WALWORTH®
Since 1842

CATALOG
BALL VALVE
TRUNNION MOUNTED

Nota: Los dibujos e información aquí mostrados son ilustrativos a los diferentes diseños de Walworth®. Las configuraciones físicas de las válvulas pueden cambiar de acuerdo con los estándares de Walworth®.

WALWORTH GROUP

Note: The drawings and information shown here are illustrative of the different Walworth® designs. Valve physical configurations may change in accordance with Walworth® standards.

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INTRODUCTION

TRUNNION-MOUNTED BALL VALVES API 6D

TÜV CERT

Certificate API-6D No. 6D-0097
STD API-6D-0097

Lloyd's Register Marine
PED Nr. 0343/PED/ROT/HSN1620126/1

API Spec Q1 Registered
Registration No. Q1-1479

QMS REGISTERED
Certificate ISO-9001 No. 0038

WALWORTH®

WALWORTH® is regarded as a leading manufacturer of industrial valves worldwide. Since its foundation in the 19th century by James WALWORTH®, the company has focused its efforts on innovating and producing different product lines for fluid control.

The accumulated experience throughout this long and successful journey, coupled with a spirit of constant innovation, allows WALWORTH® to provide satisfactory solutions to a wide range of industries, and end-users, meeting and exceeding the most stringent quality standards. Among these industries are petrochemical, gas, oil, power generation, pulp, and paper converters, as well as companies related to geothermal and cryogenic technologies, among others.

During its history, it has produced more than 40,000 different products, positioning itself as a globalized corporation serving different industries with the experience of more than 500 employees.

WALWORTH® has facilities for manufacturing valve series in a fully integrated operation workflow: Raw material warehouses, various types of machining, welding processes such as SMAW, GMAW, SAW, PAW, assembly, testing for low and high pressure for high temperature or cryogenic service, painting process, packaging, and shipping.

All this infrastructure allows us to serve the markets of North America, Central America, South America, Europe and Africa; additionally, with our master distributors we reach countries as far away as Indonesia, Singapore or Australia, as well as the Middle, and Far East.

WALWORTH® VALUES

MISSION

To contribute to the development of our clients and partners through sustainable growth.

VISION

To be a robust and innovative company, offering our clients comprehensive outstanding solutions.

QUALITY POLICY

WALWORTH® is a global company focused on the design, manufacturing, and marketing of flow control valves, complying with applicable national and international legal requirements and standards.

We are committed to attaining stakeholder satisfaction, meeting quality objectives and promoting continual improvement of our quality management system.

SAFETY, HEALTH AND ENVIRONMENT POLICY

WALWORTH® is a global company focused on the design, manufacturing, and marketing of flow control valves, complying with applicable national and international legal requirements and standards. We are committed to responsibly conducting business, ensuring the prevention of employee, customer, visitor, and community injuries and illnesses, as well as environmental care, pollution prevention, and sustainable use of resources, promoting employee consultation, participation, and continuous improvement of the safety, health and environmental system.

WALWORTH® DESIGN CONTROL

WALWORTH® products are manufactured according to strict compliance with the world's leading standards such as API, ASME, ASTM, MSS, NACE, AWWA, BSI, CSA, among others. Our engineering team constantly reviews the latest updates to these standards to incorporate any changes that affect the design, regulations, or performance of our products, always taking the lead in the new developments obtained.

The engineering department uses state-of-the-art technology and equipment, as well as the use of finite elements and design programs to ensure the proper assembly and performance of our products from their inception, calculations, and creation of detailed drawings for manufacturing, placing WALWORTH® as a leader in product development for today's needs within the valve market

WALWORTH® QUALITY SYSTEM

Over time, WALWORTH® developed its Quality Management System, used not as a separate information system, but as the main Administrative System focused on Quality. In this regard, WALWORTH® is an ISO-9001 certified company and upholds the leading worldwide certifications.

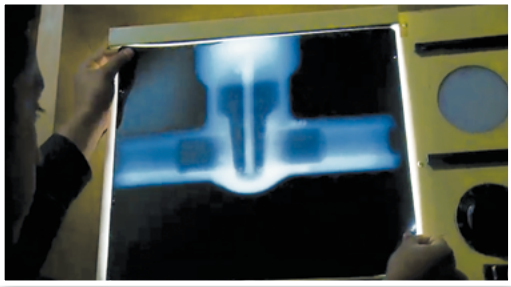
This system requires rigorous quality control and selection of raw materials from approved suppliers, as well as control of the manufacturing process. With the serial number, WALWORTH® can monitor the product throughout the manufacturing process and provides traceability information for the materials used in each valve. The following are some of the main certifications:

WALWORTH® CERTIFICATIONS

STANDARD	STANDARD NAME	CERTIFICATE No.
API-6D	SPECIFICATION FOR PIPELINE AND PIPING VALVES	6D-0097
API-600	STEEL GATE VALVES - FLANGED AND BUTT-WELDING ENDS, BOLTED BONNETS	600-0109
API-602	GATE, GLOBE, AND CHECK VALVES FOR SIZES DN 100 (NPS 4) AND SMALLER FOR THE PETROLEUM AND NATURAL GAS INDUSTRIES	602-0024
API-594	CHECK VALVES: FLANGED, LUG, WAFER, AND BUTT-WELDING	594-0007
API-6A	SPECIFICATION FOR WELLHEAD AND CHRISTMAS TREE EQUIPMENT	6A-0234
API-6FA	SPECIFICATION FOR FIRE TEST FOR VALVES	VARIOS DE ACUERDO AL TAMAÑOY CLASE DE LA VÁLVULA
API-607	FIRE TEST FOR QUARTER-TURN VALVES AND VALVES EQUIPPED WITH NONMETALLIC SEATS	VARIOS DE ACUERDO AL TAMAÑO Y CLASE DE LA VÁLVULA
API-608	METAL BALL VALVES - FLANGED, THREADED, AND WELDING ENDS	608-0068
API-624	TYPE TESTING OF RISING STEM VALVES EQUIPPED WITH GRAPHITE PACKING FOR FUGITIVE EMISIONS	VARIOS DE ACUERDO AL TAMAÑO Y CLASE DE LA VÁLVULA
ISO-15848-1	INDUSTRIAL VALVES-MEASUREMENT, TEST AND QUALIFICATION PROCEDURES FOR FUGITIVE EMMISIONS	VARIOS DE ACUERDO AL TAMAÑO Y CLASE DE LA VÁLVULA
ISO-10497	TESTING OF VALVES - FIRE-TYPE TESTING REQUIREMENTS	VARIOS DE ACUERDO AL TAMAÑO Y CLASE DE LA VÁLVULA
ISO-9001	QUALITY MANAGEMENT SYSTEMS - REQUIREMENTS	API QR-0038
PED (2014/68/UE)	PRESSURE EQUIPMENT DIRECTIVE MODULE H FOR EUROPEAN COMMUNITY	0343/PED/ROT/HSN1620126/1
IEC 61508	SAFETY INTEGRAL LEVEL CERTIFICATION FOR TRUNNION BALL VALVES (SIL3)	No. 968/V 1135.00/19
API-Q1	SPECIFICATION FOR QUALITY MANAGEMENT SYSTEMS	Q1-1479

QUALITY CONTROL EQUIPMENT

To ensure that WALWORTH products comply with International Standards, we employ professional-quality monitoring equipment, several of which are described below:



Radiographic Examination Equipment. - WALWORTH® has in its facilities its own source of Iridium Ir-92, for radiographic testing of castings from 0.100" to 2 1/2" wall thickness, ascertaining the healthiness of the raw materials.

Positive Material Identification (PMI) - We have the latest generation equipment for positive material identification. These are used to conduct qualitative chemical analysis starting at the incoming inspection stage and/or on components to be assembled to verify that proper materials are being used for the specific valve service according to the customer's requirements.

Magnetic Particle Testing - WALWORTH® has the equipment for magnetic particle testing applied to ferrous materials susceptible to magnetism. This test is performed by sampling or when the customer requests Magnetic Particle Certification.

Liquid Penetrant Testing - WALWORTH® has the personnel and materials to perform this test, using water or solvent removable liquid penetrant techniques. The personnel are certified according to the American Society for Non-Destructive Testing (ASNT).

