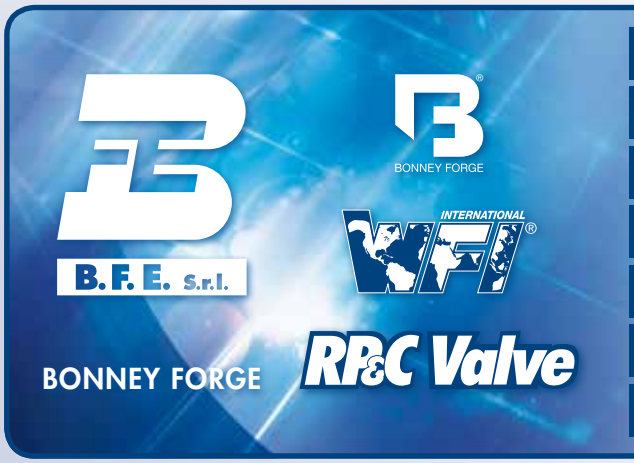
Trunnion Mounted Ball Valves

B.F.E. S.r.l.

BONNEY FORGE

TABLE OF CONTENTS



TRUNNION BALL VALVE DESCRIPTION

The trunnion ball valve is a form of quarter-turn valve which uses a hollow, perforated and fixed/supported ball to control flow through it.
A trunnion mounted valve means that the ball is constrained by bearings and is only allowed to rotate, the majority of the hydraulic load is supported by the System constraints, resulting in low bearing pressure and no shaft fatigue. The line pressure drives the upstream seat against the stationary ball so that the line pressure forces the upstream seat onto the ball causing it to seal.
The mechanical anchoring of the ball absorbs the thrust from the line pressure, preventing excess friction between the ball and seats, so even at full rated working pressure operating torque remains low. This is particularly advantageous when the ball valve is actuated because it reduces the size of the actuator and hence the overall costs of the valve actuation package.
Advantages of trunnion ball design is the lower operating torque, ease of operation, minimized seat wear (Stem/ball isolation prevents side loading and wear of downstream seats improving performance and service life), superior sealing performance at both high and low pressure (a separate spring mechanism and upstream line pressure is used as the sealing against the stationary ball for low pressure and high pressure applications).
The trunnion is available for all sizes and for all pressure classes but they are not suitable for throttling purposes.

PRODUCT FEATURES

1. Standard double block sealing performance.
2. Full die forged structure for all pressure containing parts.
3. Flanged valves are provided with flanged integral with closure member.
4. Standard primary gasket design is OR AED type, secondary emergency seal always provided for fire-safe purpose.
5. High quality stem gasket for reliable tightness and low emission performance.
6. Use of low seat-ball friction materials and surface finish for reliable sealing and long service life.
7. Best-in-Class CV values.
8. Standard split & bolted design for body-closure connection.
9. Low operation torque design.
10. Static conduction spring is used as standard between the stem and the ball (Antic-Static Device).
11. Anti blow-out proof stem design.

P&ID SYMBOL

Applicable Standards

DESIGN	API 6D - ASME B16.34 - ISO 17292 - API 608
INSPECTION & TESTING	API 598
MARKING	MSS SP-25
RATING	ASME B16.34 With possible derating for high temperature based on seat material.
FUGITIVE EMISSION	ISO 15848

BFE AVAILABLE CATALOGUES

BFE - BONNEY FORGE:
VALVE PRODUCTS FOR EVERY INDUSTRY INFRASTRUCTURE

BFE is proud to offer the widest variety of high-quality products and unmatched services. Search our catalogs, search for a product, or contact us for help with your order.

Forged Valves | Forged Pressure Seal Valves | API 6A Valves

Cast Steel Valves | Trunnion Mounted Ball Valves

Forged Floating Ball Valves | Double Block & Bleed Valves

THE COMPANY BEHIND THE BRAND

BFE: EXPERIENCE AND EXPERTISE AT YOUR SERVICE

More than 50 years of experience, expertise and know how strengthen BFE's leadership in the production and commercialization of valves for for oil and gas, mining industry, petrochemical, power generation and utilities. This solid and dynamic business strategy allows BFE to identify and provide solutions to meet specific needs, and aims to achieve complete customer satisfaction which today turns out to be of great value.

BONNEY FORGE: THE NAME YOU TRUST FOR FORGED STEEL VALVES

Bonney Forge's forged steel valves and piping components have led the way for over eighty years in state-of-the-art design and dependable performance. It is qualities like these, combined with a customer-driven culture, that maintains Bonney Forge's leadership position within the industry for exceeding customer expectations. Our goal is to make Bonney Forge your number one world-wide choice for forged valves.

OUR MISSION

To be, today and in the future, the recognized leader in our industry, marketing and manufacturing forged steel valves, cast steel valves, forged fittings, branch connections and other related products to satisfy our customer's expectations.
To be cost effective through Total Quality performance of these operations, and thus provide the resources required to support our commitment to improve our products, processes and customer service.
To be a law abiding corporate citizen respecting the rights of individuals, contributing to the needs of the community and conserving the state of the environment.

OUR CREED

- Continuously improving quality, processes and customer service.
- Eliminating delays, errors and defects in materials and workmanship.
- Providing customers with access to statistical evidence that quality is incorporated in our products and production processes.
- Requiring suppliers to provide statistical evidence of quality in products and process capabilities.
- Sharing with the organization the cost of poor quality in products and services.
- Driving out fear and bringing problems to light for all to see.
- Working together to address specific problems and establish goals and solutions as a team.
- Controlling manufacturing processes which determine the final cost and quality of our products.
- Removing barriers which stand between employees and their pride of workmanship, and implementing ongoing training, supervision and employee development programs.
- Good housekeeping, which reflects on the company, its operating philosophy and our people.

B.F.E. S.r.l.

BFE is specialized in the production of industrial valves for use in oil & gas, chemical, petrochemical, power, onshore and offshore industries. BFE has two main division:

- Albano Sant'Alessandro - BG - Italy: The management sales and operative offices are located here, as well as the machining, assembly and final testing workshop for forged valves
- Bosisio Parini - LC - Italy: The main components for forged valves are forged and represent BFE's first basic factor of global quality, seeing that the entire manufacturing process is controlled and guaranteed by the Company Quality System.

BONNEY FORGE

Bonney Forge is an industry leader in marketing and manufacturing forged steel fittings and unions, branch connections, forged steel valves, cast steel valves and specialty products.
For more than a century, Bonney Forge has achieved manufacturing excellence through the detailed attention to customer's needs and producing consistently superior flow control products. Today, the Bonney Forge name is synonymous with quality that exceeds all industry standards.

INTERNATIONAL WFI

WFI International, a Bonney Forge Company, is a leading manufacturer of ferrous and non-ferrous branch connection fittings, specialty flanges, and seamless fittings for use in piping systems and on pressure vessels. WFI and Bonney Forge are the world's leading manufacturers of integrally reinforced branch connection fittings.

RP&C Valve

Bonney Forge acquired RP&C Valve in 2004. RP&C traces its' origin back to 1878 with the Steam Boiler Appliance Company. RP&C products consist of Forged Steel Valves used in the chemical processing, pulp and paper, petroleum, power, and residential and commercial construction markets.

COMPANY BACKGROUND

2013 BONNEY FORGE CORPORATION ACQUIRES BFE

Bonney Forge Corporation has expanded its global footprint in manufacturing industrial valves and fittings by completing the purchase of BFE. As one of the world's leading manufacturers of forged steel valves, cast steel valves, forged steel fittings, unions and branch connections, our commitment to excellence in producing the highest quality products makes this acquisition a significant alliance in the international market.

2004 ENHANCED APPROACHES TO ENVIRONMENTAL AND ECOLOGICAL MANAGEMENT

As well as guaranteeing maximum functionality, all valves made by B.F.E. S.p.A. fully comply with international and EU norms to reduce atmospheric pollution and leakage also under critical conditions such as high pressures, temperatures and the presence of aggressive products, etc.

1996 DYNAMISM, INNOVATION AND GROWTH

A significant year for B.F.E. S.p.A. Bonney Forge Valve Licensee as Acciaierie Valbruna di Vicenza, one of the world's largest steel companies, comes in as controlling shareholder. The US-based Bonney Forge Corporation continues to maintain its position as a shareholder and licensor.

1987 BONNEY FORGE EUROPE BECOMES B.F.E. S.P.A.

In 1987 the current B.F.E. S.p.A. Bonney Forge Valve Licensee is created: the company was acquired from Bonney Forge Corporation; however the latter remains a shareholder and licensor.

1966 BONNEY FORGE EUROPE IS FOUNDED

December 1966. Bonney Forge Europe S.p.A. is officially incorporated. The Firm continues to operate mainly in energy production and the petrolchemical industry. In order to meet increasingly sophisticated and complex market demands, Bonney Forge Europe buys a production plant exclusively dedicated to forging.

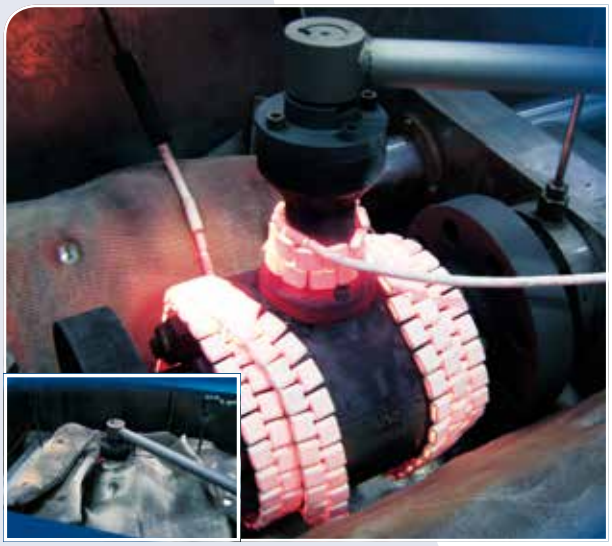
1955 FIRST DAYS, A PROMISE OF QUALITY AND COMMITMENT

Forged valves production first started as long ago as 1955 in a converted warehouse in Albano S. Alessandro originally built as a barn. The production was the responsibility of four people but in just a few years there were thirty on the payroll - thanks to a policy of steadfast commitment and the winning of a series of important orders from Italy's fast growing chemical and petrolchemical industries.

TAKING QUALITY TO THE NEXT LEVEL

ENGINEERING IN A QUALITY DRIVEN MARKET

Our extensive, uncompromising, company-wide quality control system carefully monitors our manufacturing processes to assure a product that performs to the highest industry standards.
Quality assurance procedures include 100% hydrostatic and pneumatic testing of all valves in full conformance to applicable API standards and industry codes.

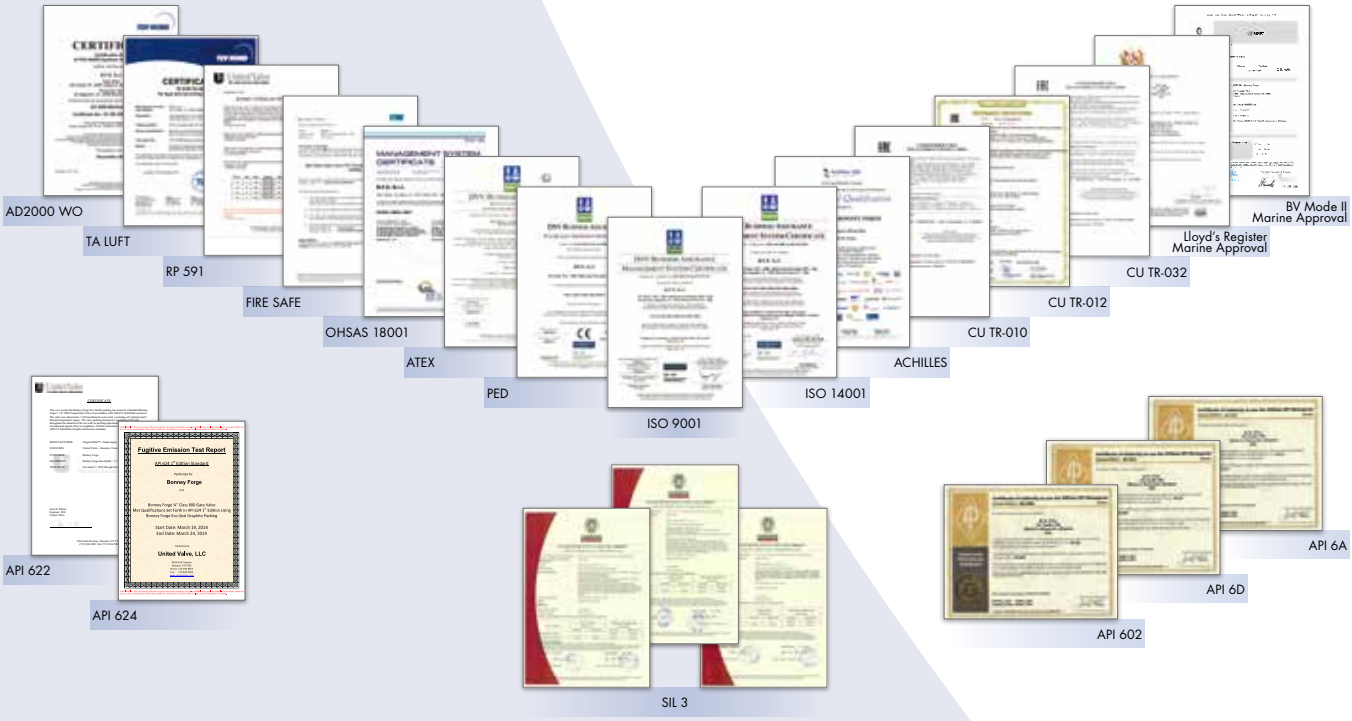


QUALITY THAT YOU CAN COUNT ON

BFE products are manufactured and tested in strict accordance to ASTM, ASME, ANSI, API and other applicable industry codes and specifications.
Chemical and mechanical properties of all Bonney Forge products are fully traceable to the original forging lot and raw material heat. Requirements of the market are in a state of constant evolution, and customers' quality needs are met and exceeded by the complete business process.

THE ASSURANCE YOU NEED

It is our policy to supply only quality products that conform fully to customer and statutory or regulatory requirements including codes and standards. To help meet our objective we operate an exacting quality control system, which has been audited and assessed by numerous customers and external authorities for compliance with all merket standards.



CONFIDENCE IN STEEL FORGING

WHY FORGINGS?

Forging offers uniformity of composition and structure. Forging results in metallurgical recrystalisation and grain refinement as a result of the thermal cycle and deformation process. This strengthens the resulting steel product particularly in terms of impact and shear strength. Forged steel is generally stronger and more reliable than castings and plate steel due to the fact that the grain flows of the steel are altered, conforming to the shape of the part.

WHAT YOU GAIN WHEN YOU SELECT OUR FORGINGS

- Dimensional uniformity and close dimensional tolerances.
- High Strength.
- Tougher than alternatives.
- Better response to heat treatment than alternatives.
- Will handle impact better than alternatives.
- The nature of forging excludes the occurence of porosity, shrinkage, cavities and cold pour issues.
- The tight grain structure of forgings making it mechanically strong.
- The tight grain structure offers great wear resistance.

IN-HOUSE FORGING PRODUCTION

Thanks to constant search of efficient solutions the plant has the most modern forging production built on basis of semi-automatic and continuous forging line. High quality of forging is provided by the modern production accessories of the plant and usage of software for modeling the process of forging.

HIGHEST POSSIBLE MATERIAL QUALITY

BFE uses only high-quality materials inspected & tested to International Standards and utilizes advanced manufacturing technology with special emphasis on safety, quality, and long service life of our products, to ensure that our clients receive the "best in class" products available from us at a competitive price and delivered on time.

CHALLENGING MATERIALS FOR THE MOST CRITICAL APPLICATIONS

Forging material has increased strength under maximum rated operation pressure compared with cast. Other forging properties include greater impact resistance, resistance to fatigue cracking, particularly when cycling at either high or cryogenic temperature.

UNIQUE EXPERTISE FOR VALVE ENGINEERING

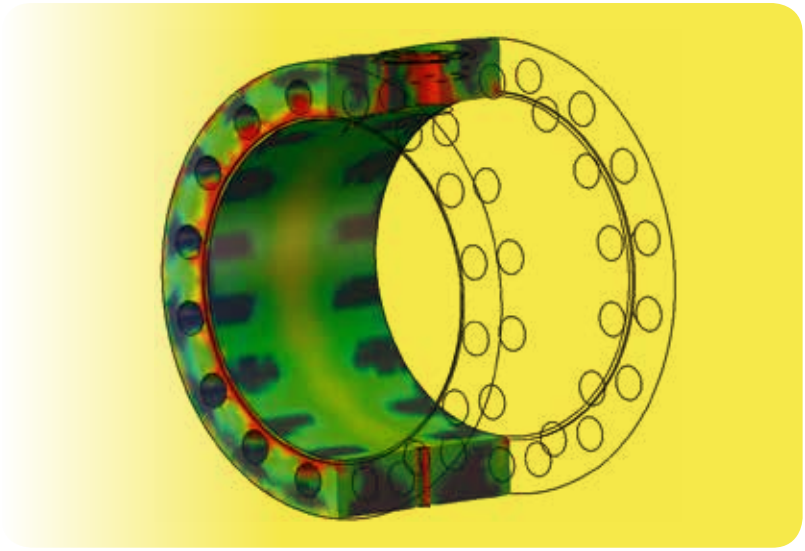
BFE offers extensive expertise in the design that provide the advantage of sophisticated product development with fast and cost-effective manufacturing capabilities.

Our approach ensures that you receive the lowest cost, and highest efficiency solution with a quick turn-around.

Bonney Forge represent decades of design experience across all market sectors. Using the latest software and design technologies, our Engineering can take your requirements and develop a specific custom solution.

BFE Engineering Department operates state of the art design tools with last generation solid modeling, linear and non linear finite element analysis and computational fluid dynamic analysis.

FMEA and FMECA tools tools are used to used to minimize the development risks and increase product reliability during the development of new products.



PRODUCTION CAPABILITIES THAT MEET YOUR DEMANDS

BFE is an integrated supplier with in-house forging, machining and assembly-test operations.

Continuous investment in computerized systems and integrated machining centres ensure the highest level of component repeatability, high volume capabilities with uncompromising quality.

BFE experience in managing the complete production process for complex and highly variable requirements benefits our customers by achieving a high rate of on-time delivery and the ability to meet some of the most demanding fast track shipments.

Combined with unlimited local qualified third party capabilities,

BFE production system is constantly expanding to handle steady growth rates and complex customer requirements.

VALVE SEAT & GASKET MATERIAL SELECTION GUIDE

Choosing the right seat material is the most important decision in ball valve selection. Use the Pressure/Temperature rating chart for the most common seat materials and ask us in case of special material or applications.

