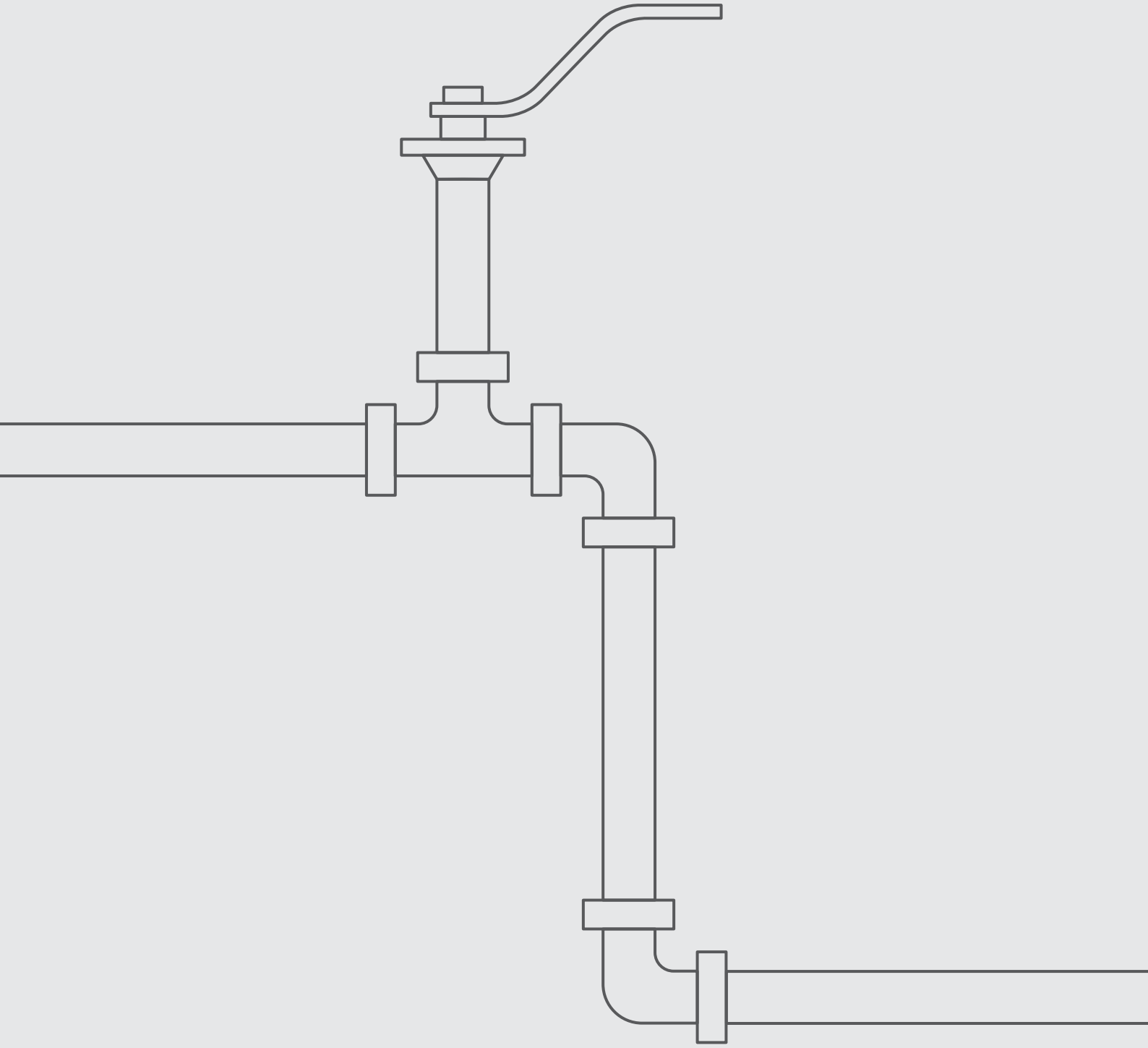
Outer Seal Material (17)	
G	Expanded graphite

End connections (19-24)	
Welded Ends	
XBW160	Extended buttweld sch 160
XBWXXS	Extended buttweld sch XXS
XBW80*	Extended buttweld sch 80

* Sizes ¼" & ⅜" Only

Threaded Ends	
NPT	ASME B1.20.1 - National Pipe Taper thread
BSPP	ISO228-1 - Pipe Parallel thread
DIN3852	DIN3852 - Pipe Parallel thread
BSPT	EN 10226 - Pipe Taper thread

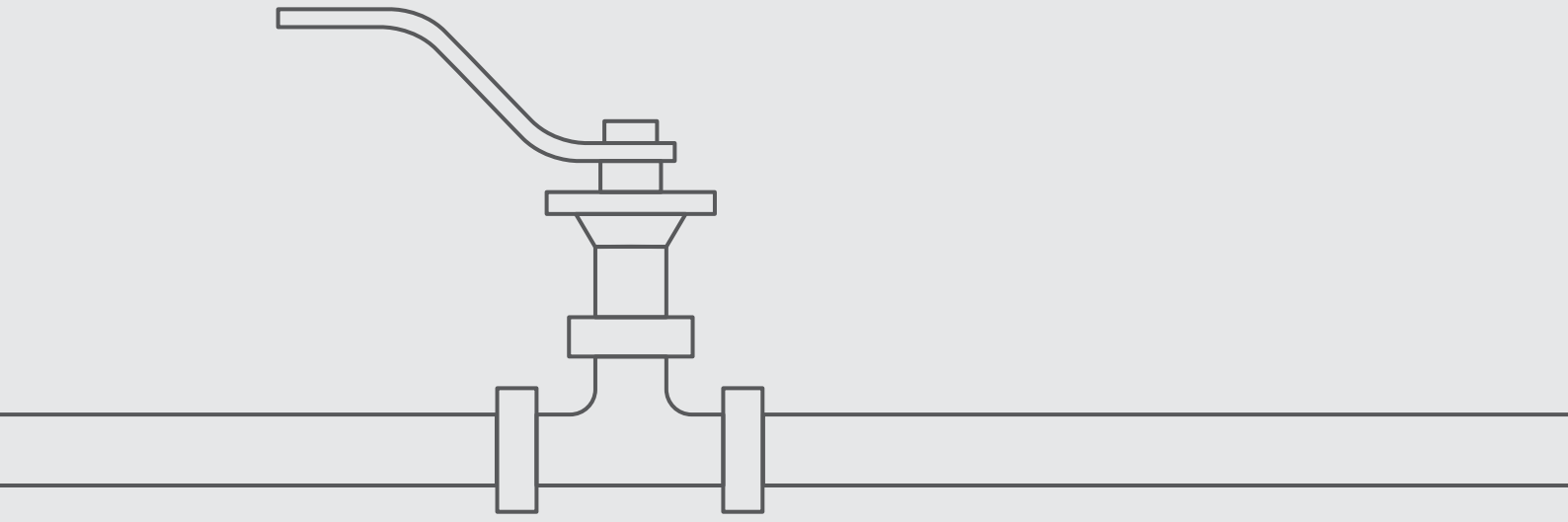
Special Features (25-30)



M

AMMONIA SERVICE

BALL VALVES



M

Ammonia Service Ball Valves (M)

Habonim's ammonia service ball valves are suited to provide optimal protection and functionality for use in severe ammonia service applications. valves designated for ammonia service are specially prepared and cleaned to meet requirements for the safe operation of ammonia service equipment and media purity.

Ammonia

Ammonia is a compound of nitrogen and hydrogen with the formula NH, at atmospheric conditions, ammonia is a colorless gas lighter than air with a pungent, suffocating odor. It is a highly caustic irritant that is both toxic and flammable. Ammonia is soluble in water to provide an alkaline solution.

Ammonia is lighter than air, its density 0.73 kg/m3 (1.013bar at 15°C).

- Ammonia boiling point is -33°C (-28°F) at a pressure of 1 atmosphere, a liquid ammonia needs to be stored under high pressure or at low temperature.
- Ammonia melting point is -78°C (-108°F).

Ammonia Uses

Manufactured by synthesis from nitrogen and hydrogen, ammonia has many uses in the production of fertilizers, plastics, explosives, pharmaceuticals, metal treating operations, refrigerant, cleaning agent and more. Ammonia is developing to be a major renewable fuel as a carrier of Hydrogen.

Ammonia Hazards

Ammonia combined with oil, grease or other combustible substances can result in explosions. valves to be used in ammonia systems should be selected properly.



Self-Relieving-Seat (SRS)

General

Ammonia Service feature is available for part of Habonim's valves series – check series ordering codes for availability. Available valve sizes, types and variety of end connections are per each relevant series ordering codes.

Design

Valves designed for ammonia in a liquid state are equipped by default with an upstream pressure relief hole in the ball (Ordering code -P250).

The relief hole avoids trapped cavities in the valve closed position and pressure buildup due to thermal expansion during liquid ammonia boil off. A valve with relief hole in the ball is uni-directional, the relief hole must be positioned at the upstream flow direction for complete in-line sealing.

For Bi-directional valve design for liquid ammonia a Self-Relief Seats (Ordering code -SRS) should be used with seats material of TFM or CF PTFE, the SRS seat design dynamically release cavity pressure buildup and return to shutoff position once the over pressure is relieved. Valves designed for ammonia in the gaseous state do not require an upstream pressure relief hole.



Cavity pressure relief (P250 Ball)
3 mm relief hole face the upstream

M

Valve Component Materials

Due to the extreme noxious nature of ammonia, it is crucial that all valve components are constructed with appropriate materials.

Materials recommendations

Bill of Materials	Wet Ammonia	Dry Ammonia
Body, ends, ball, stem	Stainless Steel 316/316L, CF8M/CF3M	Carbon Steel, WCB (min. temp. -29 °C, LCB min. -46 °C, LF2 min. -60 °C)
Seats	TFM (A), PTFE (T), CF PTFE (P), Glass filled PTFE (R), PEEK (K), CF PEEK	TFM (A), PTFE (T), CF PTFE (P), Glass filled PTFE (R), PEEK (K)
Seals	PTFE (T)	PTFE (T)

Stem packing o-ring is made of EPDM

Cleaning, Assembling and Packing

All valve components used for ammonia service, in gaseous or liquid state, are de-burred to a high standard and specifically cleaned to remove any traces of oil, grease or hydrocarbon materials prior to assembly.

Ammonia service valves are assembled in an oil-free restricted area by personnel who are specially equipped and trained to perform this task. The assembling area, work surfaces, equipment and tools are specially maintained to ensure cleanliness requirements are met.

Only lubricants compatible with ammonia are used.

- Valves are packed in open position with capped ends and plastic bagged
- Each valve is packed with a 'Silica-gel pack'
- A sticker on the plastic bag indicating “Ammonia Service"

Optional Accessories

Fugitive Emission Bonnet (FE)

An important safety mechanism that Habonim offers for ammonia service is the Fugitive Emission bonnet (FE). A stainless-steel pressure chamber bolted on and sealed against the valve ISO 5211 top platform. The FE bonnet will accumulate ammonia leak, if occurred, and contain it in a confined space until a maintenance operation is scheduled.

A readily made purge ports at the FE bonnet top allow the site technician to connect pressure gauge, pressure transducer or ammonia sniffer to alert for ammonia leak through the valve stem seal. The FE bonnet allows stem seal redundancy, a simple design, yet crucial to enhance site safety in terms of ammonia leak through the atmosphere.

For mor information see Habonim Valve Accessories catalog.



Locking Device (LD)

As a safety measure, it is advisable that valve for ammonia service should be equipped with spring loaded locking device do avoid unauthorized or unintentional valve operation.

For more information see Habonim Valve Accessories catalog.

M

Quick Selection Table

Total Hermetix™ | **Port:** Standard Port | Full Port | Tube Size | **End Connections:** Threaded | Flanged | Welded | Ordering Code

Temperature: -60°C - +260°C (-76 °F ÷ +500 °F)

Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16 — MWP (ASME Class / DIN PN)
Trunnion Mounted Ball	3 Piece	OC	M91	TH	Standard Port, Full Port	Threaded, Flanged, Welded										150							
		OC	M92	TH	Standard Port, Full Port	Threaded, Flanged, Welded										300							
		OC	M93	TH	Standard Port, Full Port	Threaded, Flanged, Welded										600							
		OC	M94	TH	Standard Port, Full Port	Threaded, Flanged, Welded										900							
	2 Piece	OC	M81	TH	Full Port	Threaded, Flanged										150							
		OC	M82	TH	Full Port	Threaded, Flanged										300							
		OC	M83	TH	Full Port	Threaded, Flanged										600							
Floating Ball	3 Piece	OC	M47	TH	Standard Port, Full Port	Threaded, Flanged, Welded									900		400						
		OC	M26	TH	Full Port	Threaded, Flanged										600							
	1 Piece	OC	M31	TH	Standard Port	Threaded, Flanged										150							
		OC	M32	TH	Standard Port	Threaded, Flanged										300							
	1 Piece 2 Piece	OC	M73	TH	Full Port	Threaded, Flanged										150							
		OC	M74	TH	Full Port	Threaded, Flanged										300							
		OC	M77	TH	Full Port	Threaded, Flanged											PN16						
		OC	M78	TH	Full Port	Threaded, Flanged										PN40							
	DS (DBB)	OC	M47DS	TH	Standard Port	Threaded, Flanged, Welded									600								
		OC	M73DS	TH	Full Port	Threaded, Flanged											150						
		OC	M74DS	TH	Full Port	Threaded, Flanged											300						
		OC	M77DS	TH	Full Port	Threaded, Flanged											PN16						
	Multiport 3 Pcs.	OC	M61	TH	Standard Port, Full Port	Threaded, Flanged, Welded									600			300					
		OC	M62	TH	Standard Port, Full Port	Threaded, Flanged, Welded																	
	Diverter 3 Pcs.	OC	MD47	TH	Standard Port, Full Port	Threaded, Flanged, Welded										600		300					
	Side-Entry 3 Pcs.	OC	MS47	TH	Standard Port, Full Port	Threaded, Flanged, Welded																	
	Diverter 2 Pcs.	OC	MD31	TH	Standard Port	Threaded, Flanged										150							
		OC	MD32	TH	Standard Port	Threaded, Flanged																	
	Side-Entry 2 Piece	OC	MS31	TH	Standard Port	Threaded, Flanged																	
		OC	MS32	TH	Standard Port	Threaded, Flanged																	
	Flush tank	OC	MR47	TH	Standard Port	Threaded, Flanged, Welded										300							

ASME Class			150	300	600	900	1500	2500	6000
Pressure Bar	-1*	0	16	50	100	150	250	400	1034
Pressure psi	-14*	0	290	725	1450	2175	3600	5800	15000

* Vacuum 10^{-6} Tor

M

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
2	0			F	M	4	7	W	-	6	6	6		A	T	A	/	B	W							
Size		Features				Series		Design		Body material	Ends material	Ball/Stem material		Seat material	Inner Seal material	Outer Seal material		End connection					Special features			

Size (1-2)		
Code	inch	mm
Per Base Series		

Features (3-6)	
F	Fire safe
M	Ammonia service
B	Full port

Series (7-8)	
	Per base series

Design (9)	
W	Total HermetiX Integrity package

Body material (11)	
6	S. SteelCF8M/CF3M
4	C. steel
W	Hasteloy-C22

Ends material (12)	
6	S. SteelCF8M/CF3M
4	C. steel
W	Hasteloy-C22

Ball material (13)	
6	316L
W	Hasteloy-C22
M	High Strength S. Steel
7	Monel

Stem material (14)	
6	316L
W	Hasteloy-C22
M	High Strength S. Steel
7	Monel

Seat material (15)	
A	TFM
P	CF PTFE

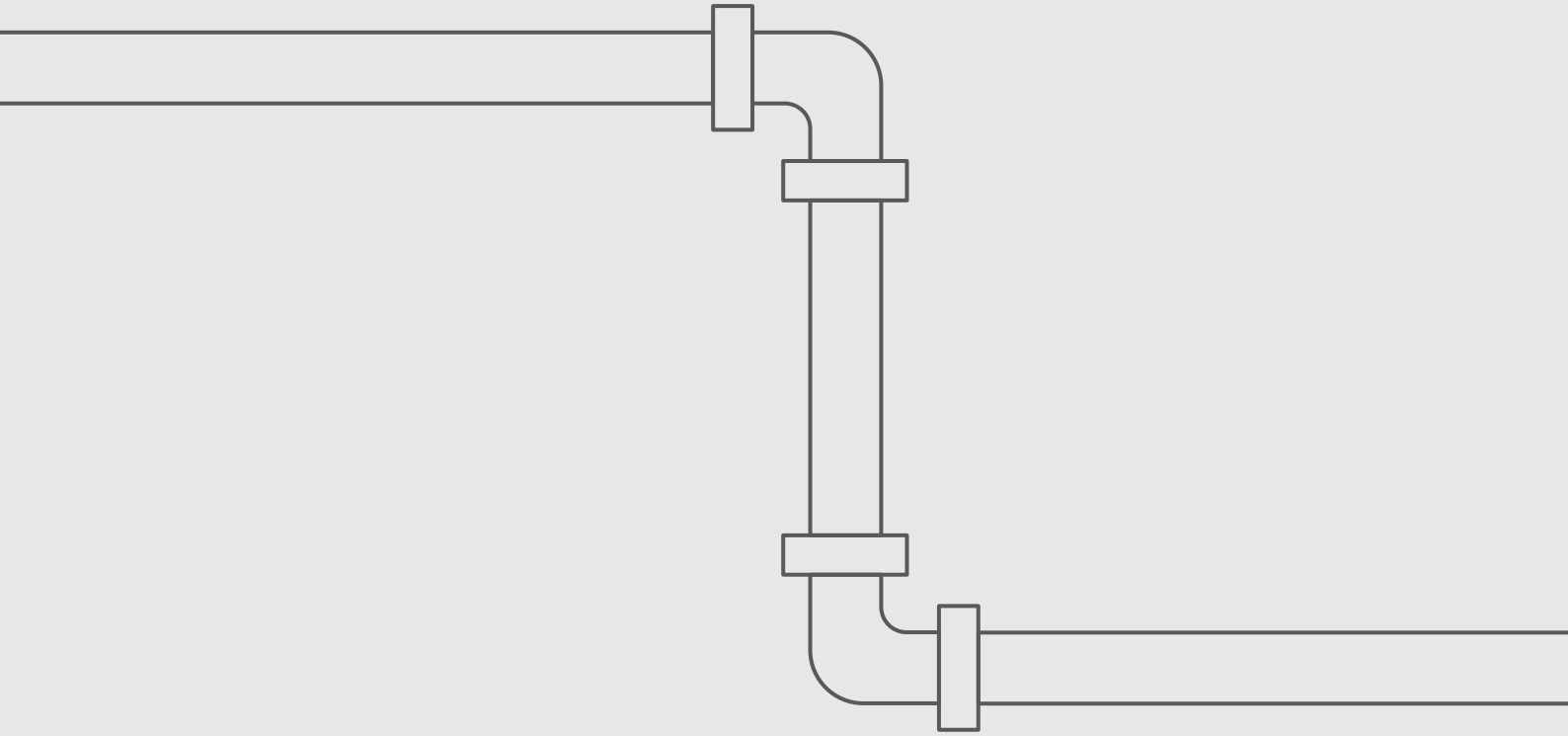
Inner Seal Material (16)	
T	PTFE
A	TFM

Outer Seal Material (17)	
G	Expanded graphite
A	TFM

End Connection (19-22)
Per Base Series

Special Features (24-30)	
P250	Ball with Upstream Relief Hole
FE	FE-Fugitive Emission Bonnet
B	Body made from barstock
SRS*	Self Relief Seat
CAX	CAX-PCTFE thrust and TFM X shape gasket
CPX	CPX-PCTFE thrust and CF PTFE X shape gasket
DS	DS-Dual Safe with Ball Valve Bleed
LD	LD-Locking Device
LDN	LDN-Lockable handle
OVL	OVL-Oval handle
SRH	SRH-Spring Return Handle

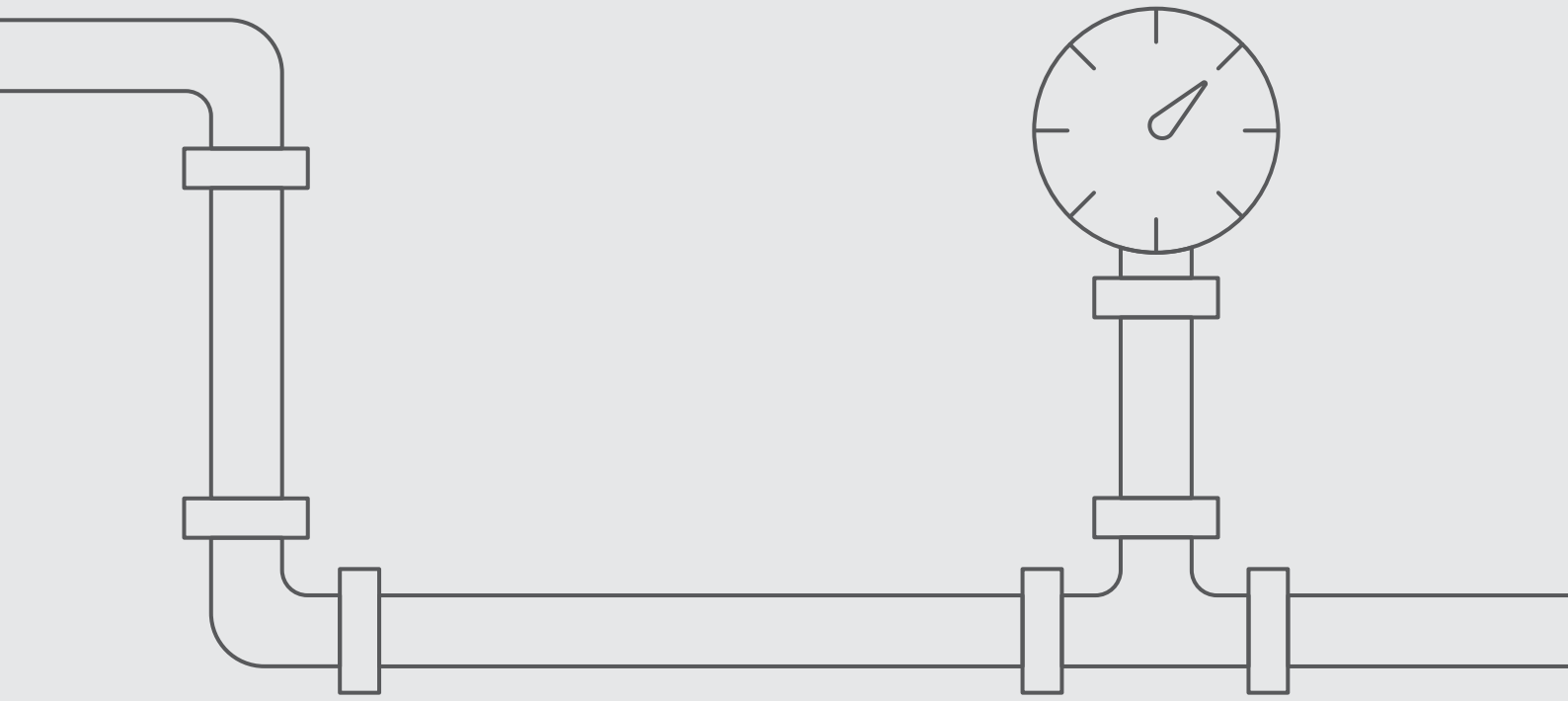
* Limited to #300



O

OXYGEN SERVICE

BALL VALVES



O

Oxygen Service Ball Valves (O)

HABONIM ball valves for oxygen service are suited to be used with both liquid and gaseous oxygen, cleaned and assembled with required measures for a safe use in oxygen service equipment and avoid valve contamination to the media purity.

Note: Habonim oxygen service valves (O) are not following any medical-use or breathing oxygen standards or regulations.

Oxygen

Oxygen, chemical element with symbol O_2 , content in air is approximately 21% by volume. Oxygen is an odorless, colorless gas, with many industrial uses, mainly in the manufacture of steel and chemicals. Oxygen itself is nonflammable, however materials that are flammable in air, burn far more vigorously mixed with oxygen. Oxygen is shipped as a non-liquefied gas at pressures of 2000 psig (138bar) and above, also as a cryogenic liquid at pressures and temperatures below 13.8bar (200 psi) and -146.5°C (-232°F). Air separation plants produce pure oxygen via liquefaction of atmospheric air and separation of the oxygen by fractionation. Also minute quantities of Oxygen can be produced by electrolysis of water.

Oxygen density is 1.429 kg/m3 (1.013bar at 0°C) Oxygen boiling point -182.95°C (-297.31 °F) at a pressure of 1 atmosphere, the liquid oxygen usually stored under high pressure or at cryogenic temperature. Oxygen melting point -218.79°C (-361.82°F).

Oxygen Uses

Oxygen is used extensively in medicine, high altitude flying, deep sea diving and as rocket fuel. Industrial applications include utilization with acetylene, propane, hydrogen and other fuel gases for metal cutting, welding, hardening and scarfing. In steel and iron manufacturing, oxygen helps increase the capacity and efficiency of furnaces. Another major use of oxygen is in the making of 'Synthesis Gas' for production of gasoline, methanol and ammonia. Oxygen is also used in the manufacture of nitric acid, ethylene and other compounds.

Oxygen Hazards

Oil, grease or other combustible substances should not be allowed to come in contact with oxygen service valves or components. Oxygen combined with these substances can result in explosions.

O

General

Oxygen Service feature is available for part of Habonim's valves series – check series ordering codes for availability. Available valve sizes, types and variety of end connections are per each relevant series ordering codes.

Valve Component Materials

Gaseous oxygen is non corrosive and may be contained in systems constructed of any common metal. Stainless steel, Monel, Bronze and Brass are sometimes the preferred materials for metal components coming into contact with gaseous Oxygen. In the extreme low temperatures of cryogenic liquid oxygen, stainless steel of 3xx series is often the preferred material. TFM, PTFE or glass filled PTFE are inert in oxygen and are considered standard seat and seal materials for oxygen service.

Warning! Delrin (Acetal resin) seats and Nylatron stem thrust seals MUST NOT BE USED IN OXYGEN SERVICE.

Habonim oxygen service valves may be used with both liquid and gaseous oxygen. For temperatures below -60°C (-76°F), we recommend using Habonim's Cryogenic valves series.

Cleaning, Assembling and Packing

A meticulous cleaning and assembly procedure minimize the ignition hazards that can be caused by the presence of hydrocarbon oil, grease, and metal chips.

Our process of cleaning, assembling and packing refers to international standards in partial or in full:

ASTM A380 | CGA G 4.1 | EN 12300

Habonim uses an environment friendly, alkaline-based degreasing process with controlled parameters. Valves are assembled in an oil-free restricted area by personnel who are specially equipped and trained to perform this task. The assembling area, work surfaces, equipment and tools are specially maintained to ensure cleanliness requirements are met.

- Valves are capped ends and plastic bagged
- Each valve is packed with a 'Silica-gel pack'
- A sticker on the plastic bag indicating "oxygen use"

Optional Accessories

Locking Device (LD)

As a safety measure, it is advisable that valve for oxygen service should be equipped with spring loaded locking device do avoid unauthorized or unintentional valve operation.

For mor information see Habonim Valve Accessories catalog.



Fail Close Assembly

O

Quick Selection Table

Total Hermetix™ | **Port:** Standard Port | Full Port | Tube Size | **End Connections:** Threaded | Flanged | Welded | Ordering Code

Temperature: -60°C - +260°C (-76 °F ÷ +500 °F)

Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	MWP (ASME Class / DIN PN) 3	4	6	8	10	12	14	16
Trunnion Mounted Ball	3 Piece	OC	O91	TH	Standard Port	Threaded, Flanged, Welded										150							
		OC	O92	TH	Standard Port	Threaded, Flanged, Welded										300							
		OC	O93	TH	Standard Port	Threaded, Flanged, Welded										600							
		OC	O94	TH	Standard Port	Threaded, Flanged, Welded										900							
	2 Piece	OC	O81	TH	Full Port	Threaded, Flanged										150							
		OC	O82	TH	Full Port	Threaded, Flanged										300							
		OC	O83	TH	Full Port	Threaded, Flanged										600							
Floating Ball	3 Piece	OC	O47	TH	Standard Port	Threaded, Flanged, Welded										900			400				
		OC	O26	TH	Full Port	Threaded, Flanged										600							
	1 Piece	OC	O31	TH	Standard Port	Threaded, Flanged										150							
		OC	O32	TH	Standard Port	Threaded, Flanged										300							
	1 Piece 2 Piece	OC	O73	TH	Full Port	Threaded, Flanged										150							
		OC	O74	TH	Full Port	Threaded, Flanged										300							
		OC	O77	TH	Full Port	Threaded, Flanged										PN16							
		OC	O78	TH	Full Port	Threaded, Flanged										PN40							
	DS (DBB)	OC	O47DS	TH	Standard Port	Threaded, Flanged, Welded										600							
		OC	O73DS	TH	Full Port	Threaded, Flanged										150							
		OC	O74DS	TH	Full Port	Threaded, Flanged										300							
		OC	O77DS	TH	Full Port	Threaded, Flanged										PN16							
	Multiport 3 Pcs.	OC	O61	TH	Standard Port	Threaded, Flanged, Welded										600			300				
		OC	O62	TH	Standard Port	Threaded, Flanged, Welded																	
	Diverter 3 Pcs.	OC	OD47	TH	Standard Port	Threaded, Flanged, Welded										600			300				
	Side-Entry 3 Pcs.	OC	OS47	TH	Standard Port	Threaded, Flanged, Welded																	
	Diverter 2 Pcs.	OC	OD31	TH	Standard Port	Threaded, Flanged										150							
		OC	OD32	TH	Standard Port	Threaded, Flanged																	
	Side-Entry 2 Piece	OC	OS31	TH	Standard Port	Threaded, Flanged																	
		OC	OS32	TH	Standard Port	Threaded, Flanged																	
	Flush tank	OC	OR47	TH	Standard Port	Threaded, Flanged, Welded										300							

ASME Class			150	300	600	900	1500	2500	6000
Pressure Bar	-1*	0	16	50	100	150	250	400	1034
Pressure psi	-14*	0	290	725	1450	2175	3600	5800	15000

* Vacuum 10^{-6} Tor

O

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
2	0			F	O	4	7	W	-	6	6	6		A	T	A	/	B	W							
Size		Features				Series		Design		Body material		Ends material		Ball/Stem material		Seat material		Inner Seal material		Outer Seal material			End connection					Special features			

Size (1-2)		
Code	inch	mm
Per Base Series		

Features (3-6)	
F	Fire safe
O	Oxygen service
B	Full port

Series (7-8)	
	Per base series

Design (9)	
W	Total HermetiX Integrity package

Body material (11)	
6	S. SteelCF8M/CF3M
1	Bronze
W	Hasteloy-C22
7	Monel

Ends material (12)	
6	S. SteelCF8M/CF3M
1	Bronze
W	Hasteloy-C22
7	Monel

Ball material (13)	
6	316L
1	Bronze
W	Hasteloy-C22
M	High Strength S. Steel
7	Monel

Stem material (14)	
6	316L
W	Hasteloy-C22
M	High Strength S. Steel
7	Monel

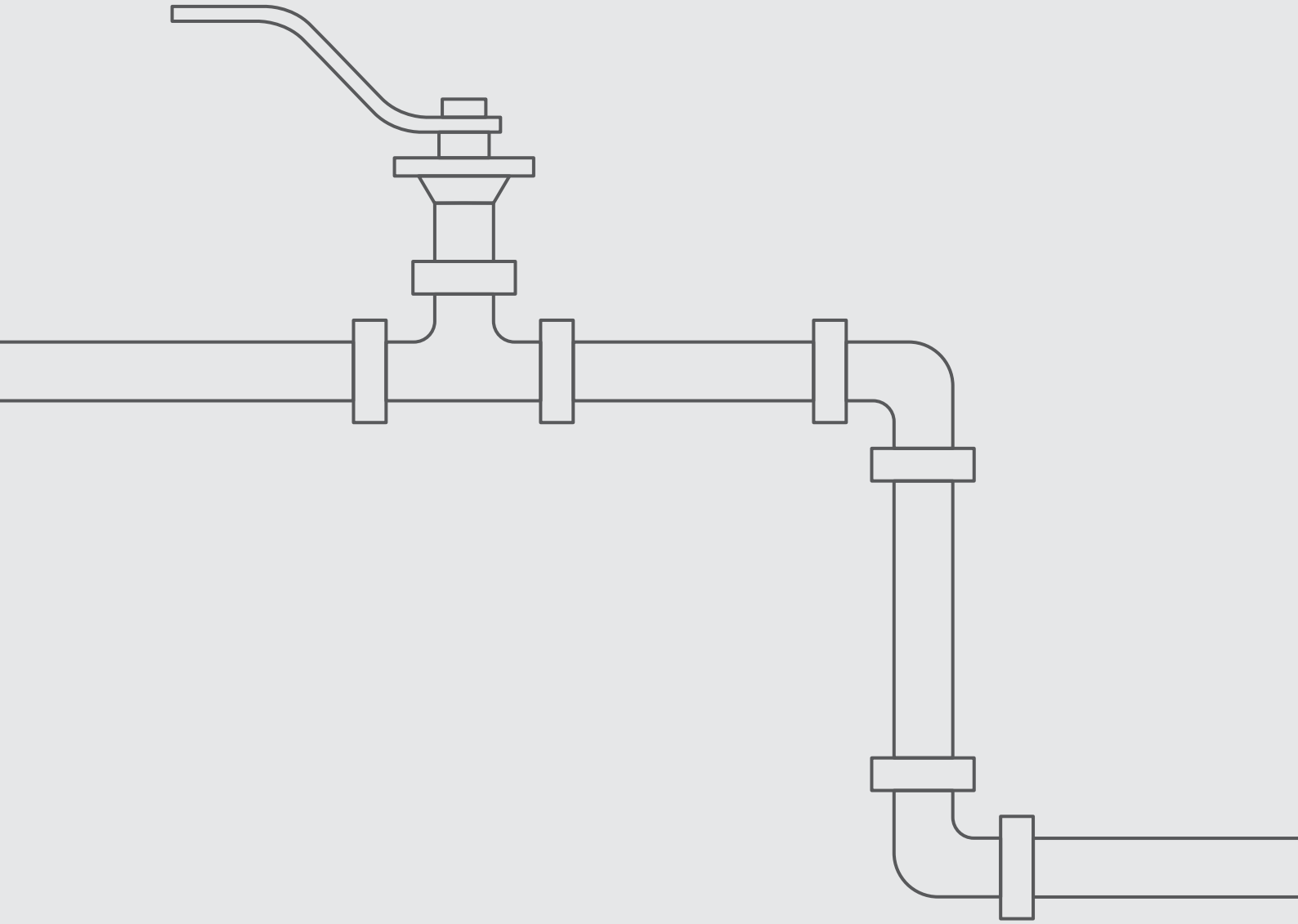
Seat material (15)	
A	TFM
Y	PTFE

Inner Seal Material (16)	
T	PTFE
G	Expanded graphite
V	Viton

Outer Seal Material (17)	
A	TFM
G	Expanded graphite
T	PTFE

End Connection (19-22)
Per Base Series

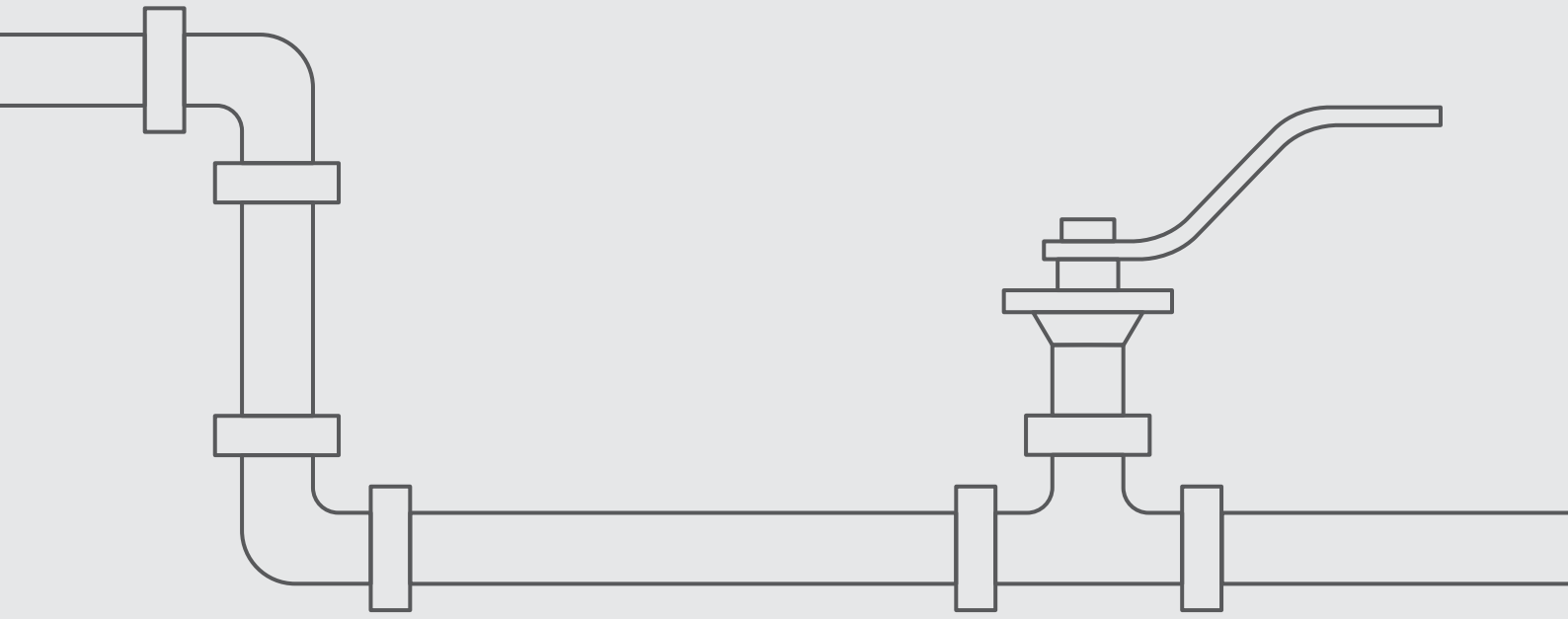
Special Features (24-30)	
B	Body made from barstock
CAX	CAX-PCTFE thrust and TFM X shape gasket
CPX	CPX-PCTFE thrust and CF PTFE X shape gasket
DS	DS-Dual Safe with Ball Valve Bleed
FE	FE-Fugitive Emission Bonnet
LD	LD-Locking Device
LDN	LDN-Lockable handle
OVL	OVL-Oval handle
SRH	SRH-Spring Return Handle



K

CHLORINE SERVICE

BALL VALVES



K

Chlorine Service Ball Valves (K)

HABONIM ball valves for chlorine service are designed for use with chlorine, cleaned and assembled with required measures for a safe use in chlorine service equipment and avoid valve contamination to the media purity. Some of the designs comply with the Chlorine Institute Pamphlet 6: "Piping Systems for Dry Chlorine".