Metrology Laboratory - WALWORTH® developed a verification and calibration system for all equipment used in our facilities to ensure traceability of measurements against internationally recognized standards. In this way, control is maintained over the measurements taken during manufacturing, ensuring compliance with the major international standards.

Fire Test - Appropriate facilities are available to perform the fire test according to API requirements. This test exposes the valve to fire from 1,400 to 1,800ºF (761 to 980ºC) to verify the tightness and proper sealing of the valve after a certain exposure time.

Low Leakage Emission Testing Equipment - Applies when a customer requires a Low Leakage Emission certificate. The laboratory is equipped with its LFE equipment capable of measuring under 20 ppm in static or dynamic conditions at room temperature or under thermal cycling operating conditions.

Wall Thickness Measuring Equipment - Using ultrasound techniques, the wall thickness of various metallic materials including ferrous and stainless steel can be measured.

Stress Testing Equipment - To ensure the mechanical properties of the materials used in manufacturing. WALWORTH® performs sample testing of specimens of raw materials from our suppliers, even when receiving quality certifications from them.

Hardness Equipment - For both laboratory and in-plant testing, WALWORTH® has Rockwell B, C, Brinell, and Vickers testing equipment to verify compliance with the standard's hardness requirements.

TRUNNION-MOUNTED BALL VALVE
STANDARDS AND SPECIFICATIONS

Although their primary use is to convey crude oil, gas mixtures, or petroleum products, trunnion ball valves (trunnion mounted) can handle any type of fluid, liquid, gas, and steam (including water steam); whether or not containing suspended solid particles. The most common application for trunnion ball valves is port shut-off; due to its design, it has a smooth and uninterrupted port passage that offers little (or almost no) resistance to flow when open; this enables to significantly reduction flow turbulence due to section changes and minimizes pressure drop.

The WALWORTH® trunnion ball valve is designed and manufactured under API-6D and ISO-14313 international standards. They also meet the criteria referenced in ASME B16.34 and ASME PVC Section VIII Division I; they also comply with the criteria of the Technical Specification PEMEX-EST-0211/02-2017. Its main features are:

- Three-piece design (Side Entry), Bolted Body (Bolted body) or Welded Body (Fully welded)
- Full constant port to minimize pressure drop and allow inspection or cleaning tools (pigs) through. Reduced port option upon customer request.
- Ball (or sphere) type plug mounted on trunnions rotating on its axis perpendicular to the flow direction.
- Ejection-proof stem.
- Dynamic Seat Rings, Spring-loaded.
- Seats for soft seals (inserts); manufactured from elastomers chosen according to service conditions (pressure, temperature).
- Anti-static device to avoid electrostatic charges (sparks) that may cause a fire.
- Metal to metal seats or Dual Seats (PMSS) option.
- Perform Double Block and Bleed (DBB) function.
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seat option.
- •DIB-1 or DIB-2 type Double Block and Bleed options.
- Face-to-face dimension (RF) or end-to-end dimension (RTJ or WE) under API-6D (Table C3). For dimensions not listed in API-6D, the dimensions published in ASME B16.10 are used.

- RF or RTJ flange dimensions under ASME B16.5 from NPS 1 to NPS 24; for NPS 26 and larger valves, ASME B16.47 Series A flanges. WE end dimensions under ASME B16.25.
- Suitable for sour service under NACE MR-01-75, or NACE MR-01-03 (ISO15156, or ISO 17945).
- Fireproof design in accordance with API-6FA (“Standard for Fire Test for Valves”) and API-607 (”Fire Test for Quarter Turn Valves and Valves Equipped with Nonmetallic Seals”).
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.
- Handle operated on small diameters and gear operated on large diameters.

WALWORTH®
Since 1842

TRUNNION-MOUNTED BALL VALVE
BODY AND INTERIOR MATERIALS (TRIM)

STANDARD MATERIALS: BODY and ENDS.

International standard materials of construction for body and ends are shown below:

FORGED BODY MATERIAL ASTM STANDARD.	ASME GROUP B16.34	STANDARD DESIGNATION	CAST BODY MATERIAL SPECIFICATION	BAR BODY MATERIAL SPECIFICATION
ASTM A105	1.1	CARBON STEEL C-Mn-Si	ASTM A216 WCB	ASTM A105
ASTM A105N	1.1	CARBON STEEL C-Mn-Si	ASTM A216 WCC	ASTM A105N
ASTM A350 LF1	1.4	LOW-TEMPERATURE CARBON STEEL C-Mn-Si	ASTM A352 LCB	ASTM A350 LF1
ASTM A350 LF2	1.1	LOW-TEMPERATURE CARBON STEEL C-Mn-Si	ASTM A352 LCC	ASTM A350 LF2
ASTM A182 316	2.2	STAINLESS STEEL 18 Cr-12NI-2Mo-0.08C.	ASTM A351 CF8M	ASTM A479 316
ASTM A182 F51	2.8	DUPLEX STAINLESS STEEL GRADE 4A 22Cr-5Ni-3Mo-N-0.030C	ASTM A995 CD3MN	ASTM A479 31803
ASTM A182 F53	2.8	DUPLEX STAINLESS STEEL GRADE 5A 25Cr-7Ni-4.5Mo-N-0.030C	ASTM A995 CE3MN	ASTM A479 32750

Note: The above list of consumer industries and corrosive materials are useful as examples of typical applications where these materials may be used; however, all responsibility for the selection of the proper alloy rests with the engineering firm or end-user.
If other types of end-body materials are required, consult your nearest sales representative.

STANDARD MATERIALS FOR INTERIOR ARRANGEMENT WITH SOFT SEALS:

WALWORTH® stocks soft-seal interior arrangements that cover most services. The most common internal arrangements for soft seals are as follows:

INTERNAL ARRANGEMENTS (TRIM) COMMONLY USED IN TRUNNION BALL VALVES SOFT SEALS							
WALWORTH® DESIGNATION	NPS	CLASS	PLUG	STEM	TRUNNION	SEAT RINGS	INSERT
T1	2" A 36"	150, 300, 600, 900 $ 1500	ASTM A105 +0.003" ENP	AISI 4140 +0.003"" ENP	AISI 4140 + 0.003"" ENP	A105 + 0.003" ENP	Temperature dependent
T2	2" A 36"	150, 300, 600, 900 & 1500	ASTM A182 F6A +0.003"	A182 F6A	A182 F6A	A182 F6A	Temperature dependent
T3	2" A 36"	150 & 300	ASTM A182 316	ASTM A182 316	ASTM A182 316	ASTM A182 316	Temperature dependent
	2" A 6"	600					
	8" A 24"	600	ASTM A182 316	ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17-4Ph)	ASTM A182 F6 (SS-410)	Temperature dependent
	30" A 36"	600	ASTM A693 630 H1150 (17-4Ph)				
T3	2"	900	ASTM A182 316	ASTM A182 316	ASTM A182 316	ASTM A182 316	Temperature dependent
	3" A 8"		ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17-4Ph)	ASTM A182 316 ASTM A182 F6 (SS-410)	
	10" A 24"						
T3	2"	1500	ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17Ph)	ASTM A182 316	Temperature dependent
	3" A 24"					ASTM A182 F6 (SS410)	
T5	2" A 36"	150, 300, 600, 900 & 1500	ASTM A350 LF2 +0.003" ENP	AISI 4140 +0.003" ENP	AISI 4140 + 0.003" ENP	ASTM A350 LF2 + 0.003" ENP	Temperature dependent
T35	2" A 36"	150, 300, 600, 900 & 1500	AISI-4130 + 0.003" ENP	AISI 4130 +0.003" ENP	AISI 4350 LF2 + 0.003" ENP	ASTM A182 F6 (SS-410)	Temperature dependent
T40	2" A 36"	150, 300, 600, 900 & 1500	ASTM A694 F60 +0.003" ENP	AISI 4140 +0.003" ENP	AISI 4140 + 0.003" ENP	ASTM A182 F6 (SS-410)	Temperature dependent

Note 1. ENP: 0.003" (75μm) Electrolytic nickel coating. For Class 2500 consult your nearest WALWORTH® sales representative. All interior materials in compliance with NACE MR-01-75 and/or NACE MR-01-73. Other internal arrangements are available upon request.