HOW TO USE THIS CHART

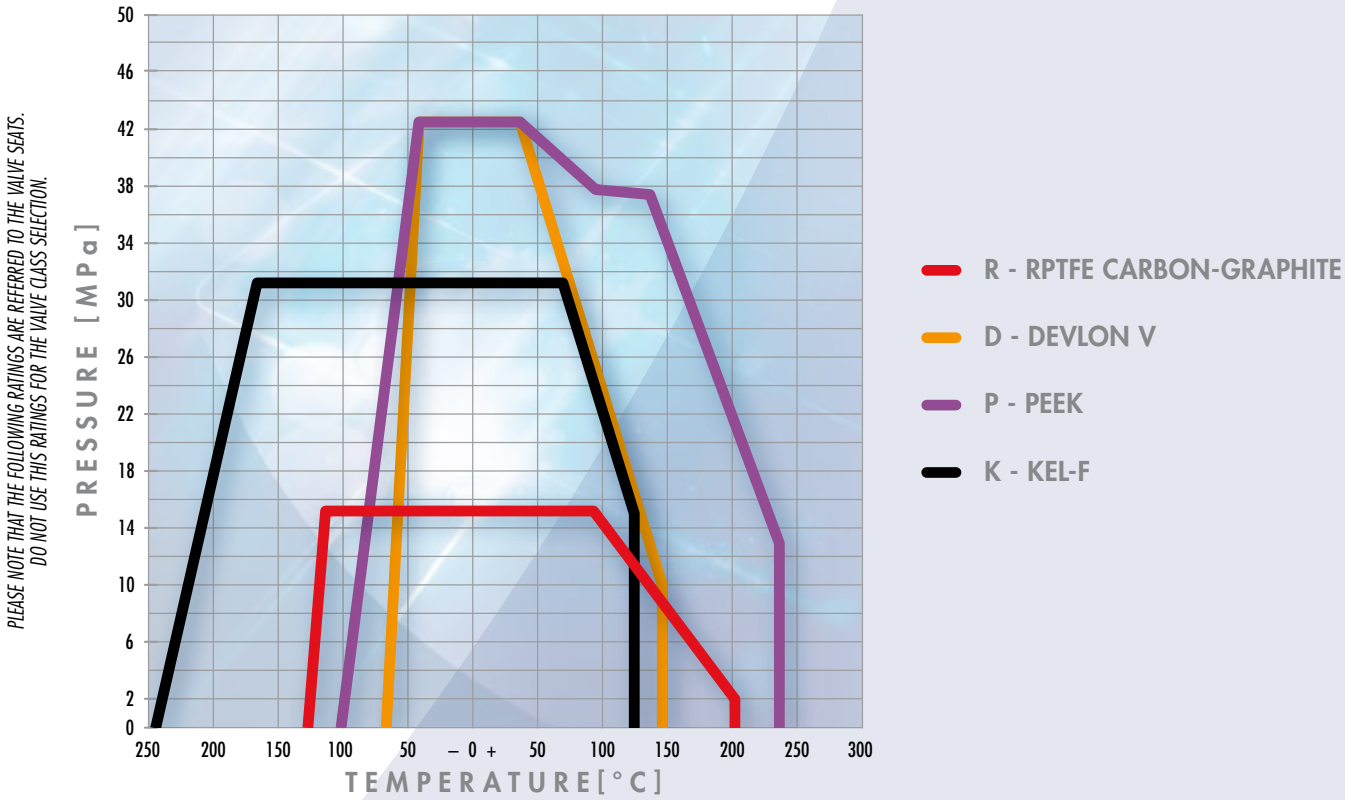
- Please note that the ratings are referred to the valve seats. Do not use these ratings for the valve class selections.
- All rating charts have been provided for non-shock fluid service.
- The choice of the seat material is limited by characteristics of the service fluid, working pressures, fluid velocity, and operational frequency of the valve. Choosing the right seat material is the most important decision in ball valve selection. Use the pressure/temperature rating charts for the most common seat materials and ask us in case of special material or applications.
- The BFE SEAL CODE (3 digits) is designed to cover essential features of BFE seats and gasket material, the code is marked on the valve name plate in order to allow customers to easily identify the internal soft material.

DIGIT-1 – INSERT SEAT MATERIAL DIGIT-2 – EMERGENCY BODY SEAL DIGIT-3 – FIRST BODY SEAL

Example: SEAL CODE "RGR":

INSERT SEAT MATERIAL	**= RPTFE CARBO-GRAPHITE**
ERGENCY BODY SEAL	**= GRAPHITE**
FIRST BODY SEAL	**= RPTFE CARBO-GRAPHITE**

TRUNNION BALL VALVES - PRESSURE/TEMPERATURE RATING CHART OF SEAT MATERIALS



VALVE SEAT & GASKET MATERIAL SELECTION GUIDE

The following table shows the most used materials, their characteristics, application (seat or gasket) and the BFE ID.

SEAL MATERIAL	MATERIALS CHARACTERISTICS	BFE SYMBOL	AVAILABLE MATERIAL FOR SEAT BFE SEAL CODE DIGIT 1	AVAILABLE MATERIAL FOR GASKET BFE SEAL CODE DIGIT 2/3
VIRGIN PTFE	Polytetrafluoroethylene is a Fluorocarbon-based polymer. This seating material has excellent chemical resistance and low coefficient of friction. PTFE is non-contaminating and accepted by FDA for use in food services. Not recommended for liquid alkalis and fluorine.	M	YES	YES
RPTFE 25% CARBON-GRAPHITE	PTFE's mechanical properties are enhanced by adding percentage of filler material to provide improved strength, stability and wear resistance.	R	YES	YES
RPTFE 25% GLASS	25% Glass Filled PTFE (Reinforced Polytetrafluoroethylene) is similar to RPTFE- CARBO-GRAPHITE but with even better resistance to wear and deformation under load. Strongly suggested for Sea-Water Service.	A	YES	YES
RPTFE 60% BRONZE	This material exhibits a unique combination of heat resistance and low friction together with outstanding chemical and good electrical properties. No moisture absorption, high arc resistance, and is self lubricating with a low coefficient of friction.	B	YES	NO
PEEK	Polyetheretherketone high temperature semi rigid elastomer. Best suited for high pressure and temperature service. Also offers very good corrosion resistance.	P	YES	NO
DEVLON-V	Devlon-V (special Nylon produced by Devol Engineering Ltd) offers very good performances regarding the maximum allowable pressure and excellent elasticity.	D	YES	NO
KEL-F	PCTFE (Polychlorotrifluoroethylene) is a fluorocarbon based polymer. It offers a unique combination of physical and mechanical properties non-flammability, chemical resistance, and near zero moisture absorption. It is suitable for cryogenic applications.	K	YES	NO
UHMWPE	Ultra-High Molecular Weight Polyethylene. Ideal for use in lowlevel radiation service. This seat also meets the requirements of the tobacco industry where TFE is prohibited and it offers an excellent resistance to abrasive media.	U	YES	YES
VESPEL	Vespel is manufactured by DuPont using high performance polyimide resin. Performs well in a variety of chemical environments and a variety of industrial fluids (fuels, oils, lubricants) at elevated temperatures. Temperature range can operate continuously from cryogenic to high temperature. Performs well in radio-active environments, even at relatively high dosage rates of exposure levels.	S	YES	NO
VITON	Standard material for O-RING.	V	NO	YES
SILICON	Silicon is a semi-organic elastomer with outstanding resistance to low temperatures. Silicon also has good resistance to compression set. Low physical strength and abrasion resistance combined with high friction limit silicone to low pressure applications. Silicone is used primarily for dry heat static seals.	S	NO	YES
SPRING ENERGIZED TFE BASED	"Spring energised plastic seals (Lip-Seal) from PTFE and PTFE compounds, with standard and special profiles for temperature from -196°C to +260°C, pressure range from high pressure to vacuum. Spring standard material ASTM F1058 R30003. Alternative spring materials are available and other elastomer compounds are available to suit special applications/media."	E	NO	YES
TUNGSTEN CARBIDE COATING	For liquid or gas services with high presence of solids or in any case where extreme hardness and wear resistance is required. Tungsten carbide itself is practically inert and extremely strong. Any attack is usually on the binder. Not suitable when small presence of caustic soda is expected.	W	YES	N.A.
CHROME CARBIDE COATING	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.	C	YES	N.A.
GRAPHITE	Hard carbon with excellent heat resistance. Not suitable as seat material when presence of oxidized service is expected.	G	YES	YES
OTHER	For other materials please ask BFE.	-	-	-

FULL BORE TRUNNION BALL VALVES
BASIC CONFIGURATION
ASME INTEGRAL FLANGED AND WELDING ENDS

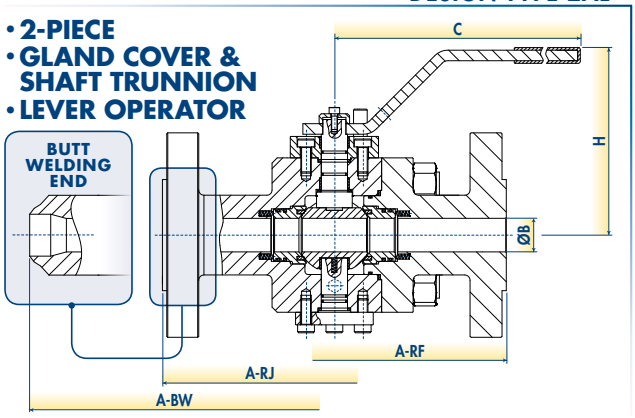
WORKING PRESSURE RATING	SIZE NPS	DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 150 (SEE NOTE 1)	1/2"	15	2AL	108	4.25	N.A.	N.A.	165[1]	6.50[1]	13	0.51	N.A.	N.A.	198	7.8	122	4.8	4.5	10	1-803
	3/4"	20	2AL	117	4.62	N.A.	N.A.	191[1]	7.50[1]	19	0.75	N.A.	N.A.	198	7.8	124	4.9	5.6	12	1-804
	1"	25	2AL	127	5.00	140	5.50	216[1]	8.50[1]	25	0.98	N.A.	N.A.	263	10.4	143	5.6	7.5	17	1-805
	1-1/2"	40	2AL	165	6.50	178	7.00	191	7.50	38	1.50	N.A.	N.A.	363	14.3	171	6.7	15	32	1-807
	2"	50	2AL	178	7.00	191	7.50	216	8.50	50	1.97	N.A.	N.A.	363	14.3	182	7.2	21	47	1-808
	3"	80	3AL	203	8.00	216	8.50	282	11.12	75	2.95	N.A.	N.A.	453	17.8	214	8.4	39	86	1-810
	4"	100	3BG	229	9.00	242	9.50	305	12.00	101	3.98	N.A.	N.A.	300	11.8	259	10.2	98	216	1-811
	6"	150	3CG	394	15.50	407	16.00	457	18.00	151	5.94	N.A.	N.A.	400	15.7	309	12.2	200	441	1-813
	8"	200	3CG	457	18.00	470	18.50	521	20.50	202	7.95	N.A.	N.A.	500	19.7	343	13.5	300	661	1-814
	10"	250	3CG	533	21.00	546	21.50	559	22.00	253	9.96	N.A.	N.A.	600	23.6	380	15.0	440	970	1-815
	12"	300	3CG	610	24.00	623	24.50	635	25.00	304	11.97	N.A.	N.A.	600	23.6	416	16.4	655	1444	1-816
	14"	350	3CG	686	27.00	699	27.50	762	30.00	335	13.19	N.A.	N.A.	600	23.6	470	18.5	970	2138	1-817
	16"	400	3CG	762	30.00	775	30.50	838	33.00	386	15.20	N.A.	N.A.	800	31.5	505	19.9	1250	2756	1-818
	18"	450	3CG	864	34.00	877	34.50	914	36.00	437	17.20	N.A.	N.A.	800	31.5	549	21.6	1800	3968	1-819
	20"	500	3CG	914	36.00	927	36.50	991	39.00	488	19.21	N.A.	N.A.	800	31.5	604	23.8	2300	5071	1-820
	22"	550	3CG	991	39.00	1003	39.50	1092	43.00	539	21.22	N.A.	N.A.	800	31.5	658	25.9	2920	6437	1-822
	24"	600	3CG	1067	42.00	1080	42.50	1143	45.00	590	23.23	N.A.	N.A.	800	31.5	700	27.6	3640	8025	1-824
ASME 300 (SEE NOTE 1)	1/2"	15	3AL	140	5.50	151	5.94	165[1]	6.50[1]	13	0.51	N.A.	N.A.	198	7.8	122	4.8	5.2	11	3-803
	3/4"	20	3AL	152	6.00	165	6.50	191[1]	7.50[1]	19	0.75	N.A.	N.A.	198	7.8	124	4.9	6.6	15	3-804
	1"	25	3AL	165	6.50	178	7.00	216[1]	8.50[1]	25	0.98	N.A.	N.A.	263	10.4	143	5.6	9.9	22	3-805
	1-1/2"	40	3AL	191	7.50	203	8.00	191	7.50	38	1.50	N.A.	N.A.	363	14.3	171	6.7	18	41	3-807
	2"	50	3AL	216	8.50	232	9.12	216	8.50	50	1.97	N.A.	N.A.	363	14.3	182	7.2	27	59	3-808
	3"	80	3AL	282	11.12	298	11.74	282	11.12	75	2.95	N.A.	N.A.	453	17.8	214	8.4	51	112	3-810
	4"	100	3BG	305	12.00	321	12.62	305	12.00	101	3.98	N.A.	N.A.	300	11.8	259	10.2	136	300	3-811
	6"	150	3CG	403	15.88	419	16.50	457	18.00	151	5.94	N.A.	N.A.	500	19.7	309	12.2	230	507	3-813
	8"	200	3CG	502	19.75	518	20.37	521	20.50	202	7.95	N.A.	N.A.	500	19.7	343	13.5	374	825	3-814
	10"	250	3CG	568	22.38	584	23.00	559	22.00	253	9.96	N.A.	N.A.	600	23.6	382	15.0	540	1190	3-815
	12"	300	3CG	648	25.50	664	26.12	635	25.00	304	11.97	N.A.	N.A.	600	23.6	430	16.9	805	1775	3-816
	14"	350	3CG	762	30.00	778	30.62	762	30.00	335	13.19	N.A.	N.A.	800	31.5	475	18.7	1180	2601	3-817
	16"	400	3CG	838	33.00	854	33.62	838	33.00	386	15.20	N.A.	N.A.	800	31.5	520	20.5	1660	3660	3-818
	18"	450	3CG	914	36.00	930	36.62	914	36.00	437	17.20	N.A.	N.A.	800	31.5	570	22.4	2200	4850	3-819
	20"	500	3CG	991	39.00	1010	39.75	991	39.00	488	19.21	N.A.	N.A.	800	31.5	620	24.4	2700	5952	3-820
	22"	550	3CG	1092	43.00	1114	43.88	1092	43.00	539	21.22	N.A.	N.A.	800	31.5	670	26.4	3350	7385	3-822
	24"	600	3CG	1143	45.00	1165	45.88	1143	45.00	590	23.23	N.A.	N.A.	800	31.5	710	28.0	4100	9039	3-824

PRODUCT FEATURES:
- *Standard O-Rings in Viton with AED properties.*

NOTE 1: ASME B16.10 does not specify any value, selected Face-to-Face acc.to ASME B16.10 related to class 600.

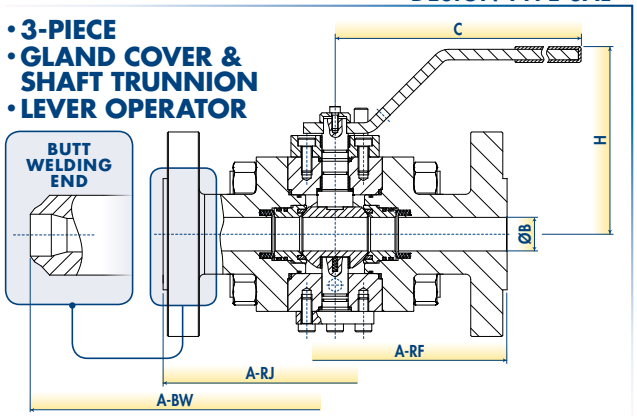
DESIGN TYPE 2AL

- 2-PIECE
- GLAND COVER & SHAFT TRUNNION
- LEVER OPERATOR



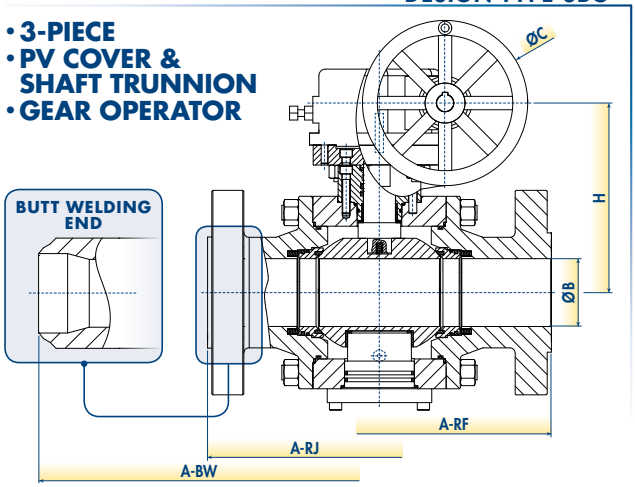
DESIGN TYPE 3AL

- 3-PIECE
- GLAND COVER & SHAFT TRUNNION
- LEVER OPERATOR



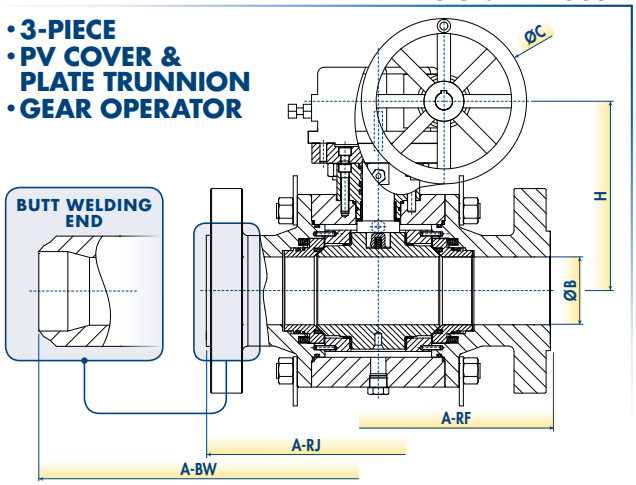
DESIGN TYPE 3BG

- 3-PIECE
- PV COVER & SHAFT TRUNNION
- GEAR OPERATOR



DESIGN TYPE 3CG

- 3-PIECE
- PV COVER & PLATE TRUNNION
- GEAR OPERATOR



REDUCED BORE TRUNNION BALL VALVES
BASIC CONFIGURATION
ASME INTEGRAL FLANGED ENDS

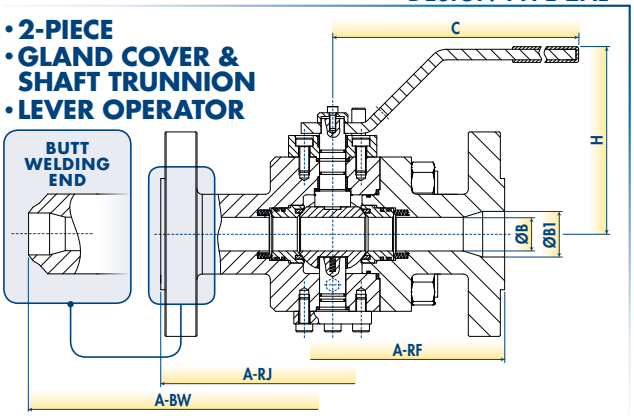
WORKING PRESSURE RATING	SIZE NPS	DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 150 (SEE NOTE 1)	1/2"	15	2AL	108	4.25	N.A.	N.A.	165(1)	6.50(1)	13	0.51	13	0.51	198	7.8	122	4.8	4.5	10	L1 803
	3/4"	20	2AL	117	4.62	N.A.	N.A.	191(1)	7.50(1)	13	0.51	19	0.75	198	7.8	122	4.8	5.1	11	L1 804
	1"	25	2AL	127	5.00	140	5.50	216(1)	8.50(1)	19	0.75	25	0.98	198	7.8	124	4.9	5.5	12	L1 805
	1-1/2"	40	2AL	165	6.50	178	7.00	191	7.50	25	0.98	38	1.50	263	10.4	143	5.6	10	22	L1 807
	2"	50	2AL	178	7.00	191	7.50	216	8.50	38	1.50	50	1.97	363	14.3	171	6.7	18	39	L1 808
	3"	80	2AL	203	8.00	216	8.50	282	11.12	50	1.97	75	2.95	363	14.3	182	7.2	27	60	L1 810
	4"	100	3AL	229	9.00	242	9.50	305	12.00	75	2.95	101	3.98	453	17.8	214	8.4	44	97	L1 811
	6"	150	3BG	394	15.50	407	16.00	457	18.00	101	3.98	151	5.94	300	11.8	259	10.2	120	265	L1 813
	8"	200	3CG	457	18.00	470	18.50	521	20.50	151	5.94	202	7.95	400	15.7	309	12.2	223	492	L1 814
	10"	250	3CG	533	21.00	546	21.50	559	22.00	202	7.95	253	9.96	500	19.7	343	13.5	328	723	L1 815
	12"	300	3CG	610	24.00	623	24.50	635	25.00	253	9.96	304	11.97	600	23.6	380	15.0	501	1105	L1 816
	14"	350	3CG	686	27.00	699	27.50	762	30.00	304	11.97	335	13.19	600	23.6	416	16.4	740	1631	L1 817
	16"	400	3CG	762	30.00	775	30.50	838	33.00	335	13.19	386	15.20	600	23.6	470	18.5	1098	2421	L1 818
	18"	450	3CG	864	34.00	877	34.50	914	36.00	386	15.20	437	17.20	800	31.5	505	19.9	1330	2932	L1 819
	20"	500	3CG	914	36.00	927	36.50	991	39.00	437	17.20	488	19.21	800	31.5	549	21.6	2000	4409	L1 820
	22"	550	3CG	991	39.00	1003	39.50	1092	43.00	488	19.21	539	21.22	800	31.5	604	23.8	2600	5732	L1 822
	24"	600	3CG	1067	42.00	1080	42.50	1143	45.00	539	21.22	590	23.23	800	31.5	658	25.9	3200	7055	L1 824
ASME 300 (SEE NOTE 1)	1/2"	15	3AL	140	5.50	151	5.94	165(1)	6.50(1)	13	0.51	13	0.51	198	7.8	122	4.8	5.2	11	L3 803
	3/4"	20	3AL	152	6.00	165	6.5	191(1)	7.50(1)	13	0.51	19	0.75	198	7.8	122	4.8	6.1	13	L3 804
	1"	25	3AL	165	6.50	178	7.00	216(1)	8.50(1)	19	0.75	25	0.98	198	7.8	124	4.9	8	18	L3 805
	1-1/2"	40	3AL	191	7.50	203	8.00	191	7.50	25	0.98	38	1.50	263	10.4	143	5.6	14	31	L3 807
	2"	50	3AL	216	8.50	232	9.12	216	8.50	38	1.50	50	1.97	363	14.3	171	6.7	20	44	L3 808
	3"	80	3AL	282	11.12	298	11.74	282	11.12	50	1.97	75	2.95	363	14.3	182	7.2	35	78	L3 810
	4"	100	3AL	305	12.00	321	12.62	305	12.00	75	2.95	101	3.98	453	17.8	214	8.4	59.5	131	L3 811
	6"	150	3BG	403	15.88	419	16.50	457	18.00	101	3.98	151	5.94	300	11.8	259	10.2	161	355	L3 813
	8"	200	3CG	502	19.75	518	20.37	521	20.50	151	5.94	202	7.95	500	19.7	309	12.2	265	584	L3 814
	10"	250	3CG	568	22.38	584	23.00	559	22.00	202	7.95	253	9.96	500	19.7	343	13.5	418	922	L3 815
	12"	300	3CG	648	25.50	664	26.12	635	25.00	253	9.96	304	11.97	600	23.6	382	15.0	600	1323	L3 816
	14"	350	3CG	762	30.00	778	30.62	762	30.00	304	11.97	335	13.19	600	23.6	430	16.9	898	1980	L3 817
	16"	400	3CG	838	33.00	854	33.62	838	33.00	335	13.19	386	15.20	800	31.5	475	18.7	1300	2866	L3 818
	18"	450	3CG	914	36.00	930	36.62	914	36.00	386	15.20	437	17.20	800	31.5	520	20.5	1750	3858	L3 819
	20"	500	3CG	991	39.00	1010	39.75	991	39.00	437	17.20	488	19.21	800	31.5	570	22.4	2350	5181	L3 820
	22"	550	3CG	1092	43.00	1114	43.88	1092	43.00	488	19.21	539	21.22	800	31.5	620	24.4	3100	6834	L3 822
	24"	600	3CG	1143	45.00	1165	45.88	1143	45.00	539	21.22	590	23.23	800	31.5	670	26.4	4050	8929	L3 824

PRODUCT FEATURES:
- *Standard O-Rings in Viton with AED properties.*

NOTE 1: ASME B16.10 does not specify any value, selected Face-to-Face acc.to ASME B16.10 related to class 600.