Chlorine

Chlorine is a hazardous and toxic material that irritates the respiratory, with a distinctive pungent odor. Chlorine, chemical element symbol Cl, is nonflammable in both gaseous and liquid states however; chlorine gas is a strong oxidizer, which may react with flammable materials, and can support combustion when combined with other substances.

The Chlorine gas has an irritating odor that many people can detect with as little as 3.5ppm (parts per million) chlorine present. Breathing air containing more than1000 ppm of chlorine might be fatal.

Chlorine density is 3.2 kg/m^3 (1.013bar at 0°C), because it is heavier than air, it tends to accumulate at the bottom of poorly ventilated spaces. Chlorine boiling point -34.04°C (-29.27°F) at a pressure of 1 atmosphere, the liquid must be stored under high pressure or at low temperature. Chlorine melting point is -101.5°C (-150.7°F).

Chlorine Uses

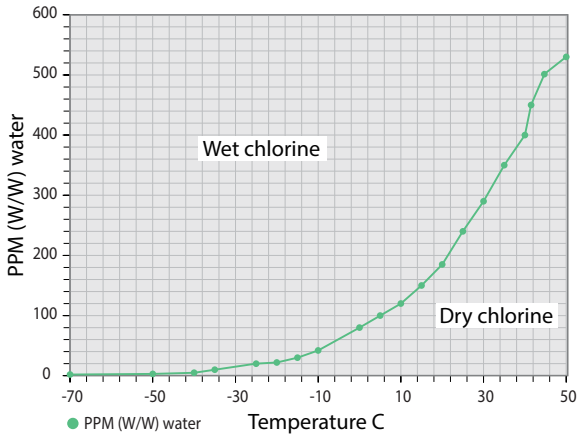
Chlorine is mainly used in manufacturing chemicals; including solvents, pesticides and herbicides, plastics and fibers, refrigerants and propellants. It is also an ingredient in bleach, deodorizer and disinfectant. In addition, chlorine is widely used in bleaching pulp, paper and textiles; disinfecting drinking water and swimming pool purification; plus in sanitation of industrial and sewage wastes.

'Chlorine' term

Gas and liquid refer to the physical state of chlorine itself; dry and wet refer to the content of moisture within the gas or liquid. **Dry chlorine is either gaseous or liquid chlorine with less than 150 ppm of water by weight.** Chlorine containing more than 150 ppm is considered as wet chlorine, gas or liquid.

Note: HABONIM offers metallic valves only for dry chlorine!

Solubility of Water in Liquid Chlorine



General

Chlorine Service feature is available for part of Habonim's valves series – check series ordering codes for availability. Available valve sizes, types and variety of end connections are per each relevant series ordering codes.

Design

Valves designed for chlorine in a liquid state should be equipped with an upstream pressure relief hole in the ball (Ordering code -P250). The relief hole avoids trapped cavities in the valve closed position and pressure buildup due to thermal expansion during liquid ammonia boil off. A valve with relief hole in the ball is uni-directional, the relief hole must be positioned at the upstream flow direction for complete in-line sealing. For Bi-directional valve design for liquid chlorine a Self-Relief Seats (Ordering code -SRS) should be used with seats material of TFM or CF PTFE, the SRS seat design dynamically release cavity pressure buildup and return to shutoff position once the over pressure is relieved. Valves designed for chlorine in the gaseous state do not require an upstream pressure relief hole.



Self-Relieving-Seat (SRS)

Valve Materials for dry chlorine

Valves for dry Chlorine Systems are used with chlorine in gas or liquid state, usually at temperatures between -101°C (-150°F) and +149°C (+300°F). Steel piping is commonly used for handling dry chlorine, defined as containing no more than 150 PPM of water by weight. Stainless steels of types 3xx might fail due to chloride stress cracking, particularly in presence of moisture at ambient and elevated temperatures. Monel 400 and Alloy C22, or Alloy C276 are the recommended materials for ball and stem, with TFM or CF PTFE seats. Body and stem seals can be PTFE, CF PTFE or graphite for fire-safe valves.

Moisture Level	Recommended Material
0 - 20 PPM	Alloy C22 ball and Monel 400 stem
20 - 50 PPM	Alloy C22 ball and stem
0 - 50 PPM	Alloy C22 ball and stem (for end of line service

Note: For higher moisture levels up to 150 PPM, Alloy C22 is the recommended material of construction for all metal parts.



Cavity pressure relief (P250 Ball)
3 mm relief hole face the upstream

K

The following material of construction are recommended for dry chlorine service by the Chlorine Institute, Pamphlet #6:

Temperature	-29°C (-20°F) to 149°C (300°F)	-46°C (-50°F) to 149°C (300°F)	-60°C (-76°F) to 149°C (300°F)
Fluid State	Gas or Liquid (<150ppm water)	Gas or Liquid (<150ppm water)	Gas or Liquid (<150ppm water)
Ends	Threaded, Welded, Flanged	Threaded, Welded, Flanged	Threaded, Welded, Flanged
Body/Ends	A216 WCB, Alloy C22, Alloy C276	A352 LCB, Alloy C22, Alloy C276	LF2, Alloy C22, Alloy C276
Ball/Stem	Alloy C22, Alloy C276	Alloy C22, Alloy C276	Alloy C22, Alloy C276
Bolts	ASTM A193 Grade B7, B7M (Ferritic Steels)	ASTM A320 Grade L7	ASTM A320 Grade L7
Nuts	ASTM A194 Grade 2H, 2HM (Carbon Steel)	ASTM A194 Grade 4 (Carbon-Molybdenum steel)	ASTM A194 Grade 4 (Carbon-Molybdenum steel)
Seats	PTFE, TFM	PTFE, TFM	PTFE, TFM
Seals	PTFE, Graphite	PTFE, Graphite	PTFE, Graphite

Warning: The HermetiX™ stem seal valve for chlorine service include different material than PEEK.

Cleaning, Assembling and Packing

All valve components used for chlorine service, in gaseous or liquid state, are de-burred to a high standard and specifically cleaned to remove any traces of oil, grease or hydrocarbon materials prior to assembly.

Chlorine service valves are assembled in an oil-free restricted area by personnel who are specially equipped and trained to perform this task. The assembling area, work surfaces, equipment and tools are specially maintained to ensure cleanliness requirements are met.

Only lubricants compatible with chlorine are used.

- Valves are packed in open position with capped ends and plastic bagged
- Each valve is packed with a 'Silica-gel pack'
- A sticker on the plastic bag indicating "Chlorine Service"

Optional Accessories

Locking Device (LD)

As a safety measure, it is advisable that valve for chlorine service should be equipped with spring loaded locking device do avoid unauthorized or unintentional valve operation.

For more information see Habonim Valve Accessories catalog.



Fail Close Assembly

Quick Selection Table

Total Hermetix™ | **Port:** Standard Port | Full Port | Tube Size | **End Connections:** Threaded | Flanged | Welded | Ordering Code

Temperature: -60°C - +260°C (-76 °F ÷ +500 °F)

Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16 — MWP (ASME Class / DIN PN)
Trunnion Mounted Ball	3 Piece	OC	K91	TH	Standard Port, Full Port	Threaded, Flanged, Welded										150							
		OC	K92	TH	Standard Port, Full Port	Threaded, Flanged, Welded										300							
		OC	K93	TH	Standard Port, Full Port	Threaded, Flanged, Welded										600							
	2 Piece	OC	K81	TH	Full Port	Flanged										150							
		OC	K82	TH	Full Port	Flanged										300							
		OC	K83	TH	Full Port	Flanged										600							
Floating Ball	3 Piece	OC	K47	TH	Standard Port, Full Port	Threaded, Flanged, Welded									900		400						
		OC	K26	TH	Full Port	Flanged										600							
	1 Piece	OC	K31	TH	Standard Port	Flanged										150							
		OC	K32	TH	Standard Port	Flanged										300							
	1 Piece 2 Piece	OC	K73	TH	Full Port	Flanged										150							
		OC	K74	TH	Full Port	Flanged										300							
		OC	K77	TH	Full Port	Flanged											PN16						
		OC	K78	TH	Full Port	Flanged										PN40							
	DS (DBB)	OC	K47DS	TH	Standard Port	Threaded, Flanged, Welded									600								
		OC	K73DS	TH	Full Port	Flanged											150						
		OC	K74DS	TH	Full Port	Flanged											300						
		OC	K77DS	TH	Full Port	Flanged											PN16						
	Multiport 3 Pcs.	OC	K61	TH	Standard Port, Full Port	Threaded, Flanged, Welded									600		300						
		OC	K62	TH	Standard Port, Full Port	Threaded, Flanged, Welded																	
	Diverter 3 Pcs.	OC	KD47	TH	Standard Port, Full Port	Threaded, Flanged, Welded										600	300						
	Side-Entry 3 Pcs.	OC	KS47	TH	Standard Port, Full Port	Threaded, Flanged, Welded																	
	Diverter 2 Pcs.	OC	KD31	TH	Standard Port	Flanged										150							
		OC	KD32	TH	Standard Port	Flanged																	
	Side-Entry 2 Piece	OC	KS31	TH	Standard Port	Flanged																	
		OC	KS32	TH	Standard Port	Flanged																	
	Flush tank	OC	KR47	TH	Standard Port	Threaded, Flanged, Welded										300							

ASME Class			150	300	600	900	1500	2500	6000
Pressure Bar	-1*	0	16	50	100	150	250	400	1034
Pressure psi	-14*	0	290	725	1450	2175	3600	5800	15000

* Vacuum 10^{-6} Tor

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
2	0			F	K	4	7	W	-	W	W	W		A	T	G	/	B	W							
Size		Features				Series		Design		Body material		Ends material		Ball/Stem material		Seat material		Inner Seal material		Outer Seal material			End connection				Special features			

Size (1-2)		
Code	inch	mm
Per Base Series		

Features (3-6)	
F	Fire safe
K	Chlorine service
B	Full port
DS	Dual Safe
D	Divertor Bottom Entry
R	Flush Tank

Series (7-8)	
47/26	3 Piece
31/32	1 Piece
73/74/77/78	1 & 2 Piece

Design (9)	
W	Total HermetiX Integrity package

Body material (11)	
4	C. Steel
9	Low Temp C. steel
6	S. SteelCF8M/CF3M
W	Hasteloy-C22
C	Hasteloy-C276

Ends material (12)	
4	C. Steel
9	Low Temp C. steel
6	S. SteelCF8M/CF3M
W	Hasteloy-C22
C	Hasteloy-C276

Ball material (13)	
W	Hasteloy-C22
7	Monel
C	Hasteloy-C276

Stem material (14)	
W	Hasteloy-C22
7	Monel
C	Hasteloy-C276

Seat material (15)	
A	TFM
P	CF PTFE

Inner Seal Material (16)	
T	PTFE

Outer Seal Material (17)	
A	TFM
G	Expanded graphite

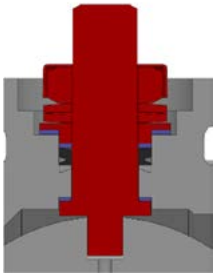
End Connection (19-22)
Per Base Series

Special Features (24-30)	
P250	Ball with Upstream Relief Hole
SRS	Self Relief Seat
AAX	FDA compliant stem seal. TFM thrust bearing and X shape gasket
CFP6	Pamphlet 6 compliance (US)
B	Body made from barstock
FE	Fugitive emissions
PT	Basic paint system

K-CFP6

Pamphlet 6 by the Chlorine institute (US)

Pamphlet 6 compatible valves (CFP6) are available upon request.



Per Pamphlet 6, Habonim ball valves incorporate a blow-out-proof stem design and a means to externally adjust the stem seal. Available with full or standard bore and a pressure relief mechanism (upstream hole or spring-loaded seats) which is supplied with positive indication of the direction of pressure tightness.

Valve Testing

Special testing is available by request.

Cleaning and Packaging

All valves are degreased, specially cleaned, dried, and prepared for use in chlorine service including the use of special chlorine compatible lubricants for valve assembly.

Valves are then packaged with end-connection capping for preventing moisture to protrude the inner parts.

Identification

A securely attached tag indicates the valve has been prepared and ready for chlorine service.

Valve Materials for dry chlorine per Pamphlet 6. The body and end-connections are made of low temperature carbon steel, Inconel 718 made disc springs and Monel is used for follower and gland nut.

B7 or B7M or alloy 20 is used for bolting (series K47, K73, K74).

Chlorine-use - Pamphlet 6

- Total HermetiX sealing.
- Hasteloy C22 made ball and stem.
- Pressure-relieving ball
- Cryogenic post-assembly test

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0			F	K	7	8	W	-	4	4	W		A	T	G	/	1	5	0			C	F	P	6
Size		Features				Series		Design		Body material		Ends material		Ball/Stem material		Seat material		Inner Seal material		Outer Seal material			End connection				Special features		

Size (1-2)		
Code	inch	mm
Per Base Series		

Features (3-6)	
F	Fire safe
K	Chlorine service
B	Full port
DS	Dual Safe
D	Divertor Bottom Entry
R	Flush Tank

Series (7-8)	
47/26	3 Piece
31/32	1 Piece
73/74/77/78	1 & 2 Piece

Design (9)	
W	Total HermetiX Integrity package

Body material (11)	
4	C. Steel
9	Low Temp C. steel

Ends material (12)	
4	C. Steel
9	Low Temp C. steel

Ball material (13)	
W	Hasteloy-C22
C	Hasteloy-C276

Stem material (14)	
W	Hasteloy-C22
C	Hasteloy-C276

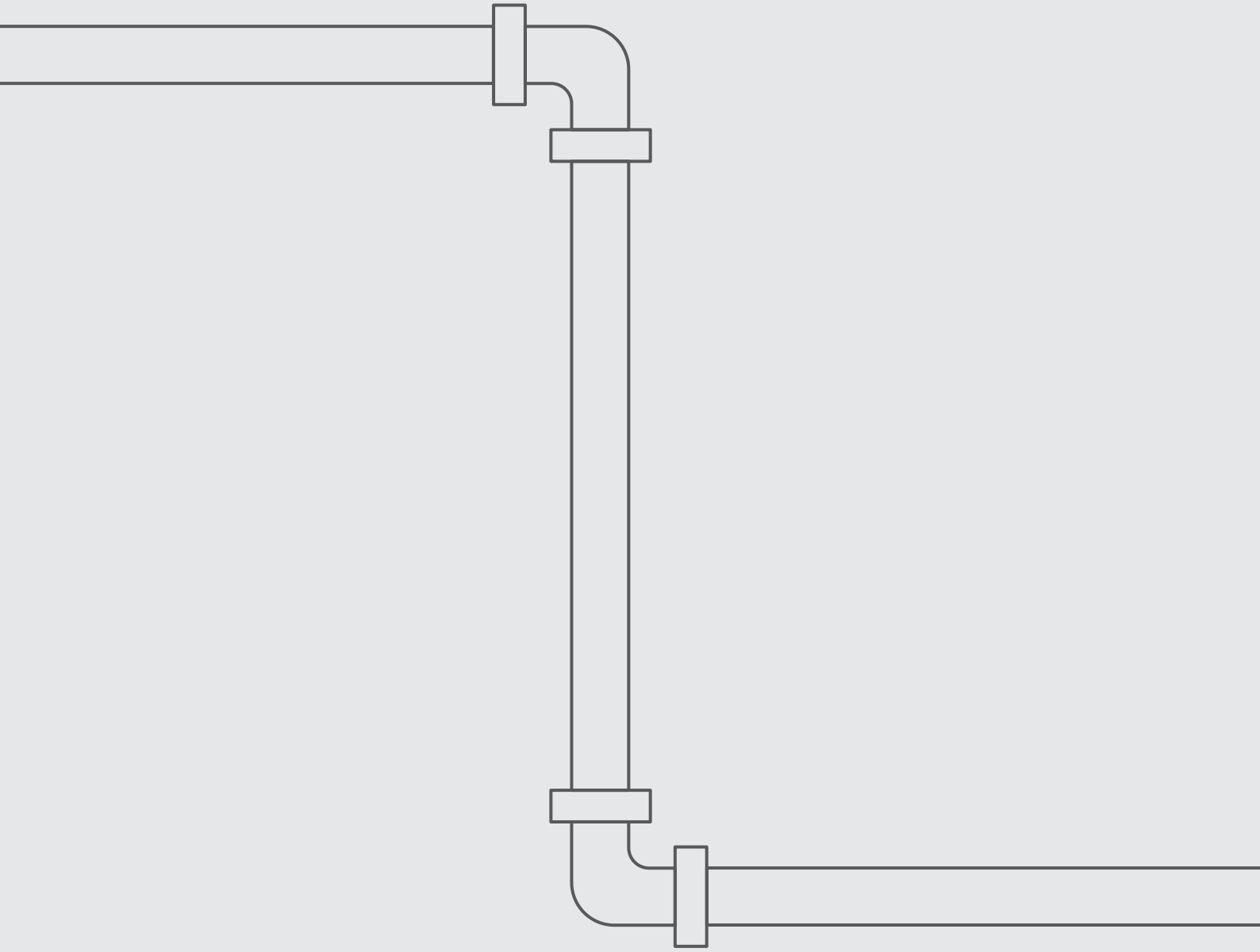
Seat material (15)	
A	TFM

Inner Seal Material (16)	
T	PTFE

Outer Seal Material (17)	
A	TFM
G	Expanded graphite

End Connection (19-22)
Per Base Series

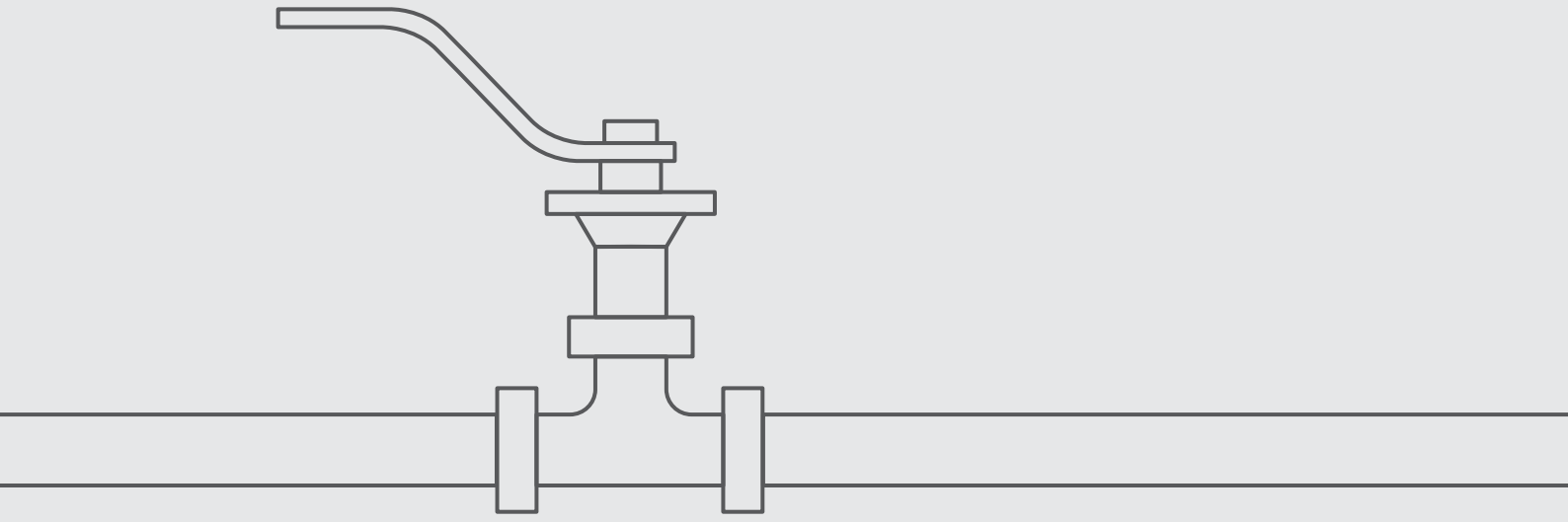
Special Features (24-30)	
CFP6	Pamphlet 6 compliance (US)
B	Body made from barstock
FE	Fugitive emissions
PT	Basic paint system



W

STEAM SERVICE

BALL VALVES



W

General

HABONIM ball valves "W" Series for Steam service offer reliable and economical solutions for applications that require Steam service valve operation.

Steam Valves Certifications

- Fire safe design according to ISO 10497 and API 607.
- Fugitive emissions tested according to ISO 15848-1 and API641.

Steam

Steam is vastly used in many industrial applications.

In process industry, water is heated and steam is generated at boilers, the steam is transferred through pipes and used to heat process. During the process steam condenses back to water releasing latent heat of vaporization back to the process.

Condensed water is collected and sent to boiler again for further production of steam.

The four steam types

Saturated Steam

Saturated steam is the most common type, it is steam at its boiling point, under atmospheric pressure, it would be 100°C (212°F).

As the pressure of the steam goes up, so does its corresponding boiling point temperature.

Superheated Steam

Superheated steam is steam that is hotter than its boiling point for a given pressure. Superheated steam at atmospheric pressure would be hotter than 100°C (212°F).

Dry Steam

Dry steam has no liquid content in it and is entirely in the vapor state.

Superheated steam is always dry because any liquid would be immediately vaporized into steam. Saturated steam would usually require water traps to ensure steam is dry enough when reaching its use point.

Wet Steam

Wet steam (or unsaturated steam) is simply the opposite of dry steam and is in both liquid and vapor state.

Design

Habonim steam Service valves are available in a variety of connections – threaded, welded, and flanged. Sizes range between ¼" to 8".

Valve's body available in wide range of materials with 316 stainless steel and carbon steel being the standard offering, 316 stainless steel is standard for ball and stem. TFM and CF PTFE and graphite are standard materials for seats and seals.

Steam service valves will be equipped with red handle sleeve by default.

Quick Selection Table

Total Hermetix™ | **Port:** Standard Port, Full Port, Tube Size | **End Connections:** Threaded, Flanged, Welded

OC Ordering Code

Temperature: -60°C - +260°C (-76 °F ÷ +500 °F)

Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16 — MWP (ASME Class / DIN PN)
Floating Ball	3 Piece	OC	W47	TH	Port	End Con.	900								400								
		OC	W26	TH	Port	End Con.									600								
	1 Piece	OC	W31	TH	Port	End Con.									150								
		OC	W32	TH	Port	End Con.									300								
	1 Piece 2 Piece	OC	W73	TH	Port	End Con.									150								
		OC	W74	TH	Port	End Con.									300								
		OC	W77	TH	Port	End Con.										PN16							
		OC	W78	TH	Port	End Con.									PN40								
	DS (DBB)	OC	W47DS	TH	Port	End Con.	600																
		OC	W73DS	TH	Port	End Con.										150							
		OC	W74DS	TH	Port	End Con.										300							
		OC	W77DS	TH	Port	End Con.										PN16							
	Multiport 3 Pcs.	OC	W61	TH	Port	End Con.	600								300								
		OC	W62	TH	Port	End Con.																	
	Diverter 3 Pcs.	OC	WD47	TH	Port	End Con.					600				300								
	Side-Entry 3 Pcs.	OC	WS47	TH	Port	End Con.																	
	Diverter 2 Pcs.	OC	WD31	TH	Port	End Con.					150												
		OC	WD32	TH	Port	End Con.																	
	Side-Entry 2 Piece	OC	WS31	TH	Port	End Con.																	
		OC	WS32	TH	Port	End Con.																	
	Flush tank	OC	WR47	TH	Port	End Con.	300																

ASME Class			150	300	600	900	1500	2500	6000
Pressure Bar	-1*	0	16	50	100	150	250	400	1034
Pressure psi	-14*	0	290	725	1450	2175	3600	5800	15000

* Vacuum 10^{-6} Tor

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
2	0			F	W	4	7	P	-	6	6	6		P	G	G	/	B	W							
Size		Features				Series		Design		Body material		Ends material		Ball/Stem material		Seat material		Inner Seal material		Outer Seal material			End connection				Special features			

Size (1-2)		
Code	inch	mm
Per Base Series		

Features (3-6)	
F	Fire safe
W	Steam service
B	Full port

Series (7-8)	
	Per base series

Design (9)	
P	Graphite stem seal
W*	CF PTFE HermetiX

* Up to 230°C (446°F)

Body material (11)	
6	S. SteelCF8M/CF3M
4	C. steel
W	Hasteloy-C22
S	254SMO
D	Duplex
9	Low Temp C. steel
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hasteloy-C276

Ends material (12)	
6	S. SteelCF8M/CF3M
4	C. steel
W	Hasteloy-C22
S	254SMO
D	Duplex
9	Low Temp C. steel
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hasteloy-C276

Ball material (13)	
6	316L
W	Hasteloy-C22
A	Alloy-20

Stem material (14)	
6	316L
W	Hasteloy-C22
M	High Strength S. Steel

Seat material (15)	
P	CF PTFE
K	CF PEEK

Inner Seal Material (16)	
G	Expanded graphite
A*	TFM

* Up to 230°C (446°F)

Outer Seal Material (17)	
G	Expanded graphite

End Connection (19-22)
Per Base Series

Special Features (24-30)	
B	Body made from barstock
DS	DS-Dual Safe with Ball Valve Bleed
FE	FE-Fugitive Emission Bonnet
EXT	Extended Bonnet
LD	LD-Locking Device
LDN	LDN-Lockable handle
OVL	OVL-Oval handle
SRH	SRH-Spring Return Handle

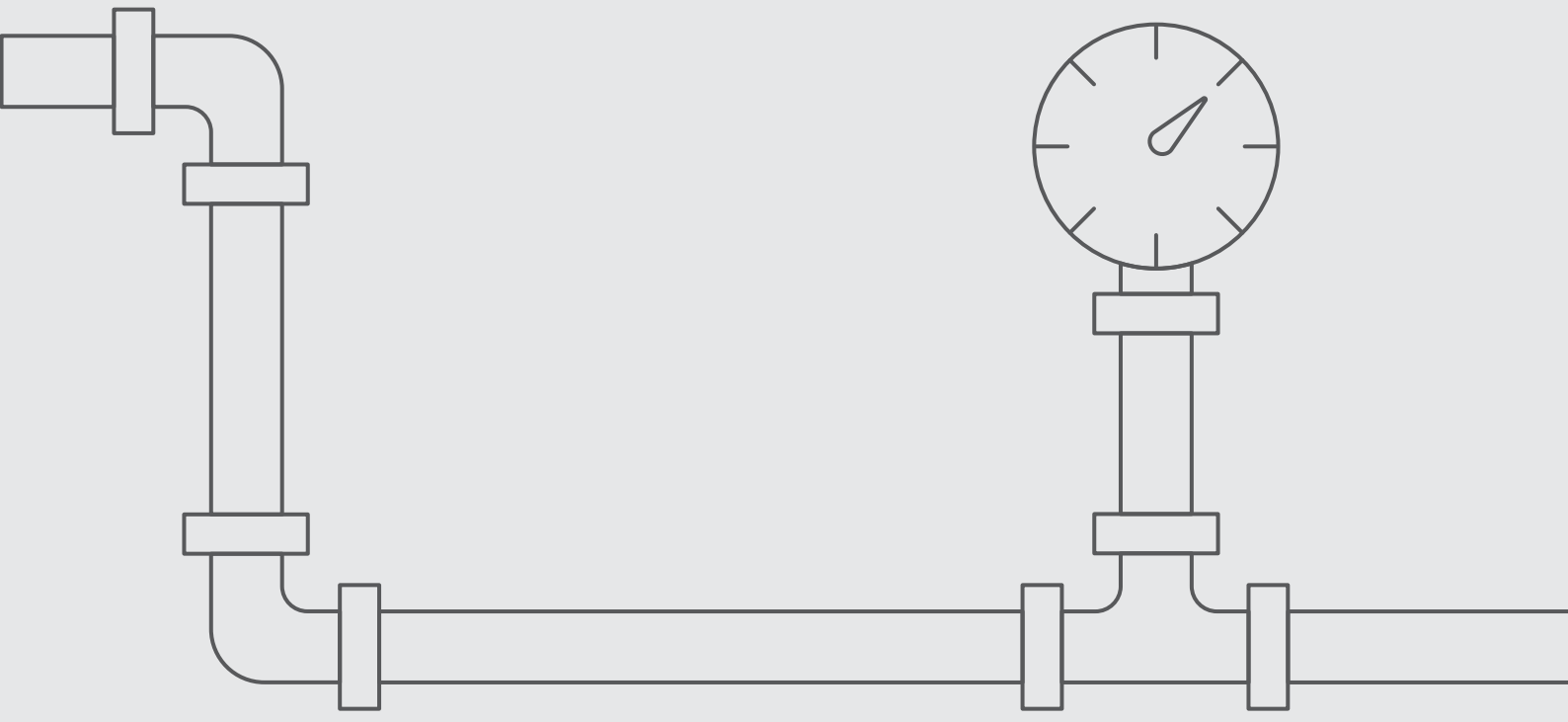
Red handle sleeve by default



V

VACUUM SERVICE

BALL VALVES



V

General

HABONIM ball valves "V" Series for vacuum service offer reliable and economical solutions for applications that require vacuum service valve operation.

Standard Habonim ball valves can easily be converted for effective use in vacuum service applications down to 2.666 pascal, and with specific preparation, can also perform in higher vacuum service applications, down to 0.000132 pascal.

Vacuum Valves Certifications

- Fire safe design according to ISO 10497 and API 607.
- Fugitive emissions tested according to ISO 15848-1 and API641.
- All valves designed for vacuum service are expertly prepared and cleaned to standards required for the safe operation of vacuum service equipment and product purity.

Vacuum

Vacuum is defined as a space in which the pressure is below normal atmospheric pressure, so that the remaining gases do not affect processes being carried on in the space.

Design

Habonim Vacuum Service valves are available in a variety of connections – threaded, welded, and flanged. Sizes range between ¼" to 8".

Valve's body available in wide range of materials with 316 stainless steel and carbon steel being the standard offering, 316 stainless steel is standard for ball and stem. TFM and PTFE are standard materials for seals and stem O-ring used for vacuum service valves.

High Vacuum Applications

Applications such as the stated below would most likely perform under vacuum conditions:

- Plasma Processing and Research.
- Thin Film Coating, Atmospheric and Space Simulation.
- Gas and Materials Analysis.
- Materials Research and Processing.
- Vacuum Metallurgy and Joining Techniques.
- Environmental Testing and Lab Applications.

Although there are numerous methods for measuring vacuum service, some of the most common measurements are shown in the table below.

Standard Atmospheres	PSI Absolute	Inches of Mercury	TORR	Minimum orifice mm(in)
1	14.7	29.92	760	101325
0.068	1	2.04	51.7	6890.1
0.033	0.48	1	25.4	3343.73
0.0013	0.0191	0.0394	1	131.72
0.0000013	0.000019	0.000039	0.001	0.132

Preparations

All valves's components used for vacuum service are de-burred to a high standard and specifically cleaned to remove any trace of oil, grease or hydrocarbon materials prior to assembly. Vacuum service valve assembly is carried out in a high quality clean environment by trained personnel and adequate handling equipment, to ensure that no ingress of grease or dust remains inside the valve.

Only apprvoed lubricants, comptabile with vacuum service valves are applied. Valve is line and shell tested in clean environment, using pure Nitrogen.

Packing

Following assembly and tests, High Vacuum service valve are then bagged and sealed in Polyethylene bags with silica gels packs. The bags are clearly marked with "Prepared for Vacuum Service" label.