TRUNNION-MOUNTED BALL VALVE
BODY AND INTERIOR MATERIALS (TRIM)

Manufacturing range. WALWORTH® offers a wide range of side entry style trunnion ball valves in both body-screwed ends (bolted body) and body-welded ends (fully welded); and through Conduit reduced port styles in accordance with the following table:

BODY-JOINT ENDS	STYLE	CLASS 150 NPS (DN)	CLASS 300 NPS (DN)	CLASS 600 NPS (DN)	CLASS 900 NPS (DN)	CLASS 1500 NPS (DN)	CLASS 2500 NPS (DN)
BODY-SCREWED ENDS	FULL PORT	2-48 (50-1200)	2-48 (50-1200)	2-48 (50-1200)	2-42 (50-1050)	2-36 (50-900)	2-24 (50-600)
BODY-SCREWED ENDS	REDUCED PORT	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	UPON REQUEST	UPON REQUEST
BODY-WELDED ENDS	FULL PORT	2-48 (50-1200)	2-48 (50-1200)	2-48 (50-1200)	2-42 (50-1050)	2-36 (50-900)	2-24 (50-600)
BODY-WELDED ENDS	REDUCED PORT	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	UPON REQUEST	UPON REQUEST

STANDARD MATERIALS FOR INTERIOR ARRANGEMENT WITH METAL TO METAL SEALS:

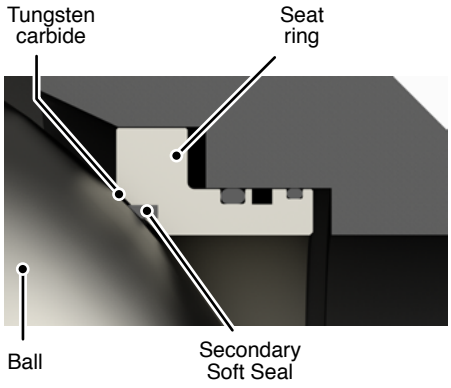
In services where abrasive solids are in suspension, critical services, or where the operating temperature compromises the proper functioning of the soft seals, WALWORTH® offers the option of metal-to-metal seals. The most common arrangements are:

WALWORTH® DESIGNATION	NPS	CLASS	PLUG	STEM	TRUNNION	SEAT RINGS	INSERT
T6	2" a 36"	150, 300,600,900 & 1500	ASTM A105 + TC	ASTM 4140 + TC	ASTM 4140 + TC	ASTM 4140 + TC	N/A
T7	2" a 36"	150, 300,600,900 & 1500	ASTM A320 LF2 + TC	ASTM A350 LF2 + TC	ASTM A350 LF2 + TC	ASTM A350 LF2 + TC	N/A
T8	2" a 24"	150, 300,600,900 & 1500	ASTM A182 F6A + TC	ASTM A182 F6A + TC	ASTM A182 F6A + TC	ASTM A182 F6A + TC	N/A
T9	2" a 12"	150, 300,600,900 & 1500	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	N/A
T10	2" a 12"	150, 300,600,900 & 1500	AISI 4140 + ST-6	AISI 4140 + ST-6	AISI 4140 + ST-6	AISI 4140 + ST-6	N/A
T11	2" a 12"	150, 300,600,900 & 1500	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	N/A
T12	2" a 12"	150, 300,600,900 & 1500	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	N/A
T13	2" a 12"	150, 300,600,900 & 1500	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	N/A

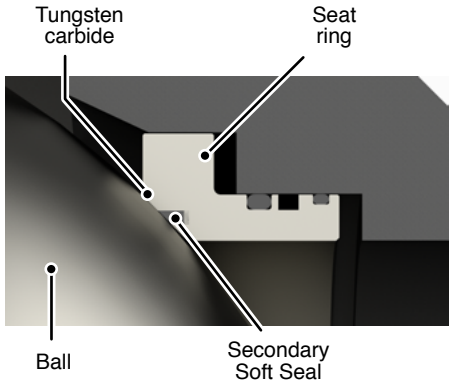
TC: Tungsten carbide coating applied by HVOF process with a minimum thickness of 0.006".
ST-6: Stellite 6 coating applied by HVOF process with a minimum thickness of 0.006".
N/A: Not Applicable
NOTE: Hard chromium carbide coating is available upon request.

STANDARD MATERIALS FOR INTERIOR ARRANGEMENT WITH DUAL SEALS (PMSS).

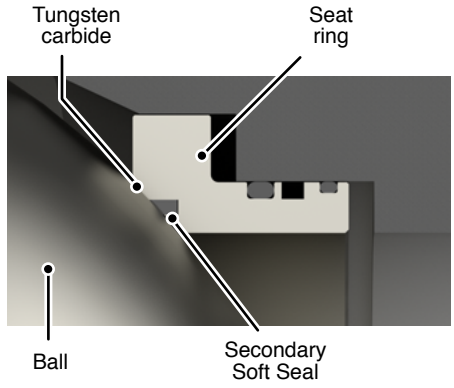
The dual seal arrangement (primary metal-to-metal seal and secondary soft seal) combines the advantages of both of the above options.



The secondary seal is the soft seal that allows the valve to seal when there is low pressure in the system; it also provides a seal that prevents sludge or foreign material from being trapped between the annulus and plug.



When the pressure increases, the soft seals collapse in their elastic zone; then the metal coating (primary seal) of the ball comes in contact with the metal seal of the seat rings achieving the metal-to-metal seal.



When the pressure decreases again, the soft (secondary) seals return to their position due to the phenomenon of resilience. This dual-action provides a tighter seal for longer and fewer in-service problems.

TRUNNION-MOUNTED BALL VALVE
BODY AND INTERIOR MATERIALS (TRIM)

The most common arrangements for dual seals are shown below:

WALWORTH® DESIGNATION	NPS	CLASS	PLUG	STEM	TRUNNION	SEAT RINGS	INSERT
T6-D	2" a 36"	150, 300,600,900 & 1500	ASTM A105 + TC	ASTM 4140 + TC	ASTM 4140 + TC	ASTM 4140 + TC	Temperature dependent
T7-D	2" a 36"	150, 300,600,900 & 1500	ASTM A320 LF2 + TC	ASTM A350 LF2 + TC	ASTM A350 LF2 + TC	ASTM A350 LF2 + TC	Temperature dependent
T8-D	2" a 24"	150, 300,600,900 & 1500	ASTM A182 F6A + TC	ASTM A182 F6A + TC	ASTM A182 F6A + TC	ASTM A182 F6A + TC	Temperature dependent
T9-D	2" a 12"	150, 300,600,900 & 1500	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	Temperature dependent
T10-D	2" a 12"	150, 300,600,900 & 1500	AISI 4140 + ST-6	AISI 4140 + ST-6	AISI 4140 + ST-6	AISI 4140 + ST-6	Temperature dependent
T11-D	2" a 12"	150, 300,600,900 & 1500	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	Temperature dependent
T12-D	2" a 12"	150, 300,600,900 & 1500	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	Temperature dependent
T13-D	2" a 12"	150, 300,600,900 & 1500	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	Temperature dependent

TC: Tungsten carbide coating applied by HVOF process with a minimum thickness of 0.006".
ST-6: Stellite 6 coating applied by HVOF process with a minimum thickness of 0.006".
Note: Hard chromium carbide coating is available upon request.

TRUNNION-MOUNTED BALL VALVE
DESIGN FEATURES.

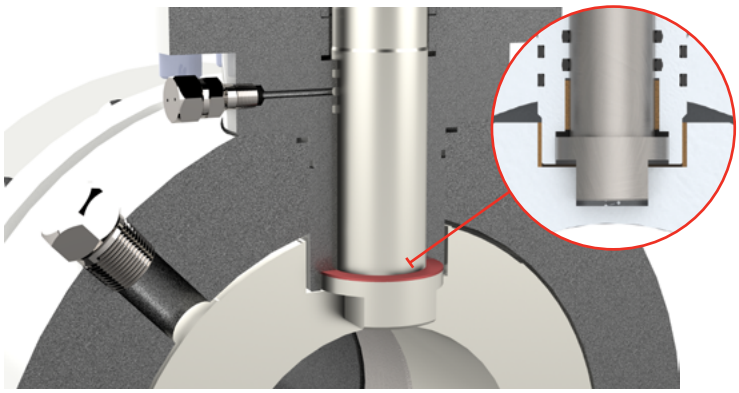
QUARTER-TURN OPERATION.