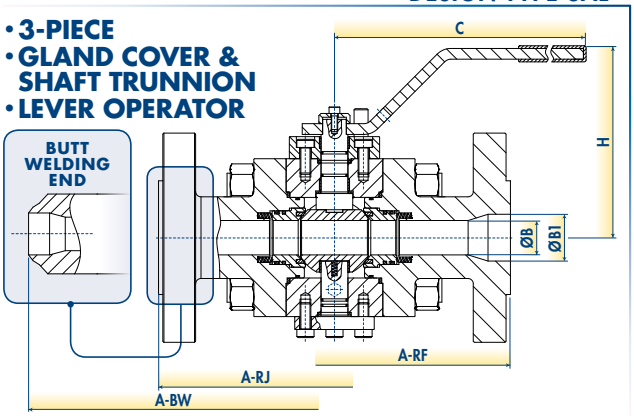
DESIGN TYPE 2AL

- 2-PIECE
- GLAND COVER & SHAFT TRUNNION
- LEVER OPERATOR



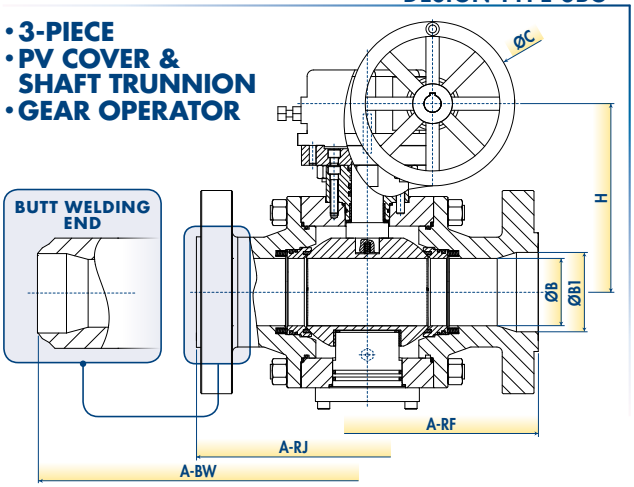
DESIGN TYPE 3AL

- 3-PIECE
- GLAND COVER & SHAFT TRUNNION
- LEVER OPERATOR



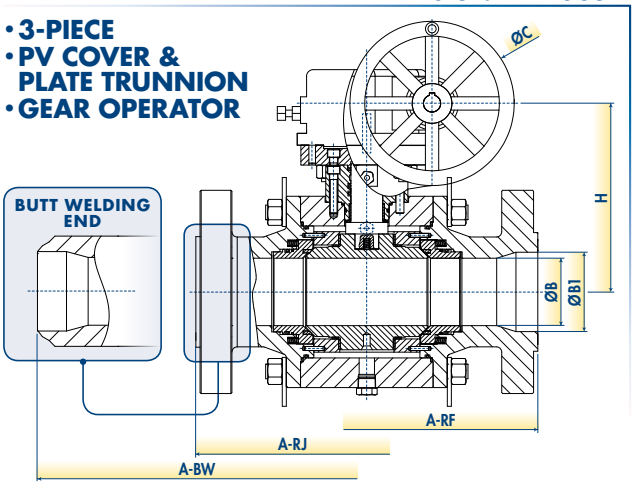
DESIGN TYPE 3BG

- 3-PIECE
- PV COVER & SHAFT TRUNNION
- GEAR OPERATOR



DESIGN TYPE 3CG

- 3-PIECE
- PV COVER & PLATE TRUNNION
- GEAR OPERATOR



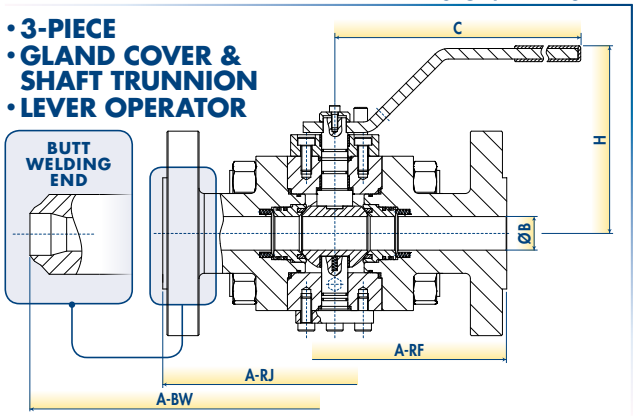
FULL BORE TRUNNION BALL VALVES
BASIC CONFIGURATION
ASME INTEGRAL FLANGED AND WELDING ENDS

WORKING PRESSURE RATING	SIZE NPS	DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 600	1/2"	15	3AL	165	6.50	163	6.44	165	6.44	13	0.51	N.A.	N.A.	198	7.8	122	4.8	6.2	14	6-803
	3/4"	20	3AL	191	7.50	191	7.50	191	7.50	19	0.75	N.A.	N.A.	263	10.4	129	5.1	8.6	19	6-804
	1"	25	3AL	216	8.50	216	8.50	216	8.50	25	0.98	N.A.	N.A.	263	10.4	143	5.6	12	27	6-805
	1-1/2"	40	3AL	241	9.50	241	9.50	241	9.50	38	1.50	N.A.	N.A.	363	14.3	171	6.7	23	50	6-807
	2"	50	3AL	292	11.50	295	11.62	292	11.50	50	1.97	N.A.	N.A.	363	14.3	182	7.2	35	77	6-808
	3"	80	3AL	356	14.00	359	14.12	356	14.00	75	2.95	N.A.	N.A.	453	17.8	214	8.4	65	143	6-810
	4"	100	3BG	432	17.00	435	17.12	432	17.00	101	3.98	N.A.	N.A.	400	15.7	259	10.2	173	381	6-811
	6"	150	3CG	559	22.00	562	22.12	559	22.00	151	5.94	N.A.	N.A.	500	19.7	309	12.2	316	697	6-813
	8"	200	3CG	660	26.00	663	26.12	660	26.00	202	7.95	N.A.	N.A.	500	19.7	355	14.0	523	1153	6-814
	10"	250	3CG	787	31.00	790	31.12	787	31.00	253	9.96	N.A.	N.A.	600	23.6	400	15.7	800	1764	6-815
	12"	300	3CG	838	33.00	841	33.12	838	33.00	304	11.97	N.A.	N.A.	800	31.5	455	17.9	1100	2425	6-816
	14"	350	3CG	889	35.00	892	35.12	889	35.00	335	13.19	N.A.	N.A.	800	31.5	490	19.3	1250	2756	6-817
	16"	400	3CG	991	39.00	994	39.12	991	39.00	386	15.20	N.A.	N.A.	800	31.5	530	20.9	1750	3858	6-818
	18"	450	3CG	1092	43.00	1095	43.12	1092	43.00	437	17.20	N.A.	N.A.	800	31.5	590	23.2	2650	5842	6-819
	20"	500	3CG	1194	47.00	1200	47.25	1194	47.00	488	19.21	N.A.	N.A.	800	31.5	640	25.2	3150	6945	6-820
	22"	550	3CG	1295	51.00	1305	51.38	1295	51.00	539	21.22	N.A.	N.A.	800	31.5	705	27.8	4300	9480	6-822
	24"	600	3CG	1397	55.00	1407	55.38	1397	55.00	590	23.23	N.A.	N.A.	800	31.5	750	29.5	5300	11684	6-824
ASME 900	1/2"	15	3AL	216	8.50	216	8.50	216	8.50	13	0.51	N.A.	N.A.	263	10.4	127	5.0	10	22	90H 803
	3/4"	20	3AL	229	9.00	229	9.00	229	9.00	19	0.75	N.A.	N.A.	263	10.4	129	5.1	12	26	90H 804
	1"	25	3AL	254	10.00	254	10.00	254	10.00	25	0.98	N.A.	N.A.	363	14.3	144	5.7	18	39	90H 805
	1-1/2"	40	3AL	305	12.00	305	12.00	305	12.00	38	1.50	N.A.	N.A.	363	14.3	171	6.7	32	70	90H 807
	2"	50	3AL	368	14.50	371	14.62	368	14.50	50	1.97	N.A.	N.A.	453	17.8	187	7.4	54	118	90H 808
	3"	80	3BG	381	15.00	384	15.12	381	15.00	75	2.95	N.A.	N.A.	400	15.7	211	8.3	104	229	90H 810
	4"	100	3BG	457	18.00	460	18.12	457	18.00	101	3.98	N.A.	N.A.	400	15.7	259	10.2	187	412	90H 811
	6"	150	3CG	610	24.00	613	24.12	610	24.00	151	5.94	N.A.	N.A.	500	19.7	319	12.6	405	893	90H 813
	8"	200	3CG	737	29.00	740	29.12	737	29.00	202	7.95	N.A.	N.A.	600	23.6	390	15.4	810	1786	90H 814
	10"	250	3CG	838	33.00	841	33.12	838	33.00	253	9.96	N.A.	N.A.	800	31.5	434	17.1	1160	2557	90H 815
	12"	300	3CG	965	38.00	968	38.12	965	38.00	304	11.97	N.A.	N.A.	800	31.5	483	19.0	1640	3616	90H 816
	14"	350	3CG	1029	40.50	1039	40.88	1029	40.50	323	12.72	N.A.	N.A.	800	31.5	520	20.5	2150	4740	90H 817
	16"	400	3CG	1130	44.50	1140	44.88	1130	44.50	374	14.72	N.A.	N.A.	800	31.5	587	23.1	3030	6680	90H 818
	18"	450	3CG	1219	48.00	1232	48.50	1219	48.00	424	16.69	N.A.	N.A.	800	31.5	625	24.6	3400	7496	90H 819
	20"	500	3CG	1321	52.00	1334	52.50	1321	52.00	472	18.58	N.A.	N.A.	800	31.5	720	28.3	4850	10692	90H 820
	22"	550	3CG	1435	56.50	1448	57.00	1435	56.50	523	20.59	N.A.	N.A.	800	31.5	832	32.8	5900	13007	90H 822
	24"	600	3CG	1549	61.00	1568	61.75	1549	61.00	571	22.48	N.A.	N.A.	800	31.5	850	33.5	7450	16424	90H 824

PRODUCT FEATURES:
- *Standard O-Rings in Viton with AED properties.*

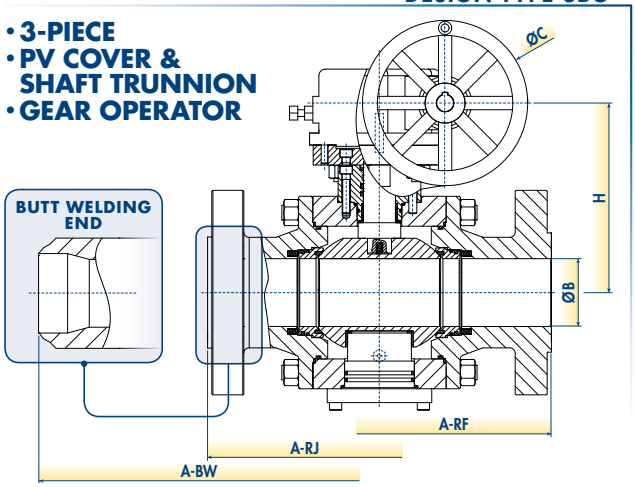
DESIGN TYPE 3AL

- 3-PIECE
- GLAND COVER & SHAFT TRUNNION
- LEVER OPERATOR



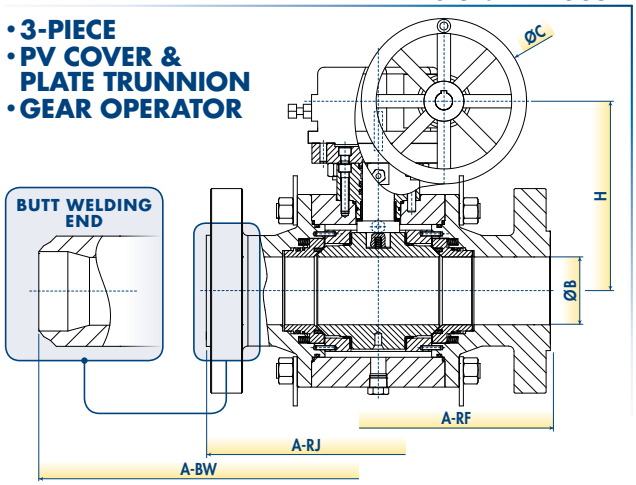
DESIGN TYPE 3BG

- 3-PIECE
- PV COVER & SHAFT TRUNNION
- GEAR OPERATOR



DESIGN TYPE 3CG

- 3-PIECE
- PV COVER & PLATE TRUNNION
- GEAR OPERATOR



REDUCED BORE TRUNNION BALL VALVES

BASIC CONFIGURATION

ASME INTEGRAL FLANGED ENDS

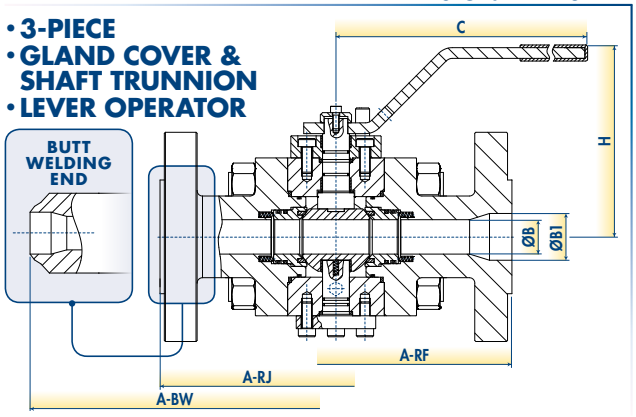
WORKING PRESSURE RATING	SIZE NPS	SIZE DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 600	1/2"	15	3AL	165	6.50	163	6.44	165	6.50	13	0.51	13	0.51	198	7.8	122	4.8	6.2	14	L6 803
	3/4"	20	3AL	191	7.50	191	7.50	191	7.50	13	0.51	19	0.75	198	7.8	122	4.8	7.7	17	L6 804
	1"	25	3AL	216	8.50	216	8.50	216	8.50	19	0.75	25	0.98	263	10.4	129	5.1	9.7	21	L6 805
	1-1/2"	40	3AL	241	9.50	241	9.50	241	9.50	25	0.98	38	1.50	263	10.4	143	5.6	18	40	L6 807
	2"	50	3AL	292	11.50	295	11.62	292	11.50	38	1.50	50	1.97	363	14.3	171	6.7	26	58	L6 808
	3"	80	3AL	356	14.00	359	14.12	356	14.00	50	1.97	75	2.95	363	14.3	182	7.2	45	99	L6 810
	4"	100	3AL	432	17.00	435	17.12	432	17.00	75	2.95	101	3.98	453	17.8	214	8.4	85	187	L6 811
	6"	150	3BG	559	22.00	562	22.12	559	22.00	101	3.98	151	5.94	400	15.7	259	10.2	216	476	L6 813
	8"	200	3CG	660	26.00	663	26.12	660	26.00	151	5.94	202	7.95	500	19.7	309	12.2	370	816	L6 814
	10"	250	3CG	787	31.00	790	31.12	787	31.00	202	7.95	253	9.96	500	19.7	355	14.0	570	1257	L6 815
	12"	300	3CG	838	33.00	841	33.12	838	33.00	253	9.96	304	11.97	600	23.6	400	15.7	850	1874	L6 816
	14"	350	3CG	889	35.00	892	35.12	889	35.00	304	11.97	335	13.19	800	31.5	455	17.9	1180	2601	L6 817
	16"	400	3CG	991	39.00	994	39.12	991	39.00	335	13.19	386	15.20	800	31.5	490	19.3	1360	2998	L6 818
	18"	450	3CG	1092	43.00	1095	43.12	1092	43.00	386	15.20	437	17.20	800	31.5	530	20.9	1900	4189	L6 819
	20"	500	3CG	1194	47.00	1200	47.25	1194	47.00	437	17.20	488	19.21	800	31.5	590	23.2	2980	6570	L6 820
	22"	550	3CG	1295	51.00	1305	51.38	1295	51.00	488	19.21	539	21.22	800	31.5	640	25.2	4050	8929	L6 822
	24"	600	3CG	1397	55.00	1407	55.38	1397	55.00	539	21.22	590	23.23	800	31.5	705	27.8	5200	11464	L6 824
ASME 900	1/2"	15	3AL	216	8.50	216	8.5	216	8.50	13	0.51	13	0.51	263	10.4	127	5.0	10	22	90HL 803
	3/4"	20	3AL	229	9.00	229	9.0	229	9.00	13	0.51	19	0.75	263	10.4	127	5.0	11	24	90HL 804
	1"	25	3AL	254	10.00	254	10.00	254	10.00	19	0.75	25	0.98	263	10.4	129	5.1	15	34	90HL 805
	1-1/2"	40	3AL	305	12.00	305	12.00	305	12.00	25	0.98	38	1.50	363	14.3	144	5.7	22	49	90HL 807
	2"	50	3AL	368	14.50	371	14.62	368	14.50	38	1.50	50	1.97	363	14.3	171	6.7	43	95	90HL 808
	3"	80	3AL	381	15.00	384	15.12	381	15.00	50	1.97	75	2.95	453	17.8	187	7.4	60	132	90HL 810
	4"	100	3BG	457	18.00	460	18.12	457	18.00	75	2.95	101	3.98	400	15.7	211	8.3	125	276	90HL 811
	6"	150	3BG	610	24.00	613	24.12	610	24.00	101	3.98	151	5.94	400	15.7	259	10.2	250	551	90HL 813
	8"	200	3CG	737	29.00	740	29.12	737	29.00	151	5.94	202	7.95	500	19.7	319	12.6	480	1058	90HL 814
	10"	250	3CG	838	33.00	841	33.12	838	33.00	202	7.95	253	9.96	600	23.6	390	15.4	920	2028	90HL 815
	12"	300	3CG	965	38.00	968	38.12	965	38.00	253	9.96	304	11.97	800	31.5	434	17.1	1300	2866	90HL 816
	14"	350	3CG	1029	40.50	1039	40.88	1029	40.50	304	11.97	323	12.72	800	31.5	483	19.0	1740	3836	90HL 817
	16"	400	3CG	1130	44.50	1140	44.88	1130	44.50	323	12.72	374	14.72	800	31.5	520	20.5	2330	5137	90HL 818
	18"	450	3CG	1219	48.00	1232	48.50	1219	48.00	374	14.72	424	16.69	800	31.5	587	23.1	3250	7165	90HL 819
	20"	500	3CG	1321	52.00	1334	52.50	1321	52.00	424	16.69	472	18.58	800	31.5	625	24.6	4500	9921	90HL 820
	22"	550	3CG	1435	56.50	1448	57.00	1435	56.50	472	18.58	523	20.59	800	31.5	720	28.3	5700	12566	90HL 822
	24"	600	3CG	1549	61.00	1568	61.75	1549	61.00	523	20.59	571	22.48	800	31.5	832	32.8	7100	15653	90HL 824