V

Quick Selection Table

Total Hermetix™ | **Port:** Standard Port Full Port Tube Size | **End Connections:** Threaded Flanged Welded
Ordering Code

Temperature: -60°C - +260°C (-76 °F ÷ +500 °F)

Ball Valve	Design Type	OC	Series	TH	Port	End Con.	Valve Size (Inches) ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	6	8	10	12	14	16 — MWP (ASME Class / DIN PN)
Floating Ball	3 Piece	OC	V47	TH	Standard Port, Full Port	Threaded, Flanged, Welded	900								400								
		OC	V26	TH	Full Port	Flanged									600								
	1 Piece	OC	V31	TH	Standard Port	Flanged									150								
		OC	V32	TH	Standard Port	Flanged									300								
	1 Piece 2 Piece	OC	V73	TH	Full Port	Flanged									150								
		OC	V74	TH	Full Port	Flanged									300								
		OC	V77	TH	Full Port	Flanged										PN16							
		OC	V78	TH	Full Port	Flanged									PN40								
	DS (DBB)	OC	V47DS	TH	Standard Port	Threaded, Flanged, Welded	600																
		OC	V73DS	TH	Full Port	Flanged										150							
		OC	V74DS	TH	Full Port	Flanged										300							
		OC	V77DS	TH	Full Port	Flanged										PN16							
	Multiport 3 Pcs.	OC	V61	TH	Standard Port, Full Port	Threaded, Flanged, Welded	600								300								
		OC	V62	TH	Standard Port, Full Port	Threaded, Flanged, Welded																	
	Diverter 3 Pcs.	OC	VD47	TH	Standard Port, Full Port	Threaded, Flanged, Welded					600				300								
	Side-Entry 3 Pcs.	OC	VS47	TH	Standard Port, Full Port	Threaded, Flanged, Welded																	
	Diverter 2 Pcs.	OC	VD31	TH	Standard Port	Threaded, Flanged					150												
		OC	VD32	TH	Standard Port	Threaded, Flanged																	
	Side-Entry 2 Piece	OC	VS31	TH	Standard Port	Threaded, Flanged																	
		OC	VS32	TH	Standard Port	Threaded, Flanged																	
	Flush tank	OC	VR47	TH	Standard Port	Threaded, Flanged, Welded					300												

ASME Class			150	300	600	900	1500	2500	6000
Pressure Bar	-1*	0	16	50	100	150	250	400	1034
Pressure psi	-14*	0	290	725	1450	2175	3600	5800	15000

* Vacuum 10^{-6} Tor

V

Ordering Code System

"Mandatory option" options are marked with green background | "Standard offer" options are marked with light green background

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
2	0			F	V	4	7	W	-	6	6	6		A	T	A	/	B	W							
Size		Features				Series		Design		Body material		Ends material		Ball/Stem material		Seat material		Inner Seal material		Outer Seal material			End connection					Special features			

Size (1-2)

Code	inch	mm
Per Base Series		

Features (3-6)

F	Fire safe
V	Vacuum service
B	Full port

Series (7-8)

	Per base series

Design (9)

W	Total HermetiX Integrity package

Body material (11)

6	S. SteelCF8M/CF3M
4	C. steel
W	Hasteloy-C22
S	254SMO
D	Duplex
9	Low Temp C. steel
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hasteloy-C276

Ends material (12)

6	S. SteelCF8M/CF3M
4	C. steel
W	Hasteloy-C22
S	254SMO
D	Duplex
9	Low Temp C. steel
1	Bronze
K	Super Duplex
7	Monel
A	Alloy-20
C	Hasteloy-C276

Ball material (13)

6	316L
W	Hasteloy-C22
A	Alloy-20
M	High Strength S. Steel
7	Monel

Stem material (14)

6	316L
W	Hasteloy-C22
M	High Strength S. Steel
7	Monel
A	Alloy-20

Seat material (15)

A	TFM
P	CF PTFE
K	CF PEEK
L	Virgin Peek
U	UHMWPE
C	PCTFE
Y	Delrin
W	PVDF
T	PTFE

Inner Seal Material (16)

T	PTEE
G	Expanded graphite
U	UHMWPE
V	Viton
B	NBR

Outer Seal Material (17)

G	Expanded graphite
A	TFM

End Connection (19-22)

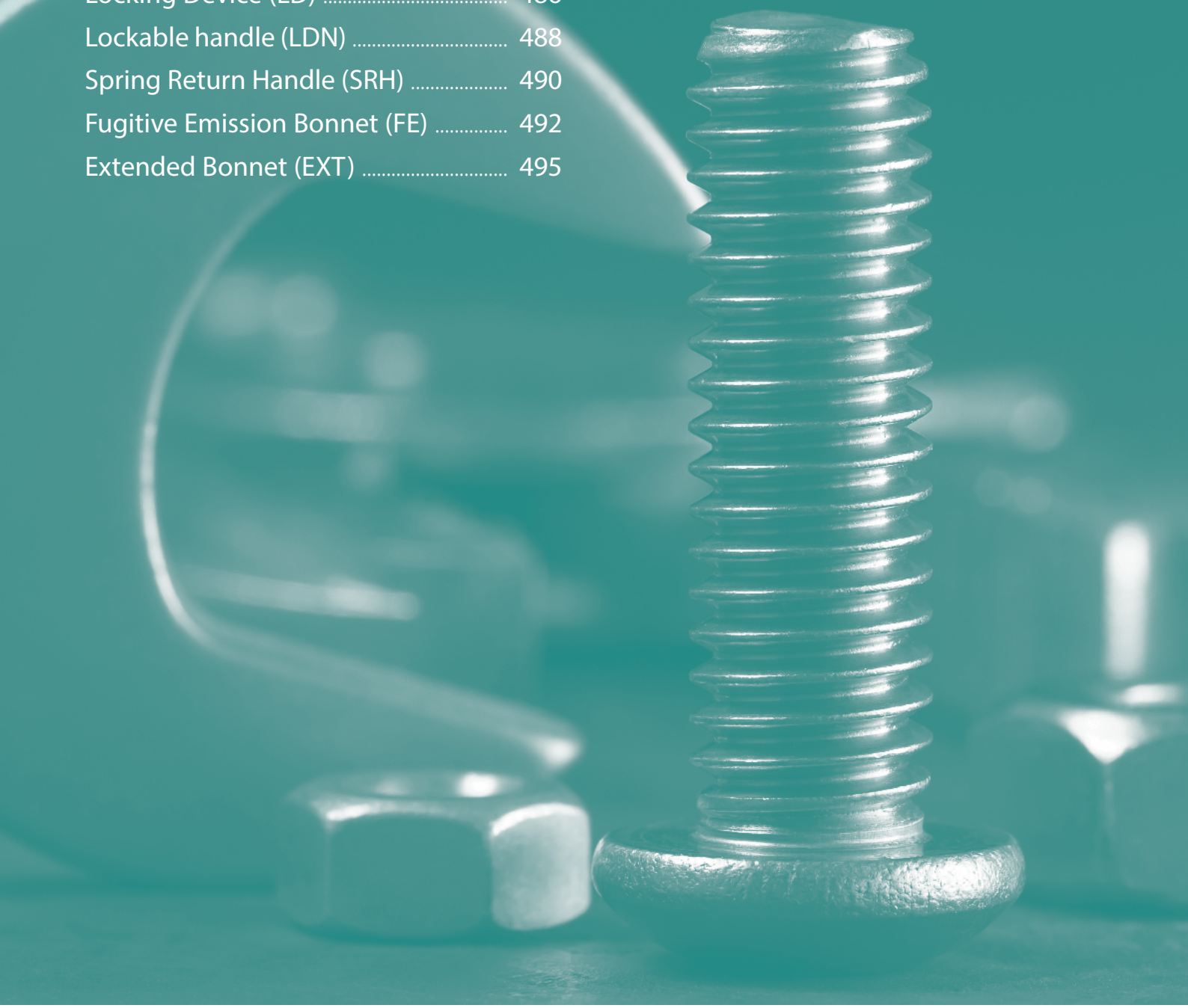
Per Base Series

Special Features (24-30)

P250	Ball with Upstream Relief Hole
SRS	Self Relief Seat
B	Body made from barstock
LD	LD-Locking Device
LDN	LDN-Lockable handle
OVL	OVL-Oval handle
SRH	SRH-Spring Return Handle
EP	Electropolished
J2N05	Jacketed valve - number of ports(2), type(NPT) and size(½")

VALVE ACCESSORIES

Locking Device (LD) 486
Lockable handle (LDN) 488
Spring Return Handle (SRH) 490
Fugitive Emission Bonnet (FE) 492
Extended Bonnet (EXT) 495

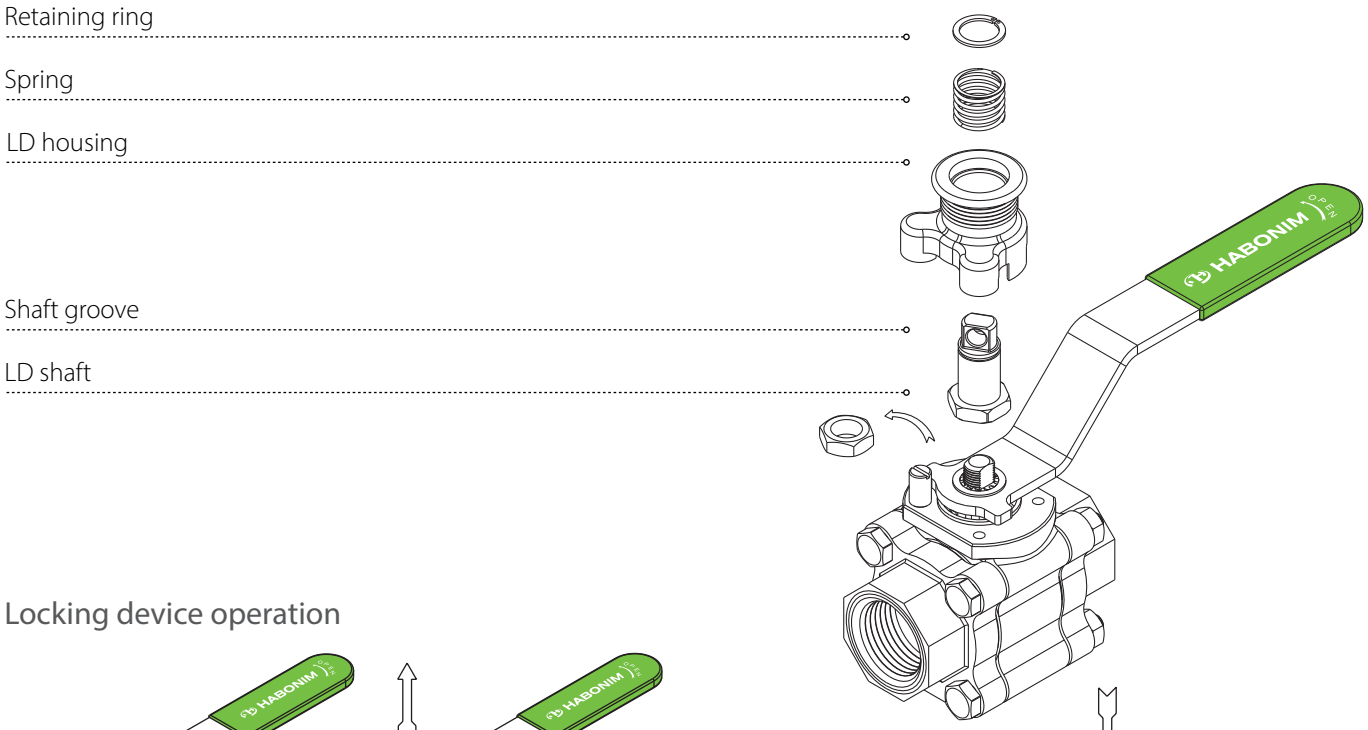


VALVE ACCESSORIES

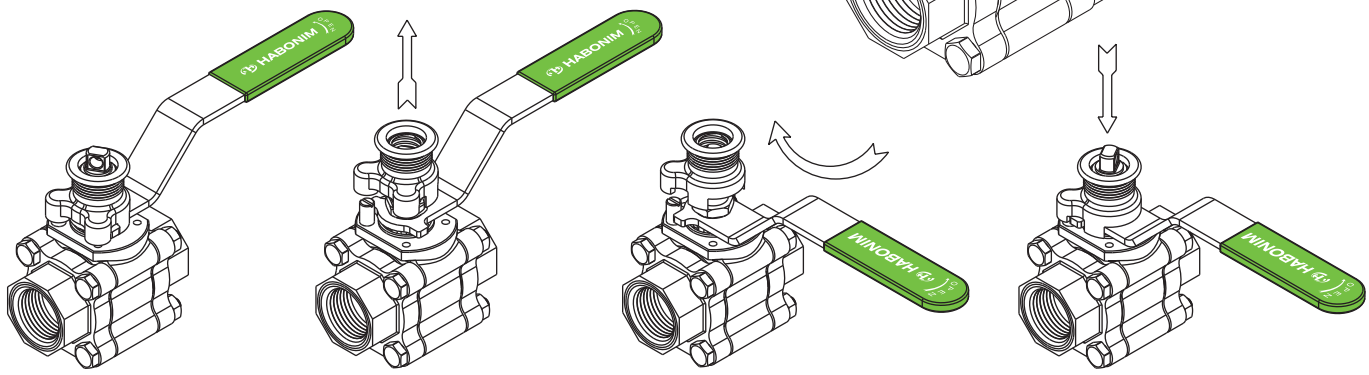
Locking Device (LD)

The robust device locks the valve handle at open or close position and allow to add a pad lock (up to 6mm) for misuse prevention. The spring-load construction ensure handle is lock in position at all valve installation orientations and under vibrating conditions. An accidently push / pull / turn of the handle is prevented.

Locking device assembly for valves with ISO 5211 top mounting pad



Locking device operation



Valve locked in open position

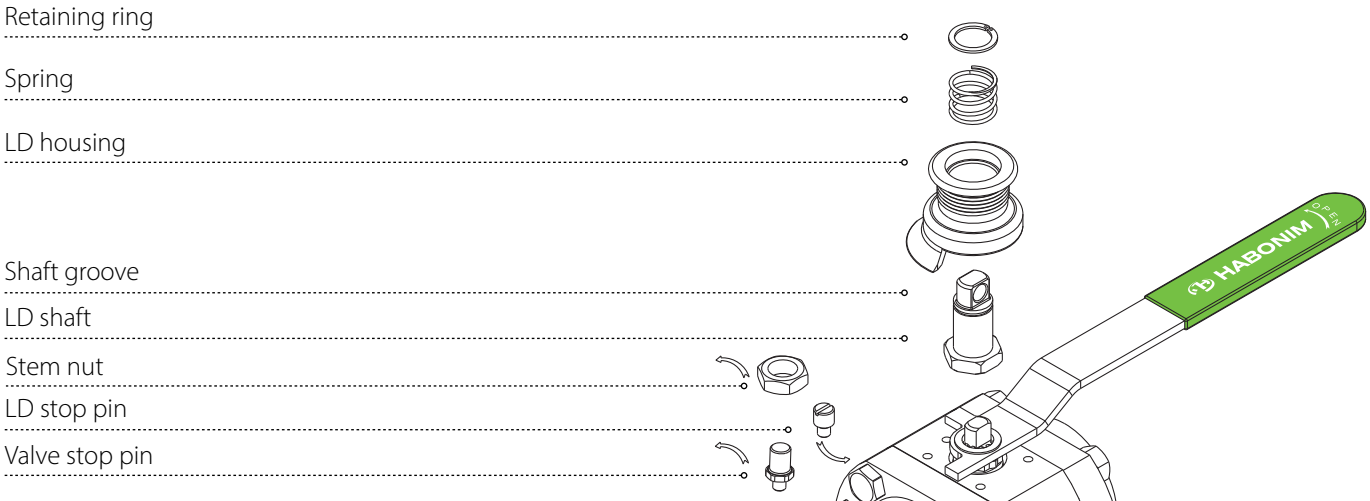
Lift LD housing above valve stop

Turn the valve handle 90° LD housing to the close position

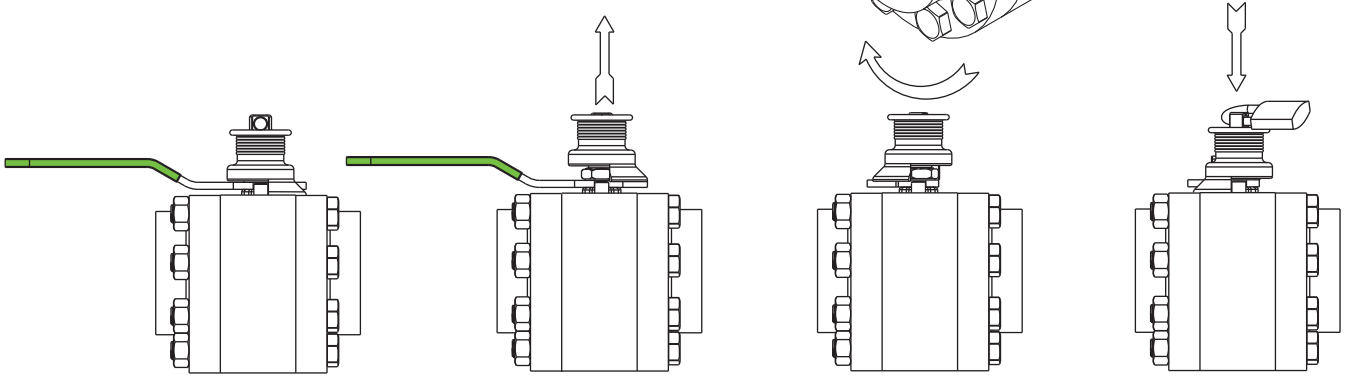
Release the LD housing down to lock

Locking Device (LD)

Locking device assembly for valves without ISO 5211 top mounting pad



Locking device operation



Valve locked in open position

Lift LD housing above valve stop

Turn the valve handle 90° LD housing to the close position

Release the LD housing down to lock

Ordering Code System

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0				F	4	7	W	-	6	6	6	6	A	T	G	/	B	W			-	L	D		
Size		Features				Series		Design		Body material	Ends material	Ball/Stem material		Seat material	Inner Seal	Outer Seal		End Connection					Special features			

Special Features (24-30)	
LD	Locking Device

LDN

Lockable Handle (LDN)

A simple way to allow valve lock in open or closed position using a padlock

A simple way to allow valve lock in open or closed position using a padlock

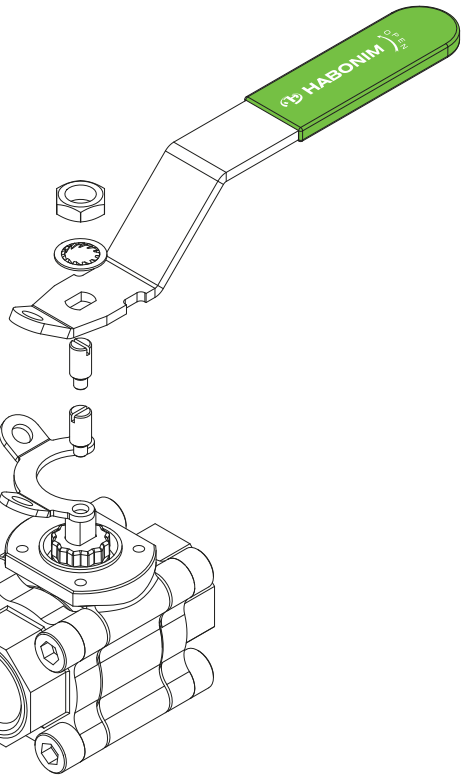
Handle nut

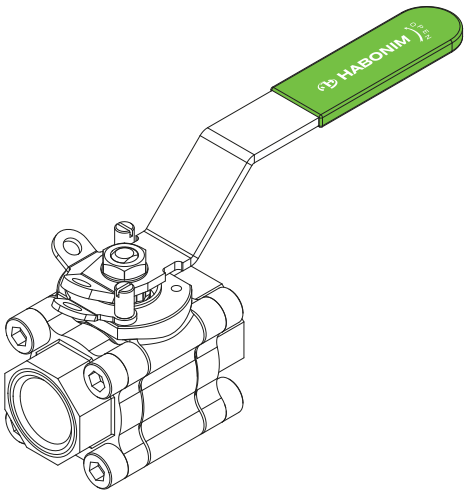
Serrated

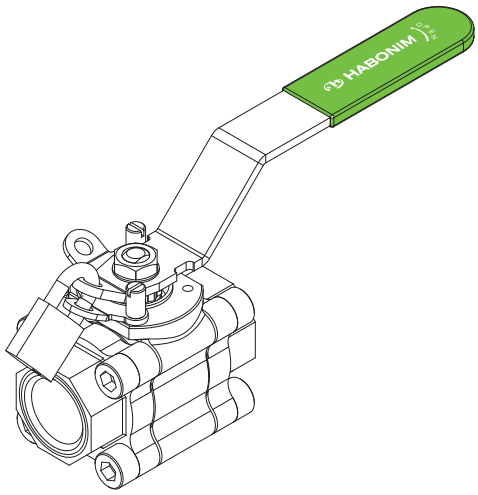
LDN Handle

Stop pin

LDN piece



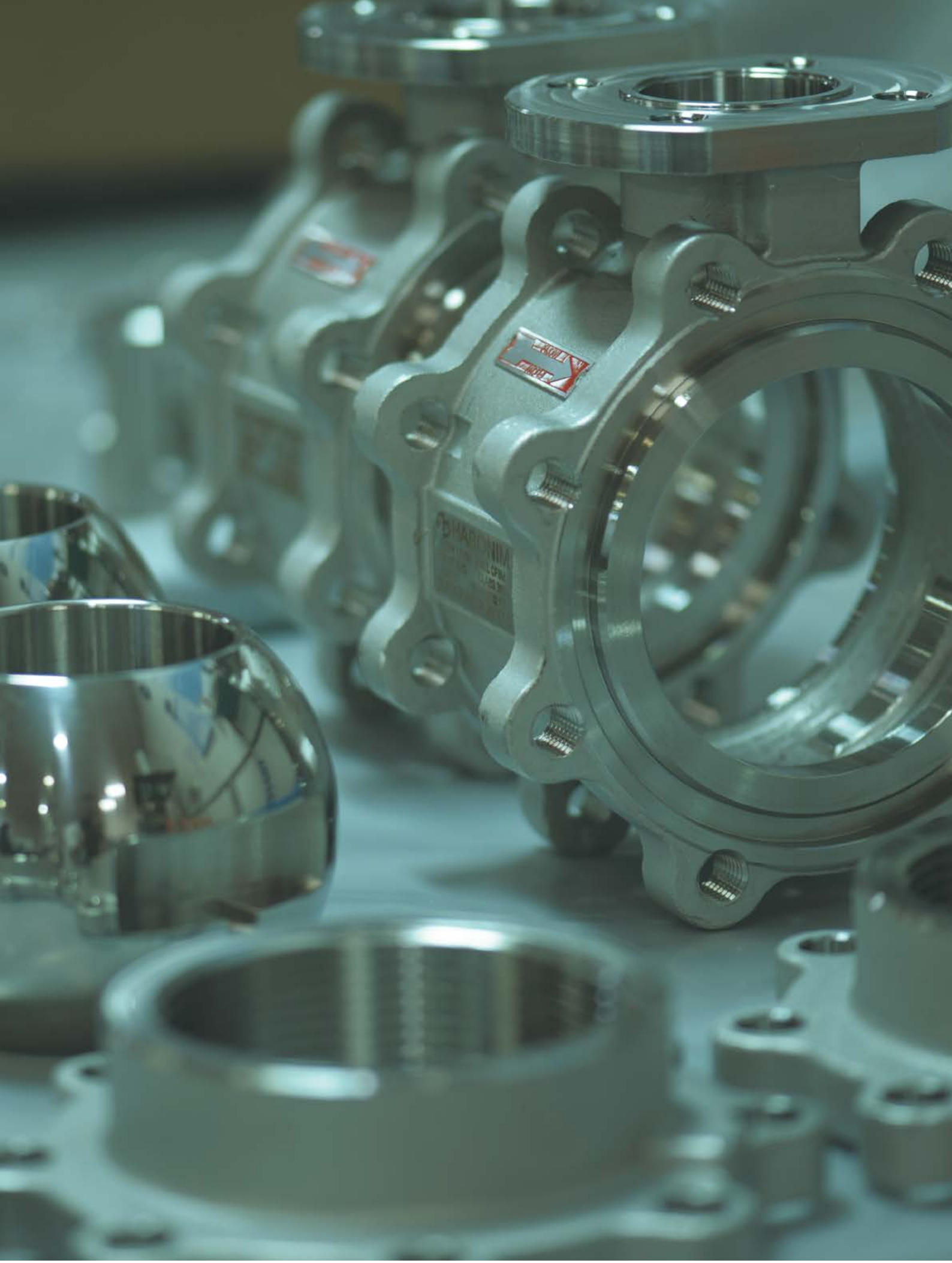




Ordering Code System

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0				F	4	7	W	-	6	6	6	6	A	T	G	/	B	W			-	L	D	N	
Size		Features				Series		Design		Body material	Ends material	Ball/Stem material		Seat material	Inner Seal	Outer Seal		End Connection					Special features			

Special Features (24-30)	
LDN	Lockable handle



VALVE ACCESSORIES

Spring Return Handle (SRH)

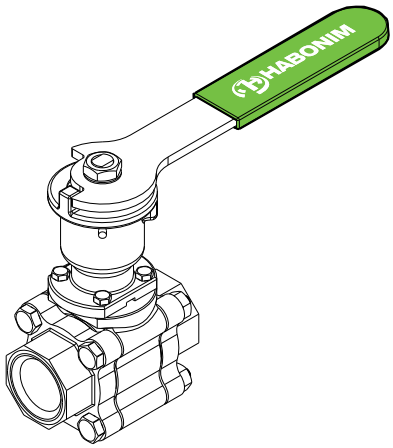
A spring-loaded device that forces the valve into close or open base position, by manually forcing the handle it can be temporary turned into the opposite position (close or open respectively). Once the handle is released the device will automatically force the valve into its base position.

Features

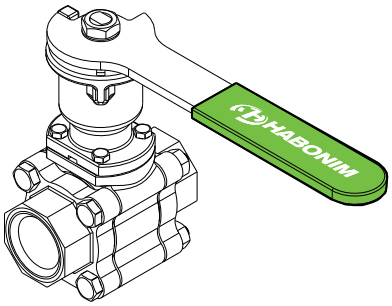
- Compact size, rugged construction, device internals are open to atmosphere (no pressure is build inside)
- In-Line Assembly: The SRH can be fitted on valves in line without shutting down the system or removing the valve from the line
- Fail to close, fail to open options
- Size range:
  - Standard port: ½"- 1¼" (DN15 - DN32)
  - Full port: ½"- 1" (DN15 - DN25)
- Stroke End Output Torque: 11 Nm (97 in-lb)
- Construction materials: Stainless Steel
- Direct mount on top of Habonim valve ISO 5211 pad
- Optional locking device

CAUTION! While operating the spring-loaded device, hold lever firmly and release gently. Slamming the unit might cause human injuries or handle deformation.

Fail Open Assembly



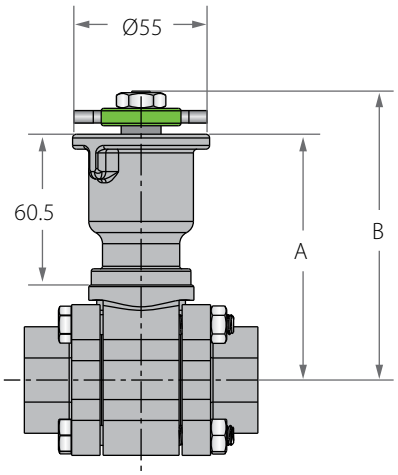
Fail Close Assembly

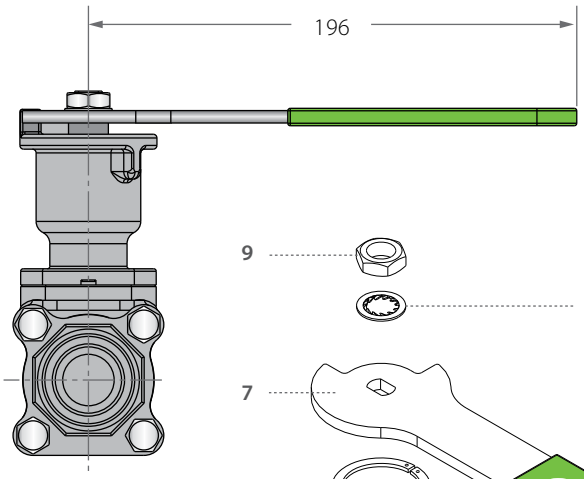




Spring Return Handle (SRH)

Device Dimensions

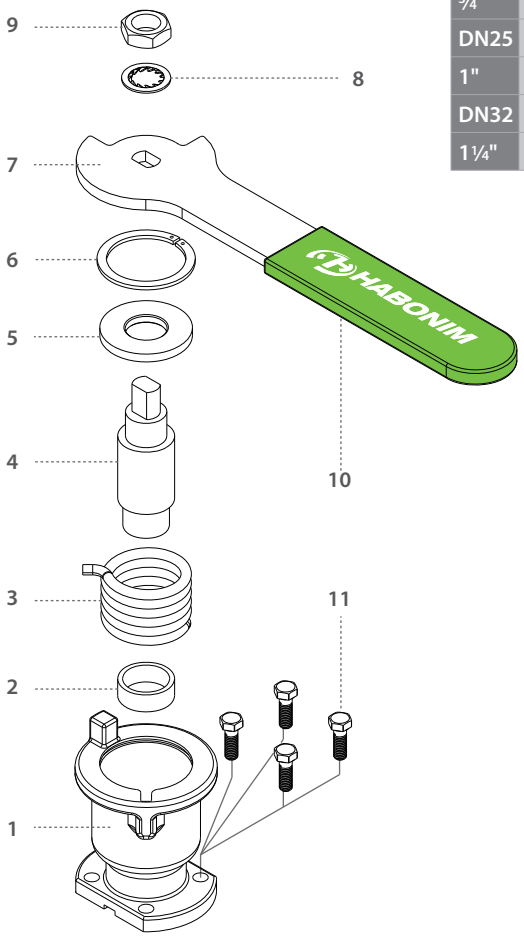




Valve size		A	B
DN15	mm	89.50	106.80
½"	inch	3.52	4.20
DN20	mm	91.90	109.20
¾"	inch	3.62	4.30
DN25	mm	98.70	116.00
1"	inch	3.89	4.57
DN32	mm	103.20	120.50
1¼"	inch	4.06	4.74

Components & Materials

Item	Description	Material specification	Qty.
1	Body housing	Stainless St. ASTM A351 CF8M	1
2	Bottom bearing	PTFE	1
3	Spring	Spring Steel ASTM A401	1
4	Stem	Stainless Steel 17-4 PH	1
5	Top bearing	BRASS ASTM B121	1
6	Locking clip	A167 304	1
7	Handle	Stainless Steel AISI 430	1
8	Serrated washer	A240 410	1
9	Handle nut	Stainless Steel 316 ASTM A194	1
10	Handle sleeve	PVC	1
11	Housing screws	Stainless Steel A2-70 ISO 4014	4



Ordering Code System

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0				F	4	7	W	-	6	6	6	6	A	T	G	/	B	W			-	S	R	H	
Size		Features				Series		Design		Body material	Ends material	Ball/Stem material		Seat material	Inner Seal	Outer Seal		End Connection					Special features			

Special Features (24-30)	
SRH	Spring Return Handle

VALVE ACCESSORIES

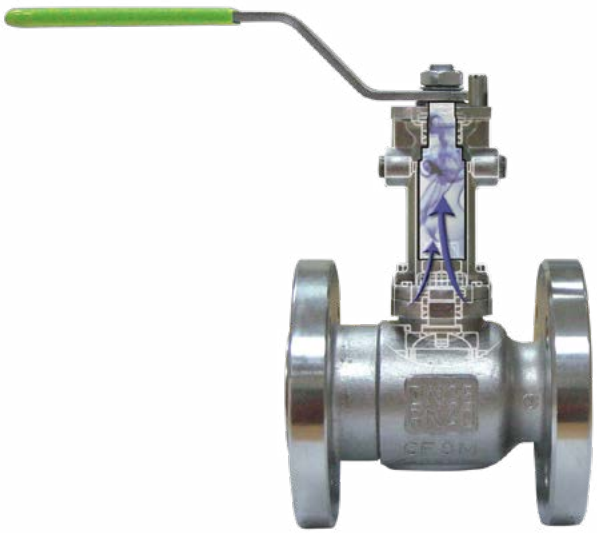
Fugitive Emission Bonnet (FE)

A device for improved Fugitive Emission prevention from valve stem sealing. The device adds a secondary sealing layer on top of the valve integral stem sealing.

Features

- Secondary HermetiX or High temperature graphite sealing arrangement.
- Any media that might breach the valve stem seal is contained within the device bonnet until valve maintenance can be safely held.
- The bonnet design allows a sensing device to be fitted between the two sealing arrangements, allow immediate breach identification or alerting.
- A machined lip on the bonnet bottom plane ensures a safe fit over the valve ISO pad. A static seal provides sealing to the atmosphere.
- Double blowout proof stems.
- Linear alignment between valve stem, extension and actuator to reduce side load.

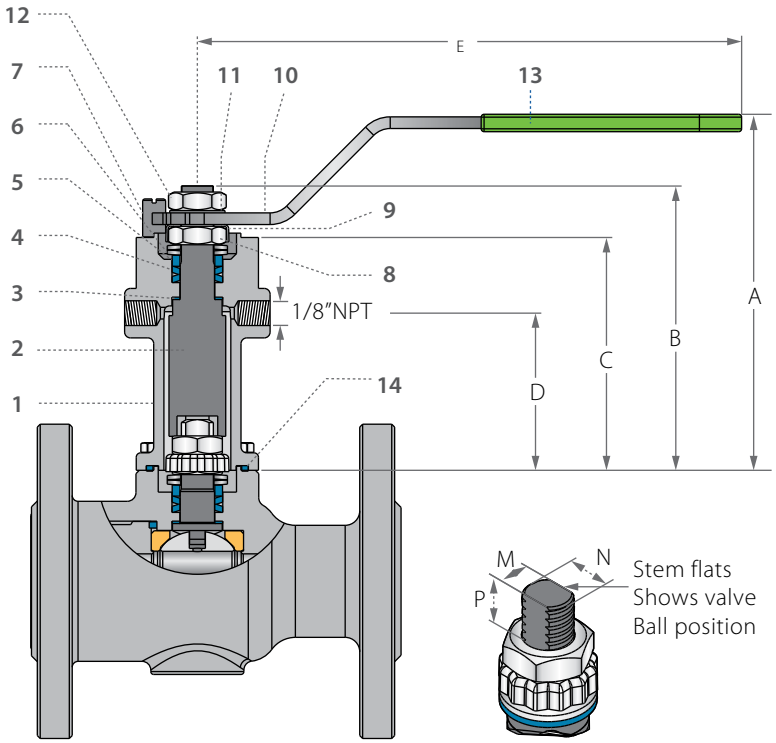
Caution!: Pressure within the FE bonnet must not exceed 50 bar!