The Quarter-turn operation, coupled with the small force required to operate the trunnion ball valve, makes the trunnion ball valve preferred for applications where frequent shut-offs are needed, as they are easy to operate. Even with gear operation, the number of turns required on the hand wheel is much less than the number of turns required to operate a multi-turn valve such as a gate valve.

Lever Operation

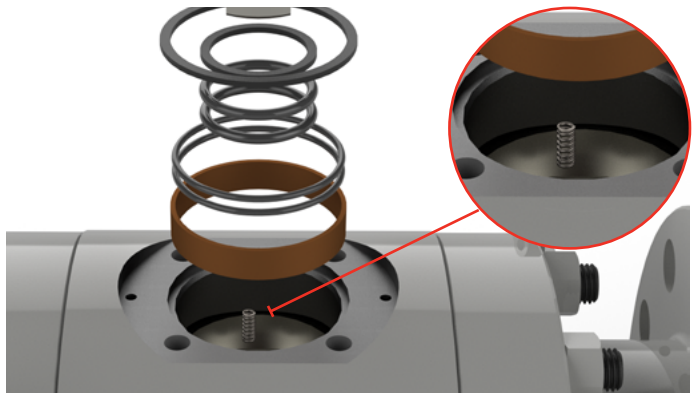
Gear Operation

STEM WITH ANTI-EJECTION SYSTEM.



Stem design - For safety, the stem has an inverted “T” type machined flange on the lower part that limits its outflow so that in case of overpressure it is not expelled through the upper part of the valve.

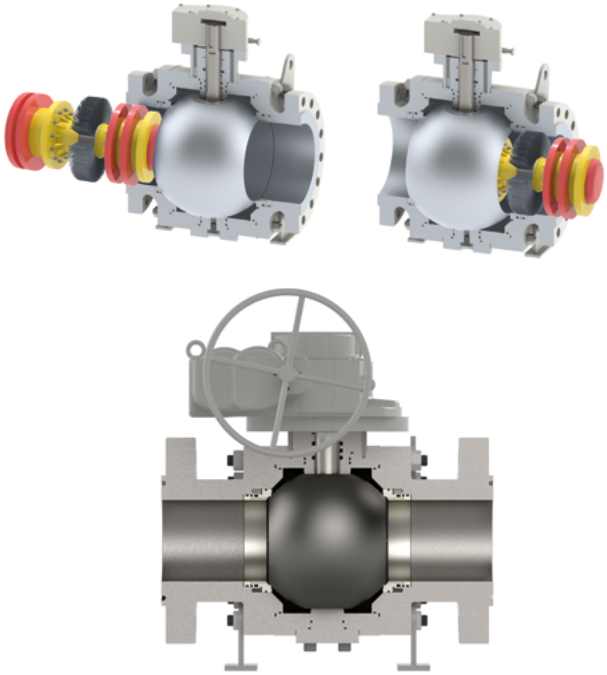
ANTI-STATIC SYSTEM.



Anti-static spring or anti-static washer to reduce the friction coefficient between the contact zone of the stem and the ball that could generate electrostatic charges (electric sparks) that can cause fire when mixed with the fluid.

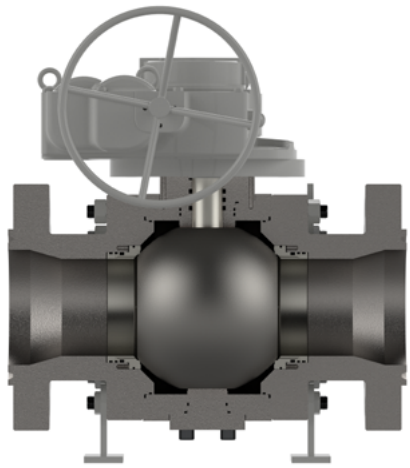
TRUNNION-MOUNTED BALL VALVE
DESIGN FEATURES

FULL CONSTANT PORT DESIGN
(FULL PORT)



Because the port has no interference along the entire valve path, the fluid passes through without creating turbulence; this full port, through conduit feature also allows the passage of inspection tools such as instrumented pigs or cleaning brushes used for maintenance purposes.

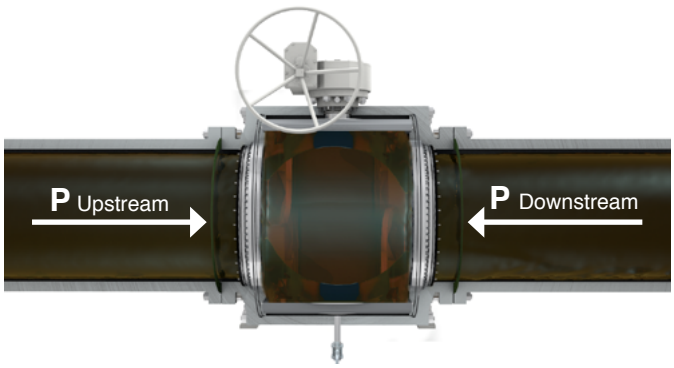
REDUCED PORT DESIGN
(REDUCED PORT)

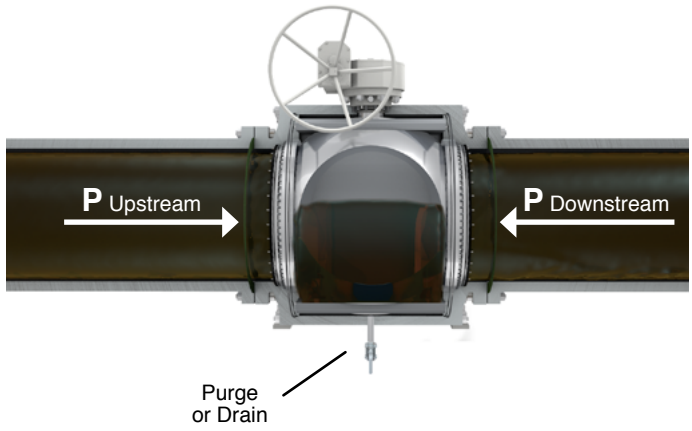


When it is required to reduce the flow capacity without the use of reducers, a Reduced Port design is used; when using this type of valve, it is necessary to consider what type of pigs will pass through the pipeline to prevent them from getting stuck at the valve inlet, otherwise, they will get stuck causing a severe problem that will require shutting down the process.

DOUBLE BLOCK AND BLEED (DBB)

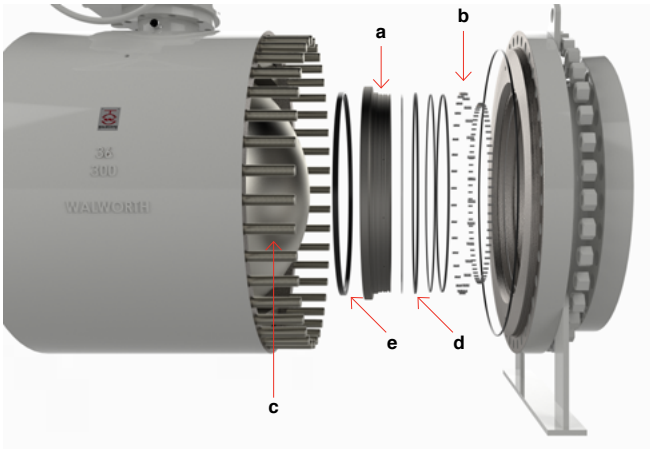
Due to the seat design, the valve is capable of sealing the central cavity even when there is upstream and/or downstream pressure, allowing the central cavity to be drained to clean debris such as slurries, particles,or even small stones that remain in the lower part of the valve after a certain time of operation or to verify the integrity of the seals without the need to stop the fluid. This function applies to Unidirectional, Bidirectional or Mixed seats and works either with the valve fully open or fully closed.