PRODUCT FEATURES:

- *Standard O-Rings in Viton with AED properties.*

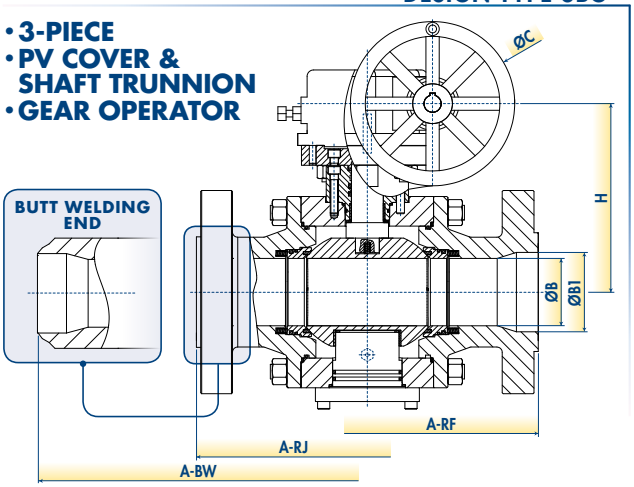
DESIGN TYPE 3AL

- 3-PIECE
- GLAND COVER & SHAFT TRUNNION
- LEVER OPERATOR



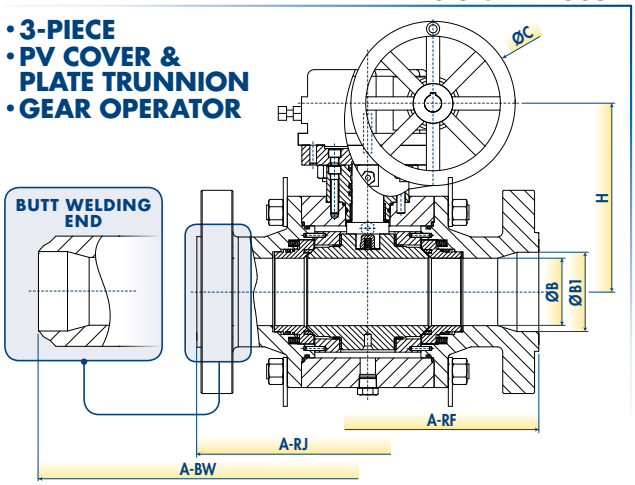
DESIGN TYPE 3BG

- 3-PIECE
- PV COVER & SHAFT TRUNNION
- GEAR OPERATOR



DESIGN TYPE 3CG

- 3-PIECE
- PV COVER & PLATE TRUNNION
- GEAR OPERATOR



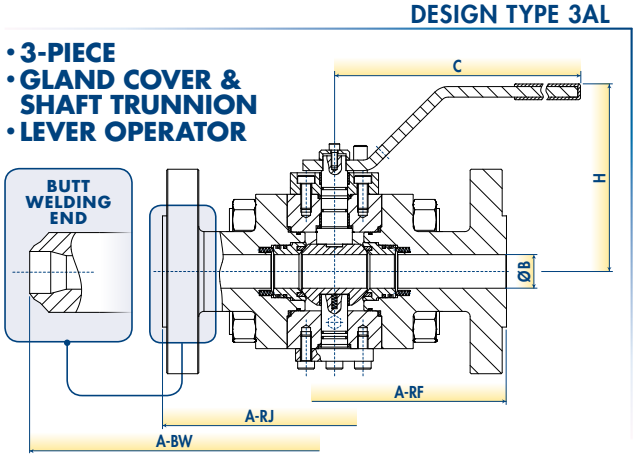
FULL BORE TRUNNION BALL VALVES
BASIC CONFIGURATION
ASME INTEGRAL FLANGED AND WELDING ENDS

WORKING PRESSURE RATING	SIZE NPS	DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 1500	1/2"	15	3AL	216	8.50	216	8.50	216	8.50	13	0.51	N.A.	N.A.	263	10.4	127	5.0	10	22	15H 803
	3/4"	20	3AL	229	9.00	229	9.00	229	9.00	19	0.75	N.A.	N.A.	263	10.4	129	5.1	12	26	15H 804
	1"	25	3AL	254	10.00	254	10.00	254	10.00	25	0.98	N.A.	N.A.	363	14.3	144	5.7	18	39	15H 805
	1-1/2"	40	3AL	305	12.00	305	12.00	305	12.00	38	1.50	N.A.	N.A.	363	14.3	171	6.7	32	70	15H 807
	2"	50	3AL	368	14.50	371	14.62	368	14.50	50	1.97	N.A.	N.A.	453	17.8	187	7.4	54	118	15H 808
	3"	80	3BG	470	18.50	473	18.62	470	18.50	75	2.95	N.A.	N.A.	400	15.7	216	8.5	134	295	15H 810
	4"	100	3BG	546	21.50	549	21.62	546	21.50	101	3.98	N.A.	N.A.	500	19.7	284	11.2	301	664	15H 811
	6"	150	3CG	705	27.75	711	28.00	705	27.75	145	5.71	N.A.	N.A.	500	19.7	375	14.8	692	1526	15H 813
	8"	200	3CG	832	32.75	842	33.13	832	32.75	193	7.60	N.A.	N.A.	800	31.5	457	18.0	1240	2734	15H 814
	10"	250	3CG	991	39.00	1001	39.38	991	39.00	240	9.45	N.A.	N.A.	800	31.5	510	20.1	2080	4586	15H 815
	12"	300	3CG	1130	44.50	1146	45.12	1130	44.50	288	11.34	N.A.	N.A.	800	31.5	588	23.1	3170	6989	15H 816
	14"	350	3CG	1257	49.50	1276	50.25	1257	49.50	316	12.44	N.A.	N.A.	800	31.5	620	24.4	3900	8598	15H 817
	16"	400	3CG	1384	54.50	1406	55.38	1384	54.50	361	14.21	N.A.	N.A.	800	31.5	680	26.8	5400	11905	15H 818
	18"	450	3CG	1537	60.51	1559	61.38	1537	60.51	405	15.94	N.A.	N.A.	800	31.5	740	29.1	7100	15653	15H 819
	20"	500	3CG	1664	65.51	1686	66.38	1664	65.51	455	17.91	N.A.	N.A.	800	31.5	800	31.5	9800	21605	15H 820
	22"	550	3CG	1801	70.91	1829	72.01	1801	70.91	490	19.29	N.A.	N.A.	800	31.5	870	34.3	11600	25574	15H 822
	24"	600	3CG	1943	76.50	1972	77.64	1943	76.50	530	20.87	N.A.	N.A.	800	31.5	930	36.6	14400	31747	15H 824
ASME 2500	1/2"	15	3AL	264	10.39	264	10.39	264	10.39	13	0.51	N.A.	N.A.	263	10.4	127	5.0	13	29	25H 803
	3/4"	20	3AL	273	10.75	273	10.75	273	10.75	15.5	0.61	N.A.	N.A.	363	14.3	129	5.1	15	34	25H 804
	1"	25	3AL	308	12.12	308	12.12	308	12.12	21	0.83	N.A.	N.A.	363	14.3	144	5.7	24	54	25H 805
	1-1/2"	40	3AL	384	15.12	387	15.24	384	15.12	32	1.26	N.A.	N.A.	453	17.8	179	7.0	56	123	25H 807
	2"	50	3AL	451	17.75	454	17.87	451	17.75	43	1.69	N.A.	N.A.	453	17.8	212	8.3	95	211	25H 808
	3"	80	3BG	578	22.75	584	23.00	578	22.75	63	2.48	N.A.	N.A.	500	19.7	280	11.0	293	646	25H 810
	4"	100	3BG	673	26.50	683	26.88	673	26.50	88	3.46	N.A.	N.A.	500	19.7	355	14.0	578	1274	25H 811
	6"	150	2CG	914	36.00	927	36.50	914	36.00	132	5.20	N.A.	N.A.	600	23.6	450	17.7	1250	2756	25H 813
	8"	200	2CG	1022	40.25	1038	40.87	1022	40.25	180	7.09	N.A.	N.A.	800	31.5	560	22.0	2300	5071	25H 814
	10"	250	2CG	1270	50.00	1292	50.88	1270	50.00	224	8.82	N.A.	N.A.	800	31.5	630	24.8	3200	7055	25H 815
	12"	300	2CG	1422	56.00	1444	56.88	1422	56.00	266	10.47	N.A.	N.A.	800	31.5	700	27.6	4400	9700	25H 816
	14"	350	2CG	1532	60.63	1569	61.77	1532	60.63	272	10.71	N.A.	N.A.	800	31.5	750	29.5	6300	13889	25H 817
	16"	400	2CG	1567	61.69	1596	62.83	1567	61.69	276	10.87	N.A.	N.A.	800	31.5	820	32.3	7500	16535	25H 818
	18"	450	2CG	1825	71.85	1854	72.99	1825	71.85	311	12.24	N.A.	N.A.	800	31.5	890	35.0	8900	19621	25H 819
	20"	500	2CG	1875	73.82	1904	74.96	1875	73.82	343	13.50	N.A.	N.A.	800	31.5	970	38.2	11200	24692	25H 820
	22"	550	2CG	2055	80.91	2086	82.13	2055	80.91	378	14.88	N.A.	N.A.	800	31.5	1050	41.3	13000	28660	25H 822
	24"	600	2CG	2257	88.86	2286	90.00	2257	88.86	413	16.26	N.A.	N.A.	800	31.5	1200	47.2	16000	35274	25H 824

PRODUCT FEATURES:
- *Standard O-Rings in Viton with AED properties.*

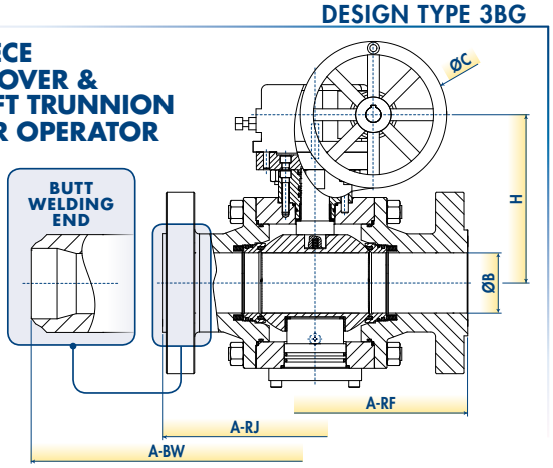
DESIGN TYPE 3AL

- 3-PIECE
- GLAND COVER & SHAFT TRUNNION
- LEVER OPERATOR



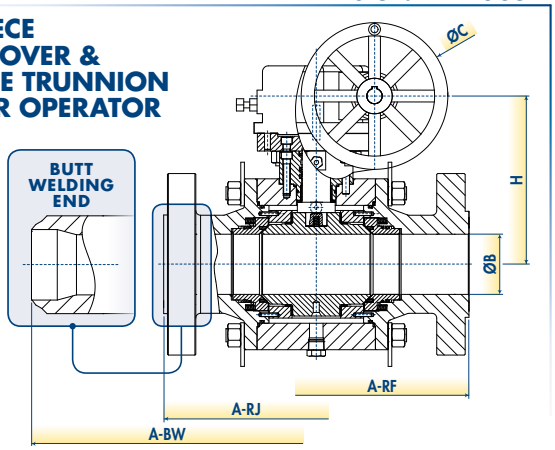
DESIGN TYPE 3BG

- 3-PIECE
- PV COVER & SHAFT TRUNNION
- GEAR OPERATOR



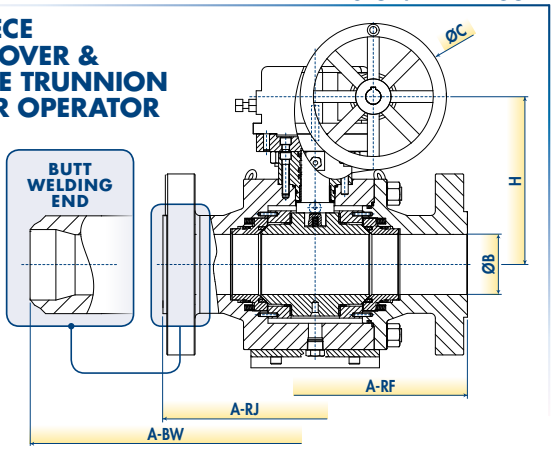
DESIGN TYPE 3CG

- 3-PIECE
- PV COVER & PLATE TRUNNION
- GEAR OPERATOR



DESIGN TYPE 2CG

- 2-PIECE
- PV COVER & PLATE TRUNNION
- GEAR OPERATOR



REDUCED BORE TRUNNION BALL VALVES

BASIC CONFIGURATION

ASME INTEGRAL FLANGED ENDS

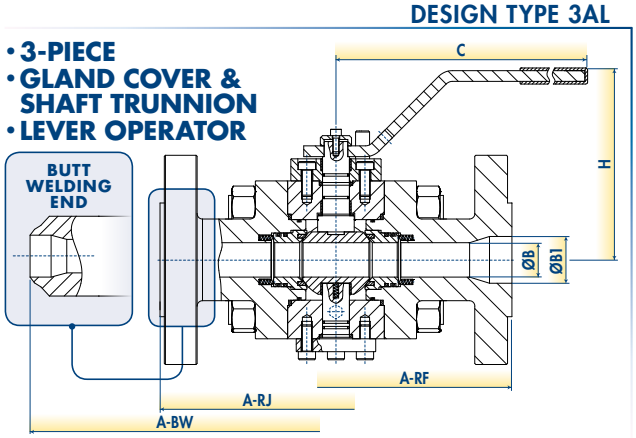
WORKING PRESSURE RATING	SIZE NPS	SIZE DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 1500	1/2"	15	3AL	216	8.50	216	8.5	216	8.50	13	0.51	13	0.51	263	10.4	127	5.0	10	22	15HL 803
	3/4"	20	3AL	229	9.00	229	9.00	229	9.00	13	0.51	19	0.75	263	10.4	127	5.0	11	24	15HL 804
	1"	25	3AL	254	10.00	254	10.00	254	10.00	19	0.75	25	0.98	263	10.4	129	5.1	15	34	15HL 805
	1-1/2"	40	3AL	305	12.00	305	12.00	305	12.00	25	0.98	38	1.50	363	14.3	144	5.7	22	49	15HL 807
	2"	50	3AL	368	14.50	371	14.62	368	14.50	38	1.50	50	1.97	363	14.3	171	6.7	43	95	15HL 808
	3"	80	3AL	470	18.50	473	18.62	470	18.50	50	1.97	75	2.95	453	17.8	187	7.4	74	163	15HL 810
	4"	100	3BG	546	21.50	549	21.62	546	21.50	75	2.95	101	3.98	400	15.7	216	8.5	154	340	15HL 811
	6"	150	3BG	705	27.75	711	28.00	705	27.75	101	3.98	145	5.71	500	19.7	284	11.2	395	871	15HL 813
	8"	200	3CG	832	32.75	842	33.13	832	32.75	145	5.71	193	7.60	500	19.7	375	14.8	850	1874	15HL 814
	10"	250	3CG	991	39.00	1001	39.38	991	39.00	193	7.60	240	9.45	800	31.5	457	18.0	1450	3197	15HL 815
	12"	300	3CG	1130	44.50	1146	45.12	1130	44.50	240	9.45	288	11.34	800	31.5	510	20.1	2300	5071	15HL 816
	14"	350	3CG	1257	49.50	1276	50.25	1257	49.50	288	11.34	316	12.44	800	31.5	588	23.1	3350	7385	15HL 817
	16"	400	3CG	1384	54.50	1406	55.38	1384	54.50	316	12.44	361	14.21	800	31.5	620	24.4	4200	9259	15HL 818
	18"	450	3CG	1537	60.51	1559	61.38	1537	60.51	361	14.21	405	15.94	800	31.5	680	26.8	5900	13007	15HL 819
	20"	500	3CG	1664	65.51	1686	66.38	1664	65.51	405	15.94	455	17.91	800	31.5	740	29.1	8000	17637	15HL 820
	22"	550	3CG	1801	70.91	1829	72.01	1801	70.91	455	17.91	490	19.29	800	31.5	800	31.5	10200	22487	15HL 822
	24"	600	3CG	1943	76.50	1972	77.64	1943	76.50	490	19.29	530	20.87	800	31.5	870	34.3	12500	27558	15HL 824
ASME 2500	1/2"	15	3AL	264	10.39	264	10.39	264	10.39	13	0.51	13	0.51	263	10.4	127	5.0	13	29	25HL 803
	3/4"	20	3AL	273	10.75	273	10.75	273	10.75	13	0.51	15.5	0.61	263	10.4	127	5.0	14	32	25HL 804
	1"	25	3AL	308	12.12	308	12.12	308	12.12	15.5	0.61	21	0.83	363	14.3	129	5.1	18	39	25HL 805
	1-1/2"	40	3AL	384	15.12	387	15.24	384	15.12	21	0.83	32	1.26	363	14.3	144	5.7	34	74	25HL 807
	2"	50	3AL	451	17.75	454	17.87	451	17.75	32	1.26	43	1.69	453	17.8	179	7.0	68	150	25HL 808
	3"	80	3AL	578	22.75	584	23.00	578	22.75	43	1.69	63	2.48	453	17.8	212	8.3	155	342	25HL 810
	4"	100	3BG	673	26.50	683	26.88	673	26.50	63	2.48	88	3.46	500	19.7	280	11.0	340	750	25HL 811
	6"	150	3BG	914	36.00	927	36.50	914	36.00	88	3.46	132	5.20	500	19.7	355	14.0	805	1775	25HL 813
	8"	200	3CG	1022	40.25	1038	40.87	1022	40.25	132	5.20	180	7.09	600	23.6	450	17.7	1570	3461	25HL 814
	10"	250	3CG	1270	50.00	1292	50.88	1270	50.00	180	7.09	224	8.82	800	31.5	560	22.0	2800	6173	25HL 815
	12"	300	3CG	1422	56.00	1444	56.88	1422	56.00	224	8.82	266	10.47	800	31.5	630	24.8	3800	8378	25HL 816
	14"	350	3CG	1532	60.63	1569	61.77	1532	60.63	266	10.47	272	10.71	800	31.5	700	27.6	5300	11684	25HL 817
	16"	400	3CG	1567	61.69	1596	62.83	1567	61.69	272	10.71	276	10.87	800	31.5	750	29.5	7100	15653	25HL 818
	18"	450	3CG	1825	71.85	1854	72.99	1825	71.85	276	10.87	311	12.24	800	31.5	820	32.3	8400	18519	25HL 819
	20"	500	3CG	1875	73.82	1904	74.96	1875	73.82	311	12.24	343	13.50	800	31.5	890	35.0	10500	23149	25HL 820
	22"	550	3CG	2055	80.91	2086	82.13	2055	80.91	343	13.50	378	14.88	800	31.5	970	38.2	12000	26455	25HL 822
	24"	600	3CG	2257	88.86	2286	90.00	2257	88.86	378	14.88	413	16.26	800	31.5	1050	41.3	15000	33069	25HL 824

PRODUCT FEATURES:

- *Standard O-Rings in Viton with AED properties.*

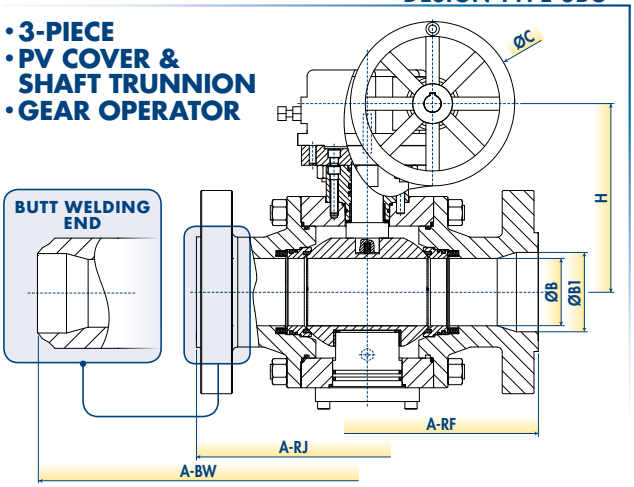
DESIGN TYPE 3AL

- 3-PIECE
- GLAND COVER & SHAFT TRUNNION
- LEVER OPERATOR



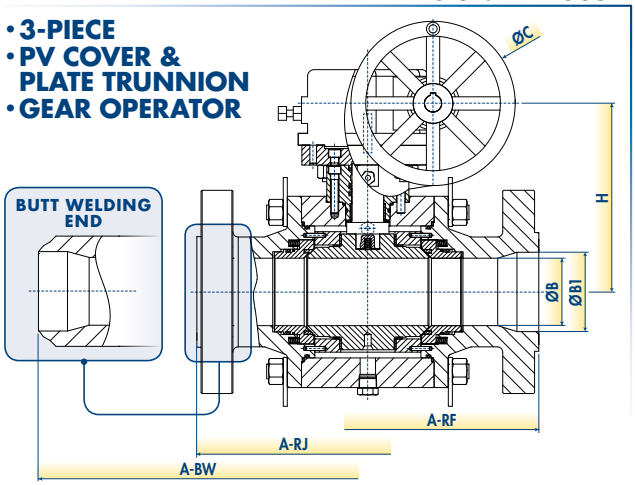
DESIGN TYPE 3BG

- 3-PIECE
- PV COVER & SHAFT TRUNNION
- GEAR OPERATOR



DESIGN TYPE 3CG

- 3-PIECE
- PV COVER & PLATE TRUNNION
- GEAR OPERATOR



FULL BORE TRUNNION BALL VALVES
BASIC CONFIGURATION
ASME INTEGRAL FLANGED AND WELDING ENDS

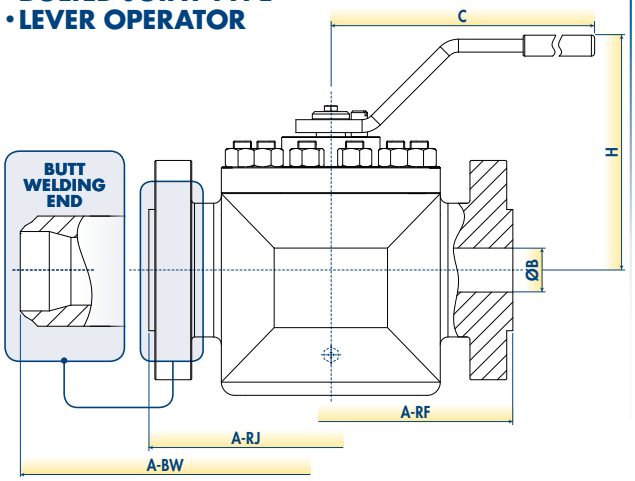
WORKING PRESSURE RATING	SIZE NPS	SIZE DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 150 (SEE NOTE 1)	1/2"	15	1TL	165(1)	6.50(1)	N.A.	N.A.	165(1)	6.50(1)	13	0.51	N.A.	N.A.	198	7.8	268	10.6	9	20	1-B03
	3/4"	20	1TL	191(1)	7.50(1)	N.A.	N.A.	191(1)	7.50(1)	19	0.75	N.A.	N.A.	198	7.8	273	10.7	11	25	1-B04
	1"	25	1TL	216(1)	8.50(1)	216(1)	8.50(1)	216(1)	8.50(1)	25	0.98	N.A.	N.A.	263	10.4	314	12.4	15	33	1-B05
	1-1/2"	40	1TL	241(1)	9.50(1)	241(1)	9.50(1)	241(1)	9.50(1)	38	1.50	N.A.	N.A.	363	14.3	342	13.5	22	48	1-B07
	2"	50	1TL	292(1)	11.50(1)	295(1)	11.62(1)	292(1)	11.50(1)	50	1.97	N.A.	N.A.	363	14.3	364	14.3	32	71	1-B08
	3"	80	1TL	356(1)	14.00(1)	359(1)	14.12(1)	356(1)	14.00(1)	75	2.95	N.A.	N.A.	453	17.8	321	12.6	55	120	1-B10
	4"	100	1TG	432(1)	17.00(1)	435(1)	17.12(1)	432(1)	17.00(1)	101	3.98	N.A.	N.A.	300	11.8	388.5	15.3	137	302	1-B11
	6"	150	1TG	559(1)	22.00(1)	562(1)	22.12(1)	559(1)	22.00(1)	151	5.94	N.A.	N.A.	400	15.7	463.5	18.2	280	617	1-B13
	8"	200	1TG	660(1)	26.00(1)	663(1)	26.12(1)	660(1)	26.00(1)	202	7.95	N.A.	N.A.	500	19.7	445.9	17.6	390	860	1-B14
	10"	250	1TG	787(1)	31.00(1)	790(1)	31.12(1)	787(1)	31.00(1)	253	9.96	N.A.	N.A.	600	23.6	494	19.4	572	1261	1-B15
	12"	300	1TG	838(1)	33.00(1)	841(1)	33.12(1)	838(1)	33.00(1)	304	11.97	N.A.	N.A.	600	23.6	540.8	21.3	851	1877	1-B16
	14"	350	1TG	889(1)	35.00(1)	892(1)	35.12(1)	889(1)	35.00(1)	335	13.19	N.A.	N.A.	600	23.6	564	22.2	1067	2352	1-B17
	16"	400	1TG	991(1)	39.00(1)	994(1)	39.12(1)	991(1)	39.00(1)	386	15.20	N.A.	N.A.	800	31.5	606	23.9	1375	3031	1-B18
	18"	450	1TG	1092(1)	43.00(1)	1095(1)	43.12(1)	1092(1)	43.00(1)	437	17.20	N.A.	N.A.	800	31.5	659	25.9	1980	4365	1-B19
	20"	500	1TG	1194(1)	47.00(1)	1200(1)	47.25(1)	1194(1)	47.00(1)	488	19.21	N.A.	N.A.	800	31.5	664	26.2	2415	5324	1-B20
	22"	550	1TG	1295(1)	51.00(1)	1305(1)	51.38(1)	1295(1)	51.00(1)	539	21.22	N.A.	N.A.	800	31.5	724	28.5	3066	6759	1-B22
	24"	600	1TG	1397(1)	55.00(1)	1407(1)	55.38(1)	1397(1)	55.00(1)	590	23.23	N.A.	N.A.	800	31.5	770	30.3	3822	8426	1-B24
ASME 300 (SEE NOTE 1)	1/2"	15	1TL	165(1)	6.50(1)	163(1)	6.44(1)	165(1)	6.50(1)	13	0.51	N.A.	N.A.	198	7.8	268	10.6	10	23	3-B03
	3/4"	20	1TL	191(1)	7.50(1)	191(1)	7.50(1)	191(1)	7.50(1)	19	0.75	N.A.	N.A.	198	7.8	273	10.7	13	29	3-B04
	1"	25	1TL	216(1)	8.50(1)	216(1)	8.50(1)	216(1)	8.50(1)	25	0.98	N.A.	N.A.	263	10.4	315	12.4	20	44	3-B05
	1-1/2"	40	1TL	241(1)	9.50(1)	241(1)	9.50(1)	241(1)	9.50(1)	38	1.50	N.A.	N.A.	363	14.3	342	13.5	28	61	3-B07
	2"	50	1TL	292(1)	11.50(1)	295(1)	11.62(1)	292(1)	11.50(1)	50	1.97	N.A.	N.A.	363	14.3	364	14.3	40	88	3-B08
	3"	80	1TL	356(1)	14.00(1)	359(1)	14.12(1)	356(1)	14.00(1)	75	2.95	N.A.	N.A.	453	17.8	321	12.6	71	157	3-B10
	4"	100	1TG	432(1)	17.00(1)	435(1)	17.12(1)	432(1)	17.00(1)	101	3.98	N.A.	N.A.	300	11.8	388	15.3	190	420	3-B11
	6"	150	1TG	559(1)	22.00(1)	562(1)	22.12(1)	559(1)	22.00(1)	151	5.94	N.A.	N.A.	500	19.7	463	18.2	322	710	3-B13
	8"	200	1TG	660(1)	26.00(1)	663(1)	26.12(1)	660(1)	26.00(1)	202	7.95	N.A.	N.A.	500	19.7	446	17.6	486	1072	3-B14
	10"	250	1TG	787(1)	31.00(1)	790(1)	31.12(1)	787(1)	31.00(1)	253	9.96	N.A.	N.A.	600	23.6	497	19.6	702	1548	3-B15
	12"	300	1TG	838(1)	33.00(1)	841(1)	33.12(1)	838(1)	33.00(1)	304	11.97	N.A.	N.A.	600	23.6	559	22.0	1046	2307	3-B16
	14"	350	1TG	889(1)	35.00(1)	892(1)	35.12(1)	889(1)	35.00(1)	335	13.19	N.A.	N.A.	800	31.5	570	22.4	1298	2862	3-B17
	16"	400	1TG	991(1)	39.00(1)	994(1)	39.12(1)	991(1)	39.00(1)	386	15.20	N.A.	N.A.	800	31.5	624	24.6	1826	4026	3-B18
	18"	450	1TG	1092(1)	43.00(1)	1095(1)	43.12(1)	1092(1)	43.00(1)	437	17.20	N.A.	N.A.	800	31.5	684	26.9	2420	5335	3-B19
	20"	500	1TG	1194(1)	47.00(1)	1200(1)	47.25(1)	1194(1)	47.00(1)	488	19.21	N.A.	N.A.	800	31.5	682	26.9	2835	6250	3-B20
	22"	550	1TG	1295(1)	51.00(1)	1305(1)	51.38(1)	1295(1)	51.00(1)	539	21.22	N.A.	N.A.	800	31.5	737	29.0	3517	7755	3-B22
	24"	600	1TG	1397(1)	55.00(1)	1407(1)	55.38(1)	1397(1)	55.00(1)	590	23.23	N.A.	N.A.	800	31.5	781	30.7	4305	9491	3-B24

PRODUCT FEATURES:
- *Standard O-Rings in Viton with AED properties.*

NOTE 1: Face-to-Face acc.to ASME B16.10 related to class 600.

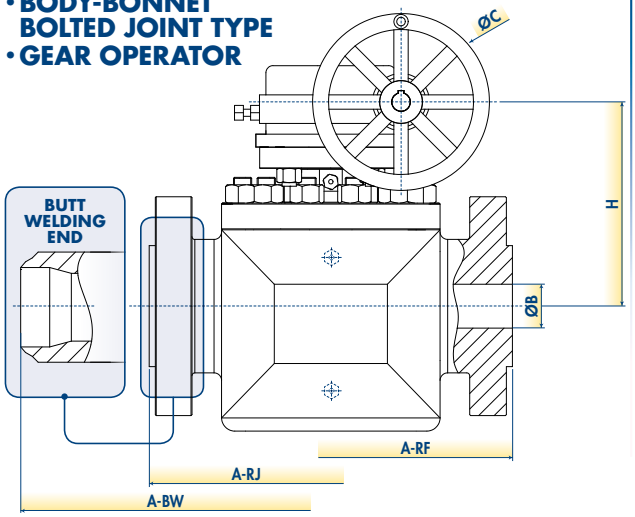
DESIGN TYPE 1TL

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- LEVER OPERATOR



DESIGN TYPE 1TG

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- GEAR OPERATOR



REDUCED BORE TRUNNION BALL VALVES

BASIC CONFIGURATION

ASME INTEGRAL FLANGED AND WELDING ENDS

WORKING PRESSURE RATING	SIZE NPS	SIZE DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 150 (SEE NOTE 1)	1/2"	15	1TL	165(1)	6.50(1)	N.A.	N.A.	165(1)	6.50(1)	13	0.51	13	0.51	198	7.8	268	10.6	9	20	L1 B03
	3/4"	20	1TL	191(1)	7.50(1)	N.A.	N.A.	191(1)	7.50(1)	13	0.51	19	0.75	198	7.8	268	10.6	10	22	L1 B04
	1"	25	1TL	216(1)	8.50(1)	216(1)	8.50(1)	216(1)	8.50(1)	19	0.75	25	0.98	198	7.8	273	10.7	11	24	L1 B05
	1-1/2"	40	1TL	241(1)	9.50(1)	241(1)	9.50(1)	241(1)	9.50(1)	25	0.98	38	1.50	263	10.4	286	11.3	15	34	L1 B07
	2"	50	1TL	292(1)	11.50(1)	295(1)	11.62(1)	292(1)	11.50(1)	38	1.50	50	1.97	363	14.3	342	13.5	27	59	L1 B08
	3"	80	1TL	356(1)	14.00(1)	359(1)	14.12(1)	356(1)	14.00(1)	50	1.97	75	2.95	363	14.3	273	10.7	38	84	L1 B10
	4"	100	1TL	432(1)	17.00(1)	435(1)	17.12(1)	432(1)	17.00(1)	75	2.95	101	3.98	453	17.8	321	12.6	61	135	L1 B11
	6"	150	1TG	559(1)	22.00(1)	562(1)	22.12(1)	559(1)	22.00(1)	101	3.98	151	5.94	300	11.8	389	15.3	168	370	L1 B13
	8"	200	1TG	660(1)	26.00(1)	663(1)	26.12(1)	660(1)	26.00(1)	151	5.94	202	7.95	400	15.7	402	15.8	290	639	L1 B14
	10"	250	1TG	787(1)	31.00(1)	790(1)	31.12(1)	787(1)	31.00(1)	202	7.95	253	9.96	500	19.7	446	17.6	426	940	L1 B15
	12"	300	1TG	838(1)	33.00(1)	841(1)	33.12(1)	838(1)	33.00(1)	253	9.96	304	11.97	600	23.6	494	19.4	651	1436	L1 B16
	14"	350	1TG	889(1)	35.00(1)	892(1)	35.12(1)	889(1)	35.00(1)	304	11.97	335	13.19	600	23.6	499	19.7	814	1795	L1 B17
	16"	400	1TG	991(1)	39.00(1)	994(1)	39.12(1)	991(1)	39.00(1)	335	13.19	386	15.20	600	23.6	564	22.2	1208	2663	L1 B18
	18"	450	1TG	1092(1)	43.00(1)	1095(1)	43.12(1)	1092(1)	43.00(1)	386	15.20	437	17.20	800	31.5	606	23.9	1463	3225	L1 B19
	20"	500	1TG	1194(1)	47.00(1)	1200(1)	47.25(1)	1194(1)	47.00(1)	437	17.20	488	19.21	800	31.5	604	23.8	2100	4630	L1 B20
	22"	550	1TG	1295(1)	51.00(1)	1305(1)	51.38(1)	1295(1)	51.00(1)	488	19.21	539	21.22	800	31.5	664	26.2	2730	6019	L1 B22
	24"	600	1TG	1397(1)	55.00(1)	1407(1)	55.38(1)	1397(1)	55.00(1)	539	21.22	590	23.23	800	31.5	724	28.5	3360	7408	L1 B24
ASME 300 (SEE NOTE 1)	1/2"	15	1TL	165(1)	6.50(1)	163(1)	6.44(1)	165(1)	6.50(1)	13	0.51	13	0.51	198	7.8	268	10.6	10	23	L3 B03
	3/4"	20	1TL	191(1)	7.50(1)	191(1)	7.50(1)	191(1)	7.50(1)	13	0.51	19	0.75	198	7.8	268	10.6	12	27	L3 B04
	1"	25	1TL	216(1)	8.50(1)	216(1)	8.50(1)	216(1)	8.50(1)	19	0.75	25	0.98	198	7.8	273	10.7	16	35	L3 B05
	1-1/2"	40	1TL	241(1)	9.50(1)	241(1)	9.50(1)	241(1)	9.50(1)	25	0.98	38	1.50	263	10.4	286	11.3	21	47	L3 B07
	2"	50	1TL	292(1)	11.50(1)	295(1)	11.62(1)	292(1)	11.50(1)	38	1.50	50	1.97	363	14.3	342	13.5	30	66	L3 B08
	3"	80	1TL	356(1)	14.00(1)	359(1)	14.12(1)	356(1)	14.00(1)	50	1.97	75	2.95	363	14.3	273	10.7	50	110	L3 B10
	4"	100	1TL	432(1)	17.00(1)	435(1)	17.12(1)	432(1)	17.00(1)	75	2.95	101	3.98	453	17.8	321	12.6	83	184	L3 B11
	6"	150	1TG	559(1)	22.00(1)	562(1)	22.12(1)	559(1)	22.00(1)	101	3.98	151	5.94	300	11.8	389	15.3	225	497	L3 B13
	8"	200	1TG	660(1)	26.00(1)	663(1)	26.12(1)	660(1)	26.00(1)	151	5.94	202	7.95	500	19.7	402	15.8	345	759	L3 B14
	10"	250	1TG	787(1)	31.00(1)	790(1)	31.12(1)	787(1)	31.00(1)	202	7.95	253	9.96	500	19.7	446	17.6	543	1198	L3 B15
	12"	300	1TG	838(1)	33.00(1)	841(1)	33.12(1)	838(1)	33.00(1)	253	9.96	304	11.97	600	23.6	497	19.6	780	1720	L3 B16
	14"	350	1TG	889(1)	35.00(1)	892(1)	35.12(1)	889(1)	35.00(1)	304	11.97	335	13.19	600	23.6	516	20.3	988	2178	L3 B17
	16"	400	1TG	991(1)	39.00(1)	994(1)	39.12(1)	991(1)	39.00(1)	335	13.19	386	15.20	800	31.5	570	22.4	1430	3153	L3 B18
	18"	450	1TG	1092(1)	43.00(1)	1095(1)	43.12(1)	1092(1)	43.00(1)	386	15.20	437	17.20	800	31.5	624	24.6	1925	4244	L3 B19
	20"	500	1TG	1194(1)	47.00(1)	1200(1)	47.25(1)	1194(1)	47.00(1)	437	17.20	488	19.21	800	31.5	627	24.7	2468	5440	L3 B20
	22"	550	1TG	1295(1)	51.00(1)	1305(1)	51.38(1)	1295(1)	51.00(1)	488	19.21	539	21.22	800	31.5	682	26.9	3255	7176	L3 B22
	24"	600	1TG	1397(1)	55.00(1)	1407(1)	55.38(1)	1397(1)	55.00(1)	539	21.22	590	23.23	800	31.5	737	29.0	4253	9375	L3 B24

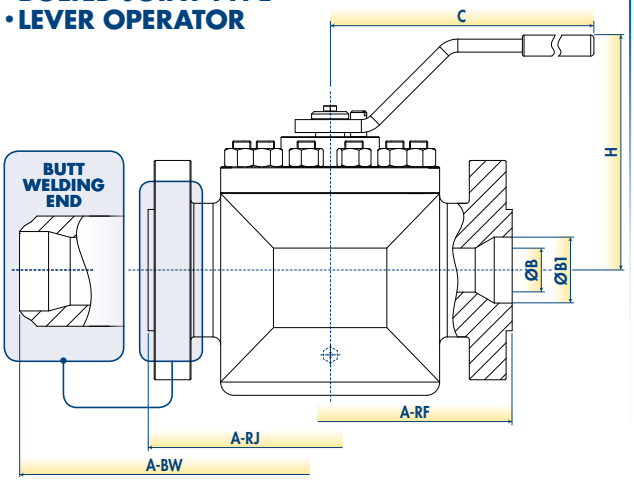
PRODUCT FEATURES:

- *Standard O-Rings in Viton with AED properties.*

NOTE 1: Face-to-Face acc.to ASME B16.10 related to class 600.