Fugitive Emission Bonnet (FE)

Device Dimensions



Components & Materials

Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Stem	Acc. Ordering Code	1
3	Stem thrust seal	Virgin PEEK	1
4	Stem seal	TFM	1
5	Follower	S. Steel	1
6	Disc spring	S. Steel	2
7	Stop pin	S. Steel	1
8	Stem nut	S. Steel	1
9	Locking clip	S. Steel	1
10	Handle	S. Steel	1
11	Serrated washer	S. Steel	1
12	Handle nut	S. Steel	1
13	Handle sleeve	PVC	1
14	Bonnet seal	PTFE / GRAPHITE	1

Dimensions

Valve size		FE Size	A	B	C	D	S	M	N	P	F	
DN15 & DN20	mm	05	114.00	89.10	80.00	55.25	150.00	5.50	⅜" UNF	7.20	(F03)	36.00
½" & ¾"	inch		4.48	3.50	3.15	2.17	5.90	0.21		0.28		1.42
DN25 & DN32	mm	10	122.00	97.40	80.00	54.00	187.00	7.54	7⁄16" UNF	7.20	(F04)	42.00
1" & 1¼"	inch		4.83	3.83	3.15	2.12	7.36	0.29		0.28		1.65
DN40 & DN50	mm	15	154.00	129.40	100.00	77.00	236.00	8.71	9⁄16" UNF	80.00	(F05)	50.00
1½" & 2"	inch		6.03	5.09	3.93	3.03	9.29	0.34		0.31		1.97
DN65	mm	25	144.00	118.10	100.00	76.50	236.00	8.71	9⁄16" UNF	13.50	(F07)	70.00
2½"	inch		5.66	4.65	3.93	3.01	9.29	0.34		0.53		2.76

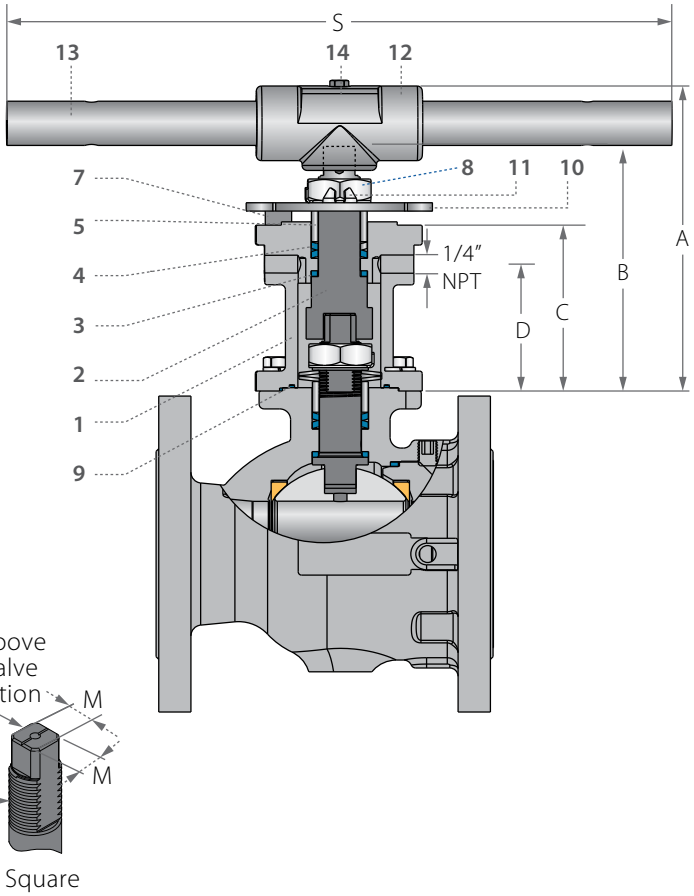
F.E. Stem operating torque

Reduced port Valve size		FE Size	HC / HermetiX™		AI packing		Control valves (N) / Graphite packing (KG)	
			N*m	lbf*inch	N*m	lbf*inch	N*m	lbf*inch
DN15 & DN20	½" & ¾"	05	2.00	17.70	3.00	26.50	4.00	35.40
DN25 & DN32	1" & 1¼"	10	5.00	44.20	7.00	62.00	9.00	79.60
DN40 & DN50	1½" & 2"	15	7.00	62.00	11.00	97.30	13.00	115.00
DN65	2½"	25	7.00	62.00	11.00	97.30	13.00	115.00

Note: When sizing an actuator add the above figures to the valve operating torque

Fugitive Emission Bonnet (FE)

Device Dimensions



Components & Materials

Item	Description	Material specification	Qty.
1	Body	Acc. Ordering Code	1
2	Stem	Acc. Ordering Code	1
3	Stem thrust seal	Virgin PEEK	1
4	Stem seal	TFM	1
5	Follower	S. Steel	1
6	Disc spring	S. Steel	2
7	Stop pin	S. Steel	1
8	Stem nut	S. Steel	1
9	Bonnet seal	PTFE / GRAPHITE	1
10	Stop plate	S. Steel	1
11	Tab lock washer	ASTM A240 304	1
12	Wrench head	S. Steel	1
13	Wrench handle	304	1
14	Wrench handle bolt	ISO 4014 A2-70	1

FE dimensions

Valve size		FE Size	A	B	C	D	S	M	N	P	F	
DN80 & DN100	mm	30	87.00	196.00	150.00	76.50	401.00	18.90	1" -14	16.70	(F10)	102.00
3" & 4"	inch		7.36	7.74	5.90	3.01	15.79	0.74	UNS-2A	0.66		4.02
DN150 & DN200	mm	60	273.00	219.00	150.00	100.00	401.00	18.90	1" -14	16.70	(F12)	125.00
6" & 8"	inch		10.74	8.62	5.90	3.93	15.79	0.74	UNS-2A	0.66		4.92

FE Stem operating torque

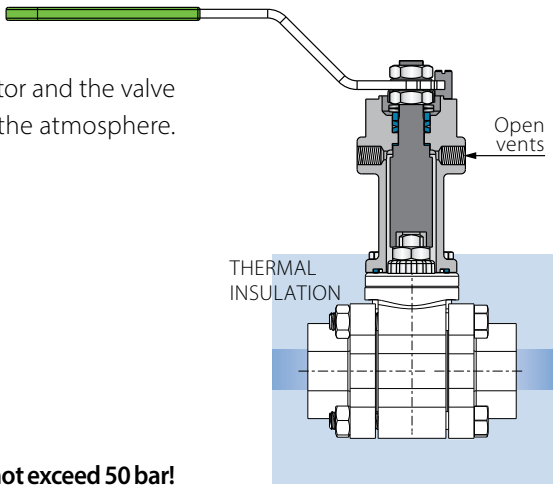
Reduced port Valve size	FE Size	HC / HermetiX™		AI packing		Control valves (N) / Graphite packing (KG)	
		N*m	lbf*inch	N*m	lbf*inch	N*m	lbf*inch
DN80 & DN100 3" & 4"	30	13.00	115.00	18.00	159.30	25.00	221.20
DN150 & DN200 6" & 8"	60	32.00	283.00	43.00	380.50	60.00	531.00

Note: When sizing an actuator add the above figures to the valve operating torque

EXT

Extended Bonnet (EXT)

An extension device to allow a larger distance between the handle or actuator and the valve body. The extension bonnet does not seal at its upper end and is open to the atmosphere. The valve stem seal is in use for media sealing.



Suitable for critical applications when:

- Valve and pipe lines need to be insulated
- Valve operation must be elevated from extreme temperature areas
- Direct mounting of actuator to a valve is not suitable

Caution!: In any case the vents are sealed - pressure within the FE bonnet must not exceed 50 bar!

FE EXT

Ordering Code System

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	.	.	30
6	0				**F**	4	7	W	-	6	6	6	6	A	T	G	/	B	W			-	F	E		
Size		Features				Series		Design		Body material	Ends material	Ball/Stem material		Seat material	Inner Seal	Outer Seal		End Connection					Special features			

Special Features (24-30)	
FE	Fugitive Emission
EXT	Extended Bonnet


HABONIM
COMPACT

ACTUATION

General 498
CompAct 4 Pistons Pneumatic Actuator 507
Power CompAct 4 Pistons Pneumatic Actuator 519
Emergency Shut-Down System (ESD) 529
Mounting Kits 530
Actuation Accessories 541



HABONIM ACTUATORS

General

Habonim's unique quarter-turn CompAct actuators have superior performance of double the torque per size, much longer cycling before any maintenance, high opening and closing speed and extraordinary durability in the most demanding industrial environments.

Our CompAct actuators are successfully used to supply control packages in diverse industries and applications that are superior in overall smaller size, with less weight, less compressed-air consumption, much more reliable especially in high cyclic applications and with very short acting times.

Habonim quarter-turn actuation offering includes:

- Double acting actuators (Air-Air operated)
- Single acting actuators (Air-Spring operated) as normally open/close options
- Shutoff valve and actuation packages
- Control valve and actuation packages
- Emergency Shut Down (ESD) and Fire Block Valve (FBV) packages

Habonim actuators product line is subject to the company's regulation, methodologies and certification – for more information, see Habonim Introduction chapter.

Design and Engineering

Habonim designs its actuators with accordance to international standards and guidelines in full, partial or with reference to. For some an external certification is available:

- Designed and tested in accordance with EN 15714-3 - Industrial valves - Actuators - Part 3: Pneumatic part-turn actuators for industrial valves - Basic requirements
- ISO 5211:2017 - Industrial valves - part-turn actuator attachments
- VDI/VDE 3845:2010 (NAMUR) - Industrial process control - pneumatic control valves - Interfaces of valves and auxiliary equipment
- IEC 61508-2:2010 SIL2/3 - Safety integrity level - functional safety of electrical/ electronic/ programmable electronic safety-related systems (optional)

Testing

100% of actuators are tested

- External shell and internal leak test
- Functional testing



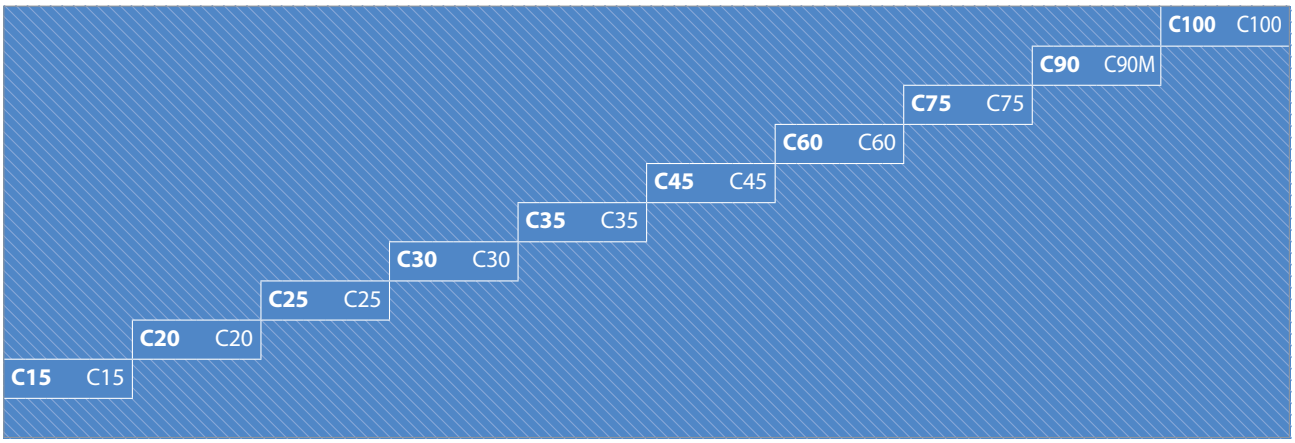
Packing

Habonim actuators are delivered as a standard:

- Air inlet and outlets are capped
- Each actuator is packed in a firm, clean package

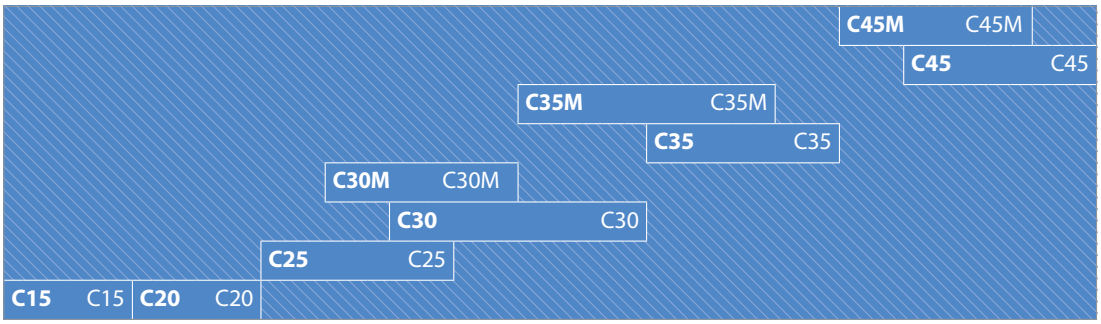
Quick Selection Table

Double Acting - Torque

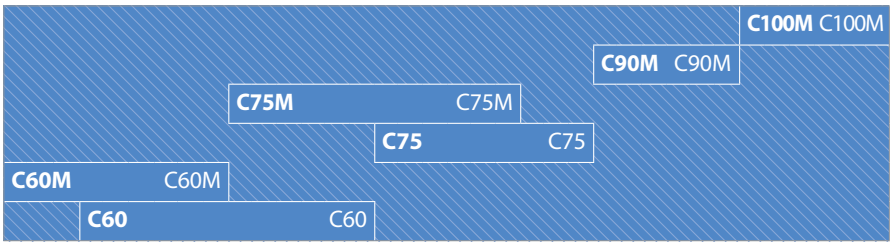


Stroke Time																			
3.5 Sec.																			
3.0 Sec.																			
2.5 Sec.																			
1.5 Sec.																			
0.75 Sec.																			
0.4 Sec.																			
0.24 Sec.																			
0.2 Sec.																			
0.13 Sec.																			
0.1 Sec.																			
0 Sec.																			
Torque NM	19	27	35	51	72	105	119	176	208	304	408	593	967	1406	1768	2596	3268	4754	6320	8600
Torque in/lb	172	244	311	468	639	961	1052	1611	1848	2780	3622	5429	8585	12872	15856	23767	28922	42073	55937	76116

Spring Return - Start Torque



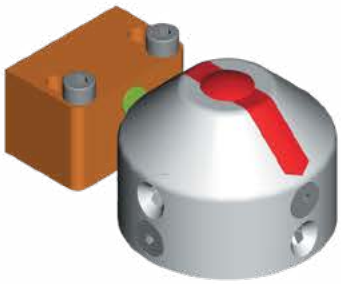
Stroke Time																	
0.8 Sec.																	
0.77 Sec.																	
0.5 Sec.																	
0.48 Sec.																	
0.28 Sec.																	
0.28 Sec.																	
0.23 Sec.																	
0.15 Sec.																	
Torque NM	12	18	22	30	45	59	73	102	103	120	133	176	211	215	260	357	414
Torque in/lb	106	165	195	275	398	522	668	912	934	1099	1177	1611	1903	1932	2301	3268	3790



Stroke Time												
3.7 Sec.												
3.1 Sec.												
2.9 Sec.												
2.9 Sec.												
1.6 Sec.												
1.6 Sec.												
Torque NM	495	635	835	953	1003	1184	1575	1867	1869	3006	3890	5620
Torque in/lb	4381	5620	7645	8434	9183	10478	14419	17093	16541	22709	34429	49741

HABONIM ACTUATORS

CompAct Actuator Features

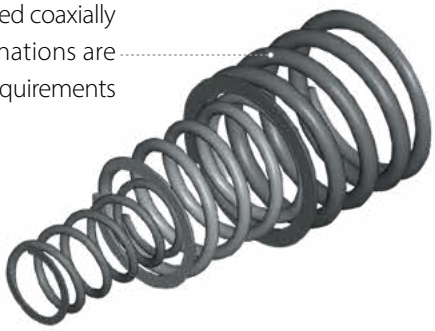


NAMUR VDI/VDE 3845
connection to limit switches



NAMUR output drive for limit switches and positioners

Springs painted for protection and fitted coaxially in a chamber. Various spring combinations are available to suit varying air pressure requirements

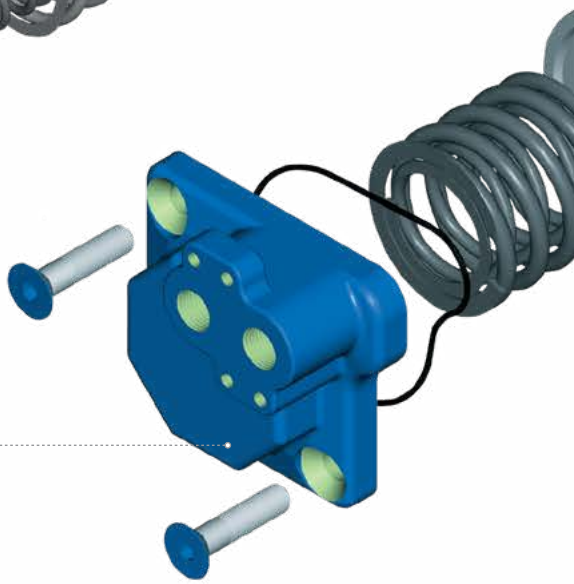




Smaller in the overall size compared to double piston actuators

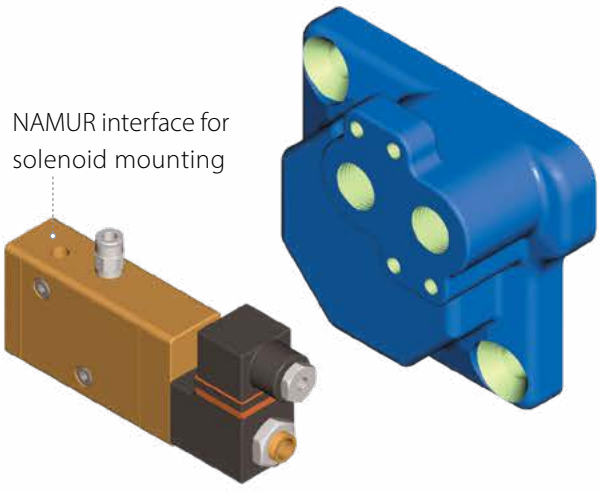


Spring cartridge: Improves the torque characteristics of the CompAct actuator



Spring return covers with extended screws for safe relief of springs

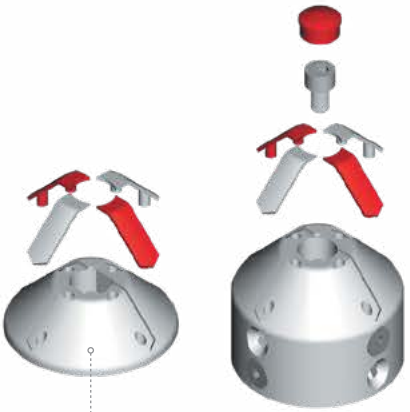
NAMUR interface for solenoid mounting





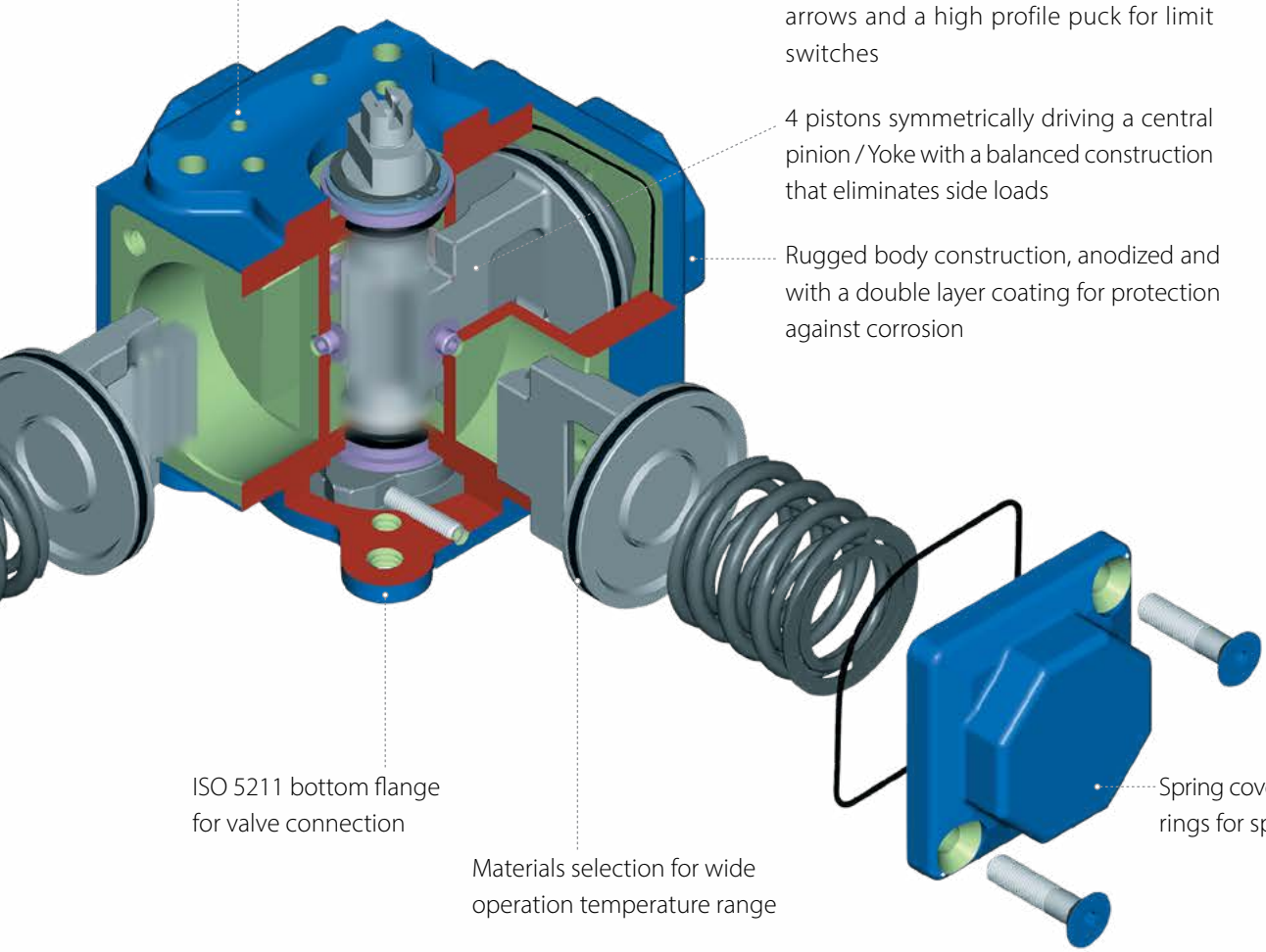
Limit stop for open-close and intermediate positions

CompAct Actuator Features



Visible position indicator with colored arrows and a high profile puck for limit switches





4 pistons symmetrically driving a central pinion / Yoke with a balanced construction that eliminates side loads

Rugged body construction, anodized and with a double layer coating for protection against corrosion

ISO 5211 bottom flange for valve connection

Materials selection for wide operation temperature range

Spring covers with centering rings for spring alignment



4-piston actuator provides double the torque output of a double piston actuator



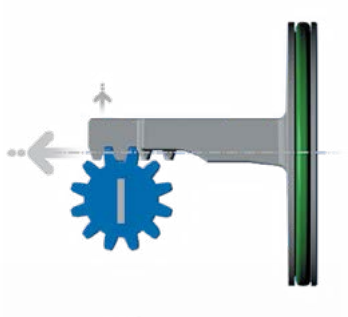
CompAct size with flat covers for double acting applications and minimum air consumption

HABONIM ACTUATORS

CompAct Actuator Features

Balanced Forces

The cube-shaped configuration positions the pistons in a way that allows each piston to develop thrust along its own axis with zero side load. This efficient design eliminates the use of guide rods and thrust bearings. The result is less stress on the seals than off-axis piston thrust, which is caused by the piston side loading that is inherent in the geometry of traditional actuator configurations.



Less Wear

The CompAct's unique 4-piston design achieves a more uniform load distribution than standard single-or double-piston actuators, therefore greatly reducing the wear on gears at the points of contact between rack and pinion.

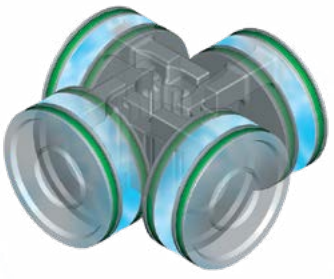
The force-balanced, shorter-stroke piston prevents uneven wear of O-rings, gears and pistons. This design eliminates the need for bearings and guiding rods and reduces the number of soft parts, thereby resulting in longer maintenance schedules and lower cost of repair kits.

The surface of the four cylinders is hardened by an anodizing treatment, which protects their high surface finish.



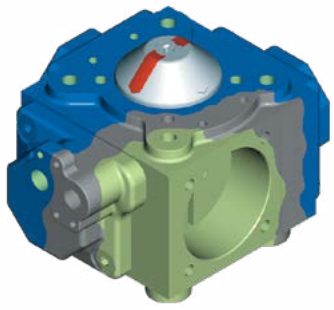
Superior Corrosion Resistance

The body and covers are anodized internally and externally to protect against corrosive atmospheres tested to more than 336 hours of life in a salt spray bath. An external epoxy base layer and a second layer of polyurethane paint provide additional protection against aggressive environments.



Less Air Consumption

Fast action is one of the most attractive features of the CompAct 4-piston actuator. The distinctive four-piston design allows for a smaller diameter actuator pinion that significantly shortens piston travel and response time.



Fast Action

Fast action is one of the most attractive features offered by the CompAct 4-piston actuator. The unique four-piston design allows for a smaller diameter actuator pinion that significantly shortens piston travel, resulting in a shorter response time.

HABONIM ACTUATORS

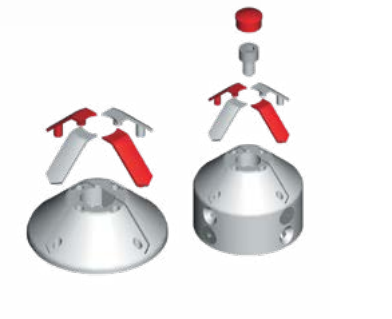
CompAct Actuator Features



Pinion

The pinion has a double-square female drive on its bottom plane that complies with the ISO 5211 standard. The top plane has the NAMUR slot for attachment to switches or positioners. There is a machined flat below the NAMUR interface to enable manual operation of the actuator with a wrench.

Indicator & Puck

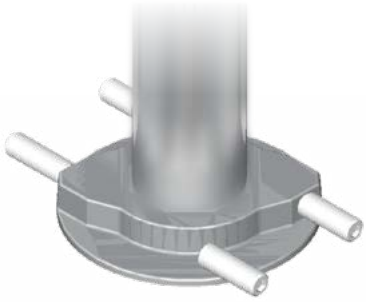


A highly visible indicator with flow direction arrows is snapped on to the pinion, to provide easy identification of the valve position. These indicator arrows allow true positioning of any type of valve entry and direction. The modular design makes it easy to change the indicator to match various flow patterns.

Safety Features

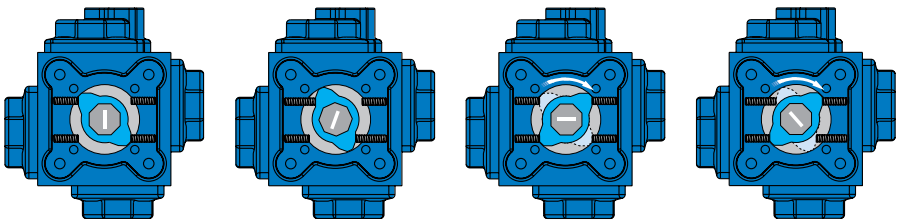
The CompAct's built-in safety features ensure secure and safe operation. Assembly and dismantling of the actuator are simple tasks. Long cover-bolts for spring return actuators relieve the spring load before they disengage from their threads. Before the pistons can be removed, the stop screw must be released and the pinion removed thus ensuring that any trapped and potentially hazardous pressure in the body will escape.

Limit Stop



The pinion and stop rotation can be adjusted by four large-diameter, diametrically-opposed adjustable set-screws that are threaded into the actuator body. Each opposing pair of screws exerts simultaneous and equal force on opposite sides of the stop when the rotation limit is reached, thus preventing the generation of off-center forces.

The stop screws allow for +/-5° rotation adjustment in both directions of travel. Larger span can be achieved with a longer set of stop screws. This feature is built into the actuator stop mechanism and eliminates the need for additional plates and screws. The stop material is stainless steel for better wear and corrosion resistance.



Closed | Partially closed | Open | Partially open



HABONIM ACTUATORS

CompAct Actuator Features

Nested Springs

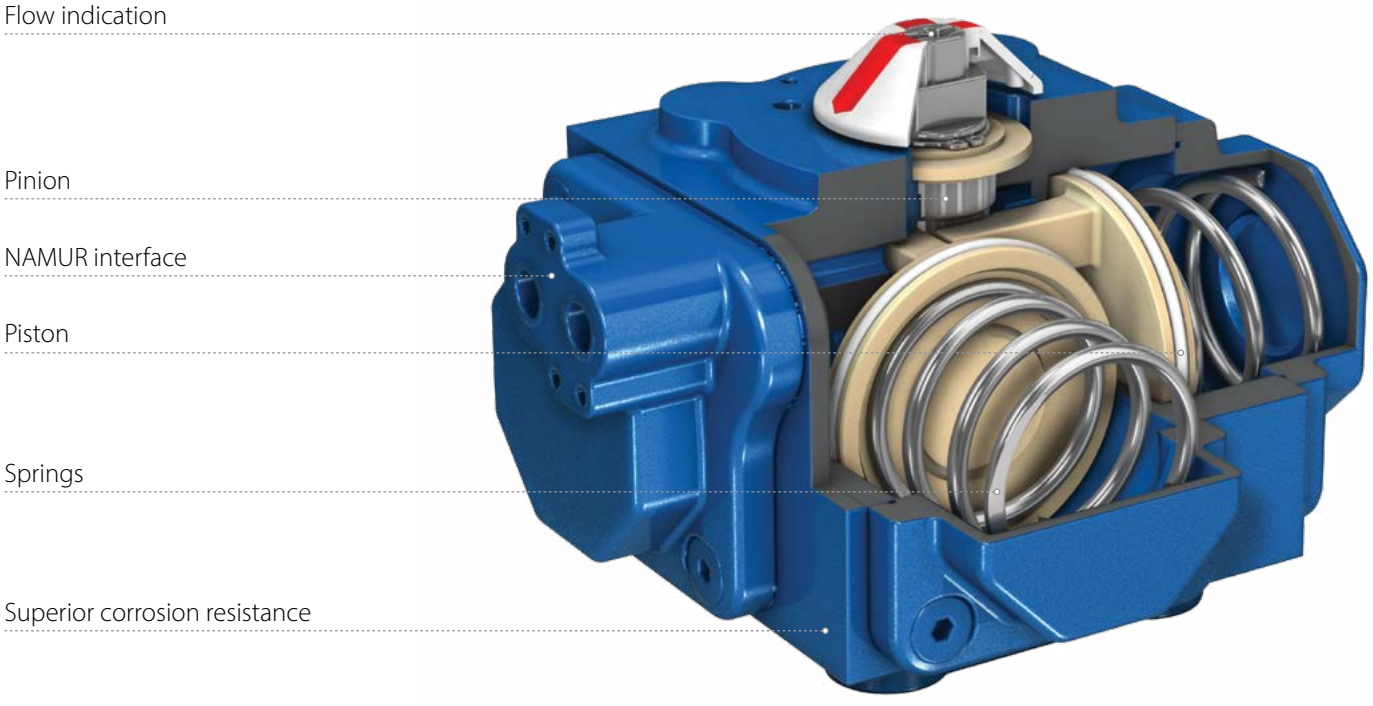


The CompAct can be used with up to three different spring sizes for the spring that, in each of the four cylinders, is nested between the cover and the piston and aligned by a centering ring. Each spring is wound in the opposite direction to its neighbor to avoid entanglement. All the springs act at the piston center axis so that no side load will occur if one spring fails to operate. By virtue of the four-cylinder design, there are many more spring combination possibilities than with double piston actuators, providing superior solutions for any air supply pressure required. Special painting of the springs provides higher corrosion resistance to the environment, resulting in more than 250 hours of life in a salt spray bath.

Spring cartridge - Only available in CxxM CompAct items



Using a spring set in a cartridge improves the torque characteristics of the CompAct actuator. The spring cartridge is comprised of a shaped tube in which the extended springs have been preloaded and are held safely in place by two rigid discs. Changing a spring set configuration in this design requires changing the complete cartridge.



HABONIM ACTUATORS

CompAct Actuator Features

NAMUR & ISO interface

An extensive range of accessories such as solenoids, positioners and limit switches are available for direct mounting to the CompAct actuator. Any accessory whose connections comply with ISO 5211 and VDI/VDE 3845 (NAMUR) mounting can be connected to the actuator.

NAMUR VDI/VDE 3845

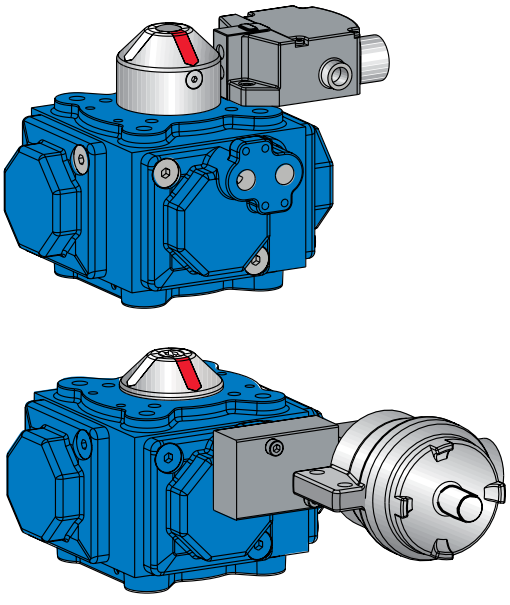
This standard provides for a range of accessories such as limit switches, pucks, indicators and positioners with a VDI/VDE interface so that they can be easily mounted onto the actuator top face.

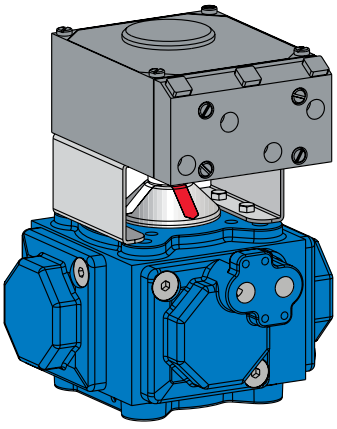
NAMUR solenoid mounting

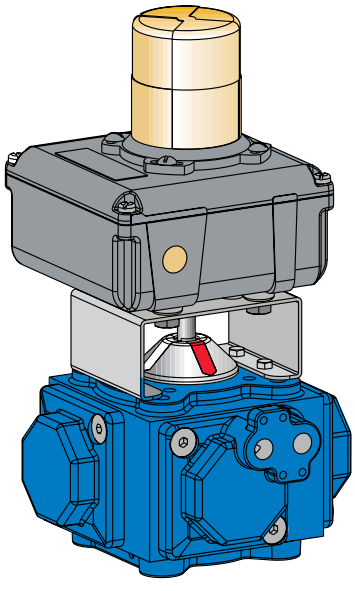
One of the four available actuator covers incorporates a pad for solenoid mounting according to the NAMUR international standard. Any solenoid that conforms to the NAMUR interface can be directly mounted to the actuators, thus simplifying the installation of solenoids and eliminating additional piping. It also allows quick actuation response as pressurized air supply is available at the port entrance.