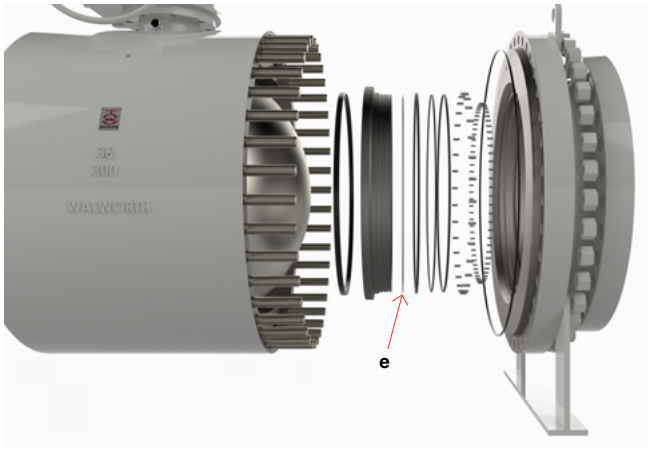
TRUNNION-MOUNTED BALL VALVE
DESIGN FEATURES.

DYNAMIC SEAT RINGS



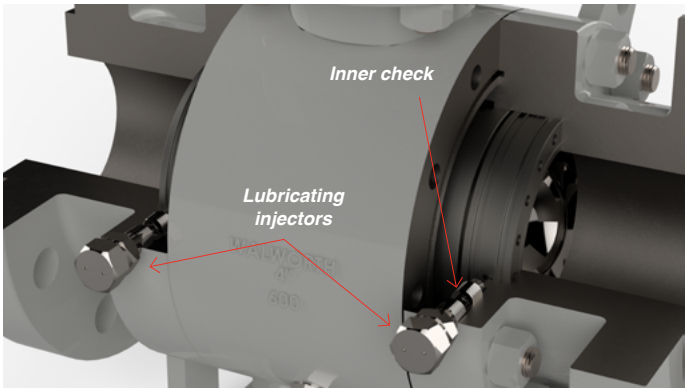
The rings (a) float by the effect of springs (b) that help to exert dynamic forces to seal against the plug (ball) (c); the action of the elastomer O-rings (d) seals the rings diametrically, and the insert (e) provides sealing against the plug.

FIREPROOF DESIGN



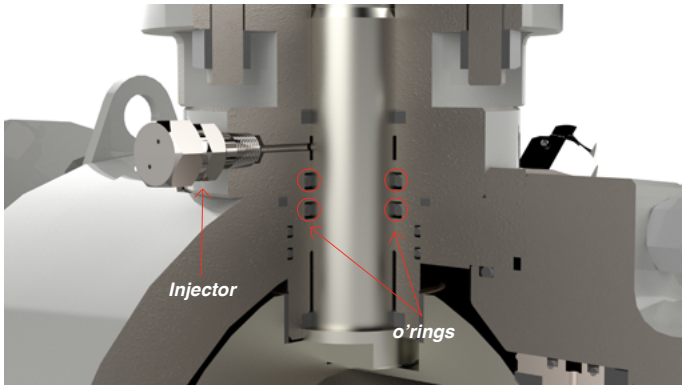
The seats have a braided graphite ring (e) installed on the perimeter of the seat; the machining allows sealing the seats in case of fire; these features allow it to fulfill the fireproof function according to API-6FA and API-607 (ISO-10497).

SEAT LUBRICATION PORTS



As the seats are dynamic, they must be kept lubricated to prevent the soft seals (O-rings) from drying out and deteriorating. To this end, it is vital that they are lubricated at pre-set intervals. This lubrication is performed using grease injectors that are strategically placed in the valve body and connected to the interior to allow the filling of a perimeter groove in the seat rings. In sizes 6" and larger, a check valve (inner check) prevents the fluid from escaping through the grease injector due to back pressure.

STEM PASS-THROUGH CHAMBER INJECTOR



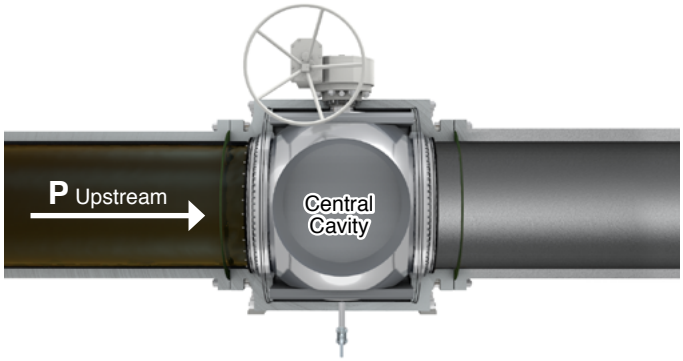
The packing chamber has elastomer-based primary seals (O-rings). The packing chamber is also equipped with a grease injection fitting for maintenance purposes; this injector functions as a sealant injector in case of leakage through the packing chamber.

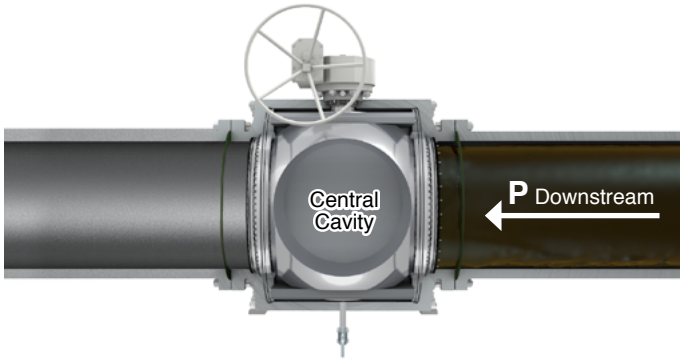
The packing chamber can be supplied with a packing flange, graphite packing, and live loading system on request.

TRUNNION-MOUNTED BALL VALVE
SEAT TYPES.

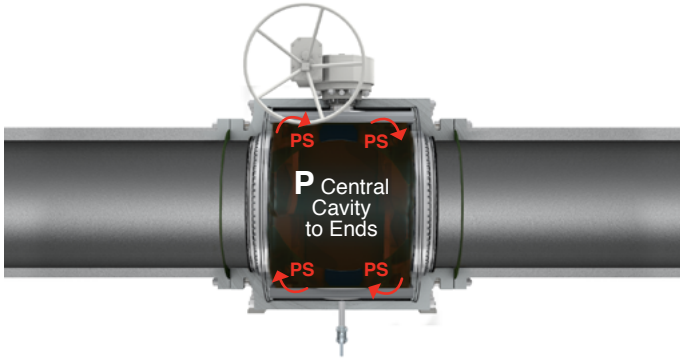
UNIDIRECTIONAL SEATS (SPE)

The seats are pushed at all times by spring force around their periphery against the plug to seal the valve from either pipeline into the central valve cavity, which also allows the double block and bleed (DBB) function to be performed. This arrangement is known as single-piston effect (SPE).





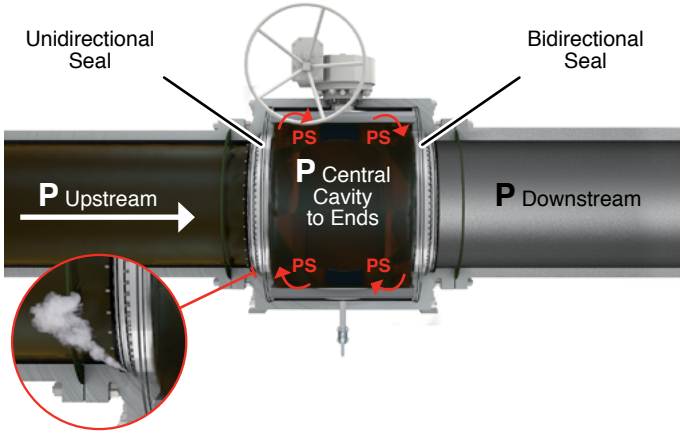
BIDIRECTIONAL SEATS (DPE)



In this type of seat, the rings are designed to create a double piston effect (DPE). Similar to Unidirectional seats, the valve is capable of sealing either from the piping to the central cavity which allows the double block and bleeds to function (see figures above); however, the Bidirectional seats also seal from the central cavity of the valve to the upstream or downstream piping so this design does not have the function of pressure-relieving seats but performs the Double Isolation and Bleed function (DIB-1).