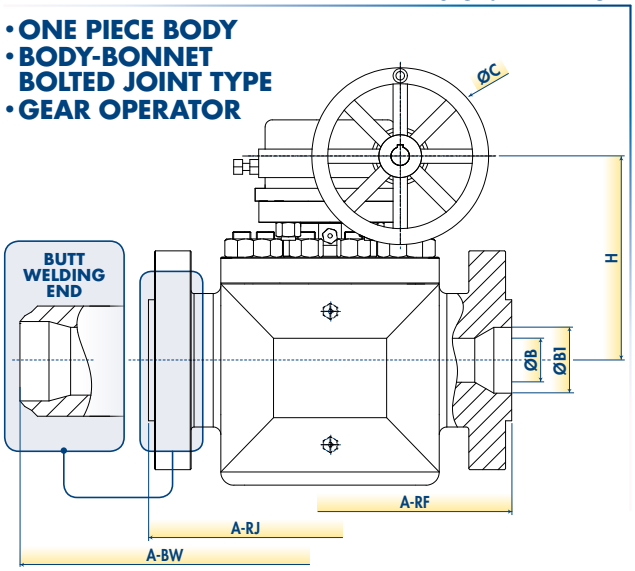
DESIGN TYPE 1TL

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- LEVER OPERATOR



DESIGN TYPE 1TG

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- GEAR OPERATOR



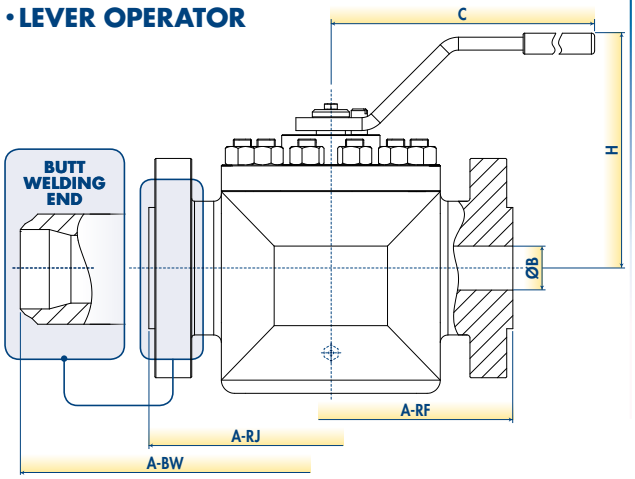
FULL BORE TRUNNION BALL VALVES
BASIC CONFIGURATION
ASME INTEGRAL FLANGED AND WELDING ENDS

WORKING PRESSURE RATING	SIZE NPS	SIZE DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 600	1/2"	15	1TL	165	6.50	163	6.44	165	6.50	13	0.51	N.A.	N.A.	198	7.8	268	10.6	12	27	6-B03
	3/4"	20	1TL	191	7.50	191	7.50	191	7.50	19	0.75	N.A.	N.A.	263	10.4	284	11.2	17	38	6-B04
	1"	25	1TL	216	8.50	216	8.50	216	8.50	25	0.98	N.A.	N.A.	263	10.4	315	12.4	25	54	6-B05
	1-1/2"	40	1TL	241	9.50	241	9.50	241	9.50	38	1.50	N.A.	N.A.	363	14.3	342	13.5	34	75	6-B07
	2"	50	1TL	292	11.50	295	11.62	292	11.50	50	1.97	N.A.	N.A.	363	14.3	364	14.3	52	115	6-B08
	3"	80	1TL	356	14.00	359	14.12	356	14.00	75	2.95	N.A.	N.A.	453	17.8	321	12.6	91	200	6-B10
	4"	100	1TG	432	17.00	435	17.12	432	17.00	101	3.98	N.A.	N.A.	400	15.7	389	15.3	242	534	6-B11
	6"	150	1TG	559	22.00	562	22.12	559	22.00	151	5.94	N.A.	N.A.	500	19.7	464	18.2	442	975	6-B13
	8"	200	1TG	660	26.00	663	26.12	660	26.00	202	7.95	N.A.	N.A.	500	19.7	462	18.2	680	1499	6-B14
	10"	250	1TG	787	31.00	790	31.12	787	31.00	253	9.96	N.A.	N.A.	600	23.6	520	20.5	1040	2293	6-B15
	12"	300	1TG	838	33.00	841	33.12	838	33.00	304	11.97	N.A.	N.A.	800	31.5	592	23.3	1430	3153	6-B16
	14"	350	1TG	889	35.00	892	35.12	889	35.00	335	13.19	N.A.	N.A.	800	31.5	588	23.1	1375	3031	6-B17
	16"	400	1TG	991	39.00	994	39.12	991	39.00	386	15.20	N.A.	N.A.	800	31.5	636	25.0	1925	4244	6-B18
	18"	450	1TG	1092	43.00	1095	43.12	1092	43.00	437	17.20	N.A.	N.A.	800	31.5	708	27.9	2915	6426	6-B19
	20"	500	1TG	1194	47.00	1200	47.25	1194	47.00	488	19.21	N.A.	N.A.	800	31.5	704	27.7	3308	7292	6-B20
	22"	550	1TG	1295	51.00	1305	51.38	1295	51.00	539	21.22	N.A.	N.A.	800	31.5	776	30.5	4515	9954	6-B22
	24"	600	1TG	1397	55.00	1407	55.38	1397	55.00	590	23.23	N.A.	N.A.	800	31.5	825	32.5	5565	12269	6-B24
ASME 900	1/2"	15	1TL	216	8.50	216	8.50	216	8.50	13	0.51	N.A.	N.A.	263	10.4	279	11.0	20	45	90H B03
	3/4"	20	1TL	229	9.00	229	9.00	229	9.00	19	0.75	N.A.	N.A.	263	10.4	284	11.2	24	52	90H B04
	1"	25	1TL	254	10.00	254	10.00	254	10.00	25	0.98	N.A.	N.A.	363	14.3	317	12.5	35	78	90H B05
	1-1/2"	40	1TL	305	12.00	305	12.00	305	12.00	38	1.50	N.A.	N.A.	363	14.3	342	13.5	48	105	90H B07
	2"	50	1TL	368	14.50	371	14.62	368	14.50	50	1.97	N.A.	N.A.	453	17.8	374	14.7	80	177	90H B08
	3"	80	1TG	381	15.00	384	15.12	381	15.00	75	2.95	N.A.	N.A.	400	15.7	317	12.5	146	321	90H B10
	4"	100	1TG	457	18.00	460	18.12	457	18.00	101	3.98	N.A.	N.A.	400	15.7	389	15.3	262	577	90H B11
	6"	150	1TG	610	24.00	613	24.12	610	24.00	151	5.94	N.A.	N.A.	500	19.7	479	18.8	567	1250	90H B13
	8"	200	1TG	737	29.00	740	29.12	737	29.00	202	7.95	N.A.	N.A.	600	23.6	507	20.0	1053	2321	90H B14
	10"	250	1TG	838	33.00	841	33.12	838	33.00	253	9.96	N.A.	N.A.	800	31.5	564	22.2	1508	3325	90H B15
	12"	300	1TG	965	38.00	968	38.12	965	38.00	304	11.97	N.A.	N.A.	800	31.5	628	24.7	2132	4700	90H B16
	14"	350	1TG	1029	40.50	1039	40.88	1029	40.50	323	12.72	N.A.	N.A.	800	31.5	624	24.6	2365	5214	90H B17
	16"	400	1TG	1130	44.50	1140	44.88	1130	44.50	374	14.72	N.A.	N.A.	800	31.5	704	27.7	3333	7348	90H B18
	18"	450	1TG	1219	48.00	1232	48.50	1219	48.00	424	16.69	N.A.	N.A.	800	31.5	750	29.5	3740	8245	90H B19
	20"	500	1TG	1321	52.00	1334	52.50	1321	52.00	472	18.58	N.A.	N.A.	800	31.5	792	31.2	5093	11227	90H B20
	22"	550	1TG	1435	56.50	1448	57.00	1435	56.50	523	20.59	N.A.	N.A.	800	31.5	915	36.0	6195	13658	90H B22
	24"	600	1TG	1549	61.00	1568	61.75	1549	61.00	571	22.48	N.A.	N.A.	800	31.5	935	36.8	7823	17246	90H B24

PRODUCT FEATURES:
- *Standard O-Rings in Viton with AED properties.*

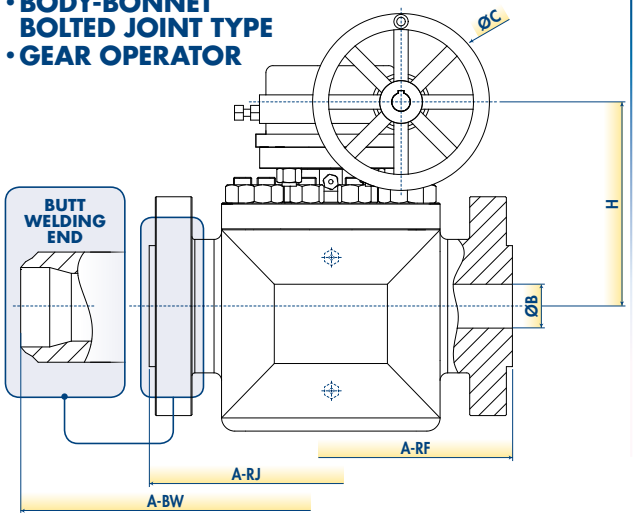
DESIGN TYPE 1TL

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- LEVER OPERATOR



DESIGN TYPE 1TG

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- GEAR OPERATOR



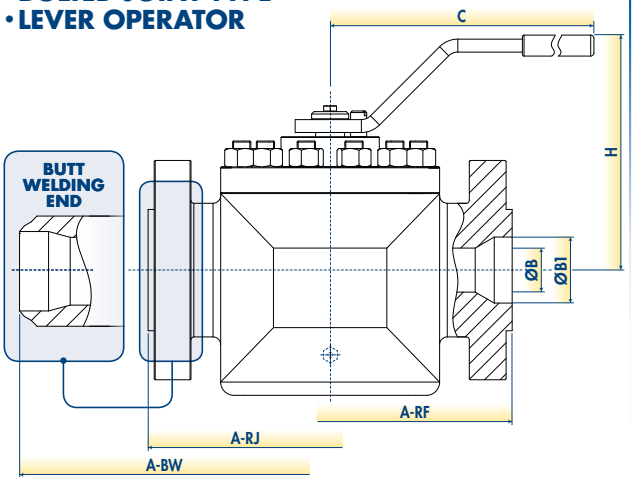
REDUCED BORE TRUNNION BALL VALVES
BASIC CONFIGURATION
ASME INTEGRAL FLANGED AND WELDING ENDS

WORKING PRESSURE RATING	SIZE NPS	SIZE DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 600	1/2"	15	1TL	165	6.50	163	6.44	165	6.50	13	0.51	13	0.51	198	7.8	268	10.6	12	27	L6 B03
	3/4"	20	1TL	191	7.50	191	7.50	191	7.50	13	0.51	19	0.75	198	7.8	268	10.6	15	34	L6 B04
	1"	25	1TL	216	8.50	216	8.50	216	8.50	19	0.75	25	0.98	263	10.4	284	11.2	19	43	L6 B05
	1-1/2"	40	1TL	241	9.50	241	9.50	241	9.50	25	0.98	38	1.50	263	10.4	286	11.3	27	61	L6 B07
	2"	50	1TL	292	11.50	295	11.62	292	11.50	38	1.50	50	1.97	363	14.3	342	13.5	39	87	L6 B08
	3"	80	1TL	356	14.00	359	14.12	356	14.00	50	1.97	75	2.95	363	14.3	273	10.7	63	139	L6 B10
	4"	100	1TL	432	17.00	435	17.12	432	17.00	75	2.95	101	3.98	453	17.8	321	12.6	119	262	L6 B11
	6"	150	1TG	559	22.00	562	22.12	559	22.00	101	3.98	151	5.94	400	15.7	389	15.3	302	667	L6 B13
	8"	200	1TG	660	26.00	663	26.12	660	26.00	151	5.94	202	7.95	500	19.7	402	15.8	481	1060	L6 B14
	10"	250	1TG	787	31.00	790	31.12	787	31.00	202	7.95	253	9.96	500	19.7	462	18.2	741	1634	L6 B15
	12"	300	1TG	838	33.00	841	33.12	838	33.00	253	9.96	304	11.97	600	23.6	520	20.5	1105	2436	L6 B16
	14"	350	1TG	889	35.00	892	35.12	889	35.00	304	11.97	335	13.19	800	31.5	546	21.5	1298	2862	L6 B17
	16"	400	1TG	991	39.00	994	39.12	991	39.00	335	13.19	386	15.20	800	31.5	588	23.1	1496	3298	L6 B18
	18"	450	1TG	1092	43.00	1095	43.12	1092	43.00	386	15.20	437	17.20	800	31.5	636	25.0	2090	4608	L6 B19
	20"	500	1TG	1194	47.00	1200	47.25	1194	47.00	437	17.20	488	19.21	800	31.5	649	25.6	3129	6898	L6 B20
	22"	550	1TG	1295	51.00	1305	51.38	1295	51.00	488	19.21	539	21.22	800	31.5	704	27.7	4253	9375	L6 B22
	24"	600	1TG	1397	55.00	1407	55.38	1397	55.00	539	21.22	590	23.23	800	31.5	776	30.5	5460	12037	L6 B24
ASME 900	1/2"	15	1TL	216	8.50	216	8.50	216	8.50	13	0.51	13	0.51	263	10.4	279	11.0	20	45	90HL B03
	3/4"	20	1TL	229	9.00	229	9.00	229	9.00	13	0.51	19	0.75	263	10.4	279	11.0	22	49	90HL B04
	1"	25	1TL	254	10.00	254	10.00	254	10.00	19	0.75	25	0.98	263	10.4	284	11.2	31	68	90HL B05
	1-1/2"	40	1TL	305	12.00	305	12.00	305	12.00	25	0.98	38	1.50	363	14.3	288	11.3	33	73	90HL B07
	2"	50	1TL	368	14.50	371	14.62	368	14.50	38	1.50	50	1.97	363	14.3	342	13.5	64	142	90HL B08
	3"	80	1TL	381	15.00	384	15.12	381	15.00	50	1.97	75	2.95	453	17.8	281	11.0	84	185	90HL B10
	4"	100	1TL	457	18.00	460	18.12	457	18.00	75	2.95	101	3.98	400	15.7	317	12.5	175	386	90HL B11
	6"	150	1TG	610	24.00	613	24.12	610	24.00	101	3.98	151	5.94	400	15.7	389	15.3	350	772	90HL B13
	8"	200	1TG	737	29.00	740	29.12	737	29.00	151	5.94	202	7.95	500	19.7	415	16.3	624	1376	90HL B14
	10"	250	1TG	838	33.00	841	33.12	838	33.00	202	7.95	253	9.96	600	23.6	507	20.0	1196	2637	90HL B15
	12"	300	1TG	965	38.00	968	38.12	965	38.00	253	9.96	304	11.97	800	31.5	564	22.2	1690	3726	90HL B16
	14"	350	1TG	1029	40.50	1039	40.88	1029	40.50	304	11.97	323	12.72	800	31.5	580	22.8	1914	4220	90HL B17
	16"	400	1TG	1130	44.50	1140	44.88	1130	44.50	323	12.72	374	14.72	800	31.5	624	24.6	2563	5650	90HL B18
	18"	450	1TG	1219	48.00	1232	48.50	1219	48.00	374	14.72	424	16.69	800	31.5	704	27.7	3575	7882	90HL B19
	20"	500	1TG	1321	52.00	1334	52.50	1321	52.00	424	16.69	472	18.58	800	31.5	688	27.1	4725	10417	90HL B20
	22"	550	1TG	1435	56.50	1448	57.00	1435	56.50	472	18.58	523	20.59	800	31.5	792	31.2	5985	13195	90HL B22
	24"	600	1TG	1549	61.00	1568	61.75	1549	61.00	523	20.59	571	22.48	800	31.5	915	36.0	7455	16435	90HL B24

PRODUCT FEATURES:
- *Standard O-Rings in Viton with AED properties.*

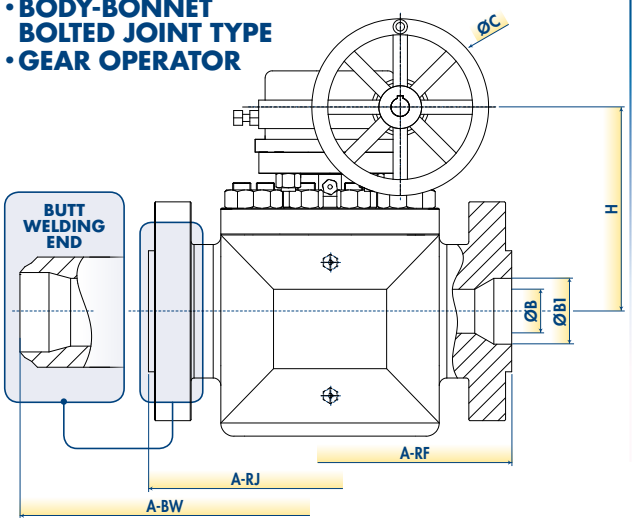
DESIGN TYPE 1TL

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- LEVER OPERATOR



DESIGN TYPE 1TG

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- GEAR OPERATOR



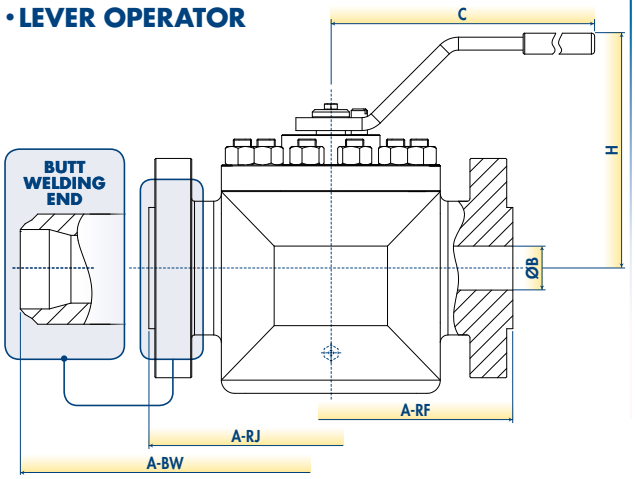
FULL BORE TRUNNION BALL VALVES
BASIC CONFIGURATION
ASME INTEGRAL FLANGED AND WELDING ENDS

WORKING PRESSURE RATING	SIZE NPS	SIZE DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 1500	1/2"	15	1TL	216	8.50	216	8.50	216	8.50	13	0.51	N.A.	N.A.	263	10.4	279	11.0	20	45	15H B03
	3/4"	20	1TL	229	9.00	229	9.00	229	9.00	19	0.75	N.A.	N.A.	263	10.4	284	11.2	24	52	15H B04
	1"	25	1TL	254	10.00	254	10.00	254	10.00	25	0.98	N.A.	N.A.	363	14.3	317	12.5	35	78	15H B05
	1-1/2"	40	1TL	305	12.00	305	12.00	305	12.00	38	1.50	N.A.	N.A.	363	14.3	342	13.5	48	105	15H B07
	2"	50	1TL	368	14.50	371	14.62	368	14.50	50	1.97	N.A.	N.A.	453	17.8	374	14.7	80	177	15H B08
	3"	80	1TG	470	18.50	473	18.62	470	18.50	75	2.95	N.A.	N.A.	400	15.7	324	12.8	188	414	15H B10
	4"	100	1TG	546	21.50	549	21.62	546	21.50	101	3.98	N.A.	N.A.	500	19.7	426	16.8	421	929	15H B11
	6"	150	1TG	705	27.75	711	28.00	705	27.75	145	5.71	N.A.	N.A.	500	19.7	563	22.1	969	2136	15H B13
	8"	200	1TG	832	32.75	842	33.13	832	32.75	193	7.60	N.A.	N.A.	800	31.5	594	23.4	1612	3554	15H B14
	10"	250	1TG	991	39.00	1001	39.38	991	39.00	240	9.45	N.A.	N.A.	800	31.5	663	26.1	2704	5961	15H B15
	12"	300	1TG	1130	44.50	1146	45.12	1130	44.50	288	11.34	N.A.	N.A.	800	31.5	764	30.1	4121	9085	15H B16
	14"	350	1TG	1257	49.50	1276	50.25	1257	49.50	316	12.44	N.A.	N.A.	800	31.5	744	29.3	4290	9458	15H B17
	16"	400	1TG	1384	54.50	1406	55.38	1384	54.50	361	14.21	N.A.	N.A.	800	31.5	816	32.1	5940	13095	15H B18
	18"	450	1TG	1537	60.51	1559	61.38	1537	60.51	405	15.94	N.A.	N.A.	800	31.5	888	35.0	7810	17218	15H B19
	20"	500	1TG	1664	65.51	1686	66.38	1664	65.51	455	17.91	N.A.	N.A.	800	31.5	880	34.6	10290	22686	15H B20
	22"	550	1TG	1801	70.91	1829	72.01	1801	70.91	490	19.29	N.A.	N.A.	800	31.5	957	37.7	12180	26852	15H B22
	24"	600	1TG	1943	76.50	1972	77.64	1943	76.50	530	20.87	N.A.	N.A.	800	31.5	1023	40.3	15120	33334	15H B24
ASME 2500	1/2"	15	1TL	264	10.39	264	10.39	264	10.39	13	0.51	N.A.	N.A.	263	10.4	279	11.0	26	58	25H B03
	3/4"	20	1TL	273	10.75	273	10.75	273	10.75	15.5	0.61	N.A.	N.A.	363	14.3	284	11.2	30	67	25H B04
	1"	25	1TL	308	12.12	308	12.12	308	12.12	21	0.83	N.A.	N.A.	363	14.3	317	12.5	49	108	25H B05
	1-1/2"	40	1TL	384	15.12	387	15.24	384	15.12	32	1.26	N.A.	N.A.	453	17.8	358	14.1	84	185	25H B07
	2"	50	1TL	451	17.75	454	17.87	451	17.75	43	1.69	N.A.	N.A.	453	17.8	424	16.7	143	316	25H B08
	3"	80	1TG	578	22.75	584	23.00	578	22.75	63	2.48	N.A.	N.A.	500	19.7	420	16.5	410	904	25H B10
	4"	100	1TG	673	26.50	683	26.88	673	26.50	88	3.46	N.A.	N.A.	500	19.7	533	21.0	809	1784	25H B11
	6"	150	1TG	914	36.00	927	36.50	914	36.00	132	5.20	N.A.	N.A.	600	23.6	675	26.6	1750	3858	25H B13
	8"	200	1TG	1022	40.25	1038	40.87	1022	40.25	180	7.09	N.A.	N.A.	800	31.5	728	28.7	2990	6592	25H B14
	10"	250	1TG	1270	50.00	1292	50.88	1270	50.00	224	8.82	N.A.	N.A.	800	31.5	819	32.2	4160	9171	25H B15
	12"	300	1TG	1422	56.00	1444	56.88	1422	56.00	266	10.47	N.A.	N.A.	800	31.5	910	35.8	5720	12610	25H B16
	14"	350	1TG	1532	60.63	1569	61.77	1532	60.63	272	10.71	N.A.	N.A.	800	31.5	900	35.4	6930	15278	25H B17
	16"	400	1TG	1567	61.69	1596	62.83	1567	61.69	276	10.87	N.A.	N.A.	800	31.5	984	38.7	8250	18188	25H B18
	18"	450	1TG	1825	71.85	1854	72.99	1825	71.85	311	12.24	N.A.	N.A.	800	31.5	1068	42.0	9790	21583	25H B19
	20"	500	1TG	1875	73.82	1904	74.96	1875	73.82	343	13.50	N.A.	N.A.	800	31.5	1067	42.0	11760	25926	25H B20
	22"	550	1TG	2055	80.91	2086	82.13	2055	80.91	378	14.88	N.A.	N.A.	800	31.5	1155	45.5	13650	30093	25H B22
	24"	600	1TG	2257	88.86	2286	90.00	2257	88.86	413	16.26	N.A.	N.A.	800	31.5	1320	52.0	16800	37038	25H B24