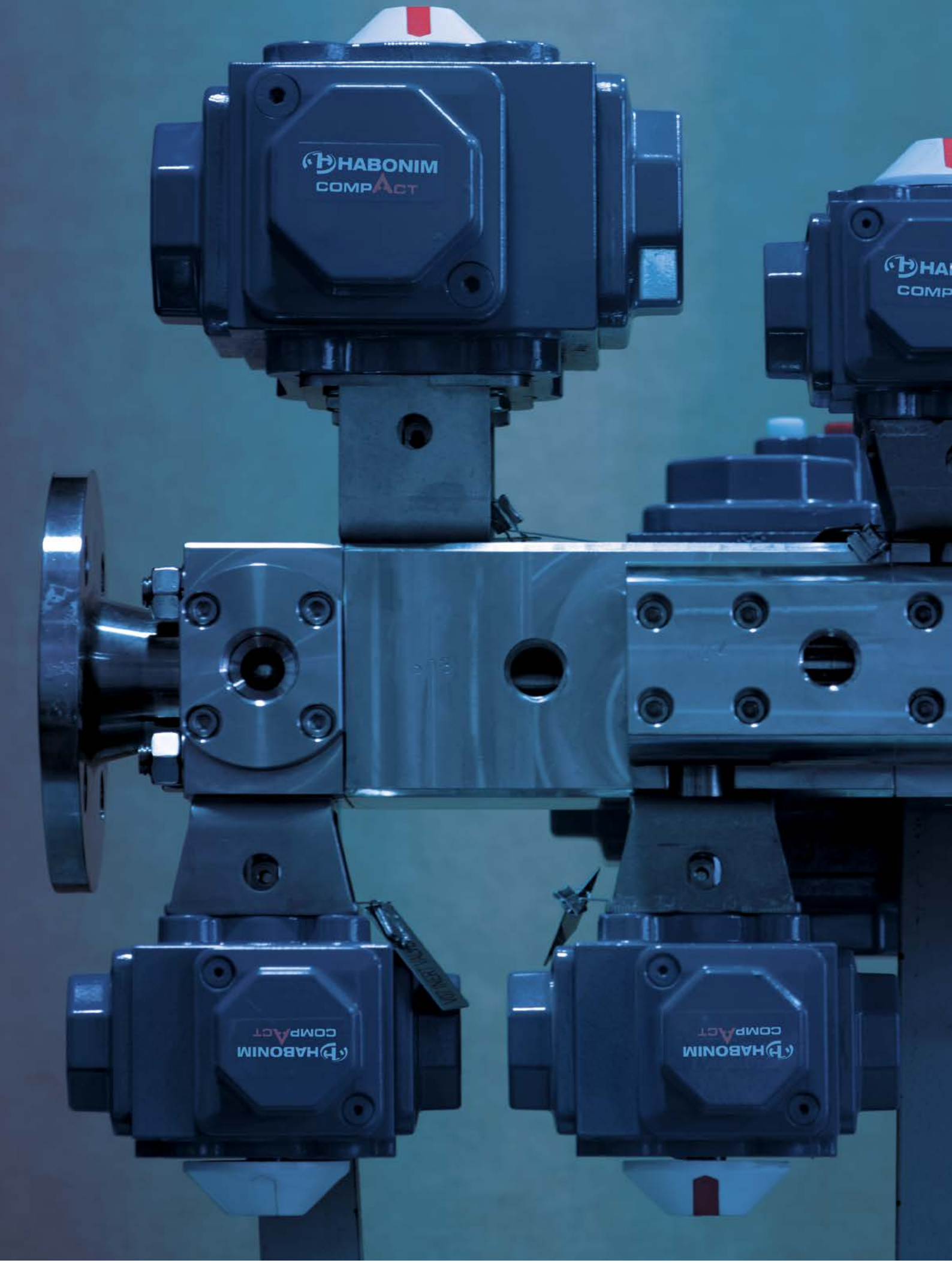
ISO 5211

The actuator bottom flange is in accordance with the ISO 5211 international standard and incorporates a star-shaped female drive to flexibly fit a variety of valve output shafts. The valve can be attached by a bracket or mounted directly onto the actuator, using one of the various ISO hole patterns.







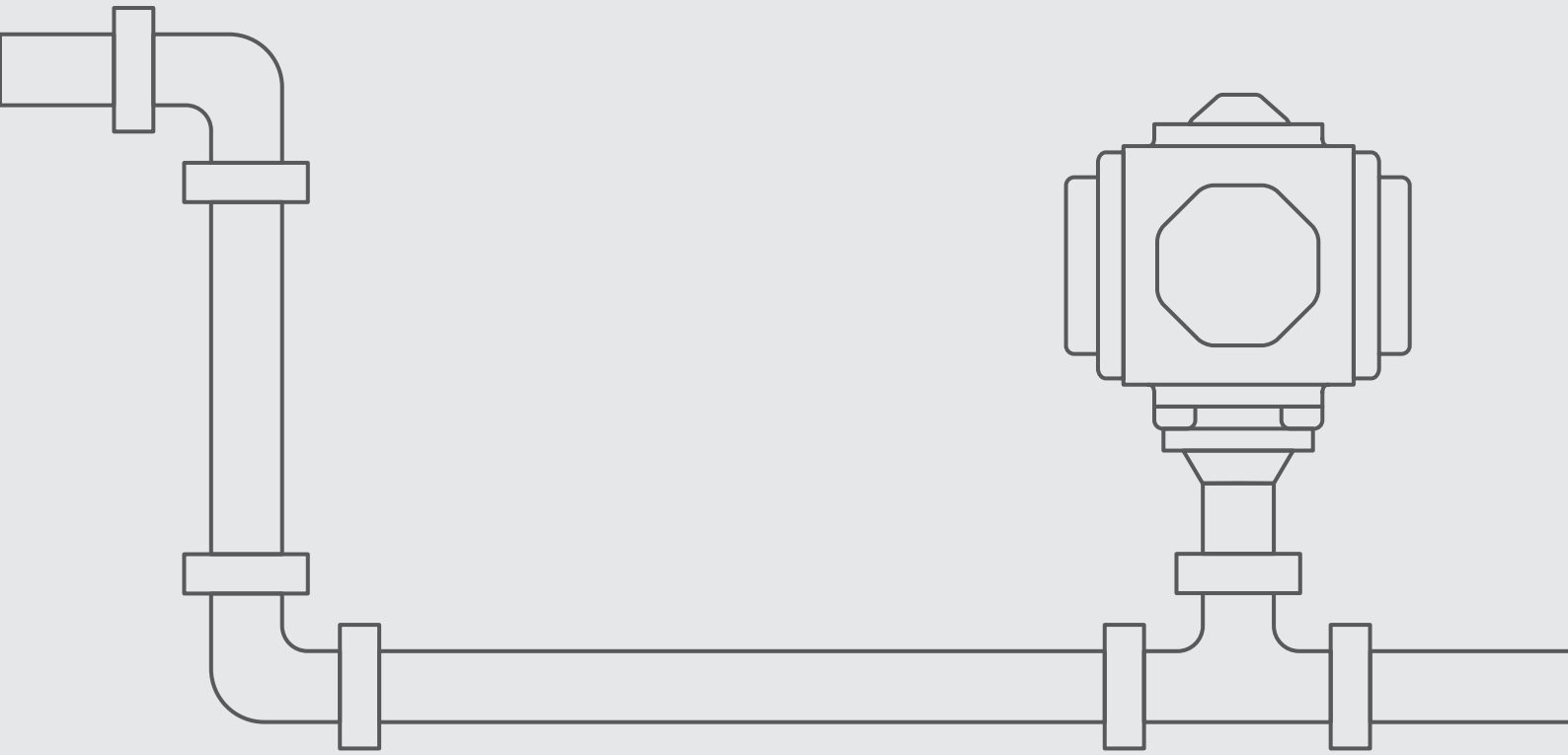

HABONIM
COMPACT

C15-C90M

Actuation

PNEUMATIC ACTUATOR

COMPACT
4 PISTONS



C15-C90M

CompAct 4 Pistons Pneumatic Actuator

Type	Working temperature C° (F°)	Working Pressure Air, Bar (psi)	Application	Ordering code
Standard	-40 to 100 (-40 to 213)	3.0 (44) to 8.0 (116)	General	Blank
High Temperatures	-20 to 120 (-4 to 250)		General	HT
High Cycle	-20 to 80 (-4 to 176)		Above 1 cycle/minute	HC
Nuclear	-40 to 80 (-40 to 176)		Nuclear use	NU

Spring combinations

C15 only

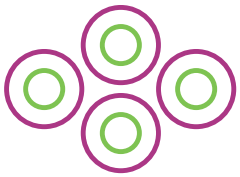
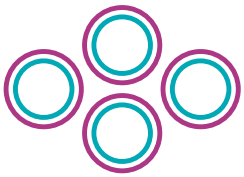
Code	Spring combinations
1A	
1B	

Code	Spring combinations
1B2	
2	



C20 -C90M0

Code	Spring combinations
2AB	
2A	
2A2B	

Code	Spring combinations
2B	
2A3	
2C	

Code	Spring combinations
2C3	
3	

Sizing a spring return actuator requires that the torque output at the start and end of both the spring and air drive strokes is greater than the valve torque at that position.

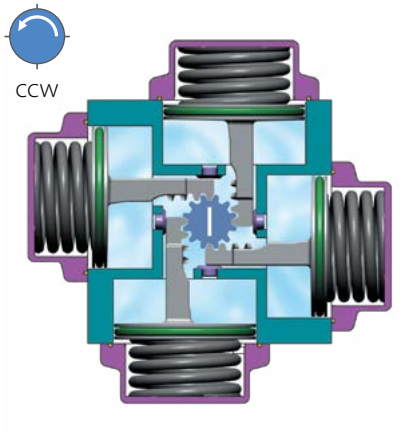
CompAct Actuators Configurations

The actuator can be configured for either spring return or double-action operation. In both cases the air supply to drive the pistons flows into Port A of the NAMUR cover. Port A is connected to the center chamber, and Port B is connected to the four outside chambers.

Spring return (fail-safe)

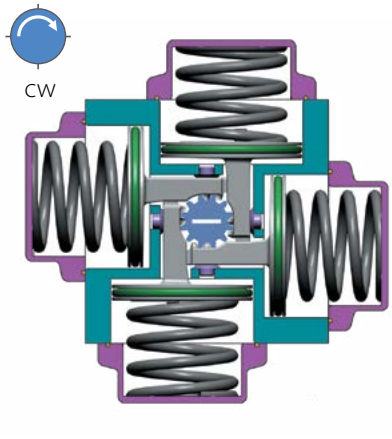
Pressure entering Port A to open:

- Center chamber is pressurized and pistons move outward
- Springs are compressed
- Pinion rotates counterclockwise



Pressure exiting Port A to close:

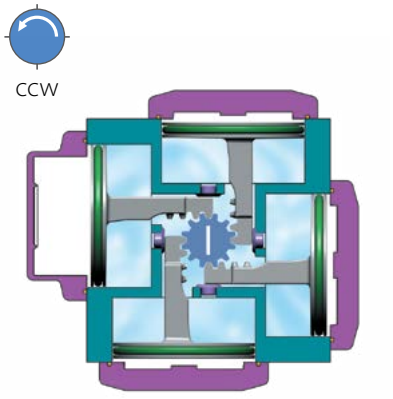
- Air released from center chamber
- Springs drive pistons inward
- Pinion rotates clockwise



Double action (increased torque)

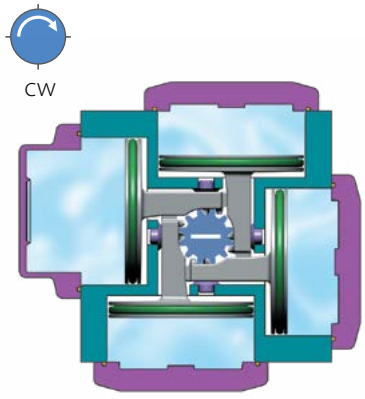
Pressure entering Port A to open:

- Center chamber is pressurized
- Pistons move outward
- Pinion rotates counterclockwise



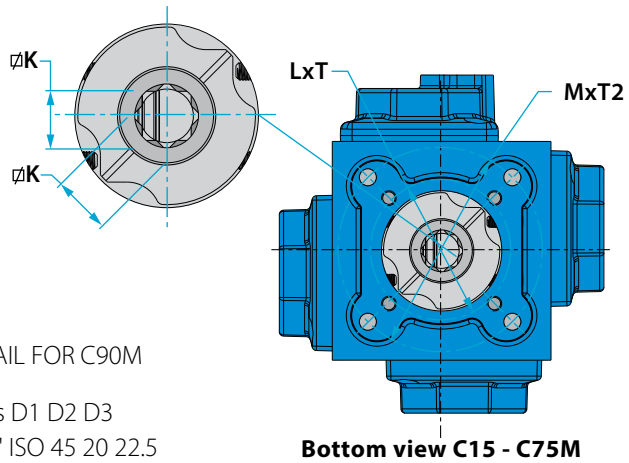
Pressure entering Port B to close:

- Outside chambers are pressurized
- Pistons move inward
- Pinion rotates clockwise



C15-C90M

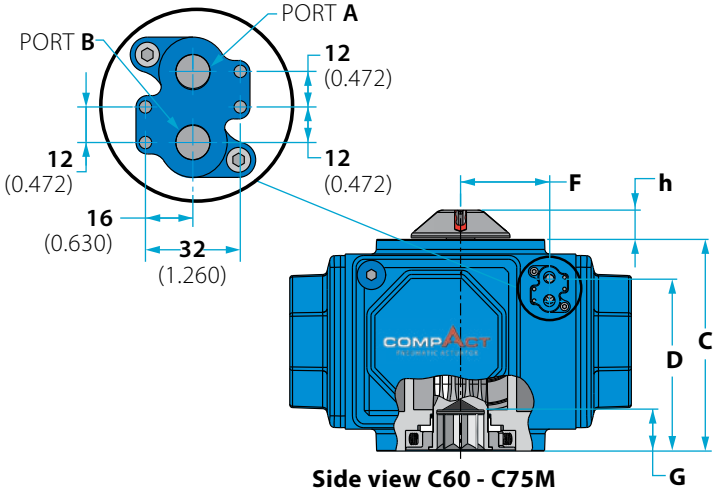
CompAct 4 Pistons Pneumatic Actuator



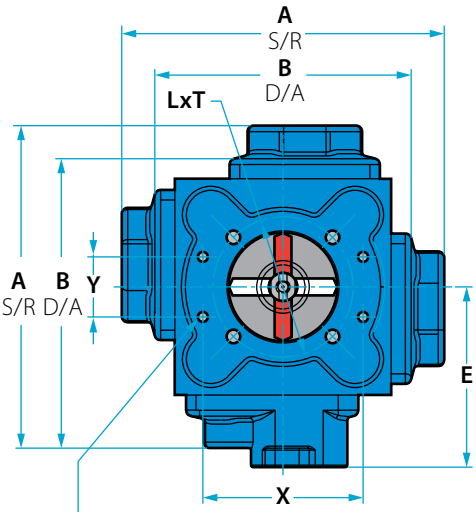
Bottom view C15 - C75M

DETAIL FOR C90M

Ports D1 D2 D3
G-½" ISO 45 20 22.5
½" NPT 1.77 0.79 0.886

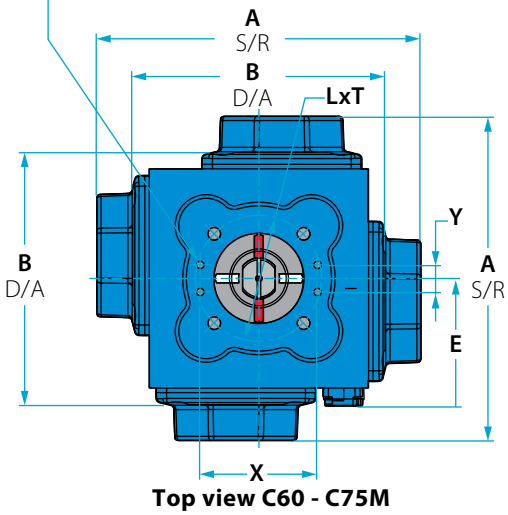


Side view C60 - C75M

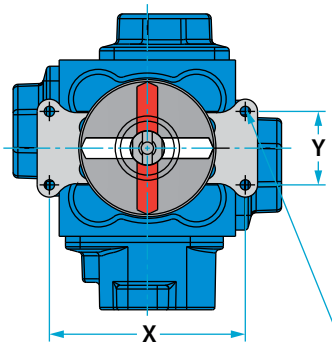


Top view C15 - C45M

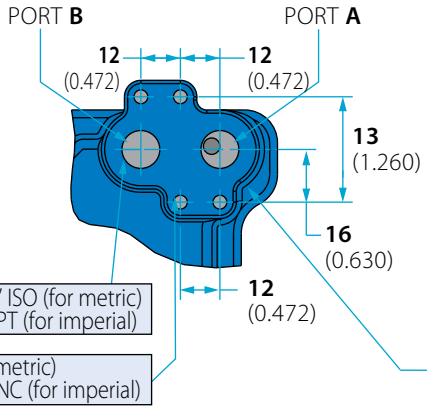
M5 (for metric)
10/24 UNC
(for imperial)

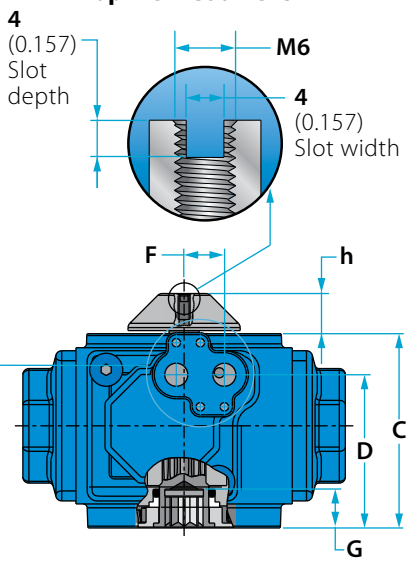


Top view C60 - C75M



Top view C15 only
VDI/VDE brackets on request





Side view C15 - C45M

VDI / VDE 3845	
Sizes	X x Y x h
C15 - C45M	80 x 30 x 20
C60 - C90M	130 x 30 x 30

Port **A** is connected to the center chamber
Port **B** is connected to the outside chambers

C15-C90M

Actuator Dimensions

Size	A S/R		B D/A		B1 D/A		C		D		E		F		G		Øk		L PCD		T Thread		M PCD (2)		T2	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
C15	110	4.31	86	3.39	97.8	3.85	68.8	2.71	50.8	2.00	66.0	2.60	16.0	0.63	13.5	0.53	9	0.35	50 (F05)	1.97 (F05)	M6x8	¼"X0.314	-	-	-	-
C20	131	5.17	102	4.03	117.0	4.6	80.5	3.17	61.5	2.42	77.2	3.04	16.5	0.65	15.0	0.59	11	0.43	50 (F05)	1.97 (F05)	M6x8	¼"X0.314	70 (F07)	2.76 (F07)	M8x11	5⁄16"X0.43
C25	161	6.34	132	5.24	147.0	5.79	97.0	3.82	76.5	3.01	90.0	3.54	20.0	0.79	19.5	0.77	14	0.55	70 (F07)	2.76 (F07)	M8x9	5⁄16"X0.354	102 (F10)	4.02 (F10)	M10X11	⅜"X0.43
C30	186	7.33	151	5.94	169.0	6.64	116.0	4.58	93.4	3.68	105.0	4.15	22.3	0.88	22.0	0.87	17	0.67	70 (F07)	2.76 (F07)	M8x11	5⁄16"X0.43	102 (F10)	4.02 (F10)	M10X12	⅜"X0.47
C30M	216	8.50	-	-	-	-	116.0	4.58	93.4	3.68	120.0	4.72	22.3	0.88	22.0	0.87	17	0.67	70 (F07)	2.76 (F07)	M8x11	5⁄16"X0.43	102 (F10)	4.02 (F10)	M10X12	⅜"X0.47
C35	222	8.74	182	7.15	202.0	7.94	135.0	5.31	102.0	4.02	114.0	4.48	22.5	0.89	26.0	1.02	22	0.87	102 (F10)	4.02 (F10)	M10x13	⅜"X0.51	-	-	-	-
C35M	256	10.07	-	-	-	-	135.0	5.31	102.0	4.02	131.0	5.15	22.5	0.89	26.0	1.02	22	0.87	102 (F10)	4.02 (F10)	M10x13	⅜"X0.51	-	-	-	-
C45	269	10.59	221	8.70	245.0	9.65	164.0	6.46	127.0	5.00	147.0	5.79	31.0	1.22	33.0	1.30	27	1.06	125 (F12)	4.92 (F12)	M12x15	½"X0.59	102* (F10)	4.02* (F10)	M10X15	⅜"X0.59
C45M	303	11.93	-	-	-	-	164.0	6.46	127.0	5.00	164.0	6.45	31.0	1.22	33.0	1.30	27	1.06	125 (F12)	4.92 (F12)	M12x15	½"X0.59	102* (F10)	4.02* (F10)	M10X15	⅜"X0.59
C60	360	14.17	285	11.22	-	-	218.0	8.58	180.0	7.09	141.0	5.57	94.0	3.70	43.0	1.69	36	1.42	140 (F14)	5.51 (F14)	M16x18	⅝"X0.71	-	-	-	-
C60M	390	15.35	-	-	-	-	218.0	8.58	180.0	7.09	141.0	5.57	94.0	3.70	43.0	1.69	36	1.42	140 (F14)	5.51 (F14)	M16x18	⅝"X0.71	-	-	-	-
C75	437	17.20	342	13.46	-	-	270.0	10.63	223.0	8.76	166.0	6.54	110.0	4.33	43.0	1.69	36	1.42	140 (F14)	5.51 (F14)	M16x18	⅝"X0.71	-	-	-	-
C75M	467	18.38	-	-	-	-	270.0	10.63	223.0	8.76	166.0	6.54	110.0	4.33	43.0	1.69	36	1.42	140 (F14)	5.51 (F14)	M16x18	⅝"X0.71	-	-	-	-
C90M	570	22.42	369	14.52	-	-	317.0	12.48	264.0	10.37	196.0	7.71	128.0	5.04	52.0	2.05	46	1.81	165 (F16)	6.5 (F16)	M20x30	¾"X1.18	-	-	-	-

* The C45 bottom PCD can be either F12 or F10, but not both. The standard is F12. When ordering C45 with F10, you must add it to the code.

Technical Data

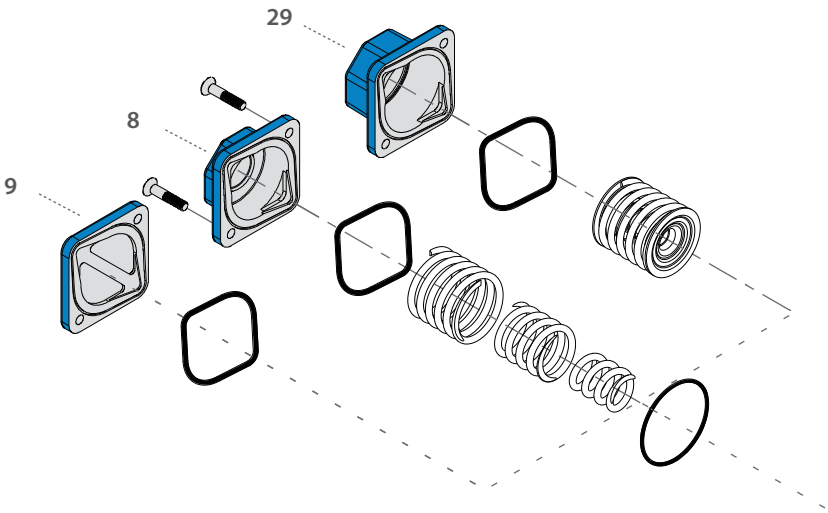
Actuator size		Unit	C15	C20	C25	C30	C30M	C35	C35M	C45	C45M	C60	C60M	C75	C75M	C90M
Weight Spring return		kg	1.10	1.90	3.50	5.00	6.10	9.00	10.40	15.00	16.70	35.00	39.40	64.00	72.00	160.00
		lb	2.40	4.20	7.70	11.00	13.40	19.80	22.00	33.10	37.40	77.20	86.00	141.10	158.00	353.00
Weight Double acting		kg	0.90	1.50	2.60	4.40	-	7.10	-	11.00	-	26.00	-	51.00	-	92.00
		lb	1.98	3.30	5.72	9.70	-	15.70	-	24.30	-	57.30	-	112.40	-	203.00
Air consumption per stroke actual volume	CCW	liter	0.07	0.12	0.25	0.44	0.44	0.74	0.74	1.33	1.33	3.20	3.2	5.76	5.76	12.00
	CW		0.09	0.15	0.33	0.54	-	0.80	-	1.33	-	3.20	-	5.76	-	-
	Total		0.16	0.27	0.58	0.98	-	1.54	-	2.66	-	6.40	-	11.52	-	-
Air consumption per stroke actual volume	CCW	in^3	4.30	7.30	15.00	27.00	27.00	45.00	45.00	81.00	81.00	195.00	195	351.00	351.00	726.00
	CW		5.50	9.20	20.00	33.00	-	49.00	-	81.00	-	195.00	-	351.00	-	-
	Total		9.80	16.50	35.00	60.00	-	94.00	-	162.00	-	391.00	-	703.00	-	-
Stroke time with S.V. with 0.9 Cv at 80 psi	D/A	sec.	0.10	0.13	0.20	0.24	-	0.40	-	0.75	-	1.50	-	2.50	-	3.00
	S/R Open		0.10	0.15	0.23	0.29	0.30	0.54	0.60	1.00	1.10	2.20	2.4	3.70	4.00	4.80
	S/R Close		0.15	0.15	0.23	0.28	0.28	0.48	0.50	0.77	0.80	1.60	1.6	2.90	2.90	3.10

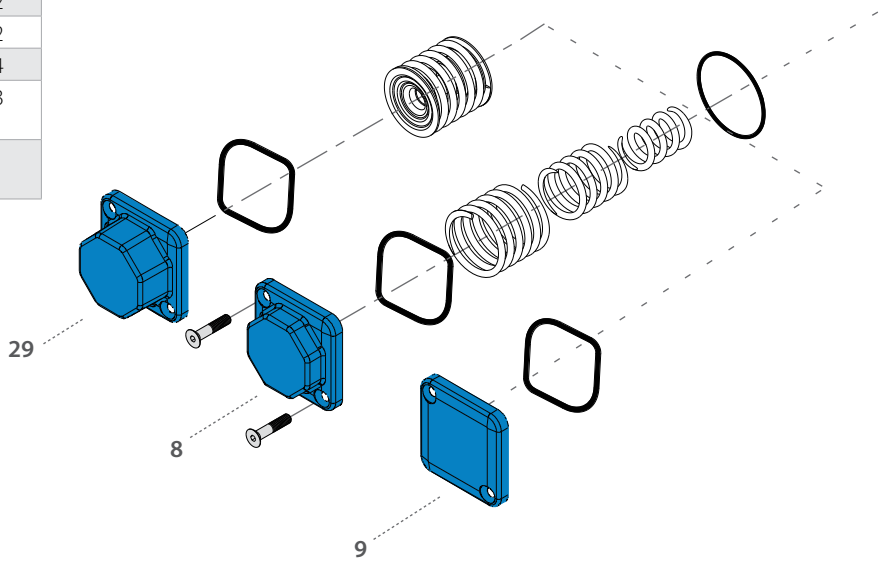
C15-C90M

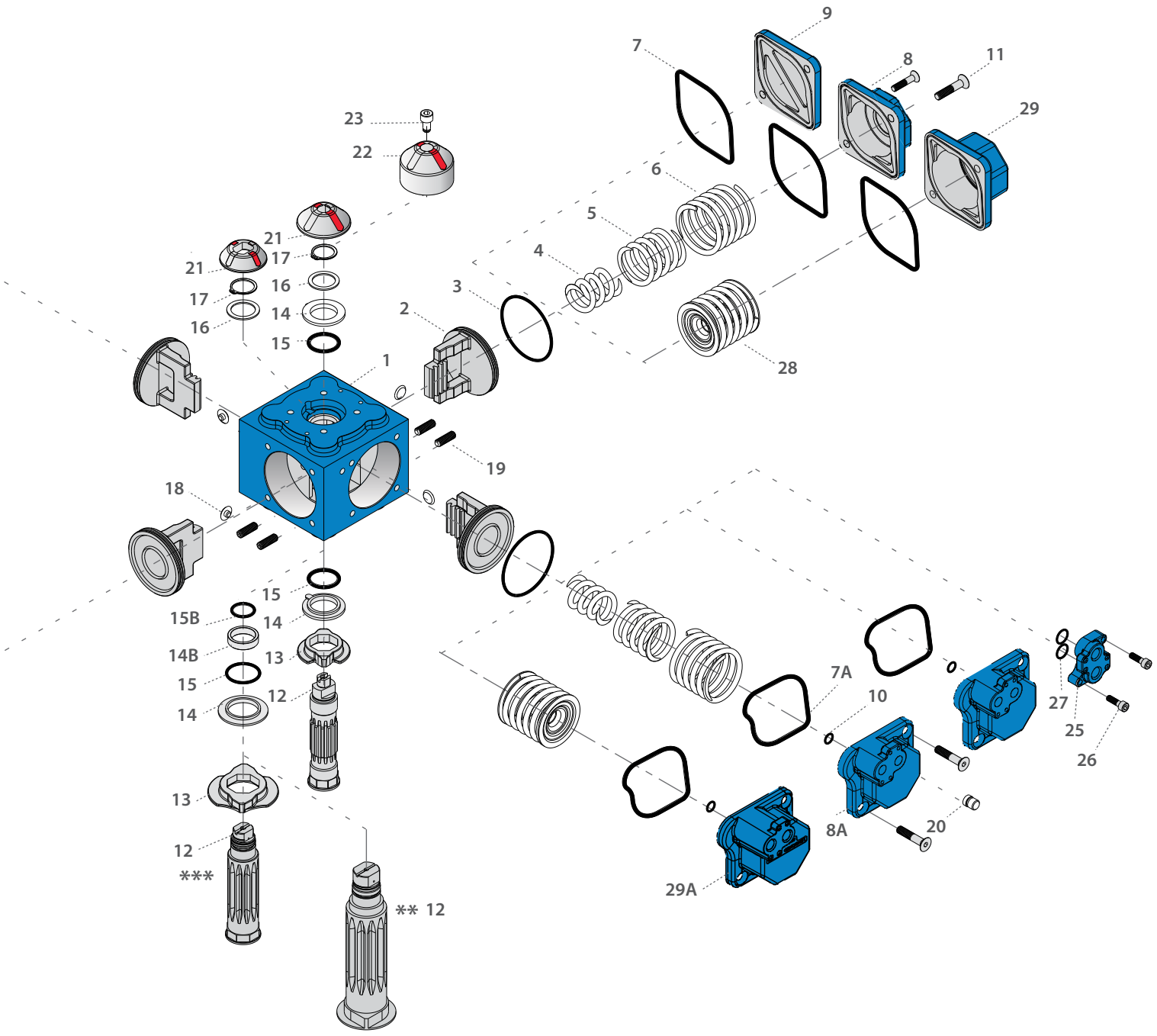
CompAct 4 Pistons Pneumatic Actuator

Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Piston	Acc. Ordering Code	4
3*	Piston O-Ring	Acc. Ordering Code	4
4	Inner Spring	Spring steel, painted	4
5	Middle Spring	Spring steel, painted	4
6	Outer Spring	Spring steel, painted	4
7*	Cover O-Ring	Acc. Ordering Code	3
7a	Namur Cover O-Ring	Acc. Ordering Code	1
8	Spring Return Cover	Acc. Ordering Code	3
8a	Namur Cover	Acc. Ordering Code	1
9	Double Acting Cover	Acc. Ordering Code	3
10	Air Supply O-Ring	Acc. Ordering Code	1
11*	Cover Screw	Stainless Steel	16
12	Pinion	Acc. Ordering Code	1
13	Stop Plate	Stainless Steel	1
14*	Thrust Washer	Acc. Ordering Code	2
14B*	Bearing	Acc. Ordering Code	1
15*	Pinion O-Ring	Acc. Ordering Code	2
15B*	Top Pinion O-Ring	Acc. Ordering Code	1
16*	Disc Bearing	Stainless Steel / Delrin	1
17*	Circlip	Stainless Steel, spring steel zinc plated	1
18*	Pad	Acc. Ordering Code	4
19	Stroke Adjustment Screw	Stainless Steel	4
20	Exhaust Plug (silencer)	Delrin, brass	1
21	Indicator	Plastic ABS, red & white	1
22	Puck	Plastic ABS, red & white	1
23	Indicator Screw	Stainless Steel	1
24	Tag (not shown)	Stainless Steel	4
25	NAMUR Insert	AL 380	1
26	Insert Screw	Stainless Steel	2
27*	NAMUR Insert O-Ring	Acc. Ordering Code	2
28	Spring Cassette	Spring steel, painted	4
29	Spring Return Cover For M Series	Acc. Ordering Code	3
29A	NAMUR Cover For M Series	AL 380	1

* Maintenance kit components
** C75 & C90M Pinion (12) and stop (13) are one piece
*** Pinion assembly for actuators C35 and above






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8A
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29A
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** 12

C15-C90M

CompAct 4 Pistons Pneumatic Actuator

Torque Chart (Nm)

Spring return single acting

Size	Spring set	Air pressure - bar (psi)														Spring torque	
		3.0 (44)		4 (58)		5 (73)		5.5 (80)		6 (87)		7 (102)		8 (116)			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
C15	1A	**7**	**4**	10	7	13	11	15	12	17	14	20	17	24	21	6	3
	1B			**8**	**4**	**12**	**8**	13	10	15	11	18	14	22	18	9	5
	1B2					10	5	**12**	**7**	**13**	**9**	16	11	20	15	12	7
	2									11	6	**14**	**8.5**	**18**	**12**	15	9
C20	2A			**16**	**10**	22	16	26	19	29	22	35	29	41	35	15	9
	2A2B			14	7	**20**	**13**	24	16	27	19	33	26	39	32	18	11
	2B					18	10	**22**	**13**	**25**	**17**	31	23	38	29	21	13
	2C							19	10	22	13	**28**	**19**	35	25	25	16
	3									19	9	24	15	**30**	**21**	29	19
C25	2A	**23**	**11**	36	23	49	36	55	42	62	49	75	62	88	74	28	16
	2A2B			**33**	**19**	46	32	53	39	60	45	73	58	86	70	32	18
	2B					**43**	**27**	50	34	57	41	70	53	83	66	36	21
	2C					38	18	**45**	**24**	**52**	**31**	64	44	77	56	47	27
	3									47	21	**60**	**34**	**73**	**46**	57	31
C30	2A	**36**	**19**	57	40	80	62	91	73	102	84	125	107	148	129	42	26
	2A2B			**52**	**30**	75	52	86	63	98	74	120	96	143	118	53	31
	2B			48	18	**70**	**43**	81	54	93	65	115	87	138	109	62	36
	2C					64	25	**73**	**39**	**85**	**50**	107	72	130	94	78	44
	3									75	33	**98**	**55**	**120**	**77**	96	54
C30M	2A	**27**	**19**	48	40	70	62	81	73	92	84	113	106	135	128	42	34
	2A2B	21	12	**42**	**33**	64	55	75	67	85	77	107	99	129	121	49	40
	2B			36	26	**57**	**48**	69	60	79	70	101	92	123	114	56	46
	2C					48	36	**59**	**47**	**69**	**58**	91	80	113	102	69	57
	3									58	44	**80**	**66**	**102**	**88**	83	68
C35	2A	**75**	**39**	111	74	150	112	168	129	186	147	224	184	262	221	74	38
	2A2B	64	26	**100**	**62**	139	99	157	117	175	134	213	171	251	208	87	49
	2B			92	44	**130**	**82**	148	99	166	117	204	154	242	191	105	58
	2C							**133**	**68**	**151**	**86**	189	123	227	160	137	73
	3									135	63	**173**	**100**	**211**	**137**	161	89
C35M	2A	**54**	**42**	89	77	126	114	143	131	160	148	197	185	234	223	70	57
	2A2B	43	28	**78**	**63**	115	110	132	117	149	134	186	171	223	209	85	69
	2B			67	49	**104**	**86**	121	103	139	120	176	157	213	195	99	80
	2C					86	65	**103**	**82**	**120**	**99**	157	136	194	173	122	100
	3									102	76	**139**	**114**	**176**	**151**	146	119
C45	2A	**134**	**60**	208	132	280	203	317	239	353	275	426	346	499	417	159	86
	2A2B			**197**	**113**	269	184	306	219	342	255	415	326	488	397	179	97
	2B			179	82	**252**	**153**	288	188	325	224	398	295	471	366	212	115
	2C					223	102	**260**	**137**	**296**	**173**	369	244	442	315	265	144
	3									268	122	**341**	**193**	**414**	**264**	318	173
C45M	2A	**90**	**60**	162	131	232	201	267	236	302	271	373	342	443	412	134	107
	2A2B	110	83	**181**	**154**	251	225	286	260	321	295	392	365	462	436	160	127
	2B			142	107	**213**	**177**	248	213	283	248	353	318	424	388	184	147
	2C					180	136	**215**	**171**	**250**	**206**	321	277	391	347	228	182
	3									216	163	**286**	**234**	**357**	**304**	273	218