Note: If the fluid to be handled is only liquid, the valve must have an external pressure relieving system (relief valve, safety valve, by-pass). Customer, or end-user should indicate the need for this accessory according to their process.

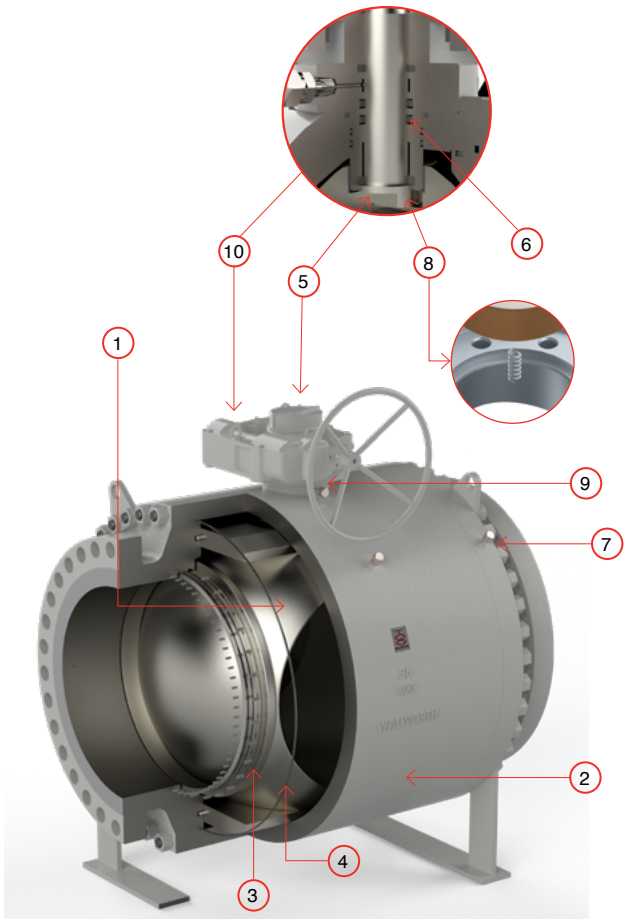
MIXED SEATS



This is an arrangement in which one seat is Unidirectional and the other is Bidirectional. The most common arrangement is one in which the Unidirectional seat is located upstream and the Bidirectional seat downstream; in case of an overpressure in the central cavity zone, the pressure release will occur in the area where the Unidirectional seat is located. Mixed seats comply with double isolation and bleed (DIB-2).

TRUNNION-MOUNTED BALL VALVE
THREE-PIECE BOLTED BODY STYLE.

- Design under API-6D and ISO-14313. Also meets the requirements of specification PEMEX-EST-0211/02-2017.
- Bolted Body Three-piece design (Side Entry).
- Full Port through the conduit.
- Ball (or sphere) type plug
- Ejection-proof stem.
- Dynamic Seat Rings. Spring-loaded.
- Interior arrangement with soft seals, metal-to-metal seals, or dual seals (PMSS).
- Anti-static Device.
- Double block and bleed (DBB) function.
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block and bleed type DIB-1 for bidirectional seats or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). For dimensions not listed in API-6D, the dimensions published in ASME B16.10 are used.
- RF or RTJ flange dimensions in accordance with ASME B16.5 from NPS 2 to NPS 24; for NPS 26 and larger valves, ASME B16.47 Series A flanges.
- WE end dimensions under ASME B16.25.
- Suitable for sour service under NACE MR-01-75 or NACE MR-01.03 (ISO-15156 or ISO-17945).
- Fireproof design under API-6FA (“Standard for Fire test for Valves”) and API-607 (“Fire Test for Quarter Turn Valves and Valves Equipped with Nonmetallic Seals”) or ISO-10497.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.
- Handle operated on small diameters and gear operated, on large diameters. Optional electric, pneumatic, gas over oil, bare stem, etc. actuator.



(1) Ball mounted on trunnions. For all diameters and classes, the ball is mounted on trunnions (lower and upper).

(2) Body. Three-piece design for easy disassembly for maintenance; made of forged steel. Its cylindrical configuration reduces the amount of sludge and debris that accumulates in the lower part of the valve.

(3) Dynamic seats that are spring-loaded at all times to keep them sealing against the plug.

(4) Fireproof seals, gaskets, packing’s, and machining designed so that in case of fire, the valve can withstand the high temperatures, and keep the valve sealing to control the emergency.

(5) Ejection-proof stem. Due to its bottom interference fit design, the stem is constrained by other assembly components such as the trunnion, preventing it from being ejected in case of over-pressure in the center cavity.

(6) Stem seal. To prevent leakage to the atmosphere through the packing chamber, O-rings and a graphite gasket are placed to keep the valve sealing.

(7) Grease injectors. Giant button head style, lubricating grease injectors are installed to keep the seat boxes lubricated, prevent the O’-rings from drying out, and to allow the seats to float at all times.

An inner check valve prevents fluid pressure from escaping to the atmosphere through the grease injectors (NPS 8 class 150, NPS 6 class 300, NPS 4 class 600, NPS 3 class 900, 1500, and 2500, and higher are available). In case of emergency due to leakage, or wear through the O’-rings , these injectors can be used to put sealant in to achieve a temporary seal, which will allow the system to continue operating until a scheduled shutdown is programmed.

(8) Anti-static Device. An Inconel X-750 spring is placed between the stem and the ball to reduce the friction coefficient when operating the valve, which can generate electrostatic charges (electric sparks) that can lead to fire when mixed with fluids.

(9) Double Block and Bleed (DBB). In the closed position, the valve can to block the fluid; with this function, it is possible to isolate the central cavity to allow the drainage of the dirty fluid, especially in the lower part of the valve, where sludge and stones are dragged by the process accumulate. The vent valve serves to verify that the valve is performing the DBB function correctly.

(10) Handle and Gear Operator. In small sizes, a handle-operated valve is supplied, while in medium, and large sizes it is supplied with a gear operator.

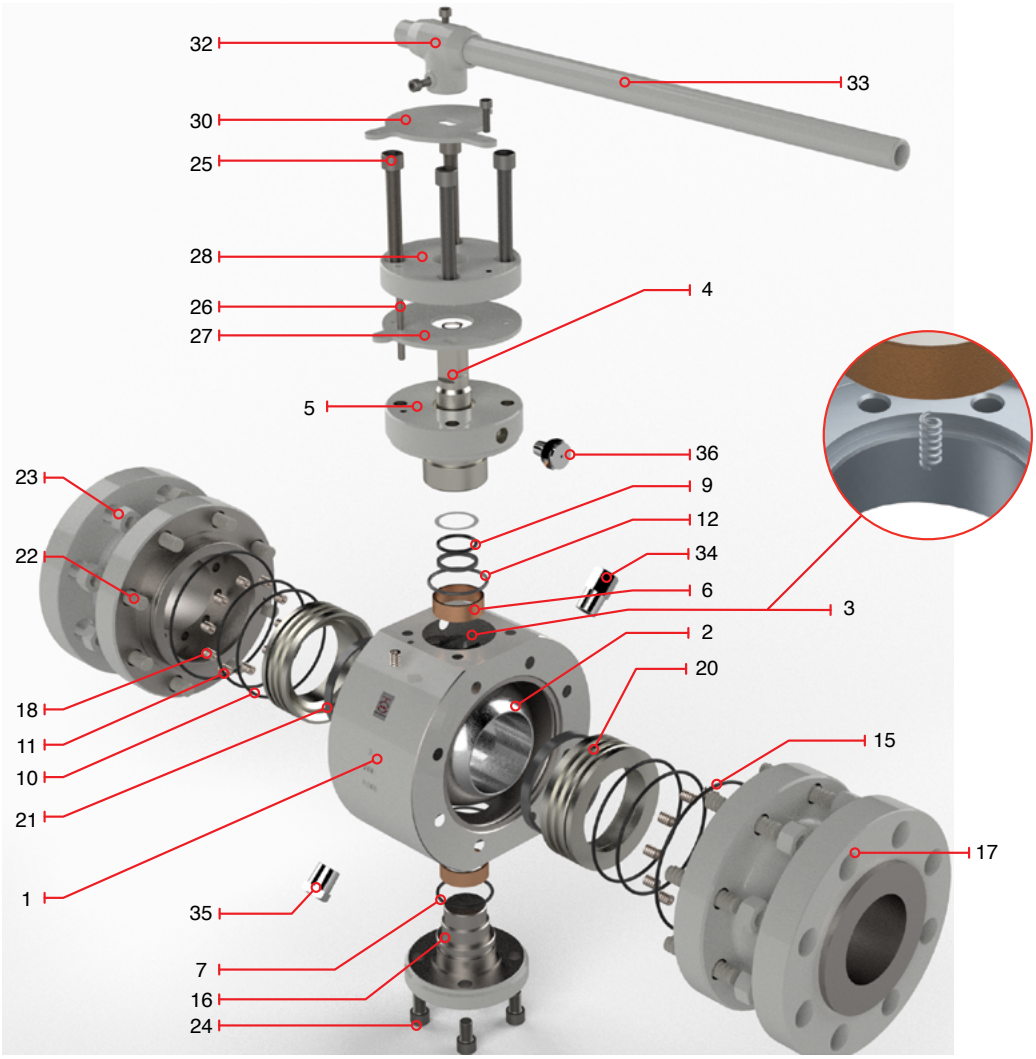
Notes: 1. The drawings shown here are a representation of various designs Walworth® has developed. 2. Valve configurations may change according to Walworth® standards. 3.Walworth® reserves the right to supply valves according to the design in stock.