PRODUCT FEATURES:
- *Standard O-Rings in Viton with AED properties.*

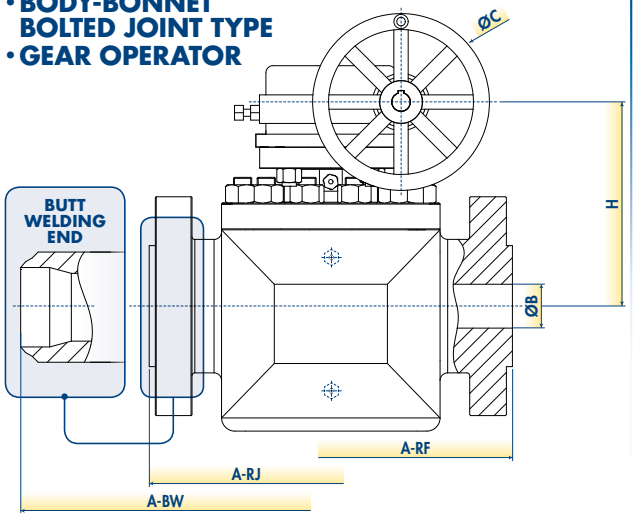
DESIGN TYPE 1TL

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- LEVER OPERATOR



DESIGN TYPE 1TG

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- GEAR OPERATOR



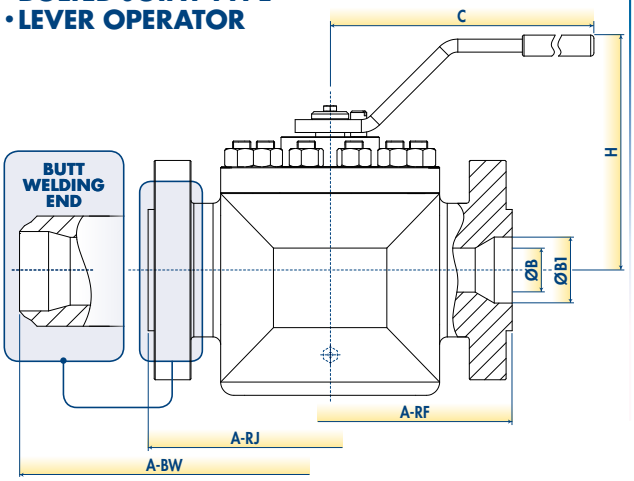
REDUCED BORE TRUNNION BALL VALVES
BASIC CONFIGURATION
ASME INTEGRAL FLANGED AND WELDING ENDS

WORKING PRESSURE RATING	SIZE NPS	DN	STANDARD DESIGN TYPE	A-RF mm	A-RF in	A-RJ mm	A-RJ in	A-BW mm	A-BW in	B mm	B in	B1 mm	B1 in	C mm	C in	H mm	H in	WEIGHT kg	WEIGHT lb	FIGURE
ASME 1500	1/2"	15	1TL	216	8.50	216	8.50	216	8.50	13	0.51	13	0.51	263	10.4	279.4	11.0	20	45	15HL B03
	3/4"	20	1TL	229	9.00	229	9.00	229	9.00	13	0.51	19	0.75	263	10.4	279.4	11.0	22	49	15HL B04
	1"	25	1TL	254	10.00	254	10.00	254	10.00	19	0.75	25	0.98	263	10.4	283.8	11.2	31	68	15HL B05
	1-1/2"	40	1TL	305	12.00	305	12.00	305	12.00	25	0.98	38	1.50	363	14.3	288	11.3	33	73	15HL B07
	2"	50	1TL	368	14.50	371	14.62	368	14.50	38	1.50	50	1.97	363	14.3	342	13.5	64	142	15HL B08
	3"	80	1TL	470	18.50	473	18.62	470	18.50	50	1.97	75	2.95	453	17.8	280.5	11.0	104	228	15HL B10
	4"	100	1TG	546	21.50	549	21.62	546	21.50	75	2.95	101	3.98	400	15.7	324	12.8	216	475	15HL B11
	6"	150	1TG	705	27.75	711	28.00	705	27.75	101	3.98	145	5.71	500	19.7	426	16.8	553	1219	15HL B13
	8"	200	1TG	832	32.75	842	33.13	832	32.75	145	5.71	193	7.60	500	19.7	487.5	19.2	1105	2436	15HL B14
	10"	250	1TG	991	39.00	1001	39.38	991	39.00	193	7.60	240	9.45	800	31.5	594.1	23.4	1885	4156	15HL B15
	12"	300	1TG	1130	44.50	1146	45.12	1130	44.50	240	9.45	288	11.34	800	31.5	663	26.1	2990	6592	15HL B16
	14"	350	1TG	1257	49.50	1276	50.25	1257	49.50	288	11.34	316	12.44	800	31.5	705.6	27.8	3685	8124	15HL B17
	16"	400	1TG	1384	54.50	1406	55.38	1384	54.50	316	12.44	361	14.21	800	31.5	744	29.3	4620	10185	15HL B18
	18"	450	1TG	1537	60.51	1559	61.38	1537	60.51	361	14.21	405	15.94	800	31.5	816	32.1	6490	14308	15HL B19
	20"	500	1TG	1664	65.51	1686	66.38	1664	65.51	405	15.94	455	17.91	800	31.5	814	32.0	8400	18519	15HL B20
	22"	550	1TG	1801	70.91	1829	72.01	1801	70.91	455	17.91	490	19.29	800	31.5	880	34.6	10710	23611	15HL B22
	24"	600	1TG	1943	76.50	1972	77.64	1943	76.50	490	19.29	530	20.87	800	31.5	957	37.7	13125	28936	15HL B24
ASME 2500	1/2"	15	1TL	264	10.39	264	10.39	264	10.39	13	0.51	13	0.51	263	10.4	279.4	11.0	26	58	25HL B03
	3/4"	20	1TL	273	10.75	273	10.75	273	10.75	13	0.51	15.5	0.61	263	10.4	279.4	11.0	29	64	25HL B04
	1"	25	1TL	308	12.12	308	12.12	308	12.12	15.5	0.61	21	0.83	363	14.3	283.8	11.2	36	78	25HL B05
	1-1/2"	40	1TL	384	15.12	387	15.24	384	15.12	21	0.83	32	1.26	363	14.3	288	11.3	50	111	25HL B07
	2"	50	1TL	451	17.75	454	17.87	451	17.75	32	1.26	43	1.69	453	17.8	358	14.1	102	225	25HL B08
	3"	80	1TL	578	22.75	584	23.00	578	22.75	43	1.69	63	2.48	453	17.8	318	12.5	217	478	25HL B10
	4"	100	1TG	673	26.50	683	26.88	673	26.50	63	2.48	88	3.46	500	19.7	420	16.5	476	1049	25HL B11
	6"	150	1TG	914	36.00	927	36.50	914	36.00	88	3.46	132	5.20	500	19.7	532.5	21.0	1127	2485	25HL B13
	8"	200	1TG	1022	40.25	1038	40.87	1022	40.25	132	5.20	180	7.09	600	23.6	585	23.0	2041	4500	25HL B14
	10"	250	1TG	1270	50.00	1292	50.88	1270	50.00	180	7.09	224	8.82	800	31.5	728	28.7	3640	8025	25HL B15
	12"	300	1TG	1422	56.00	1444	56.88	1422	56.00	224	8.82	266	10.47	800	31.5	819	32.2	4940	10891	25HL B16
	14"	350	1TG	1532	60.63	1569	61.77	1532	60.63	266	10.47	272	10.71	800	31.5	840	33.1	5830	12853	25HL B17
	16"	400	1TG	1567	61.69	1596	62.83	1567	61.69	272	10.71	276	10.87	800	31.5	900	35.4	7810	17218	25HL B18
	18"	450	1TG	1825	71.85	1854	72.99	1825	71.85	276	10.87	311	12.24	800	31.5	984	38.7	9240	20371	25HL B19
	20"	500	1TG	1875	73.82	1904	74.96	1875	73.82	311	12.24	343	13.50	800	31.5	979	38.5	11025	24306	25HL B20
	22"	550	1TG	2055	80.91	2086	82.13	2055	80.91	343	13,50	378	14,88	800	31,5	1067	42,0	12600	27778	25HL B22
	24"	600	1TG	2257	88.86	2286	90.00	2257	88.86	378	14,88	413	16,26	800	31,5	1155	45,5	15750	34723	25HL B24

PRODUCT FEATURES:
- *Standard O-Rings in Viton with AED properties.*

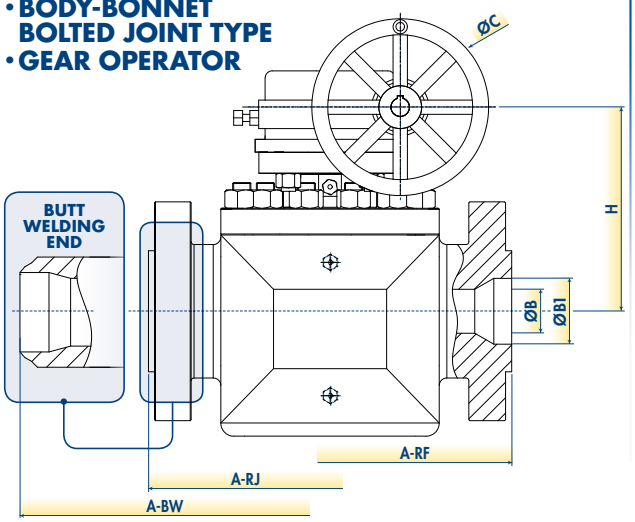
DESIGN TYPE 1TL

- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- LEVER OPERATOR



DESIGN TYPE 1TG

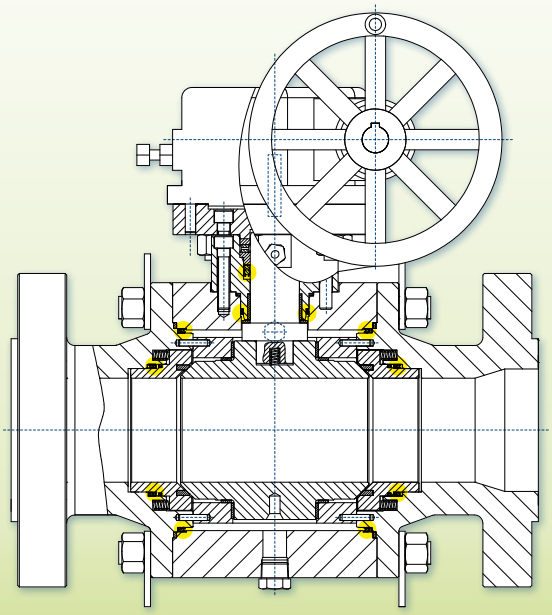
- ONE PIECE BODY
- BODY-BONNET BOLTED JOINT TYPE
- GEAR OPERATOR



ALTERNATIVE DESIGN SOLUTIONS

There are a large variety of available valve configurations for a wide variety of purposes and conditions not tabulated in this catalogue.
Some example are listed below. Other valve designs or customised configurations are available on request, contact BFE for special requirements.

LIP-SEAL CONFIGURATION



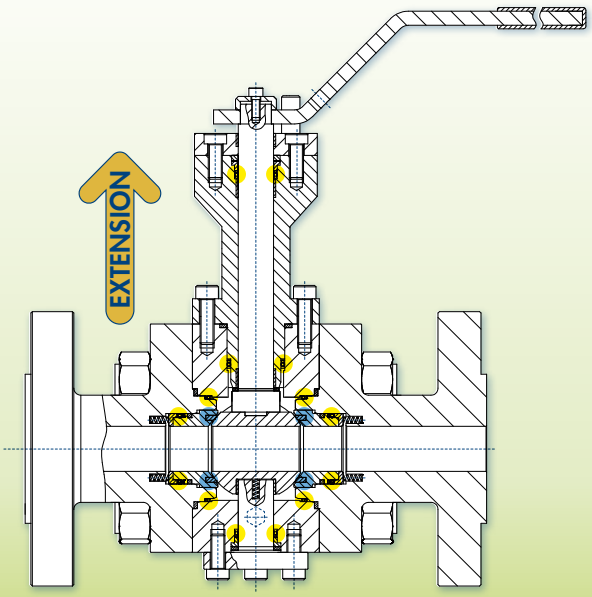
Lip-Seals were introduced to the oil and gas sector primarily to solve reliability and durability problems caused by the performance limitations of elastomeric seals (e.g. O-Ring). Spring-energized seals are pressure-assisted sealing devices, consisting of a PTFE jacket or other polymer, partially encapsulating a corrosion-resistant metal spring energizer.
The spring-energized seals are designed to withstand critical areas of concern such as aggressive media (sour gas with H2S > 15%, methanol, and other harsh chemicals) and extreme temperatures and pressures.
PTFE is one of the primary materials used to manufacture seals for deep well drilling. PTFE is known for its benefit of high heat resistance, chemical inertness, and non-adhesiveness.
To create a high level of strength and flexibility, the PTFE components are fortified with different fillers. These include carbon, graphite, and glass fiber.
The spring elements of these seals are available in a variety of materials to provide the required performance and chemical resistance to suit differing applications and environments.
Lip-Seal are typically used in areas where elastomeric seals cannot meet the frictional, temperature or chemical resistance requirements of the application.
"Profiled seals", such as lip seals, are relatively loose-fitting in the sealing gap. They usually require some initial interference so that they start to seal immediately when fluid is introduced, but then the main sealing action is provided automatically by the pressure of the total fluid being sealed.

Usually the seal is designed so that the pressure in the fluid opens the seal out forcing it to be a tight fit against the two surfaces to be sealed (energisation).

MAIN FEATURES:

1. Virtually universal compatibility with all fluids and gases.
2. Low fugitive emission control.
3. AED Native Design.

CRYOGENIC CONFIGURATION

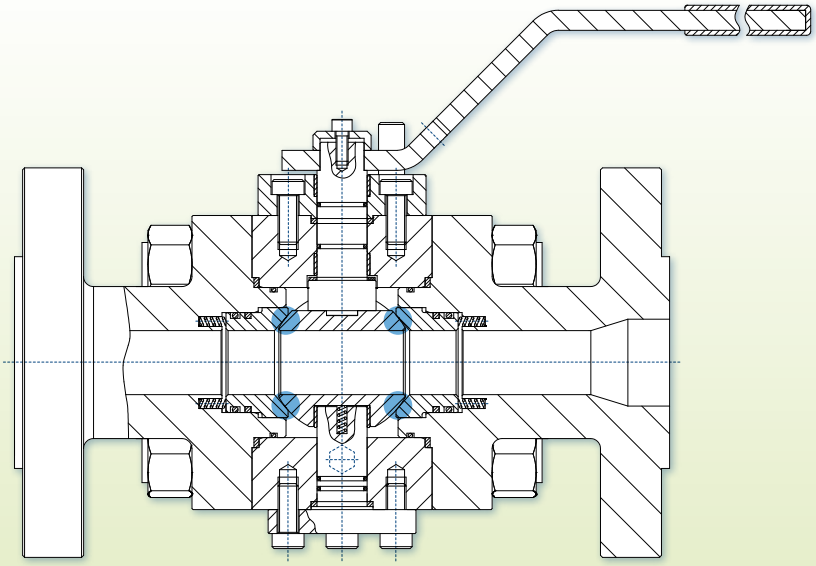


Cryogenic ball valve is suitable for service of working temperature down to –196°C, such as LNG, LPG, and air separation industry.
The cryogenic trunnion ball valves are produced using the most advanced technology and it is designed if not otherwise specified only with lip-seal primary gasket which can mantain an excellent sealing performance of the valves at ultra low temperature.

MAIN DESIGN FEATURES:

1. Bonnet extension.
2. Low fugitive emission control.
3. Lip seal (See Lip-Seal Configuration for benefits).
4. PCTFE seat insert suitable for cryogenic conditions.

EROSION SERVICE CONFIGURATION

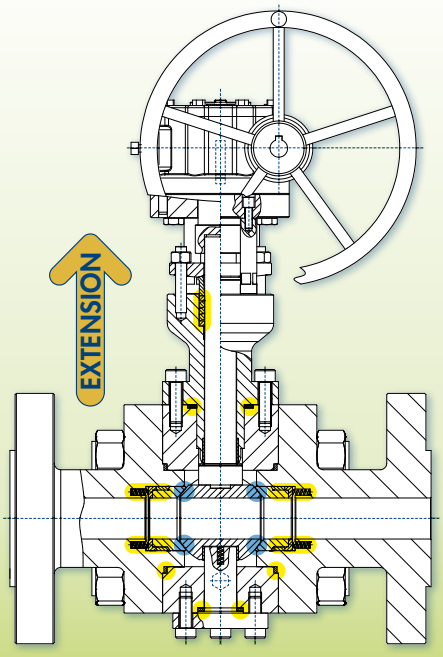


Erosion is one of the most significant major problems faced in oil and gas industries throughout the world.
For standard soft seated valve, the soft seat ring made of polymers will be worn out quickly, if the fluid carries solid particles or contains liquid drops, and it results in the deterioration of the seat rings sealing efficiency to the surface of the closure member when the valves are in the fully closed position, leakage may occur and the situation rapidly deteriorates until the valves are repaired.
Erosion Service Design improves the capability of the valves resistance to erosion by solid particles (such as grains, powders, crystals and polymers) or liquid drops carried in fluid. Seats are Tungsten Carbide Coated with metal to metal contact between seats and ball (metal to metal seat sealing characteristics).
The precise "one-to-one" grinding process ensures the precise "one-to-one" grinding between the ball and the valve seat.

MAIN DESIGN FEATURES:

1. Metal to Metal sealing surface.

HIGH TEMPERATURE CONFIGURATION



Seat of metal to metal ball valves have special design and tight shut-off design to be applied to some critical conditions, such as high-temperate, high pressure and abrasive mediums, to fully solve the problem of inner leakage and outer leakage, and ensure reliable sealing.
Seats are Tungsten Carbide Coated, Chrome Carbide Coated or overlay cladding coated with metal to metal contact between seats and ball (metal to metal seat sealing characteristics).
The precise "one-to-one" grinding process ensures the precise "one-to-one" grinding between the ball and the valve seat.
All gasket and seals are metal type suitalbe for high temperature service.