CompAct 4 Pistons Pneumatic Actuator

Torque Chart (Nm)

Spring Return Single Acting

Size	Spring set	Air pressure - bar (psi)														Spring torque	
		3.0 (44)		4 (58)		5 (73)		5.5 (80)		6 (87)		7 (102)		8 (116)			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
C60	2A	**328**	**160**	501	329	675	498	762	583	848	667	1021	835	1194	1004	360	194
	2A2B			**478**	**285**	651	454	738	538	824	623	997	791	1170	960	406	218
	2B			442	221	**615**	**390**	702	475	789	559	961	727	1134	896	473	254
	2C					548	268	**635**	**352**	**721**	**437**	894	605	1067	774	600	323
	3									657	322	**830**	**490**	**1003**	**659**	720	388
C60M	2A	259	203	**426**	**370**	593	537	677	621	760	704	927	871	1094	1038	314	255
	2A2B	**212**	**148**	379	315	546	483	630	566	714	650	880	816	1047	983	371	304
	2B			333	261	**500**	**428**	583	512	667	595	833	762	1000	929	429	353
	2C					411	321	**495**	**404**	**578**	**488**	744	654	912	821	542	447
	3									502	393	**668**	**559**	**835**	**726**	642	527
C75	2A	**614**	**345**	935	657	1255	969	1414	1124	1574	1280	1894	1592	2212	1902	615	350
	2A2B			**891**	**582**	1211	894	1370	1049	1530	1205	1850	1517	2168	1827	693	395
	2B			820	461	**1140**	**773**	1299	928	1459	1084	1779	1396	2097	1706	819	467
	2C					1025	576	**1184**	**632**	**1344**	**887**	1664	1199	1982	1509	1024	584
	3									1229	691	**1549**	**1003**	**1867**	**1313**	1229	700
C75M	2A	**480**	**360**	789	668	1098	977	1252	1131	1406	1285	1714	1594	2021	1900	596	468
	2A2B	406	269	**715**	**578**	1024	887	1177	1041	1331	1195	1640	1503	1947	1810	691	547
	2B			641	488	**949**	**797**	1103	951	1257	1104	1566	1413	1873	1720	786	624
	2C					799	606	**953**	**760**	**1107**	**913**	1415	1222	1722	1529	986	7 83
	3									959	726	**1268**	**1035**	**1575**	**1342**	1184	938
C90M	2A2B	734	467	**1328**	**1061**	1922	1655	2219	1952	2516	2249	3111	2844	3705	3438	1315	1048
	2B			1155	846	**1749**	**1440**	2046	1737	2343	2034	2938	2629	3532	3223	1530	1221
	2C					1571	1224	**1868**	**1521**	**2165**	**1818**	2760	2413	3354	3007	1746	1399
	3									1817	1376	**2411**	**1971**	**3005**	**2565**	2188	1748

Double Acting

Size	Operating pressure (bar)						
	3.0	4.0	5.0	5.5	6.0	7.0	8.0
C15	10	14	17	19	21	24	27
C20	18	25	32	35	38	45	51
C25	39	52	65	72	79	92	105
C30	62	84	107	119	130	153	176
C35	114	151	190	208	226	265	304
C45	222	297	371	408	445	519	593
C60	527	703	879	967	1,055	1,230	1,406
C75	974	1,299	1,624	1,786	1,948	2,273	2,596
C90	1,783	2,377	2,971	3,268	3,565	4,160	4,754

C15-C90M

CompAct 4 Pistons Pneumatic Actuator

Torque Chart (in-lb)

Spring Return Single Acting

Size	Spring set	Air pressure - psi (bar)														Spring torque	
		40 (2.8)		60 (4.1)		70 (4.8)		80 (5.5)		90 (6.2)		100 (6.9)		120 (8.3)			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
C15	1A	**56**	**32**	92	64	110	93	133	106	156	128	174	148	220	192	53	27
	1B			**73**	**37**	**102**	**68**	115	89	137	101	156	121	201	165	80	44
	1B2					85	42	**106**	**62**	**119**	**82**	139	95	183	137	106	62
	2									101	55	**121**	**74**	**165**	**110**	133	80
C20	2A			**146**	**92**	187	136	230	168	266	201	304	252	375	320	133	80
	2A2B			128	64	**170**	**110**	212	142	247	174	286	226	357	293	159	97
	2B					153	85	**195**	**115**	**229**	**156**	269	200	348	266	186	115
	2C							168	89	201	119	**243**	**165**	320	229	221	142
	3									174	82	208	130	**275**	**192**	257	168
C25	2A	**185**	**89**	330	211	416	306	487	372	568	449	651	538	806	677	248	142
	2A2B			**302**	**174**	390	272	469	345	549	412	633	503	787	641	283	159
	2B					**365**	**229**	443	301	522	375	607	460	760	604	319	186
	2C					322	153	**398**	**212**	**476**	**284**	555	382	705	513	416	239
	3									430	192	**521**	**295**	**668**	**421**	504	274
C30	2A	**290**	**153**	522	366	679	526	805	646	934	769	1085	928	1355	1181	372	230
	2A2B			**476**	**275**	636	441	761	558	897	677	1041	833	1309	1080	469	274
	2B			439	165	**594**	**365**	717	478	851	595	998	755	1263	998	549	319
	2C					543	212	**646**	**345**	**778**	**458**	928	625	1190	861	690	389
	3									687	302	**850**	**477**	**1099**	**705**	850	478
C30M	2A	**217**	**153**	439	366	594	526	717	646	842	769	980	920	1236	1172	372	301
	2A2B	169	97	**385**	**302**	543	467	664	593	778	705	928	859	1181	1108	434	354
	2B			330	238	**484**	**407**	611	531	723	641	876	798	1126	1044	496	407
	2C					407	306	**522**	**416**	**632**	**531**	790	694	1035	934	611	504
	3									531	403	**694**	**573**	**934**	**806**	735	602
C35	2A	**603**	**314**	1016	677	1273	950	1487	1142	1703	1346	1944	1596	2399	2023	655	336
	2A2B	515	209	**916**	**568**	1180	840	1389	1035	1602	1227	1848	1484	2298	1904	770	434
	2B			842	403	**1103**	**696**	1310	876	1520	1071	1770	1336	2216	1749	929	513
	2C							**1177**	**602**	**1382**	**787**	1640	1067	2078	1465	1212	646
	3									1236	577	**1501**	**868**	**1932**	**1254**	1425	788
C35M	2A	**434**	**338**	815	705	1069	967	1266	1159	1465	1355	1709	1605	2142	2042	620	504
	2A2B	346	225	**714**	**577**	976	933	1168	1035	1364	1227	1614	1484	2042	1913	752	611
	2B			613	449	**883**	**730**	1071	912	1273	1099	1527	1362	1950	1785	876	708
	2C					730	552	**912**	**726**	**1099**	**906**	1362	1180	1776	1584	1080	885
	3									934	696	**1206**	**989**	**1611**	**1382**	1292	1053
C45	2A	**1078**	**483**	1904	1208	2376	1723	2805	2115	3232	2518	3696	3002	4568	3818	1407	761
	2A2B			**1804**	**1035**	2283	1561	2708	1938	3131	2335	3601	2829	4468	3635	1584	858
	2B			1639	751	**2139**	**1298**	2549	1664	2975	2051	3453	2560	4312	3351	1876	1018
	2C					1892	866	**2301**	**1212**	**2710**	**1584**	3202	2117	4047	2884	2345	1274
	3									2454	1117	**2959**	**1675**	**3790**	**2417**	2814	1531
C45M	2A	**724**	**483**	1483	1199	1969	1706	2363	2089	2765	2481	3236	2967	4056	3772	1186	947
	2A2B	885	668	**1657**	**1410**	2130	1909	2531	2301	2939	2701	3401	3167	4230	3992	1416	1124
	2B			1300	980	**1808**	**1502**	2195	1885	2591	2270	3063	2759	3882	3552	1628	1301
	2C					1528	1154	**1903**	**1513**	**2289**	**1886**	2785	2403	3580	3177	2018	1611
	3									1978	1492	**2481**	**2030**	**3268**	**2783**	2416	1929

CompAct 4 Pistons Pneumatic Actuator

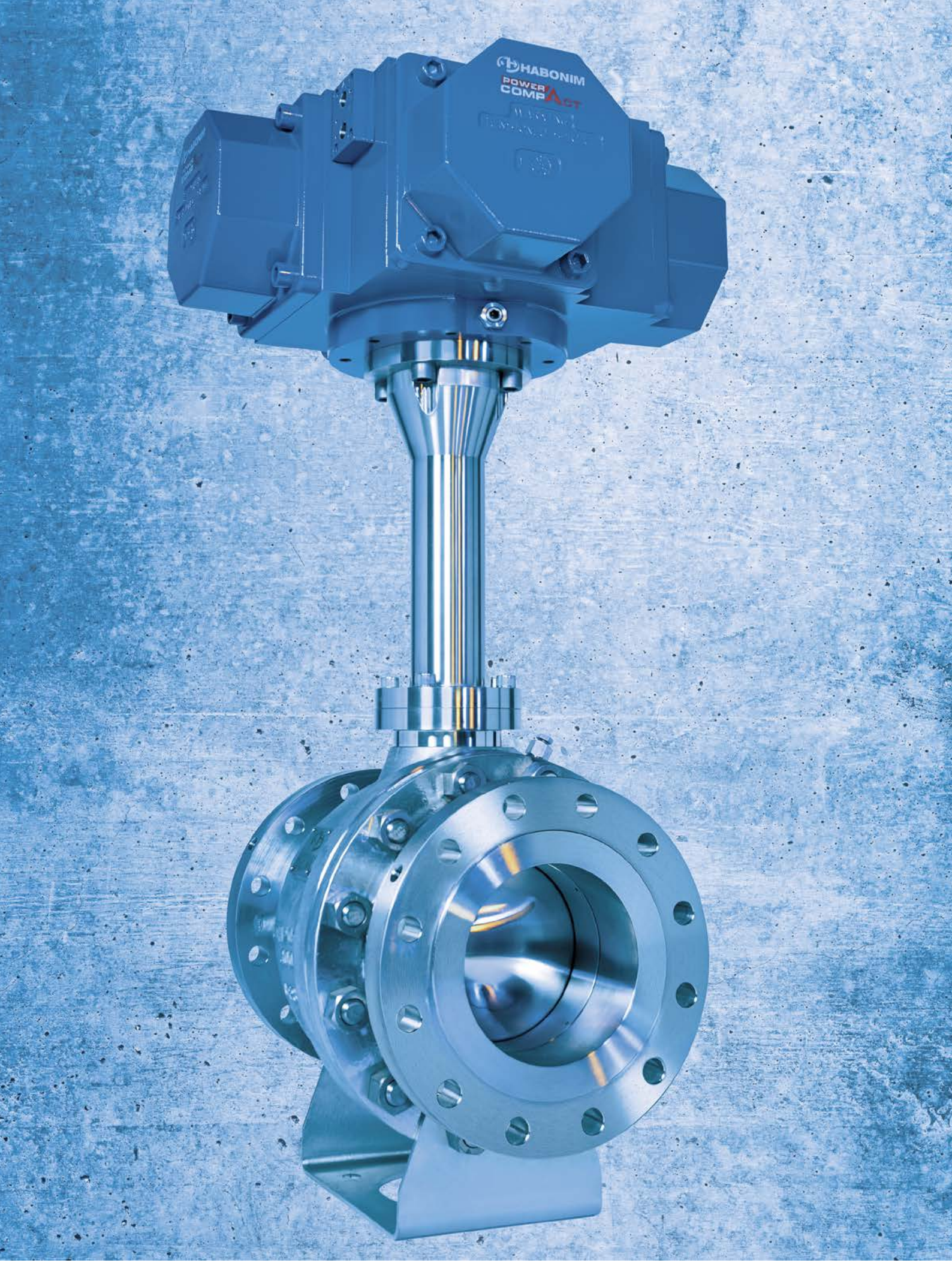
Torque Chart (in-lb)

Spring return single acting

Size	Spring set	Air pressure - psi (bar)														Spring torque	
		40 (2.8)		60 (4.1)		70 (4.8)		80 (5.5)		90 (6.2)		100 (6.9)		120 (8.3)			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
C60	2A	**2639**	**1287**	4587	3012	5728	4226	6744	5160	7764	6107	8859	7245	10931	9192	3186	1717
	2A2B			**4376**	**2609**	5525	3853	6531	4761	7544	5704	8650	6863	10712	8789	3593	1929
	2B			4047	2023	**5219**	**3310**	6213	4204	7223	5118	8338	6308	10382	8203	4186	2248
	2C					4650	2274	**5620**	**3115**	**6601**	**4001**	7757	5249	9769	7086	5310	2859
	3									6015	2948	**7201**	**4251**	**9183**	**6033**	6372	3434
C60M	2A	2084	1633	**3900**	**3387**	5032	4557	5991	5496	6958	6445	8043	7557	10016	9503	2779	2257
	2A2B	**1706**	**1191**	3470	2884	4634	4099	5576	5009	6537	5951	7635	7080	9585	9000	3283	2690
	2B			3049	2390	**4243**	**3632**	5160	4531	6107	5447	7228	6611	9155	8505	3797	3124
	2C					3488	2724	**4381**	**3575**	**5292**	**4468**	6455	5674	8350	7516	4797	3956
	3									4596	3598	**5796**	**4850**	**7645**	**6647**	5682	4664
C75	2A	**4940**	**2776**	8560	6015	10650	8223	12514	9947	14410	11719	16433	13813	20251	17413	5443	3098
	2A2B			**8157**	**5328**	10277	7587	12125	9284	14007	11032	16051	13162	19848	16727	6133	3496
	2B			7507	4221	**9674**	**6560**	11496	8213	13357	9924	15435	12112	19198	15619	7248	4133
	2C					8698	4888	**10478**	**5593**	**12305**	**8121**	14438	10403	18146	13815	9062	5168
	3									11252	6326	**13440**	**8703**	**17093**	**12021**	10877	6195
C75M	2A	**3862**	**2896**	7223	6116	9318	8291	11080	10009	12872	11764	14871	13830	18503	17395	5275	4142
	2A2B	3266	2164	**6546**	**5292**	8690	7527	10416	9213	12186	10940	14229	13041	17825	16571	6115	4841
	2B			5868	4468	**8054**	**6764**	9762	8416	11508	10107	13587	12260	17148	15747	6956	5522
	2C					6781	5143	**8434**	**6726**	**10135**	**8359**	12277	10603	15765	13998	8726	6930
	3									8780	6647	**11002**	**8980**	**14419**	**12286**	10478	8301
C90M	2A2B	5945	3789	**11856**	**9473**	16846	14506	20088	17671	22524	20134	26832	24530	33482	31069	11639	9276
	2B			10312	7553	**15329**	**12621**	18522	15724	20975	18209	25340	22675	31919	29126	13542	10807
	2C					13769	10728	**16910**	**13769**	**19382**	**16275**	23805	20812	30310	27174	15453	12382
	3									16257	12318	**20795**	**17000**	**27156**	**23180**	19365	15471

Double Acting

Size	Operating pressure (psi)						
	40	60	70	80	90	100	120
C15	81	125	149	172	188	207	244
C20	146	229	271	311	351	390	468
C25	317	476	555	639	723	802	961
C30	505	769	914	1,052	1,190	1,334	1,611
C35	928	1,382	1,624	1,848	2,073	2,311	2,780
C45	1,807	2,719	3,170	3,622	4,074	4,525	5,429
C60	4,289	6,436	7,511	8,585	9,659	10,725	12,872
C75	7,926	11,893	13,877	15,856	17,834	19,819	23,767
C90	14,442	21,222	26,040	29,584	31,915	35,880	42,962

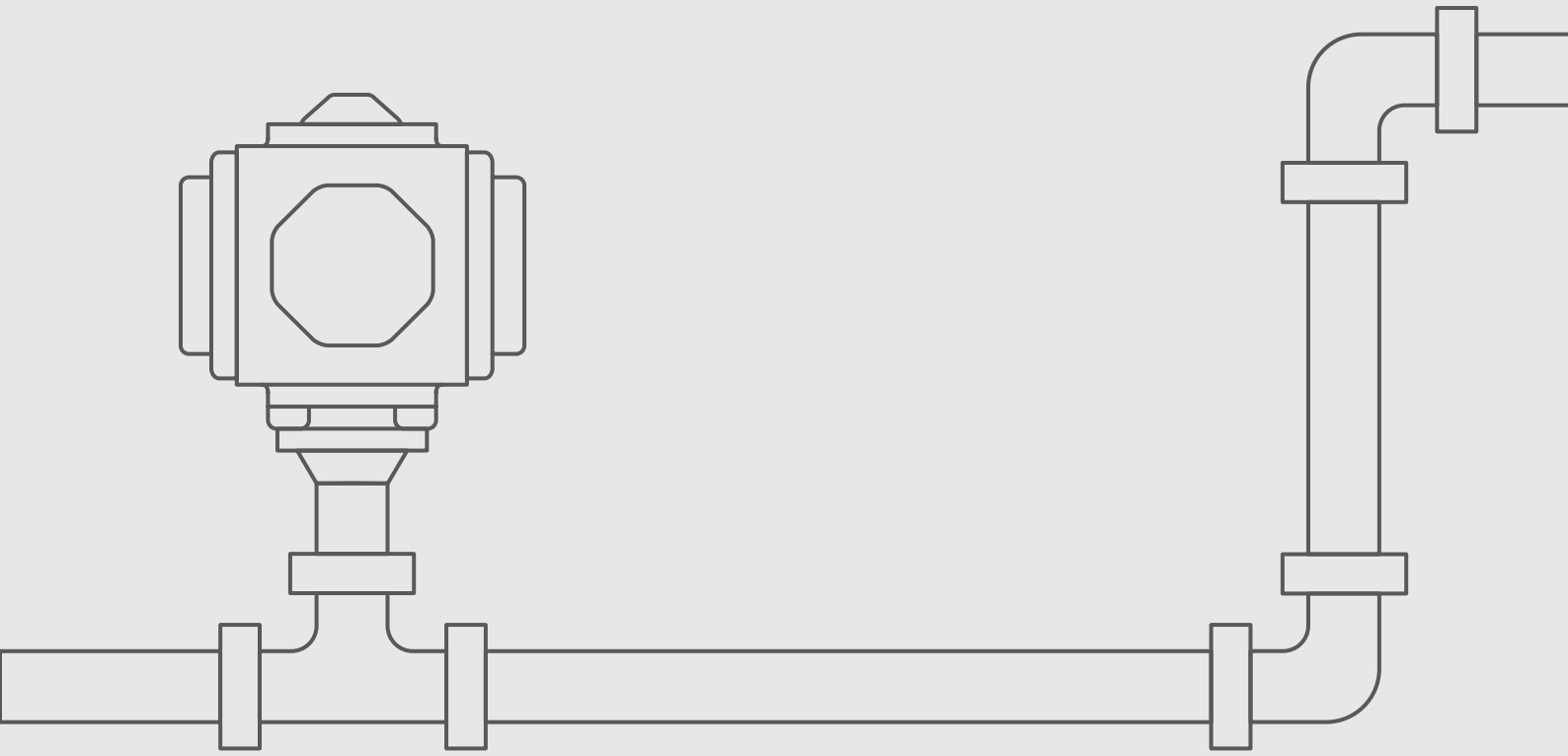

HABONIM
POWER
COMPACT

C100 C100M

Actuation

PNEUMATIC ACTUATOR

POWER CompAct
4 PISTONS



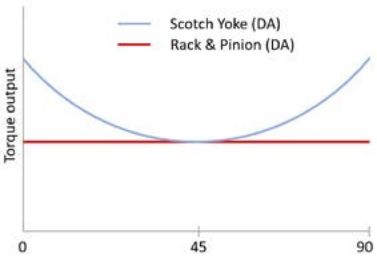
C100 C100M

Power CompAct 4 Pistons Pneumatic Actuator

PATENTED
US 11661848

Four-Pistons Scotch-Yoke design

Habonim's patented innovative four-pistons scotch-yoke design combines the benefits of high-power scotch-yoke mechanism to generate maximal power and high Start and End torques, where most valves require it and the balance and compactivity of the four-piston mechanism to provide fast and efficient operation with minimal maintenance.



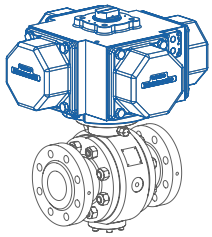
High Start & End Torques

This patented four-pistons scotch-yoke pneumatic actuator provides almost 100% higher power-to-size ratio. In other words, a comparable traditional high-torque scotch-yoke actuator will be twice as big as a Power CompAct unit. The Power CompAct unit is much faster in opening and closing and uses less compressed air to operate.

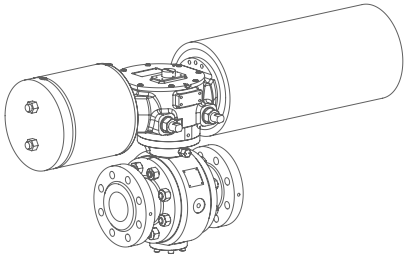
The evenly balanced forces of the four pistons and short travel (short piston) provides un-matching high cycle long life without maintenance for hundreds of thousands of operations.

Main Features

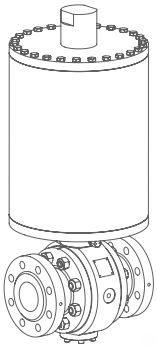
- High torque for smaller size
- High performance and durability
- Space saving
- Utilizing the well proven CompAct technology
- Low air consumption
- Versatile multi optional mounting interface



Power CompAct



Traditional scotch-yoke



Helical



Compact 4-cylinder body

The cube-shaped body is the most compact configuration capable to accommodate 4 pistons.

Drive shaft

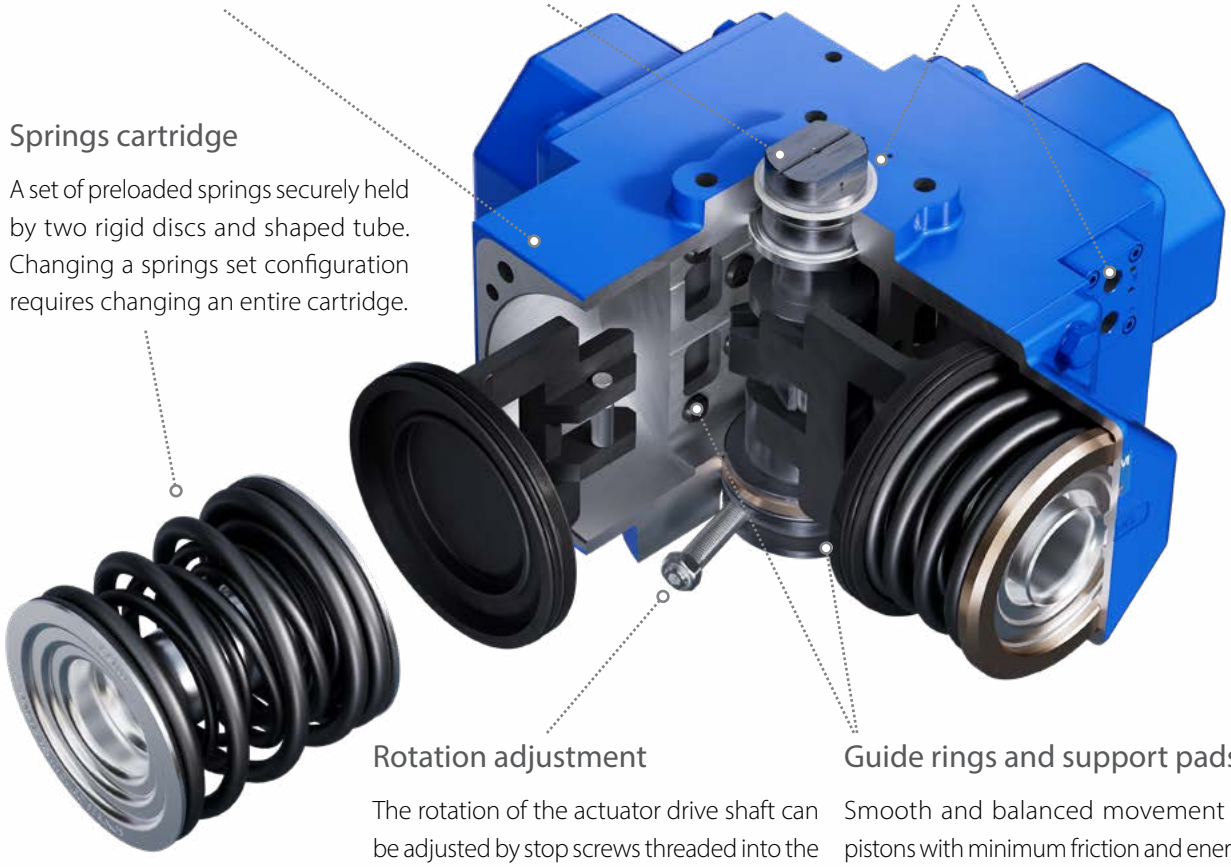
Carbon steel hardened and plated for protection against corrosive environments.

Accessory interfaces

NAMUR VDI/VDE 3845 interfaces for easy mounting of all types of accessories such as solenoid valves, limit switches and positioners.

Springs cartridge

A set of preloaded springs securely held by two rigid discs and shaped tube. Changing a springs set configuration requires changing an entire cartridge.



Rotation adjustment

The rotation of the actuator drive shaft can be adjusted by stop screws threaded into the actuator body, which allows +/-3° of rotational adjustment in both directions of travel.

Guide rings and support pads

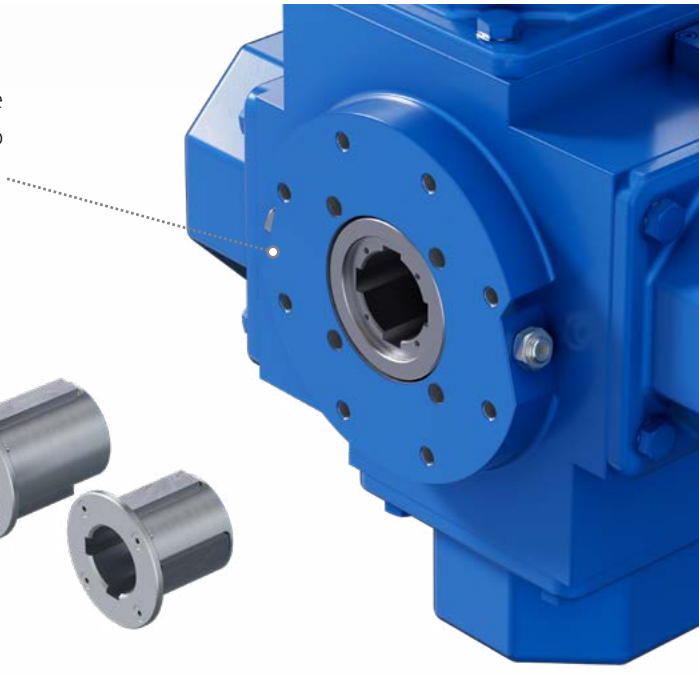
Smooth and balanced movement of the pistons with minimum friction and energy loss.

Mounting interface

ISO 5211 interface at the bottom flange with different types of female drives to flexibly fit a variety of valve shafts.







C100 C100M

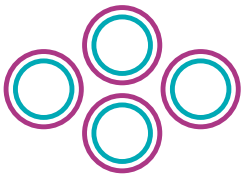
Power CompAct 4 Pistons Pneumatic Actuator

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Type	Working temperature C° (F°)	Working Pressure Air, Bar (psi)	Application	Ordering code
Standard	-40 to 100 (-40 to 213)	3.0 (44) to 8.0 (116)	General	Blank
High Temperatures	-20 to 120 (-4 to 250)		General	HT
High Cycle	-20 to 80 (-4 to 176)		Above 1 cycle/minute	HC
Nuclear	-40 to 80 (-40 to 176)		Nuclear use	NU

Spring combinations

Code	Spring combinations
2A2B	
2B	

Code	Spring combinations
2C	
2C3	
3	



Sizing a spring return actuator requires that the torque output at the start and end of both the spring and air drive strokes is greater than the valve torque at that position.

Technical Data

Weight - Spring return		kg	160
		lb	353
Weight - Double Acting		kg	102
		lb	225
Air Consumption per opening stroke actual volume - Spring Return		lit	17.7
		in^3	1073
Air Consumption per full stroke actual volume - Double Acting		lit	34.5
		in^3	2087
Stroke time with ½" solenoid valve, with Cv=3.5 at 5.5 bar (80 psi), with no load	D/A	Sec	2
	S/R Open		2.5
	S/R Close		2.5

C100 C100M

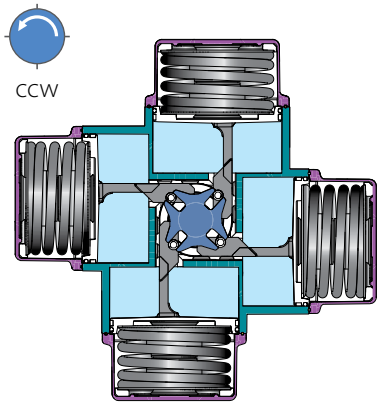
Power CompAct 4 Pistons Pneumatic Actuator

The actuator can be configured for either spring return or double-action operation. In both cases the air supply to drive the pistons flow into Port A of the NAMUR block. Port A is connected to the center chamber, and Port B is connected to the four outside chambers.