TRUNNION-MOUNTED BALL VALVE
THREE-PIECE BOLTED BODY STYLE.

Bill of materials

No.	Description
1	Body
2	Ball
3	Anti-static Spring
4	Stem
5	Trunnion / Top
6	Top bearing
7	Bottom bearing
8	Bottom O'-ring
9	Stem O'-ring
10	Seat O'-ring*
11	Backup O'-ring
12	Top fireproof seal*
13	Bottom fireproof seal*
14	Seat fireproof seal*
15	End fireproof seal
16	Bottom Trunnion
17	Flanged ends
18	Seat spring
19	Back Seat Ring*
20	Seat ring
21	Seat Insert
22	Screw
23	Nut
24	Bottom case screw
25	Top case screw
26	Bolt
27	Lock device
28	Adapter plate
29	Hexagonal screw *
30	Stop collar
31	Retainer *
32	Handle Nut
33	Handle
34	Vent Valve
35	Drain Valve
36	Stem Sealant Injector
37	Sealant Injector*
38	Lifting Lug*
39	Stand*

* Not shown



Note: The drawings and information shown here are illustrative of the different Walworth® designs. Valve physical configurations may change in accordance with Walworth® standards.

TRUNNION-MOUNTED BALL VALVE
THREE-PIECE BOLTED GEAR OPERATED TYPE.

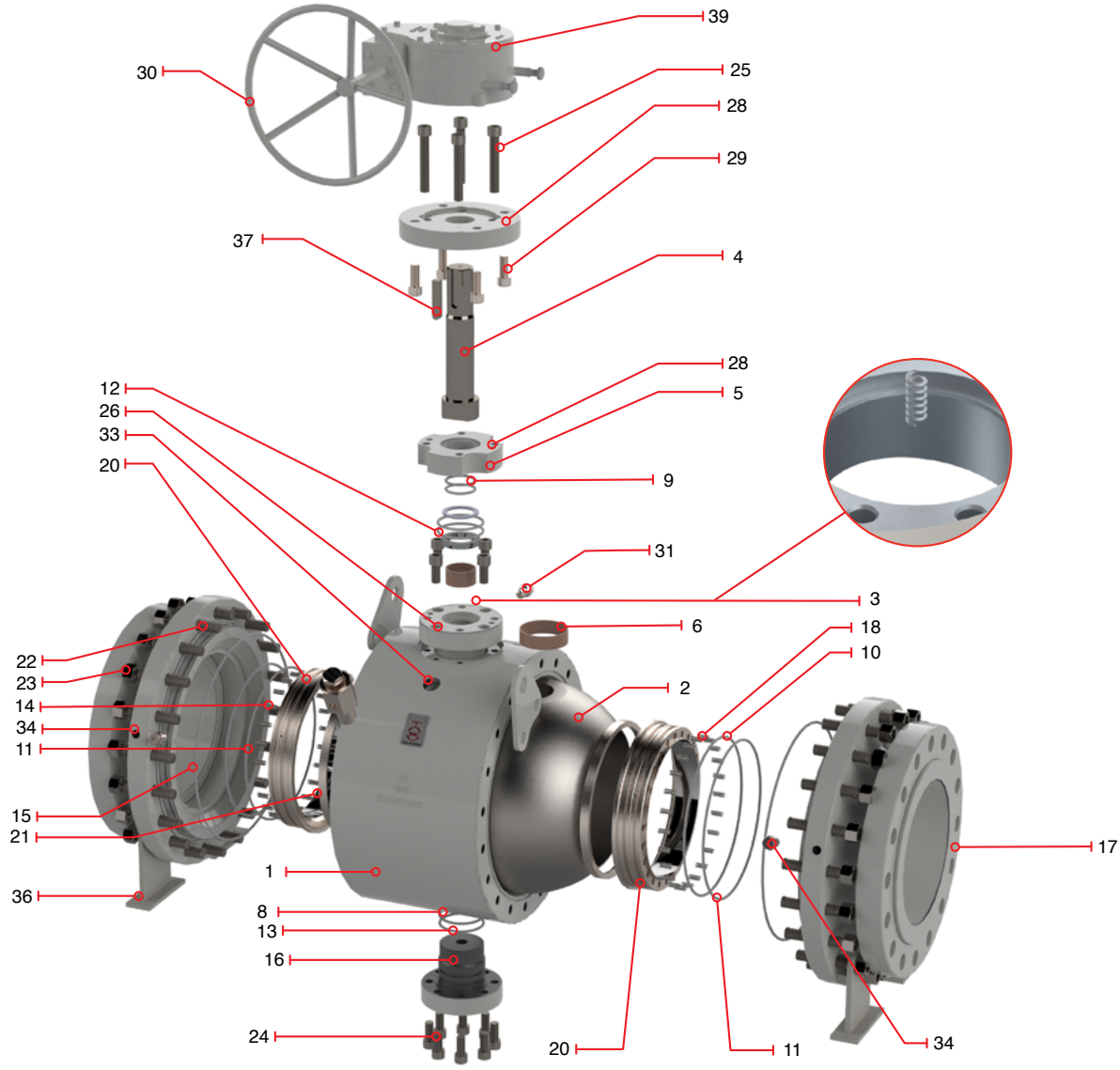
Bill of materials

No.	Description
1	Body
2	Ball
3	Anti-static Spring
4	Stem
5	Trunnion / Top
6	Top bearing
7	Bottom bearing
8	Bottom O'-ring
9	Stem O'-ring*
10	Seat O'-ring*
11	Backup O'-ring
12	Top fireproof seal
13	Bottom fireproof seal

No.	Description
14	Seat fireproof seal
15	End fireproof seal
16	Bottom Trunnion
17	Flanged ends
18	Seat spring
19	Back Seat Ring*
20	Seat ring
21	Seat Insert
22	Screw
23	Nut
24	Bottom case screw
25	Top case screw
26	Bolt

No.	Description
27	Adapter plate bushing*
28	Adapter plate
29	Screw
30	Handwheel
31	Vent Valve
32	Drain Valve
33	Stem Sealant Injector*
34	Ends Sealant Injector
35	Lifting Lug*
36	Stand
37	Shim
38	Spring lock washer*
39	Gearbox

* Not shown



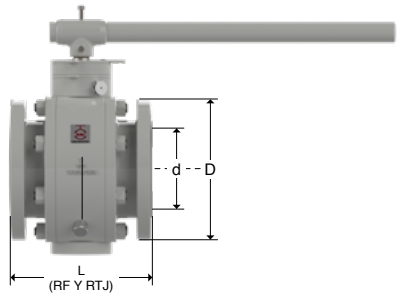
Note: The drawings and information shown here are illustrative of the different Walworth® designs. Valve physical configurations may change in accordance with Walworth® standards.