MAIN DESIGN FEATURES:

1. Metal to Metal sealing surface.
2. Bonnet extension.
3. Full metal design (no elastomers or thermoplastic materials).

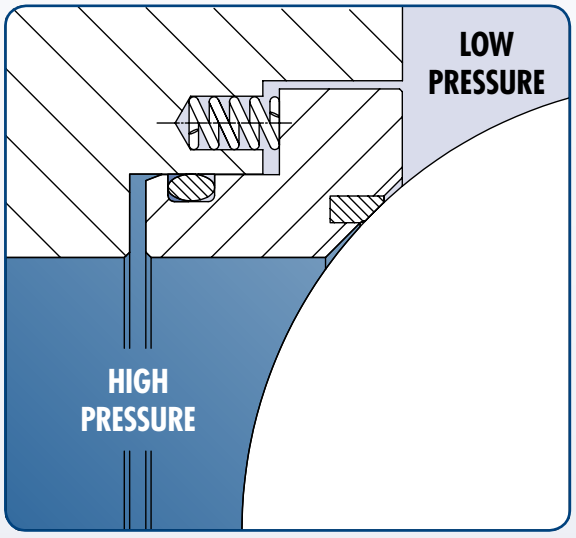
FOR TRUNNION MOUNTED BALL VALVES

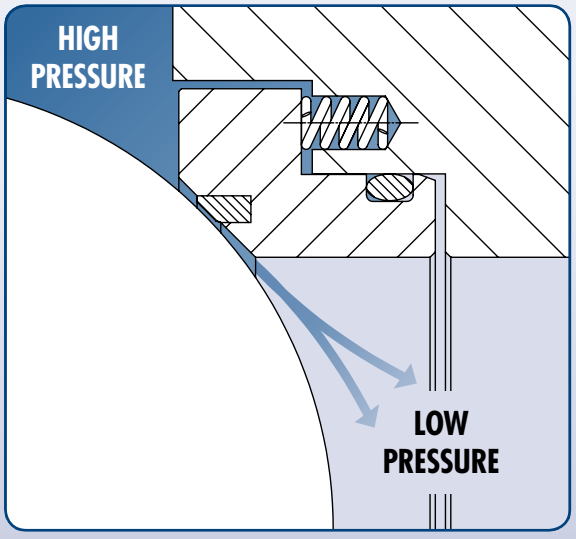
OTHER VALVE OPTIONS OR CUSTOMIZED VERSIONS ARE AVAILABLE ON REQUEST, CONTACT BFE FOR SPECIAL REQUIREMENTS.

PISTON EFFECT PRINCIPLE - BOTH APPLICABLE FOR ALL RANGE

STANDARD SINGLE PISTON EFFECT

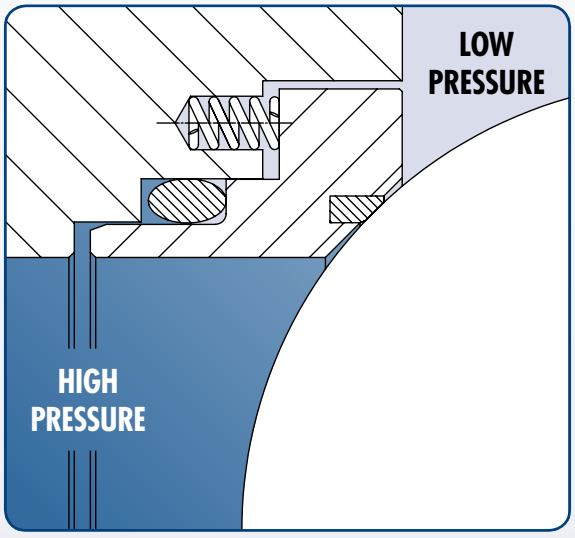
In the standard design of Trunnion Mounted Ball Valves, each seat ring performs the "Single Piston" action. In this case the pressure acting on the external side of the seat ring pushes it against the ball while the pressure acting on the internal side of the seat rings pushes it away from the ball. Therefore, while both seat-rings grant the required tightness, when the pressure is applied on their external side, they are defined "Self Relieving", allowing any over pressure acting in the body cavity to be discharged in the line as soon as the force caused by the pressure overcomes the one provided by the springs.

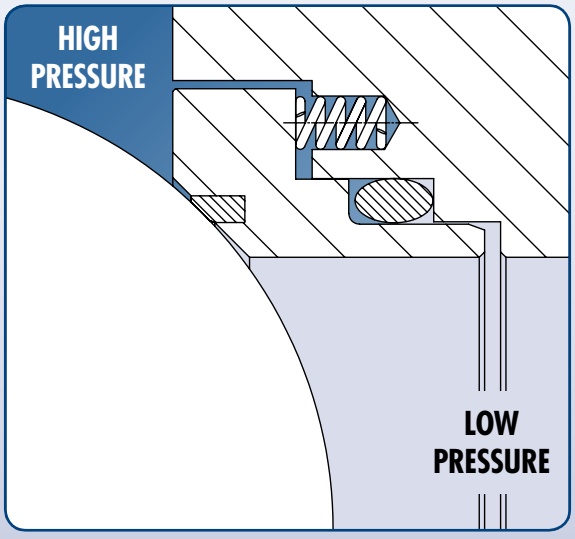




OPTIONAL DOUBLE EFFECT

On request the seat rings design may be modified to perform the "Double Piston Effect" action. In this case the pressure acting on both the external and internal side of the seat rings, results in a force pushing it against the ball, therefore each seat ring grants the required tightness even if the pressure is applied in the body cavity.
This features assures dead-tight sealing simultaneously on both sides of the ball and in order to release any possible over-pressure which develops the body cavity it is necessary to use an external safety relief valve.





FOR TRUNNION MOUNTED BALL VALVES

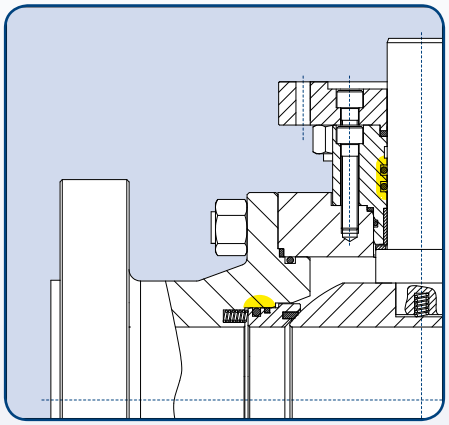
OTHER VALVE OPTIONS OR CUSTOMIZED VERSIONS ARE AVAILABLE ON REQUEST, CONTACT BFE FOR SPECIAL REQUIREMENTS.

CRA WELD OVERLAY

Cladding is defined as the act or process of bonding one metal to another, usually to protect the inner metal from corrosion.
The main reason for utilizing this process on valves is to allow for a less expensive base material to have the corrosion properties of a much more expensive material at the surface.
The benefits are that the wetted surfaces have the corrosion resistance of the clad material with an overall cost closer to that of the base material and assuring a better performance than solid exotic materials due to better resistance to deformation of base (carbon steel) material.
Weld cladding is today a very efficient & cost effective solution for the surface treatment of valves used in highly corrosive & erosive ìmetal lossî environment.
BFE provide fully project managed customer solutions for the oil and gas industry corrosion resistant overlay applications such as Inconel 625 and SS316 utilising the latest industry techniques and equipment. The base materials utilised in the production process are normally carbon steel or low alloy steel.
Valve are available partially or fully cladded as shown below, special cladding configurations or materials are available on request.

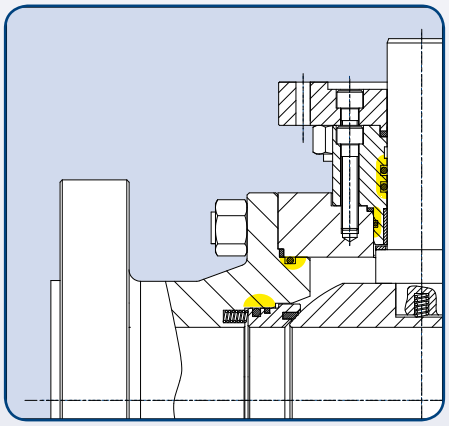
CRA OVERLAY ON DYNAMIC SEALS

Cladding only on the seal surfaces that prevent leakage past parts which are in relative motion. Typically for trunnion design dynamic seals are the stem and seat gasket.



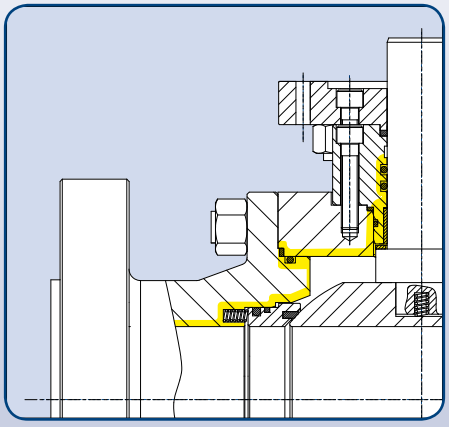
CRA OVERLAY ON STATIC & DYNAMIC SEALS

Cladding on all seal surfaces that prevent any type of leakage of the valve, static or dynamic.The connection to the line is not cladded as standard (it is considered part of the line), any pipe connection can also be cladded upon request.



CRA OVERLAY ALL ON WETTED SURFACES

Full cladding includes all wetted areas of the valve.

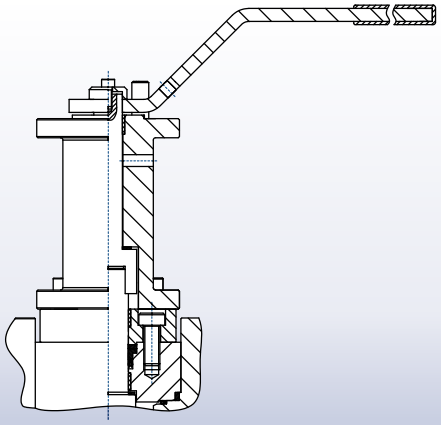


FOR TRUNNION MOUNTED BALL VALVES

OTHER VALVE OPTIONS OR CUSTOMIZED VERSIONS ARE AVAILABLE ON REQUEST, CONTACT BFE FOR SPECIAL REQUIREMENTS.

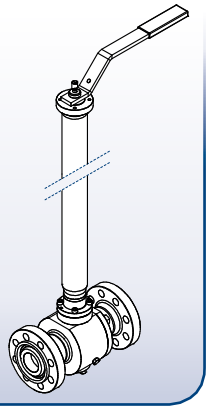
STEM EXTENSION

BFE stem extension is a simple and effectve design. This option is designed for installation where pipe insulation would make standard valve inoperable. The stem extension can also be used where a handle needs to be raised above an adjoining obstruction or where the valve is installed behind a panel.



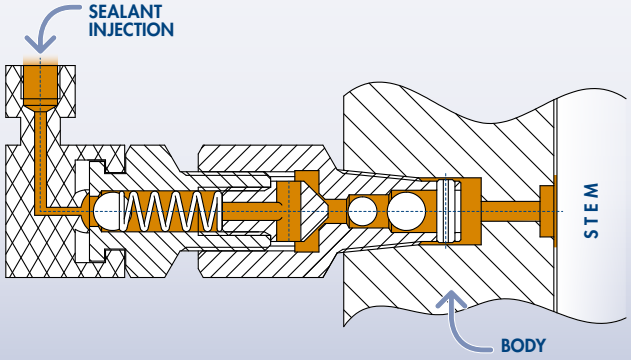
HIGH HEAD FOR REMOTE OPERATION

Ball valves can be suited for underground installations or remote services. Valves fitted with stem extensions can have extended vent drains as an option. Custom extension spindles permit the adaptation to the existing pipe cover depth.
The extensions are suitable for mounting manual, motor and cylinder operators on valves.
The floorstand includes the standard valve position indicator.



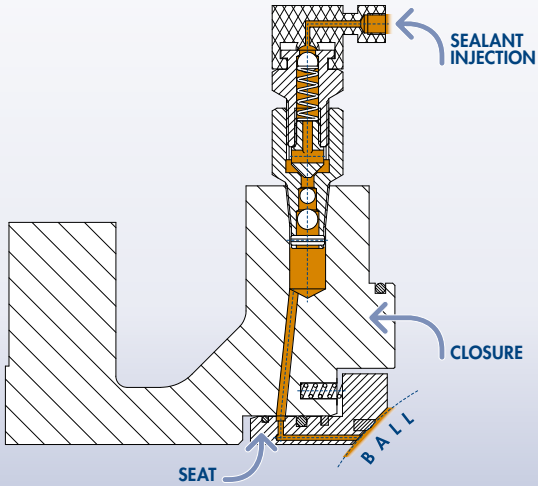
STEM EMERGENCY SEAL RESTORATION

For NPS 6 full port and larger each valve is supplied as standard complete with emergency stem sealant injection feature. When required and not in the standard NPS range the sealant supply mechanism can be provided as an option for accidental leakage form the stem sealing area. Sealant port with check valve permits safe injection of sealant for fast, simple restoration of tight shutoff.
Should the sealing material be damaged or decomposed by fire or other accidental causes, leakage can be temporarily prevented by injection of the sealant into this mechanism.



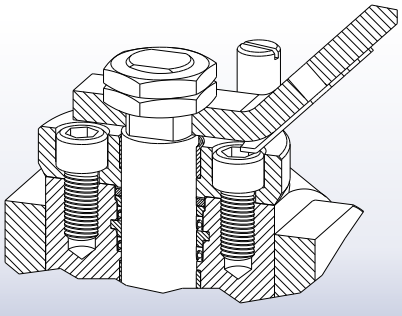
SEAT EMERGENCY SEAL RESTORATION

A sealant supply mechanism can be provided as an option for accidental leakage form the seat sealing area. Sealant port with check valve permits safe injection of sealant for fast, simple restoration of tight shutoff.
Should the sealing material be damaged or decomposed by fire or other accidental causes, leakage can be temporarily prevented by injection of the sealant into this mechanism.



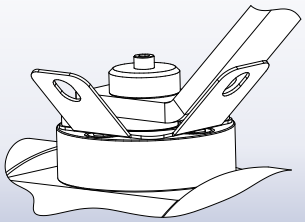
DOUBLE LIP SEAL SUPER LOW-EMISSION DESIGN

Leakage from the valve stem area can be prevented by double primary sealing with lip seal. However in case of fire, after a fire has deteriorated the primary double seal, graphite fire safe stem seal is the measure that prevents external fluid leakage.



LOCKING DEVICE

Locking devices designed to help prevent accidental or unwanted operation are built to resist excessive force. All BFE locking device options are simple but secure. Padlock available on request.

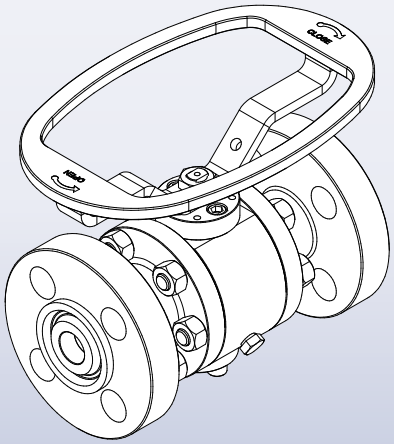


FOR TRUNNION MOUNTED BALL VALVES

OTHER VALVE OPTIONS OR CUSTOMIZED VERSIONS ARE AVAILABLE ON REQUEST, CONTACT BFE FOR SPECIAL REQUIREMENTS.

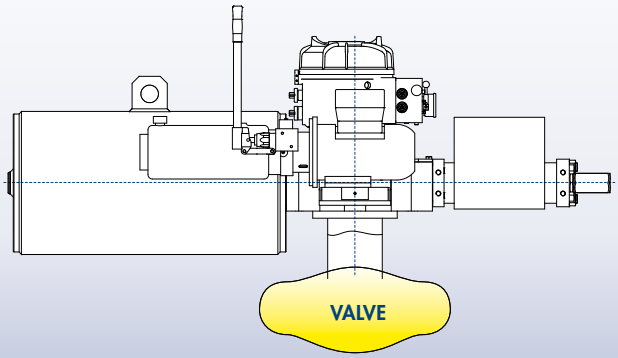
OVAL HANDLE

Oval handles are intended for several applications, they can be installed where a standard lever handle can encounter interference from piping system or support frame.
Oval handles can also prevent accidental valve operations, since they have less projection than a lever handle, and require more force to operate.
The oval handle can be field or factory mounted on the standard manual ball valve product and can be supplied with a locking device.
Tee handles can also be supplied and offer the same installation space savings as oval handles, with a slightly shorter end to end dimension.
Tee handles require more handle force to operate, so accidental openings can be reduced.



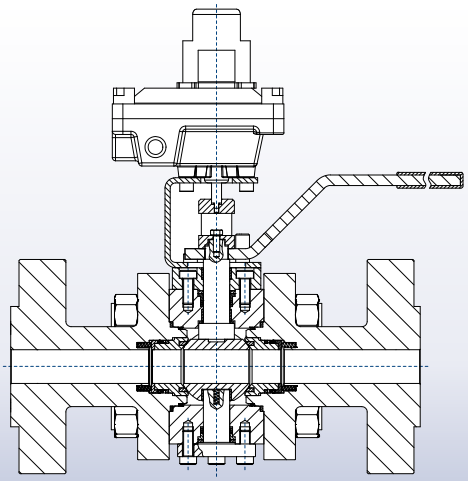
PNEUMATIC, HYDRAULIC OR ELECTRIC ACTUATORS

Motorized controls can be applied to valves of any size for operation in any position or location.
BFE ball valves are available with pre-assembled valve/pneumatic actuator packages.
BFE standard design allows users to mount most brands of valve actuators with the need of an additional bracket always available in the factory.



LIMIT SWITCH ASSEMBLIES

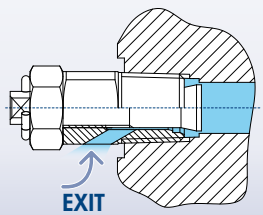
Position Limit Switch assemblies enables a remote signaling of the control system the opening of the valve.
Limit swich can be selected by customer, bracket candesigned by BFE.



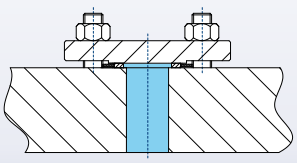
SPECIAL DRAIN AND VENT DESIGN

BFE standard drain and vent design is with a standard NPT hex plug according to ASME B16.11.
However special requirement for drain and vent design can be supplied as an option, the most common customized versions are shnown here.

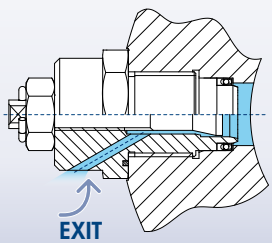
ANTI-BLOWOUT PLUG



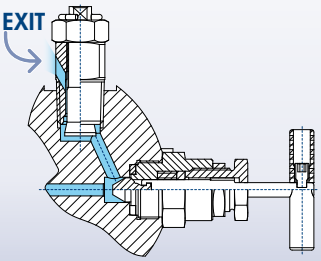
FLANGED CONNECTION



ANTI-BLOWOUT PLUG WITH EXTERNAL GASKET SYSTEM



NEEDLE VALVE AND ANTI-BLOWOUT PLUG



Printed in Italy 1th edition.
Revision 00 2017/01/31

GENERAL SALE CONDITIONS

QUOTATION VALIDITY

Unless otherwise agreed, quotations are valid for four weeks from date of issue.
The delivery terms are always "ex-works" unless otherwise stated.
Prices and sale conditions can be changed without any previous notice.

ORDERS ACCEPTANCE

Orders are considered accepted at our general sale conditions clearly mentioned on order acknowledgment.

GOODS DELIVERY

The Company does not accept any responsability for delays is delivery which are always intended as indicative and not binding. Transport risks are at receiver's charge also in case of CIF delivery.

GUARANTEE

The Company warrantees all its products, from material and/or manufacturing defects, to be used as recommended by standards, and in accordance with approved piping practice and technique, for a period of one year from shipping date, unless otherwise agreed.
The Company liability covers eventual "free of charge" replacements for defective parts or products, providing it has not failed in the observance of above mentioned conditions and in use in compliance with standards, and, anyway, after return of defective goods. Any other liability, neither objective nor subjective will be accepted.

CLAIMS AND ORDER CANCELLATIONS

Claims will be considered only if made within 10 days from goods receipt.
Partial or complete cancellations of order can be accepted only upon previous agreement or by written consent and, however, not later than 15 days from order date.
Any controversy will be handled by the Court of Milan.

B.F.E. S.r.l. - Via Tonale, 70/A - 24061 Albano S.Alessandro (BG) Italy - Phone: 035.584111 - Fax: 035.583022 - Mail: sales@bfe.it
www.bfe.it

BONNEY FORGE

+001.814.542.2545
www.bonneyforge.com

+001.713.695.3633 - +001.713.695.3528 f
www.wfi-intl.com

RP&C Valve

www.rpc-valve.com