Spring return (fail-safe)

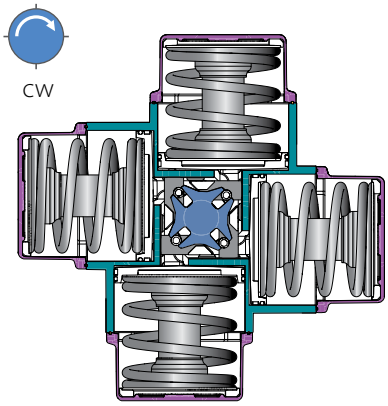
Pressure entering Port A to open:

- Center chamber is pressurized and pistons move outward
- Springs are compressed
- Yoke rotates counterclockwise



Pressure exiting Port A to close:

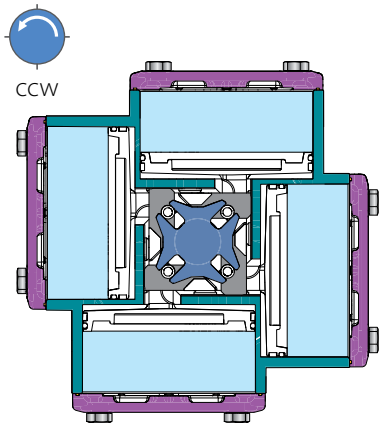
- Air released from center chamber
- Springs drive pistons inward
- Yoke rotates clockwise



Double action (increased torque)

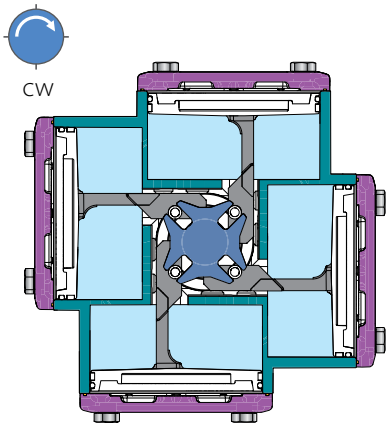
Pressure entering Port A to open:

- Center chamber is pressurized
- Pistons move outward
- Yoke rotates counterclockwise



Pressure entering Port B to close:

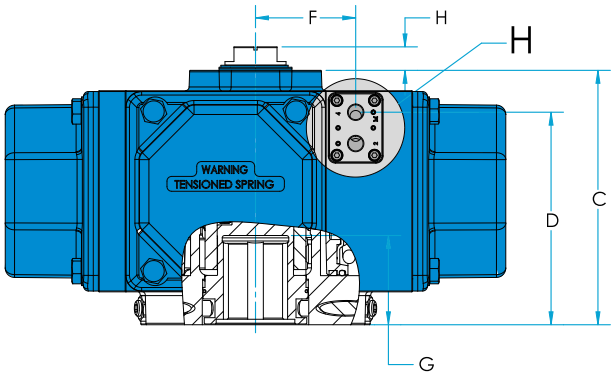
- Outside chambers are pressurized
- Pistons move inward
- Yoke rotates clockwise

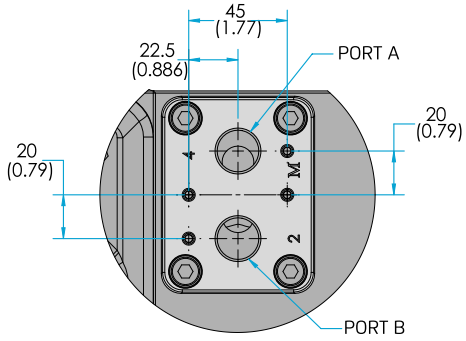


C100 C100M

Power CompAct 4 Pistons Pneumatic Actuator

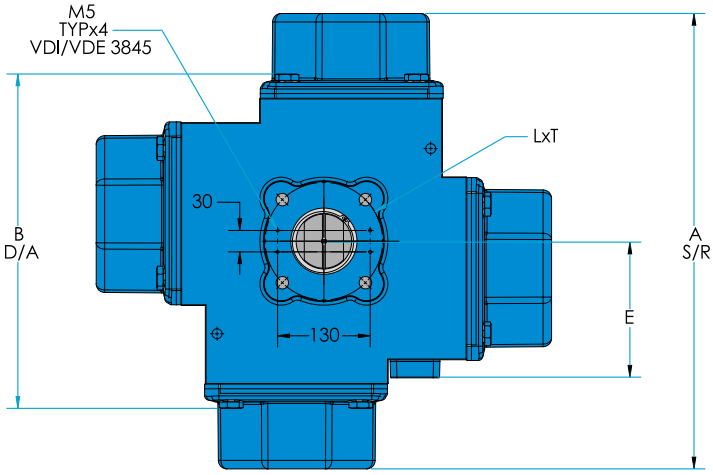
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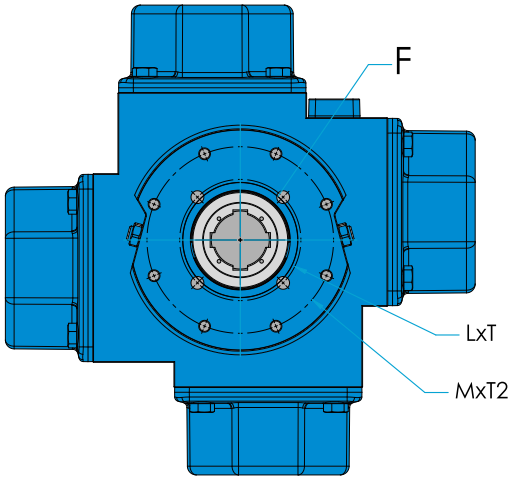


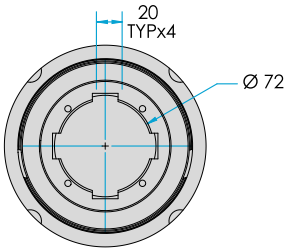


DETAIL H
G-½" ISO FOR METRIC ACTUATOR
½" NPT FOR IMPERIAL ACTUATOR

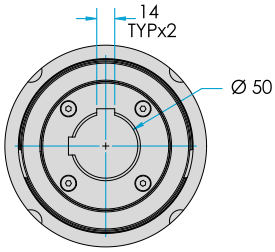
Port A is connected to the center chamber - opening (S/R & D/A)
Port B is connected to the outside chambers - closing (D/A only)



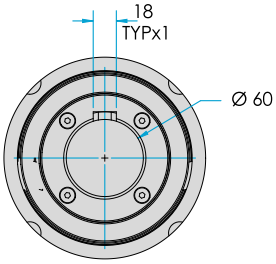




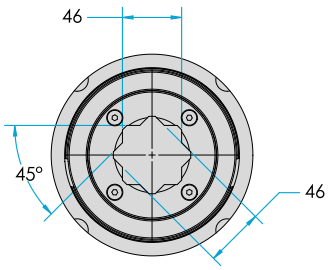
DETAIL F
BUILT-IN
ISO 5211
Ø 72mm KEY SHAFT
MAX 8000Nm



DETAIL F
OPTIONAL ADAPTER
ISO 5211
Ø 50mm KEY SHAFT INSERT
MAX 3000Nm



DETAIL F
OPTIONAL ADAPTER
ISO 5211
Ø 60mm KEY SHAFT INSERT
MAX 4000Nm



DETAIL F
OPTIONAL ADAPTER
ISO 5211
46mm SQUARE SHAFT INSERT
MAX 4000Nm

Actuator Dimensions

Size	A S/R		B D/A		C		D		E		F	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
C100M	640	25.20	470	18.50	325	12.80	272	10.71	190	7.48	128	5.04

Size	G		L PCD		T Thread	M PCD (2)		T2 Thread	H	
	mm	inch	mm	inch	mm	mm	inch	mm	mm	inch
C100M	114	4.49	165 (F16)	6.50 (F16)	M20x30	254 (F25)	10.00 (F25)	M16x30	30	1.18

C100 C100M

Power CompAct 4 Pistons Pneumatic Actuator

C100M SR Torques (Nm)

Size	Spring set	Air stroke position	Air pressure - bar (psi)							Spring torque vs spring stroke position	
			3 (44)	4 (58)	5 (73)	5.5 (80)	6 (87)	7 (102)	8 (116)		
C100M	2A2B	Start	**1800**	**3050**	4200	4700	5350	6400	7330	Start	2500
		Min	**850**	**1600**	2340	2670	3080	3850	4390	Min	1200
		End	**1010**	**2250**	3470	4170	4740	5850	6280	End	**1600**
	2B	Start	1700	**2890**	**4050**	4600	5180	6070	7000	Start	2900
		Min	610	**1380**	**2050**	2480	2890	3580	4110	Min	1390
		End	650	**1630**	**2900**	3400	4020	5220	6130	End	**1900**
	2C	Start		2150	**3370**	**3780**	4330	5280	6340	Start	3250
		Min		960	**1690**	**2050**	2350	3110	3700	Min	1670
		End		1120	**2100**	**2660**	3180	4330	5200	End	**2130**
	2C3	Start		2080	3250	**3890**	**4540**	5500	6610	Start	3750
		Min		900	1640	**1990**	**2400**	3070	3770	Min	1840
		End		1010	2050	**2640**	**3210**	4490	4140	End	**2390**
	3	Start			2400	2950	3560	**4600**	**5620**	Start	4600
		Min			1140	1540	1890	**2580**	**3220**	Min	2090
		End			1200	1890	2410	**3600**	**4790**	End	**2850**

C100 DA Torques (Nm)

Size	Air stroke position	Air pressure - bar (psi)							
		2 (29)	3 (44)	4 (58)	5 (73)	5.5 (80)	6 (87)	7 (102)	8 (116)
C100-DA	Start	2280	3370	4470	5700	6320	6890	7920	8600
	Min	1450	2210	2880	3660	4000	4400	4980	5550
	End	2280	3370	4470	5700	6320	6890	7920	8600

C100M SR Torques (in-lb)

Size	Spring set	Air stroke position	Air pressure - psi (bar)							Spring torque vs spring stroke position	
			40 (2.8)	60 (4.1)	70 (4.8)	80 (5.5)	90 (6)	100 (6.9)	120 (8.3)		
C100M	2A2B	Start	**14869**	**27670**	35686	41599	47351	55836	67309	Start	22127
		Min	**7022**	**14515**	19882	23631	27260	33589	40312	Min	10621
		End	**8343**	**20412**	29484	36908	41953	51037	57667	End	**14161**
	2B	Start	14043	**26218**	**34412**	40713	45847	52957	64279	Start	25667
		Min	5039	**12519**	**17418**	21950	25579	31233	37741	Min	12303
		End	5369	**14787**	**24640**	30093	35580	45541	56290	End	**16816**
	2C	Start		19505	**28634**	**33456**	38324	46064	58218	Start	28765
		Min		8709	**14359**	**18144**	20799	27133	33976	Min	14781
		End		10161	**17843**	**23543**	28145	37776	47750	End	**18852**
	2C3	Start		18870	27614	**34429**	**40182**	47984	60697	Start	33190
		Min		8165	13935	**17613**	**21242**	26784	34619	Min	16285
		End		9163	17418	**23366**	**28411**	39172	38016	End	**21153**
	3	Start			20392	26110	31509	**40132**	**51606**	Start	40713
		Min			9686	13630	16728	**22509**	**29568**	Min	18498
		End			10196	16728	21330	**31408**	**43985**	End	**25225**

C100 DA Torques (in-lb)

Size	Air stroke position	Air pressure - psi (bar)							
		30 (2.1)	40 (2.8)	60 (4.1)	70 (4.8)	80 (5.5)	90 (6)	100 (6.9)	120 (8.3)
C100-DA	Start	21189	27839	40552	48431	55937	60982	69097	78971
	Min	13475	18256	26127	31098	35403	38943	43447	50964
	End	21189	27839	40552	48431	55937	60982	69097	78971

Note:
Minimum torque values of the actuator shall be concidered during the sizing

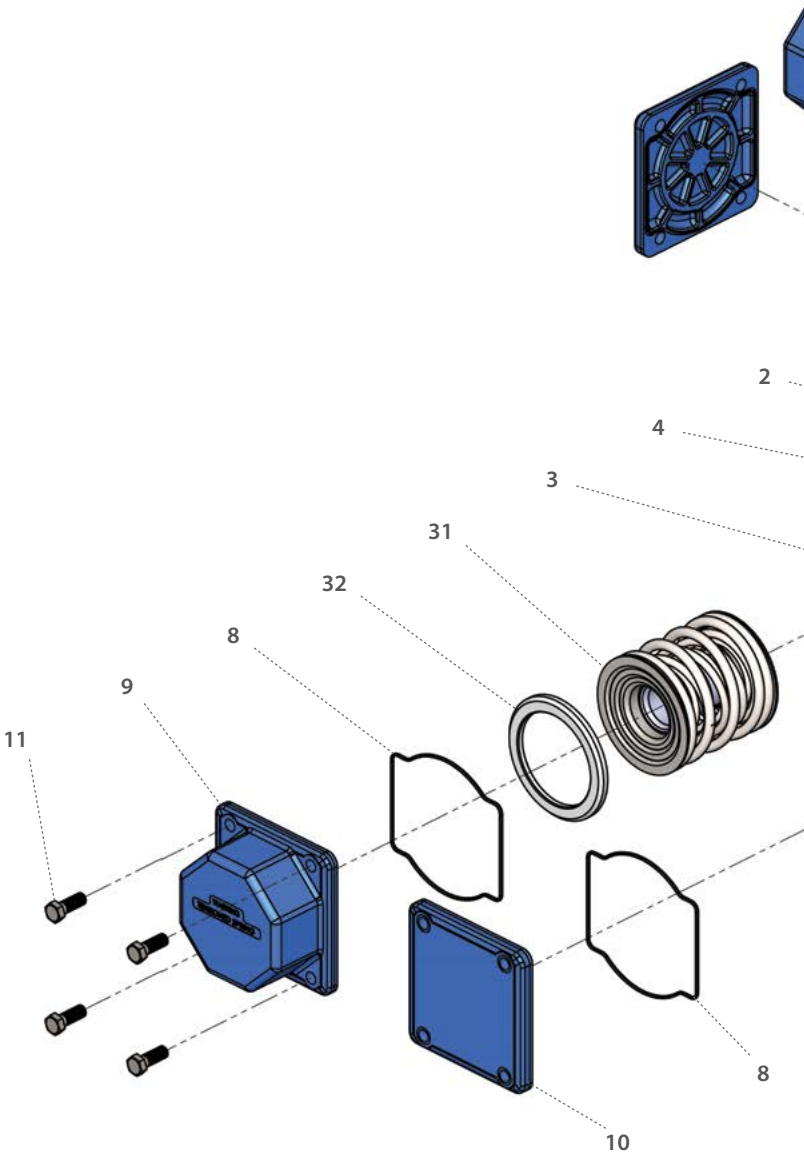
C100 C100M

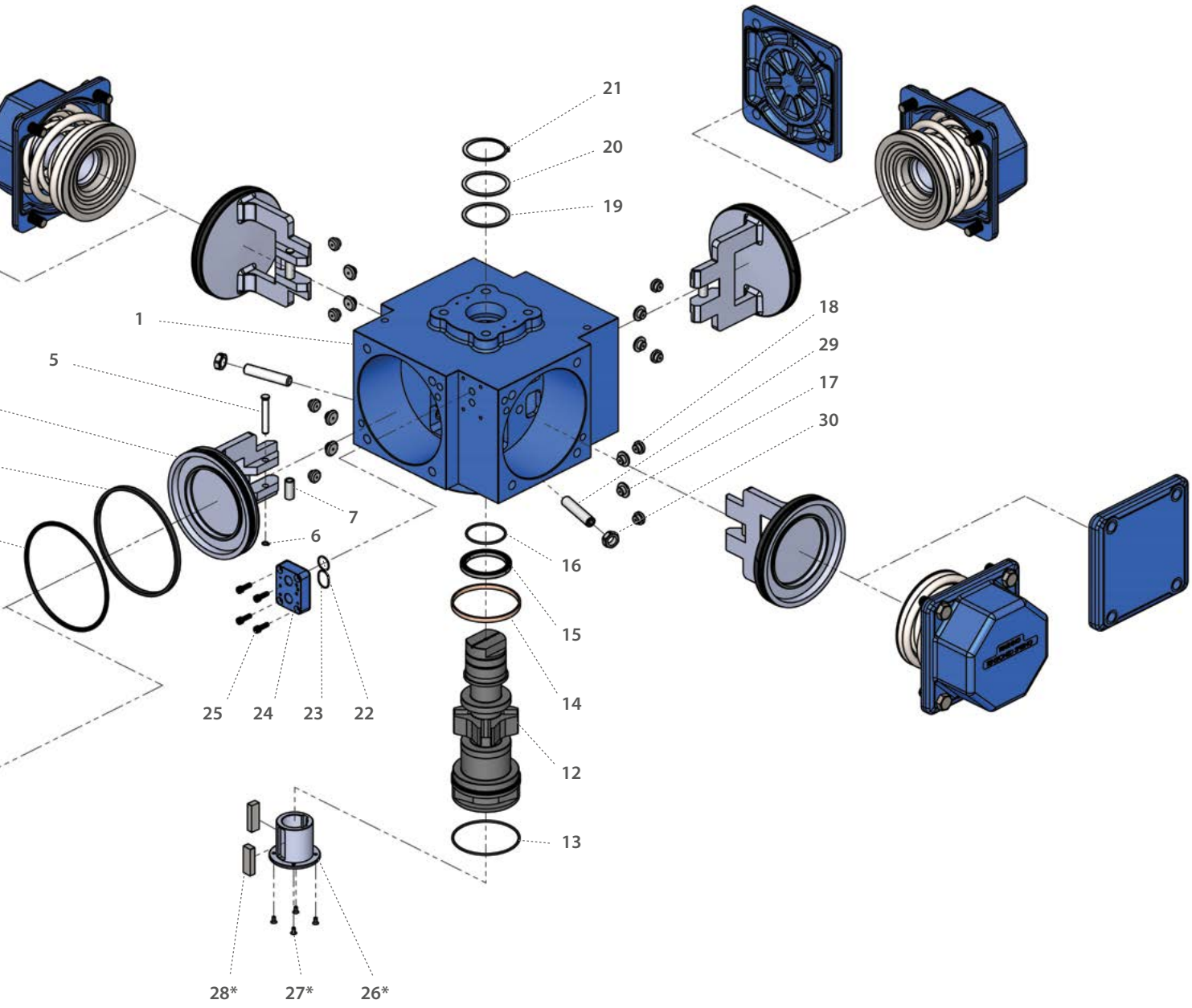
Power CompAct 4 Pistons Pneumatic Actuator

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US 11661848

Item	Description	Material specifications	Qty.
1	Body	Acc. Ordering Code	1
2	Piston	Acc. Ordering Code	4
3*	Piston O-Ring	Acc. Ordering Code	4
4*	Piston Guide Ring	Polymer	4
5	Roller Pin	Stainless steel	4
6	Circlip	Stainless steel, spring steel zinc plate	4
7	Roller	Stainless steel	4
8*	Cover O-Ring	Acc. Ordering Code	4
9	Spring Return Cover	Acc. Ordering Code	4
10	Double Acting Cover	Acc. Ordering Code	4
11	Cover Bolt	Stainless steel	16
12	Yoke	Acc. Ordering Code	1
13*	Yoke Lower O-Ring	Acc. Ordering Code	1
14*	Yoke Lower Slide Bearing	Acc. Ordering Code	1
15*	Yoke Upper Ball Bearing	Stainless steel	1
16*	Yoke Upper O-Ring	Acc. Ordering Code	1
17*	Inner Pad	Acc. Ordering Code	8
18*	Outer Pad	Acc. Ordering Code	8
19*	Polymer Disc Bearing	Polymer	1
20*	Metal Disc Bearing	Stainless steel	1
21*	Circlip	Stainless steel, spring steel zinc plated	1
22*	NAMUR Block O-Ring 1	Acc. Ordering Code	1
23*	NAMUR Block O-Ring 2	Acc. Ordering Code	1
24	NAMUR Block	Acc. Ordering Code	1
25	NAMUR Block Screws	Stainless steel	4
26**	Drive Shaft Insert	Stainless steel	1
27**	Drive Shaft Screws	Stainless steel	4
28**	Drive Key	Stainless steel	2
29	Stop Screw	Stainless steel	2
30	Locking Nut	Stainless steel	2
31	Springs Cartridge	Stainless steel, spring steel	8
32	Cartridge Support Ring	Stainless steel	4

* Maintenance kit components
** Supplied on request, see ordering code

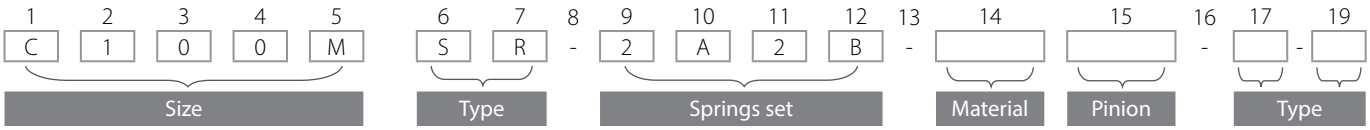



21
20
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22
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27*
26*

C15-C100M

CompAct 4 Pistons Pneumatic Actuator - Ordering Code System

"Standard offer" options are marked with light green background



Size (1-5)	
C15	Actuator sizes
C20	
C25	
C30	
C30M	
C35	
C35M	
C45	
C45M	
C60	
C60M	
C75	
C75M	
C90*	
C90M	
C100*	
C100M	

* For DA option only

Type (6-7)	
SR	Spring return
DA	Double acting

Springs set (9-12)	
1A	See spring set combinations on pages 508 & 522
1B	
1B2	
2	
2AB	
2A	
2A2B	
2B	
2A3	
2C	
2C3	
3	

Material / Coating (14)	
Blank	Aluminum
N	Electroless nickel plating
6	S.ST *

* For selected sizes only - consult factory

Pinion (15)	
Blank	C.st
6	S.ST

Type (17-19)	
Blank	Standard
HT	High Temp
HC	High cycle
NU	Nuclear
IIC	ATEC IIC

Available adapters for C100 only		
Part number	Drive Shaft type	Drive Shaft description
MK0000879	**SQ46**	46mm square drive
MK0000877	**D50-KEY14**	Ø50mm shaft, 14mm key drive
MK0000878	**D60-KEY18**	Ø60mm shaft, 18mm key drive

EMERGENCY SHUT-DOWN SYSTEM (ESD)

Short Response Time

A short response time is essential for valves operating in Emergency Shut Down (ESD) systems such as in refineries, power stations, mining and other applications where safety regulations call for such.

The values in the table below indicate the closing time (seconds) of an unloaded actuator and a loaded actuator with torque values simulating real-life situations. The stroke time measures the actual movement of the actuator without a solenoid or any other accessory delay.

CompAct actuator stroking time (sec.)

¼" NAMUR solenoid valve

CompAct actuator closing time (sec.)					
CompAct Actuator for Emergency Shut-Down (ESD) Systems		Normal		Improved	Fast
		¼" Namur solenoid valve Cv = 0.9		¼" Namur solenoid valve Cv = 0.9, & Breather Block	¼" Non-Namur Solenoid valve Cv = 1, & ¼" quick exhaust
Size	Load	3/2	5/2	3/2	3/2
C20-2C	0	0.09	0.08	0.05	0.05
	10 Nm / 89 lbf-in	0.14	0.09	0.07	0.07
C25-2C	0	0.17	0.12	0.07	0.06
	22 Nm / 195 lbf-in	0.35	0.15	0.17	0.15
C30-2C	0	0.26	0.20	0.12	0.10
	36 Nm / 319 lbf-in	0.49	0.23	0.25	0.20
C35-2C	0	0.39	0.29	0.26	0.17
	60 Nm / 531 lbf-in	0.58	0.35	0.41	0.27
C45-2C	0	0.71	0.52	0.43	0.30
	116 Nm / 1027 lbf-in	1.23	0.64	0.76	0.57
C60-2C	0	1.79	1.30	1.21	0.73
	260 Nm / 2300 lbf-in	2.36	1.38	1.73	1.13
C75-2C	0	2.78	2.00	1.86	1.08
	460 Nm / 4071 lbf-in	3.90	2.42	2.91	1.75

CompAct actuator closing time (sec.)				
CompAct Actuator for Emergency Shut-Down (ESD) Systems		Normal		Fast
		½" Namur solenoid valve Cv = 3.5		½" Non-Namur Solenoid valve Cv = 3.5, & ½" quick exhaust
Size	Load	3/2	5/2	3/2
C60-2C	0	0.71	0.49	0.53
	260 Nm / 2300 lbf-in	1.22	0.60	0.80
C75-2C	0	1.12	-	1.04
	460 Nm / 4071 lbf-in	1.79	-	1.52
C90M-2C	0	1.4	-	1.2
	770 Nm / 6815 lbf-in	2.7	-	2.4
C100M-SR2C3	0	2.5	-	2.1
	2400 Nm / 21242 lbf-in	4	-	3.4

MOUNTING KITS

Mounting kits play a major role in the proper functioning of an automated unit. A rigid bracket must connect the actuator to the valve so they become a single unit with zero movement between the three components. The coupler is an element that transfers the torque from the actuator to the valve shaft. It must fit tightly and accurately so as to minimize hysteresis and to turn the valve shaft on its center axis without side loading. The mounting kit is designed for safe installation and operation of the complete unit, having rigid construction and no sharp corners. This well-engineered product provides a wide range of movement for the spanner, allowing for easy installation and maintenance, as well as maximum worker safety. Whether pairing Habonim valves with the Habonim CompAct™ actuators, customizing a mounting kit to pair the Habonim CompAct™ actuator with other valve brands or mounting Habonim valves on a wide variety of other actuator brands; Habonim is a one stop shop, offering valve automation linkage hardware for a wide range of applications.

Cast Brackets



Habonim's rigid cast bracket, has a unique shape and precise construction with dual ISO 5211 standard hole patterns on both the top and bottom. The cast bracket is designed for installation on all Habonim valves, and the CompAct™ pneumatic actuator which conform to ISO 5211 standard. An aesthetic shape and rounded corners, allow clear visibility of the valve stem and coupler from all directions. This well-engineered product provides a wide range of movement for the spanner, allowing for easy installation and maintenance, as well as maximum worker safety. The cast bracket is made from cast grade CF8 (AISI304) stainless steel for better corrosion resistance. Each pad is marked with the relevant ISO "F" number for clear identification. The coupler is made from stainless steel 303 as standard, and the fasteners are from stainless steel 304. Other materials are available upon special request.

Sample MK code description 'MK47C-25-C35'

'Closed box' Mounting Kit



The 'closed box' mounting kit design is used mainly for Non-ISO 5211 compliant top pads, platforms larger than ISO 5211 F14 PCD, or for unique applications which are not covered by the cast bracket. A 'closed box' bracket is comprised of a top and bottom element connected by a precisely welded tongue and groove construction. This configuration delivers the load from the actuator to the valve mainly through this latch mechanism and less is applied through the welding seam. The Closed box bracket is made from stainless steel sheet AISI 304, however, for off-shore applications, desalination plants and applications exposed to corrosive environments stainless steel 316/316L is used. An epoxy painted carbon steel bracket is used to connect large scotch-yoke actuators to large high pressure valves or trunnion mounted valves. As standard the coupler is made from stainless steel 303, and the fasteners are made from stainless steel 304. Other materials are also available upon special request.

Sample MK code description 'MK47-25-C35'

Control Zero Backlash Mounting Kit



Habonim's Zero Backlash Mounting Kit design is based on the inherent flexibility of stainless steel. Two grooves allow the Mounting Kit to clamp the valve stem on one side, while locking the actuator gear in place on the other side. The Mounting Kit ensures repeatability, zero backlash, and virtually no hysteresis for the complete control unit.

'Lock Pin' mounting kit



To enhance site safety by preventing unintentional remote operation of an automated valve, Habonim provides a special lockable mounting kit. The '-LP' mounting kit consists of a special bracket and coupler. A concentric hole drilled through the coupler and bracket allows a rigid stainless steel pin to be slid through both elements, blocking the valve stem and actuator pinion. The '-LP' mounting kit does not include the lock pin itself, only the preparation to fit the lock pin as lock pins are normally part of maintenance toolbox.

Sample MK code description 'MK47-25-C35-LP'

Sample Lock pin kit codes:

- LOCK PIN KIT C15/C30
- LOCK PIN KIT C35/C45
- LOCK PIN KIT C60/C75

'IFM' mounting kit

When a small footprint automated valve is required, Habonim provides a special mounting kit to allow easy installation of a barrel type proximity switch between the valve and actuator. The '-IFM' mounting kit consist of a special bracket drilled to match the proximity switch OD, and a unique coupler with two ferromagnetic pin targets connected to it. The targets are aligned with the proximity switch unit so that when the actuator turns the valve to the open or closed position, the proximity switch signals the valve's position. This solution is an ideal non-contact detection of metal targets in position sensing applications, combined with smaller footprint allows for reduced space on the plant floor, but also minimizes the mounting space for sensors used for position control.

Sample MK code description 'MK47-10/12-C25-IFM12'

IFM shows the proximity switch type, followed by a number (8, 12, 18 or 30 mm) which indicates the outside diameter of the proximity switch cylinder.

'MOL' mounting kit

Manual operation of an automated valve is necessary during commissioning of a plant when an energy source is not stable, in case of an emergency, when there is a power outage and the valve must remain in the open or closed position, or due to an actuator malfunction. Normally a declutchable gear would be used to integrate human intervention in an automated loop, however for small size valves up to 1½" (DN40), Habonim recommends a cost effective mounting kit that allows the operator to turn the valve manually. The 'MOL' mounting kit consists of a unique coupler with milled flats, and a drilled hole in its center. The 'MOL' closed box bracket is designed with an additional groove that allows a full quarter turn of a spanner. The kit also includes a lock pin and 19 mm spanner chained to the bracket. To rotate the pneumatically automated valve, disconnect the air pressure from the actuator. Hold the coupler flats with the spanner, and turn the drive train to its counter position, slide the lock pin all the way through the bracket and coupler to hold the valve and actuator in the new position.

Sample MK code description 'MK47-10/12-C25-MOL'

47 31 32 1¼", 2½", 4" FB ARE EXCLUDED

Mounting Kits Selection Guide*

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		MK47C-05/07-C15		MK47C-10/12-C15		-	
C20		MK47C-05/07-C20		MK47C-10/12-C20		MK47C-15/20-C20	
C25		MK47-05/07-C25		MK47C-10/12-C25		MK47C-15/20-C25	
C30 / C30M		MK47-05/07-C30		MK47C-10/12-C30		MK47C-15/20-C30	
C35 / C35M		-		MK47-10/12-C35		MK47-15/20-C35	
C45 / C45M		-		-		MK47-15/20-C45	
C60 / C60M / C75 / C75M		-		-		-	
C90M		-		-		-	
C100M		-		-		-	

Valve Size Standard port / Actuator size	inch	2½"	3"	4"	4" FB	6"	8"
	mm	DN65	DN80	DN100	DN100	DN150	DN200
C15		-		-		-	
C20		-		-		-	
C25		MK47C-25-C25		-		-	
C30 / C30M		MK47C-25-C30		MK47C-30/40-C30		-	
C35 / C35M		MK47C-25-C35		MK47C-30/40-C35		-	
C45 / C45M		MK47C-25-C45		MK47C-30/40-C45		MK47-60/80-C45	
C60 / C60M / C75 / C75M		-		MK47C-30/40-C60/C75		MK47-60/80-C60/C75	
C90M		-		-		MK47-60/80-C90	
C100M		-		-		MK47-60/80-C90	

* For Control Zero Backlash Mounting Kits, use MK47V-XXX-XXX for all options

73 74 77 78 APPLICABLE FOR SIZES ½" - 2"

Mounting Kits Selection Guide

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1½"	2"
	mm	DN15	DN20	DN25	DN40	DN50
C15		MK47C-05/07-C15	MK47C-10/12-C15		-	-
C20		MK47C-05/07-C20	MK47C-10/12-C20		MK47C-15/20-C20	-
C25		MK47-05/07-C25	MK47C-10/12-C25		MK47C-15/20-C25	MK47C-25-C25
C30 / C30M		MK47-05/07-C30	MK47C-10/12-C30		MK47C-15/20-C30	MK47C-25-C30
C35 / C35M		-	MK47-10/12-C35		MK47-15/20-C35	MK47C-25-C35
C45 / C45M		-	-		MK47-15/20-C45	MK47C-25-C45
C60 / C60M / C75 / C75M		-	-		-	-
C90M		-	-		-	-
C100M		-	-		-	-

Valve Size Standard port / Actuator size	inch	3"	4"	6"	8"
	mm	DN80	DN100	DN150	DN200
C15		-		-	-
C20		-		-	-
C25		-		-	-
C30 / C30M		MK47C-30/40-C30		-	-
C35 / C35M		MK47C-30/40-C35		-	-
C45 / C45M		MK47C-30/40-C45		MK47-60/80-C45	-
C60 / C60M / C75 / C75M		MK47C-30/40-C60/C75		MK47-60/80-C60/C75	MK47-A0-C60/C75
C90M		-		MK47-60/80-C90	MK47-A0-C90
C100M		-		MK47-60/80-C90	MK47-A0-C90

* For Control Zero Backlash Mounting Kits, use MK47V-XXX-XXX for all options

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Mounting Kits Selection Guide

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		MK47C-05/07-C15		MK47C-10/12-C15		-	-
C20		MK47C-05/07-C20		MK47C-10/12-C20		MK47C-15/20-C20	-
C25		MK47-05/07-C25		MK47C-10/12-C25		MK47C-15/20-C25	MK48C-20-C25
C30 / C30M		MK47-05/07-C30		MK47C-10/12-C30		MK47C-15/20-C30	MK48C-20-C30
C35 / C35M		-		MK47-10/12-C35		MK47-15/20-C35	MK48C-20-C35
C45 / C45M		-		-		MK47-15/20-C45	MK48C-20-C45
C60 / C60M / C75 / C75M		-		-		-	-
C90M		-		-		-	-

Valve Size Standard port / Actuator size	inch	2½"	3"	4"	6"
	mm	DN65	DN80	DN100	DN150
C15		-			-
C20		-			-
C25		-			-
C30 / C30M		MK47C-30/40-C30			-
C35 / C35M		MK47C-30/40-C35			-
C45 / C45M		MK47C-30/40-C45			MK47-60/80-C45
C60 / C60M / C75 / C75M		MK47C-30/40-C60/C75			MK47-60/80-C60/C75
C90M		-			-

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Mounting Kits Selection Guide

Valve Size Standard port / Actuator size	inch	½" Full port	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		MK47C-10/12-C15		-		-	-
C20		MK47C-10/12-C20		MK47C-10/12-C20		MK47C-15/20-C20	-
C25		MK47C-10/12-C25		MK47C-10/12-C25		MK47C-15/20-C25	MK48C-20-C25
C30 / C30M		MK47C-10/12-C30		MK47C-10/12-C30		MK47C-15/20-C30	MK48C-20-C30
C35 / C35M		-		MK47-10/12-C35		MK47-15/20-C35	MK48C-20-C35
C45 / C45M		-		-		MK47-15/20-C45	MK48C-20-C45
C60 / C60M / C75 / C75M		-		-		-	-
C90M		-		-		-	-

Valve Size Standard port / Actuator size	inch	2½"	3"	4"
	mm	DN65	DN80	DN100
C15		-	-	-
C20		-	-	-
C25		-	-	-
C30 / C30M		MK48C-20-C30	MK47C-30/40-C30	-
C35 / C35M		MK48C-20-C35	MK47C-30/40-C35	-
C45 / C45M		MK48C-20-C45	MK47C-30/40-C45	MK47-60/80-C45
C60 / C60M / C75 / C75M		MK48-20-C60/C75	MK47C-30/40-C60/C75	MK47-60/80-C60/C75
C90M		-	-	-

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Mounting Kits Selection Guide

Standard

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1¼"	1½"
	mm	DN15	DN20	DN25	DN32	DN40
C15		MK24-05-C15	MK24-07-C15	-	-	-
C20		MK24-05-C20	MK24-07-C20	MK24-10-C20	MK24-12-C20	MK24-15-C20
C25		MK24-05-C25	MK24-07-C25	MK24-10-C25	MK24-12-C25	MK24-15-C25
C30 / C30M		-	-	MK24-10-C30	MK24-12-C30	MK24-15-C30
C35 / C35M		-	-	-	-	MK24-15-C35

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Mounting Kits Selection Guide

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		MK27-05-C15	MK27-07-C15	-		-	-
C20		MK27-05-C20	MK27-07-C20	MK27-10/12-C20		MK27-15-C20	-
C25		MK27-05-C25	MK27-07-C25	MK27-10/12-C25		MK27-15-C25	MK27-20-C25
C30 / C30M		MK27-05-C30	MK27-07-C30	MK27-10/12-C30		MK27-15-C30	MK27-20-C30
C35 / C35M		-	-	MK27-10/12-C35		MK27-15-C35	MK27-20-C35
C45 / C45M		-	-	-		MK27-15-C45	MK27-20-C45
C60 / C60M / C75 / C75M		-	-	-		-	-
C90M		-	-	-		-	-
C100M		-	-	-	-	-	-

Valve Size Standard port / Actuator size	inch	2½"	3"	4"	6"	8"
	mm	DN65	DN80	DN100	DN150	DN200
C15		-	-	-	-	-
C20		-	-	-	-	-
C25		-	-	-	-	-
C30 / C30M		MK27-25-C30	MK27-30-C30	MK27-40-C30	-	-
C35 / C35M		MK27-25-C35	MK27-30-C35	MK27-40-C35	-	-
C45 / C45M		MK27-25-C45	MK27-30-C45	MK27-40-C45	MK27-60-C45	-
C60 / C60M / C75 / C75M		-	MK27-30-C60/C75	MK27-40-C60/C75	MK27-60-C60/C75	MK27-A0-C60/C75
C90M		-	-	-	MK27-60-C90	MK27-A0-C90
C100M		-	-	-	MK27-60-C90	MK27-A0-C90

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Mounting Kits Selection Guide

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		-	-	-	-	-	-
C20		MK47C-05-C20	MK47C-10/12-C20	-	-	-	-
C25		MK47C-05-C25	MK47C-10/12-C25	MK28C-10-C25	MK28C-12-C25	-	-
C30 / C30M		MK47-05-C30	MK47C-10/12-C30	MK28C-10-C30	MK28C-12-C30	MK48-20-C30	MK28C-15/20-C30
C35 / C35M		-	MK47-10/12-C35	MK28-10-C35	MK28-12-C35	MK48-20-C35	MK28C-15/20-C35
C45 / C45M		-	-	MK28-10-C45	MK28-12-C45	MK48-20-C45	MK28-15/20-C45
C60 / C60M / C75 / C75M		-	-	-	-	-	-
C90M		-	-	-	-	-	-
C100M		-	-	-	-	-	-

Valve Size Standard port / Actuator size	inch	2½"	3"	4"	6"	8"
	mm	DN65	DN80	DN100	DN150	DN200
C15		-	-	-	-	-
C20		-	-	-	-	-
C25		-	-	-	-	-
C30 / C30M		-	-	-	-	-
C35 / C35M		MK47C-30/40-C35	MK28-30-C35	-	-	-
C45 / C45M		MK47C-30/40-C45	MK28-30-C45	MK28-40-C45	-	-
C60 / C60M / C75 / C75M		MK47C-30/40-60/C75	MK28-30-C60/C75	MK28-40-C60/C75	MK28-60-C60/C75	MK28-80-C60/C75
C90M		-	MK28-30-C90	MK28-40-C90	MK28-60-C90	MK28-80-C90
C100M		-	MK28-30-C90	MK28-40-C90	MK28-60-C90	MK28-80-C90

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Mounting Kits Selection Guide

Series in range: 26, 26X, 26W

Valve Size Standard port / Actuator size	inch	2"	3"	4"	6"	8"
	mm	DN50	DN80	DN100	DN150	DN200
C15		-	-		-	-
C20		-	-		-	-
C25		-	-		-	-
C30 / C30M		MK47C-30/40-C30	-		-	-
C35 / C35M		MK47C-30/40-C35	MK47-60/80-C35		-	-
C45 / C45M		MK47C-30/40-C45	MK47-60/80-C45		MK47-A0-C45	-
C60 / C60M / C75 / C75M		MK47C-30/40-60/C75	MK47-60/80-C60/C75		MK47-A0-C60/C75	MK26-80-C60/C75
C90M		-	-		MK47-A0-C90	MK26-80-F16
C100M		-	-		MK47-A0-C90	MK26-80-F16

C47 C31 C32 1¼", 2½", 4" FB ARE EXCLUDED

Mounting Kits Selection Guide

Cryogenic

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1 1/4"	1 1/2"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		MK47C-05/07-C15		MK47C-10/12-C15		-	
C20		MK47C-05/07-C20		MK47C-10/12-C20		MK47C-15/20-C20	
C25		MK47-05/07-C25		MK47C-10/12-C25		MK47C-15/20-C25	
C30 / C30M		MK47-05/07-C30		MK47C-10/12-C30		MK47C-15/20-C30	
C35 / C35M		-		MK47-10/12-C35		MK47-15/20-C35	
C45 / C45M		-		-		MK47-15/20-C45	
C60 / C60M / C75 / C75M		-		-		-	
C90M		-		-		-	
C100M		-		-		-	

Valve Size Standard port / Actuator size	inch	2½"	3"	4"	4" FB	6"	8"
	mm	DN65	DN80	DN100	DN100	DN150	DN200
C15		-	-			-	
C20		-	-			-	
C25		MK48C-20-C25	-			-	
C30 / C30M		MK48C-20C30	MK47C-30/40-C30			-	
C35 / C35M		MK48C-20-C35	MK47C-30/40-C35			-	
C45 / C45M		MK48C-20-C45	MK47C-30/40-C45			MK47-60/80-C45	
C60 / C60M / C75 / C75M		-	MK47C-30/40-C60/C75			MK47-60/80-C60/C75	
C90M		-	-			MK47-60/80-C90	
C100M		-	-			MK47-60/80-C90	

C73 C74 C77 C78 APPLICABLE FOR SIZES 3" - 6", ½" - 2"

Mounting Kits Selection Guide

Series in range: C73C, C73W, C74C, C74W, C77C, C77W (Applicable for sizes 3" - 6"), C78C, C78W (Applicable for sizes ½" - 2")

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1½"	2"
	mm	DN15	DN20	DN25	DN40	DN50
C15		MK47C-05/07-C15	MK47C-10/12-C15		-	-
C20		MK47C-05/07-C20	MK47C-10/12-C20		MK47C-15/20-C20	-
C25		MK47-05/07-C25	MK47C-10/12-C25		MK47C-15/20-C25	MK48C-20-C25
C30 / C30M		MK47-05/07-C30	MK47C-10/12-C30		MK47C-15/20-C30	MK48C-20-C30
C35 / C35M		-	MK47-10/12-C35		MK47-15/20-C35	MK48C-20-C35
C45 / C45M		-	-		MK47-15/20-C45	MK48C-20-C45
C60 / C60M / C75 / C75M		-	-		-	-
C90M		-	-		-	-
C100M		-	-		-	-

Valve Size Standard port / Actuator size	inch	3"	4"	6"	8"
	mm	DN80	DN100	DN150	DN200
C15		-		-	-
C20		-		-	-
C25		-		-	-
C30 / C30M		MK47C-30/40-C30		-	-
C35 / C35M		MK47C-30/40-C35		-	-
C45 / C45M		MK47C-30/40-C45		MK47-60/80-C45	-
C60 / C60M / C75 / C75M		MK47C-30/40-C60/C75		MK47-60/80-C60/C75	MK47-A0-C60/C75
C90M		-		MK47-60/80-C90	MK47-A0-C90
C100M		-		MK47-60/80-C90	MK47-A0-C90

C26C C26W

Valve Size Standard port / Actuator size	inch	2"	3"	4"	6"	8"
	mm	DN50	DN80	DN100	DN150	DN200
C15		-	-		-	-
C20		-	-		-	-
C25		-	-		-	-
C30 / C30M		MK47C-30/40-C30	-		-	-
C35 / C35M		MK47C-30/40-C35	MK47-60/80-C35		-	-
C45 / C45M		MK47C-30/40-C45	MK47-60/80-C45		MK47-A0-C45	-
C60 / C60M / C75 / C75M		MK47C-30/40-60/C75	MK47-60/80-C60/C75		MK47-A0-C60/C75	MK26-80-C60/C75
C90M		-	-		MK47-A0-C90	MK26-80-F16
C100M		-	-		MK47-A0-C90	MK26-80-F16

C61 C62

Valve Size Standard port / Actuator size	inch	½" Full port	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		MK47C-10/12-C15		-		-	-
C20		MK47C-10/12-C20		MK47C-10/12-C20		MK47C-15/20-C20	-
C25		MK47C-10/12-C25		MK47C-10/12-C25		MK47C-15/20-C25	MK48C-20-C25
C30 / C30M		MK47C-10/12-C30		MK47C-10/12-C30		MK47C-15/20-C30	MK48C-20-C30
C35 / C35M		-		MK47-10/12-C35		MK47-15/20-C35	MK48C-20-C35
C45 / C45M		-		-		MK47-15/20-C45	MK48C-20-C45
C60 / C60M / C75 / C75M		-		-		-	-
C90M		-		-		-	-

Valve Size Standard port / Actuator size	inch	2½"	3"	4"
	mm	DN65	DN80	DN100
C15		-	-	-
C20		-	-	-
C25		-	-	-
C30 / C30M		MK47C-30/40-C30	-	-
C35 / C35M		MK47C-30/40-C35	-	-
C45 / C45M		MK47C-30/40-C45	MK47-60/80-C45	MK47-60/80-C45
C60 / C60M / C75 / C75M		MK47C-30/40-C60/C75	MK47-60/80-C60/C75	MK47-60/80-C60/C75
C90M		-	-	-

C28

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		-	-	-		-	
C20		MK47C-05-C20	MK47C-10/12-C20	-		-	
C25		MK47C-05-C25	MK47C-10/12-C25	MK47C-15/20-C25		-	
C30 / C30M		MK47-05-C30	MK47C-10/12-C30	MK47C-15/20-C30		MK48-20-C30	
C35 / C35M		-	MK47-10/12-C35	MK47-15/20-C35		MK48-20-C35	
C45 / C45M		-	-	MK47-15/20-C45		MK48-20-C45	
C60 / C60M / C75 / C75M		-	-	-		MK48-20-C60/C75	
C90M		-	-	-		-	
C100M		-	-	-		-	

Valve Size Standard port / Actuator size	inch	2½"	3"	4"	6"	8"
	mm	DN65	DN80	DN100	DN150	DN200
C15		-	-	-	-	-
C20		-	-	-	-	-
C25		-	-	-	-	-
C30 / C30M		-	-	-	-	-
C35 / C35M		MK47C-30/40-C35	MK47-60/80-C35	-	-	-
C45 / C45M		MK47C-30/40-C45	MK47-60/80-C45	MK47-60/80-C45	-	-
C60 / C60M / C75 / C75M		MK47C-30/40-60/C75	MK47-60/80-C60/C75	MK47-60/80-C60/C75	MK28-60-C60/C75	MK28-A0-C60/C75
C90M		-	MK28-30-C90	MK28-40-C90	MK28-60-C90	MK28-A0-C90
C100M		-	MK28-30-C90	MK28-40-C90	MK28-60-C90	MK28-A0-C90

Z47Z Z47Q

Mounting Kits Selection Guide

High Temperature

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		MK47C-05/07-C15 *		-		-	
C20		MK47C-05/07-C20		MK47C-10/12-C20 (DA ONLY)		-	
C25		MK47-05/07-C25		MK47C-10/12-C25		MK47C-15/20-C25 (DA ONLY)	
C30 / C30M		MK47-05/07-C30		MK47C-10/12-C30		MK47C-15/20-C30	
C35 / C35M		-		MK47-10/12-C35		MK47-15/20-C35	
C45 / C45M		-		-		MK47-15/20-C45	
C60 / C60M / C75 / C75M		-		-		-	
C90M		-		-		-	
C100M		-		-		-	

Valve Size Standard port / Actuator size	inch	2½"	3"	4"	6"	8"	8" FB
	mm	DN65	DN80	DN100	DN150	DN200	DN200
C15		-		-		-	-
C20		-		-		-	-
C25		-		-		-	-
C30 / C30M		MK47C-30/40-C30 (DA ONLY)		-		-	-
C35 / C35M		MK47C-30/40-C35		-		-	-
C45 / C45M		MK47C-30/40-C45		MK47-60/80-C45		-	-
C60 / C60M / C75 / C75M		MK47C-30/40-C60/C75		MK47-60/80-C60/C75		MK47-A0-C60/C75	MK26-80-C60/C75
C90M		-		-		MK47-A0-C90	MK26-80-F16
C100M		-		-		MK47-A0-C90	MK26-80-F16

* (DA ONLY)

Z28Z

Mounting Kits Selection Guide

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		-	-	-	-	-	-
C20		MK47C-05-C20	MK47C-10/12-C20	-	-	-	-
C25		MK47C-05-C25	MK47C-10/12-C25	MK28C-10-C25	MK28C-12-C25	-	-
C30 / C30M		MK47-05-C30	MK47C-10/12-C30	MK28C-10-C30	MK28C-12-C30	MK48-20-C30	MK28C-15/20-C30
C35 / C35M		-	MK47-10/12-C35	MK28-10-C35	MK28-12-C35	MK48-20-C35	MK28C-15/20-C35
C45 / C45M		-	-	MK28-10-C45	MK28-12-C45	MK48-20-C45	MK28-15/20-C45
C60 / C60M / C75 / C75M		-	-	-	-	-	-
C90M		-	-	-	-	-	-
C100M		-	-	-	-	-	-

Valve Size Standard port / Actuator size	inch	2½"	3"	4"	6"
	mm	DN65	DN80	DN100	DN150
C15		-	-	-	-
C20		-	-	-	-
C25		-	-	-	-
C30 / C30M		-	-	-	-
C35 / C35M		MK47C-30/40-C35	MK28-30-C35	-	-
C45 / C45M		MK47C-30/40-C45	MK28-30-C45	MK28-40-C45	-
C60 / C60M / C75 / C75M		MK47C-30/40-60/C75	MK28-30-C60/C75	MK28-40-C60/C75	MK28-60-C60/C75
C90M		-	-	-	MK28-60-C90
C100M		-	-	-	MK28-60-C90

Z28Q

Mounting Kits Selection Guide

Valve Size Standard port / Actuator size	inch	½"	¾"	1"	1¼"	1½"	2"
	mm	DN15	DN20	DN25	DN32	DN40	DN50
C15		-	-	-		-	
C20		MK47C-05-C20	MK47C-10/12-C20	-		-	
C25		MK47C-05-C25	MK47C-10/12-C25	MK47C-15/20-C25		-	
C30 / C30M		MK47-05-C30	MK47C-10/12-C30	MK47C-15/20-C30		MK48-20-C30	
C35 / C35M		-	MK47-10/12-C35	MK47-15/20-C35		MK48-20-C35	
C45 / C45M		-	-	MK47-15/20-C45		MK48-20-C45	
C60 / C60M / C75 / C75M		-	-	-		MK48-20-C60/C75	
C90M		-	-	-		-	
C100M		-	-	-		-	

Valve Size Standard port / Actuator size	inch	2½"	3"	4"	6"
	mm	DN65	DN80	DN100	DN150
C15		-	-	-	-
C20		-	-	-	-
C25		-	-	-	-
C30 / C30M		-	-	-	-
C35 / C35M		MK47C-30/40-C35	MK47-60/80-C35	-	-
C45 / C45M		MK47C-30/40-C45	MK47-60/80-C45	MK47-60/80-C45	-
C60 / C60M / C75 / C75M		MK47C-30/40-60/C75	MK47-60/80-C60/C75	MK47-60/80-C60/C75	MK28-60-C60/C75
C90M		-	MK28-30-C90	MK28-40-C90	MK28-60-C90
C100M		-	MK28-30-C90	MK28-40-C90	MK28-60-C90


HABONIM
COMPACT



ACTUATION ACCESSORIES

Breather Block 542
IMPACT™ - Spring Assist 543

ACCESSORIES

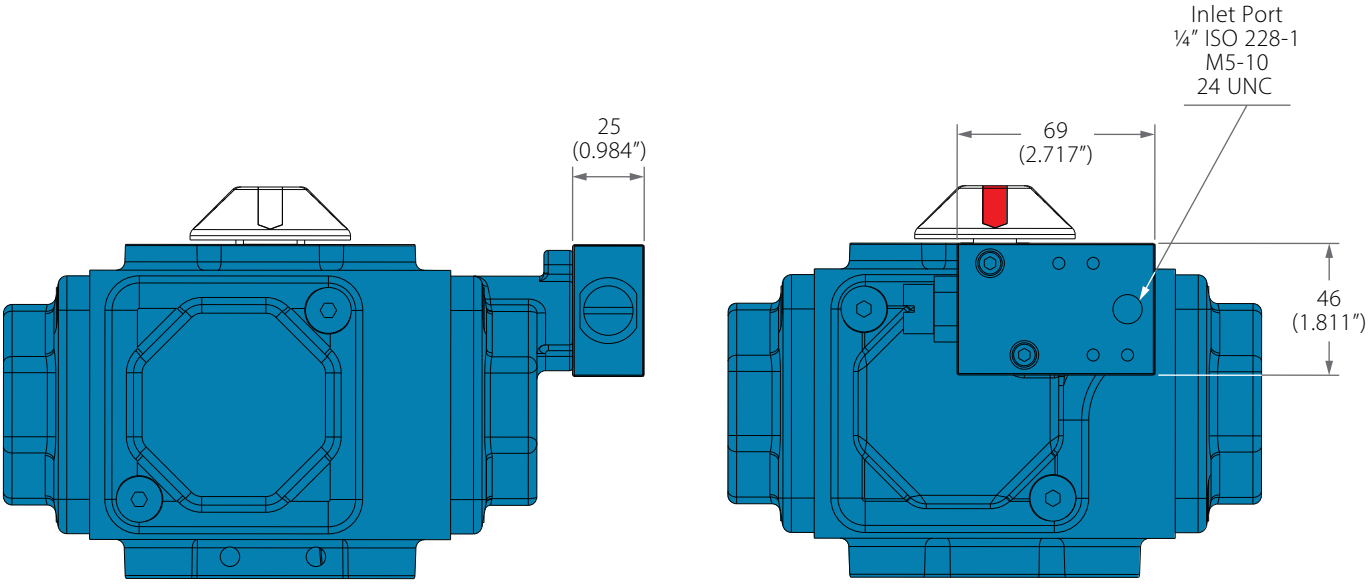
Breather Block

In applications that use a fail-safe actuator, the spring chambers are exposed to the surrounding environment. Every stroke generated by the force of the springs introduces air from the surroundings into the actuator's inner parts. In the case of corrosive and/or abrasive working environments, the springs and the interior of the spring chamber become prone to damage that could cause the product to malfunction.

The Breather Block isolates the actuator's internal parts from the corrosive/abrasive surroundings by allowing only dry and filtered instrument air to flow into the spring chamber during the actuator's spring stroke. The Breather Block's exhaust port only allows air to flow out of the spring chamber and prevents outside air from flowing in.

Features

- Fits directly onto any actuator with a Namur interface
- Interface for direct mounting of Namur solenoids
- When using remote solenoids, air supply tubes can be connected to the inlet port with a ¼" NPT (Imperial) or M5-10/24 UNC (Metric) connector
- Aluminum anodized coating and external paint layer for extreme protection
- Optional metallic construction materials are available. The O-ring and membrane are made from Buna-N
- Operating limits: pressures up to 10 bar (150 psi) and temperature range of -20º C to +85º C (-4º F to +185º F)
- One unit fits all actuator sizes



IMPACT™ - Spring Assist

In a failsafe actuator compressed air inside the actuator preloads the springs. During normal operation, each time the solenoid valve is tripped the compressed air is released into the atmosphere through the solenoid valve's exhaust port.

The patented IMPACT™ unit diverts part of this energy to the spring chamber in order to boost the torque of the actuator by at least 50%.

The IMPACT™ also functions as a Breather Block that isolates the spring chamber from the atmosphere, and as a check valve that ensures that the temporary reduction of the compressed air pressure does not trigger movement of the valve and actuator to the mid-position.

The IMPACT™ is used for on/off systems only, and cannot be used for control applications.

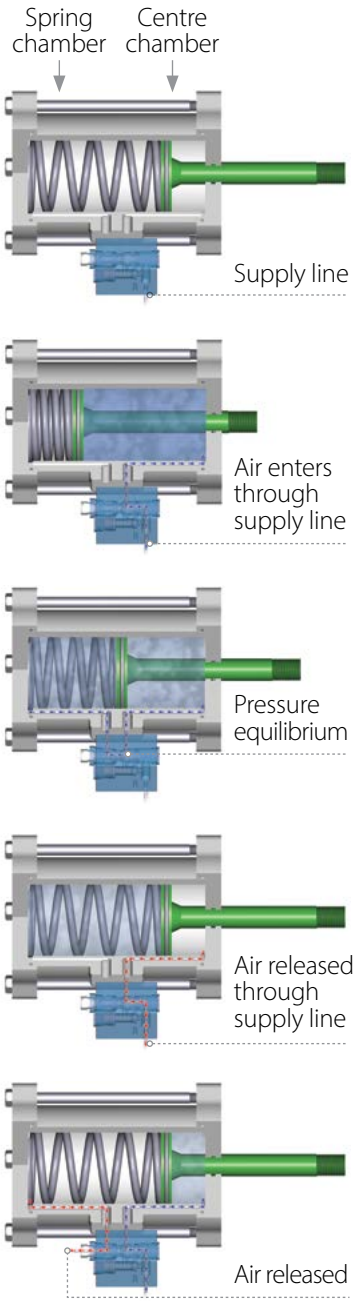
Features

- Boosts the torque of any spring return actuator
- One size down actuator for the same functionality
- Increases system reliability
- Internal Breather Block
- No external energy required
- NAMUR interface
- Single mechanical unit



ACCESSORIES

IMPACT™ Cycle Of Operation



1. Starting Point

The IMPACT™ full cycle of operation is illustrated below on a single-piston spring return actuator. In the initial startup the spring chamber and the centre chamber are not pressurized.

2. "ON" command to the actuator

At the ON command air pressure from the supply line is applied through the IMPACT™ and into the centre chamber of the actuator causing the piston to retract and compress the spring. The centre chamber stays pressurized until the OFF command is given.

3. "OFF" command to the actuator

At the OFF command air pressure is directed from the centre chamber to the spring chamber as the spring pushes the piston back. The air pressure in the spring chamber and the centre chamber reach equilibrium.

4. Spring End Position

As equilibrium is reached, the air in the centre chamber is released through the supply line it contributes additional force to the spring closing motion. Pressurized air is trapped until the next ON command.

5. Next "ON" command

At the next ON command air pressure from the supply line is applied through the IMPACT™ and into the centre chamber and at the same time exhausting the trapped air from the spring chamber.

IMPACT™

Applications

The IMPACT™ can be utilized directly on site where operating conditions may occur that cause functional disorders or become a safety issue. Some typical examples are given here:

1. Actuators that are not achieving their published torque output can have the IMPACT™ field mounted to improve their reliability without having to replace them or stop the process.
2. In situations where unexpected pressure drops occur, such as at beginning of a days work or when additional accessories are added to a system, the IMPACT™ will keep the pressure level at its maximum and prevent the actuators from shifting from their position.
3. In many cases it is possible to substitute a smaller actuator with the IMPACT™ and achieve the torque output of a larger actuator.
4. The IMPACT™ will increase the reliability and safety margin of existing actuators. The additional torque provided to existing actuators extend their life and reduce maintenance.
5. The IMPACT™ is ideal for critical applications where quick-closing actuators are required.
6. The IMPACT™ will help "self opening" valves keep their shut-off position.

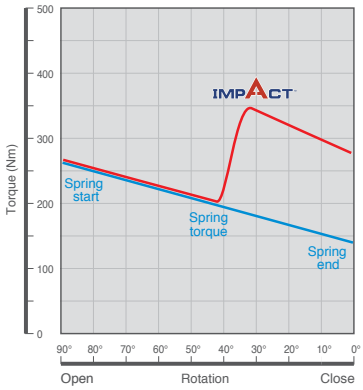
Features

Adds 50% more torque

Redirecting the air pressure into the spring chamber increases the spring end torque by 50% and more.

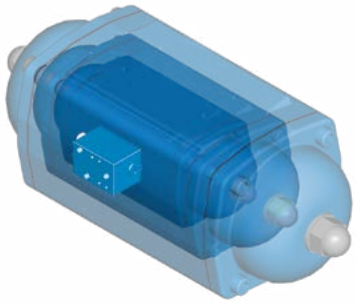
The torque generated depends on the type of valves in service and the operating conditions. The additional torque can be above 200%.

The IMPACT™ typical behavioral reaction to a spring return stroke is shown in the graph below. It is evident that the actual spring end torque is significantly higher with the IMPACT™.



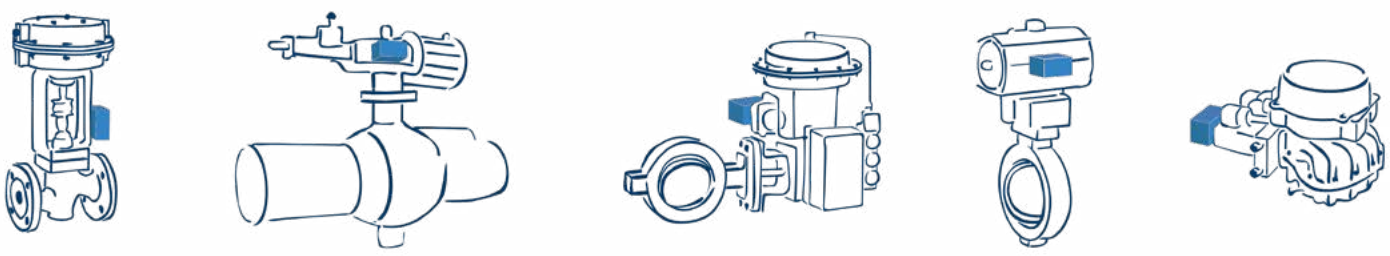
One size

The IMPACT™ comes in one size only which fits all size actuators making it a simple and easy solution for all the actuators on site or in inventory.



Used with any actuator

The IMPACT™ can be used with any type of spring return actuator, be it linear or rotary such as: rack and pinion (single piston, double piston, four piston), Scotch-Yoke, Spring-Diaphragm, Vane type and Worm gear.



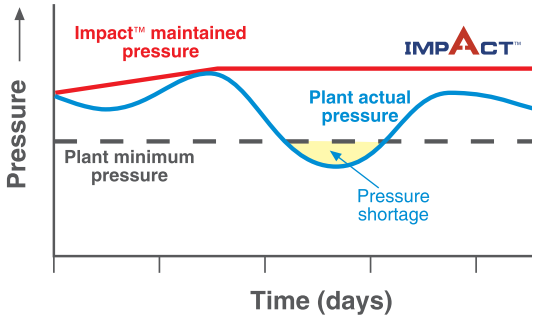
ACCESSORIES

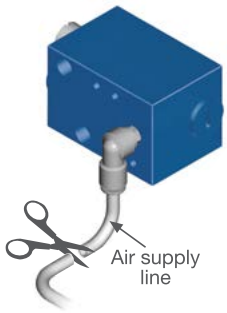
IMPACT™

Safety and reliability

1. Pressure fluctuations

The IMPACT™ has a built-in non-return valve that will hold the maximum air pressure in the centre chamber so that any pressure fluctuations in the system will not cause spring return actuators to start closing and trigger alarms.





2. Emergency cutoff

Under emergency situations the IMPACT™ will operate and react to any air supply cutoff. Unlike many other devices, the IMPACT™ is not dependant on an alternative air source.

3. No electrical hazard

The IMPACT™ does not operate on electric or electronic commands and therefore is not considered an electrical hazard.

Energy saving

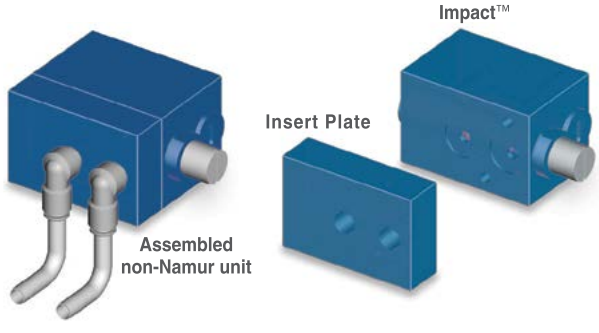
The IMPACT™ does not operate on any form of external energy and is therefore a significant energy saver for its user.

Namur interface

The IMPACT™ direct mounts to any actuator with Namur interface and has direct mounting for Namur solenoids. Only solenoids type 3/2 are required.

Non-Namur interface

By using a special insert plate the IMPACT™ can be used with any actuator that has standard threaded air connections.

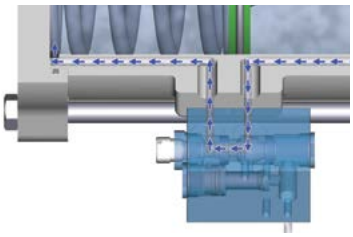




IMPACT™

No additional air

The IMPACT™ does not need an additional source of air supply and does not require a safety backup system. The air used comes from the air already supplied to the centre chamber.

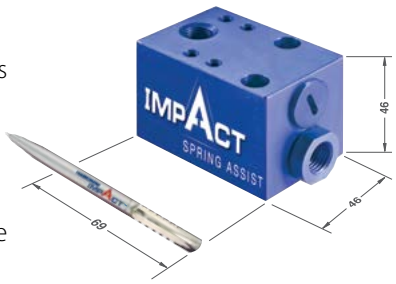


Built-in Breather Block

The IMPACT™ has a built-in Breather Block that prevents suction of external air into the spring chamber (refer to Habonim Namur Breather Block catalog).

CompAct size

The physical footprint of the IMPACT™ is slightly larger then a matchbox. The actual dimensions are 69 x 46 x 46 mm (2.716" x 1.811" x 1.811").

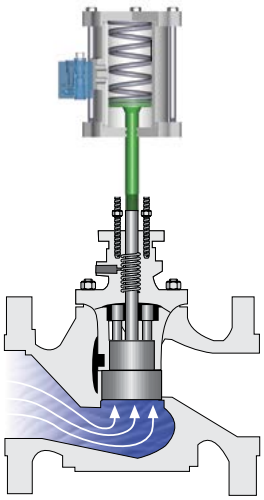


Quick shutoff

In cases where there is a requirement for increased closing speed for fail safe operations, the IMPACT™ provides faster closing due to the additional air pressure assisting the springs.

Dynamic response

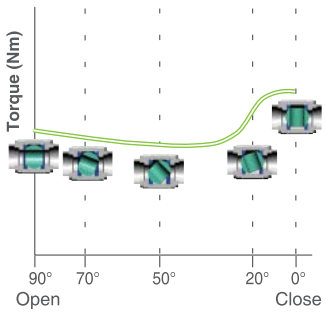
The IMPACT™ unique design dynamically responds to valve torque increases and provides the extra air pressure to the actuator when it is required. Every valve type has its typical torque profile and spring action of the actuator is required to provide enough torque through the full stroke. The IMPACT™ responds to the actual conditions to give the additional torque. The IMPACT™ will also respond to situations where unexpected conditions can cause the valves to seize.



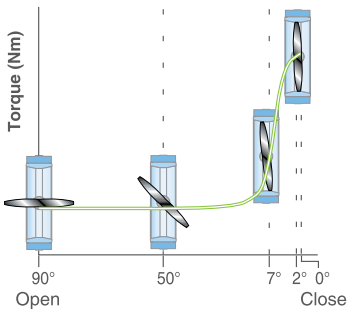
Reduce maintenance & inventory

Being only one size makes the IMPACT™ a great staff tool for the maintenance personnel on site and an economical solution for procurement.

Ball valve torque



Butterfly valve torque

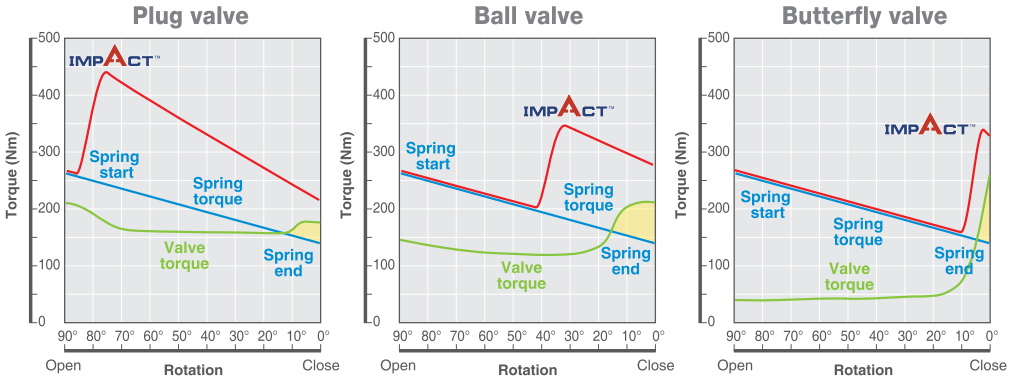


ACCESSORIES

IMPACT™

Self opening

When the actuator has closed the valve the IMPACT™ maintains the air pressure on the springs until the next operation. This gives the actuator a higher spring end torque which is ideal for "self-opening" valves. Because high pressure fluid loads the entire valve port it creates a force that acts against the actuator springs.



How to calculate additional spring closing torque

The following steps will help you understand how to calculate the additional torque the IMPACT™ Air Assist will give your Spring Return actuator. The IMPACT™ will work with any type actuator, and you should use the torque tables provided by your actuator of preference:

Step 1: Calculate Torque difference

In the Double acting Torque table find the actuator model and size that you are working with. Calculate the torque difference of 1 bar at any pressure.

Example shown The Spring Return actuator model size is C30 and the ΔP of 1 bar calculated is between 5.0 bar (73 psi) and 6.0 bar (87 psi). The additional torque will be: 130-107=23[Nm] (1,150-947=203in-lb).

Step 2: Calculate Spring Torque

In the Spring Return torque tables find the actuator model and size with the spring combination that you are working with. Locate the Spring End torque and add the additional torque as above.

Example shown The Spring Return actuator model size is C30 with 2C spring combination. The Spring End torque is 44[Nm] (389in-lb). The new Spring End torque will be: 44+23=67[Nm] (389+203=592in-lb).

Double acting table ΔP = 1 bar

Model	Operating pressure (bar)					
	3.0	4.0	5.0	6.0	7.0	8.0
C15	10	14	17	21	24	27
C20	18	25	32	38	45	51
C25	39	52	65	79	92	105
C30	62	84	**107**	**130**	153	176

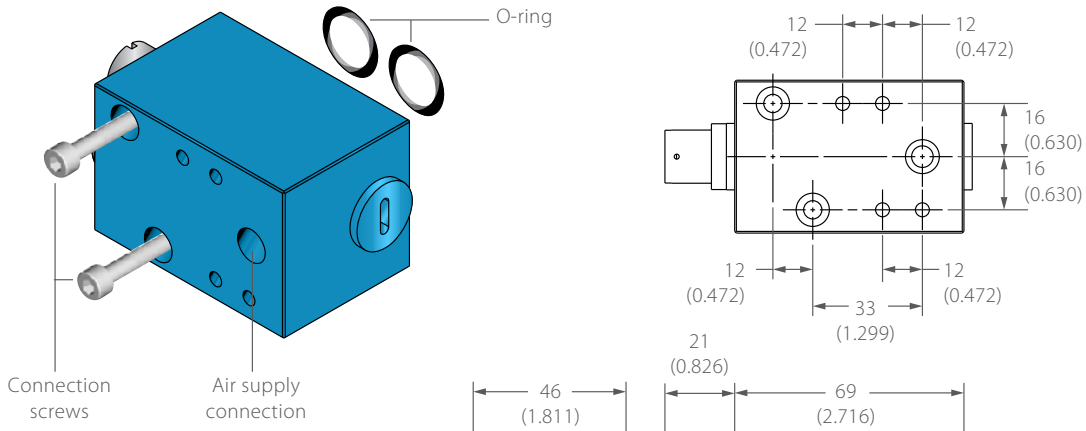
Spring return table

Size	Spring set	Air pressure - bar (psi)						Spring torque	
		3.0 (44)		7 (102)		8 (116)			
		Start	End	Start	End	Start	End	Start	End
C30	2A	**36**	**19**	125	107	148	129	42	26
	2A2B			120	96	143	118	53	31
	2B			115	87	138	109	62	36
	2C			107	72	130	94	78	**44**

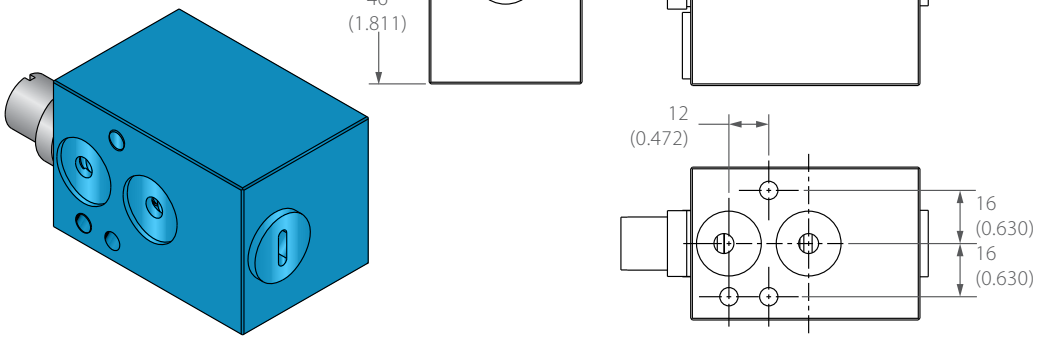
IMPACT™

Dimensions

Solenoid interface side



Actuator interface side



Specifications

- The IMPACT™ is environmentally protected by a hard anodized coating that is applied to all the parts both internally and externally.
- The temperature limits are -20°C to +80°C (-4°F to +176°F).
- The air supply pressure range is 3 to 8 bar (45 to 120 psi).
- The IMPACT™ will not operate at pressures below 3 bar (45 psi).
- The IMPACT™ is not affected by humidity, moisture, wetness or magnetic surroundings.
- Use only filtered air to 30 microns.

Ordering Information

Please provide all the information specified below:

Namur interface actuators:

- IMPACT™ - M: Metric connecting screws thread type M5 and air supply connection type G-¼" ISO.

Non-Namur actuators: As above but add the letter "X"

- IMPACT™ - M-X: for Metric
- All the IMPACT™ units are provided with the two connecting screws and two O-rings.



YP0000787 CAT-MAIN-NEW ver04_060725

About Habonim

Ball Valves & Actuators for the most demanding, challenging and hazardous applications are our passion and profession for the last 70 years.

We believe in designing, manufacturing and supplying control and shutoff components and solutions that improves the overall safety, integrity and sustainability of the systems they are installed in.

Designed, manufactured and tested according to the highest standards, our products allow us to partner within systems that flow and control varied gases and liquids in diverse markets especially where extreme temperatures and pressures are involved, hazardous materials are used and system performances are critical.

We are leading in cryogenic ball valve-based control solutions, emergency shutoff and specially designed solutions.

Believing that supplying and developing the most effective, safe and reliable products for the global leaders in the LNG and Gas distribution market continually challenges us to improve our capabilities and products.

Best coping with our prestigious customers' most challenging requirements technically, operationally and commercially is our promise fulfilled for decades.

Performing in Demanding Applications

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