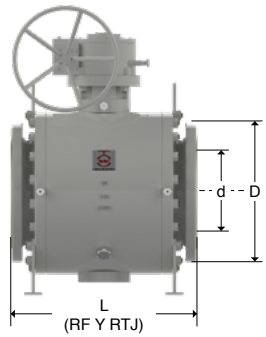
WALWORTH GROUP

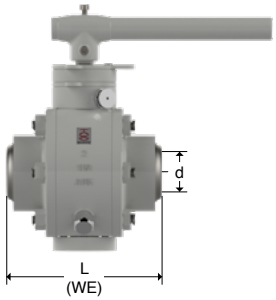
FULL PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 150.

Design features

- Three-piece design (Side Entry).
- Full constant port.
- ASME Class 150.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







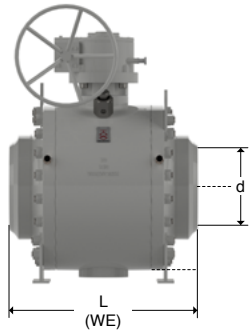


Figure No.		End types
HANDLE	GEARS	
8112	8122	Raised Face (RF)
8113	8123	Ring Type Joint (RTJ)
8114	8124	Welding Ends (WE)

HANDLE OPERATED				
DN NPS	mm (in)	50 2	80 3	100 4
d	mm (in)	49 1.94	74 2.94	100 3.94
D	mm (in)	150 6.00	190 7.50	230 9.00
L (RF)	mm (in)	178 7	203 8	229 9
L (RTJ)	mm (in)	191 7.5	216 8.50	241 9.50
L (WE)	mm (in)	216 8.5	283 11.13	305 12
Peso (RF, RTJ)	Kg (Lb)	28 62	55 121	80 176
Peso (WE)	Kg (Lb)	25 55	49 108	71 156

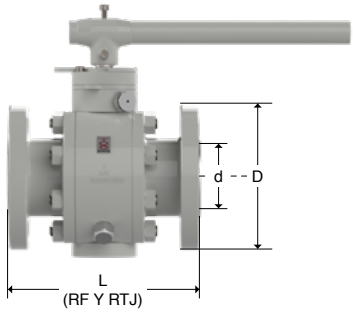
GEAR OPERATED													
mm (in)	150 6"	200 8"	250 10"	300 12"	350 14"	400 16"	450 18"	500 20"	600 24"	700 28"	750 30"	800 32"	900 36"
mm (in)	150 5.94	201 7.94	252 9.94	303 11.94	334 13.19	385 15.19	436 17.19	487 19.19	589 23.19	684 26.94	735 28.94	779 30.69	874 34.44
mm (in)	280 11.00	345 13.50	405 16.00	485 19.00	535 21.00	595 23.50	635 25.00	700 27.50	815 32.00	925 36.50	985 38.75	1060 41.75	1170 46.00
mm (in)	394 15.5	457 18	533 21.00	610 24.00	686 27	762 30	864 34.00	914 36.00	1067 42.00	1245 49.00	1295 51.00	1372 54.00	1524 60.00
mm (in)	406 16.00	470 18.50	546 21.50	622 24.50	699 27.50	775 30.50	876 34.50	927 36.50	1080 42.50	---	---	---	---
mm (in)	457 18	521 20.50	559 22.00	635 25	762 30.00	838 33.00	914 36.00	991 39.00	1143 45.00	1346 53.00	1397 55.00	1524 60.00	1727 68.00
Kg (Lb)	190 418	290 639	445 980	590 1299	780 1718	1520 3348	2300 5066	2500 5507	3950 8700	6300 13876	7100 15639	8950 19713	13500 29735
Kg (Lb)	182 401	277 610	553 1218	553 1218	747 1645	1481 3262	2266 4991	2460 5418	3904 8599	6362 14013	8149 17949	9000 19823	13570 29890

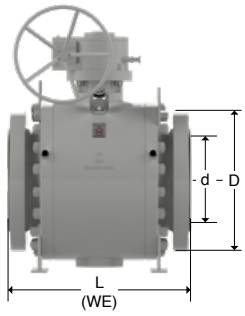
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2,3 and 4, dimension H1 does not include stands. UPC = Upon Customer Request

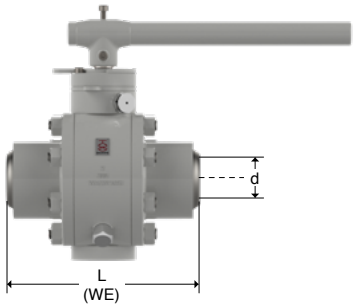
FULL PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 300.

Design features

- Three-piece design (Side Entry).
- Full constant port.
- ASME Class 300.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seals option (PMSS).
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







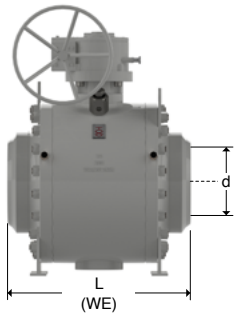


Figure No.		End types
HANDLE	GEARS	
8312	8322	Raised Face (RF)
8313	8323	Ring Type Joint (RTJ)
8314	8324	Welding Ends (WE)

HANDLE OPERATED				
DN NPS	mm (in)	50 2"	80 3"	100 4"
d	mm (in)	49 1.94	74 2.94	100 3.94
D	mm (in)	165 6.50	210 8.25	255 9.00
L (RF)	mm (in)	216 8.50	283 11.13	305 12.00
L (RTJ)	mm (in)	232 9.13	298 11.75	321 12.63
L (WE)	mm (in)	216 8.50	283 11.13	305 12.00
Peso (RF, RTJ)	Kg (Lb)	30 66	60 132	90 198
Peso (WE)	Kg (Lb)	24 53	49 108	72 159

GEAR OPERATED													
mm (in)	150 6"	200 8"	250 10"	300 12"	350 14"	400 16"	450 18"	500 20"	600 24"	700 28"	750 30"	800 32"	900 36"
mm (in)	150 5.94	201 7.94	252 9.94	303 11.94	334 13.19	385 15.19	436 17.19	487 19.19	589 23.19	684 26.94	735 28.94	779 30.69	874 34.44
mm (in)	320 12.50	380 15.00	445 17.50	520 20.50	585 23.00	650 25.50	710 28.00	775 30.50	915 36.00	1035 40.75	1090 43.00	1150 45.25	1270 50.00
mm (in)	403 15.88	502 19.75	568 22.38	648 25.50	762 30.00	838 33.00	914 36.00	991 39.00	1143 45.00	1346 53.00	1397 55.00	1524 60.00	1727 68.00
mm (in)	419 16.50	518 20.38	584 23.00	664 26.13	778 30.63	854 33.63	930 36.63	1010 39.75	1165 45.88	1372 54.00	1422 56.00	1553 61.13	1756 69.13
mm (in)	457 18.00	521 20.50	559 22.00	635 25.00	762 30.00	838 33.00	914 36.00	991 39.00	1143 45.00	1346 53.00	1397 55.00	1524 60.00	1727 68.00
Kg (Lb)	200 440	325 716	490 1079	720 1585	999 2200	1810 3987	2620 5771	2860 6299	4430 9758	6810 15000	7655 16861	9560 21057	12100 26652
Kg (Lb)	169 372	280 627	424 934	598 1317	872 1921	1655 3645	2440 5374	2635 5804	4075 8976	6225 13711	7115 15672	9230 20330	11500 25330

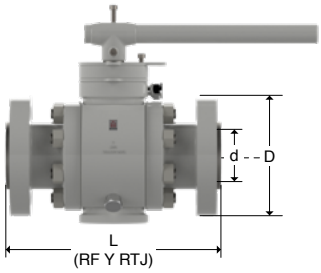
otes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, 3, 4, and 6, dimension H1 does not include stands.

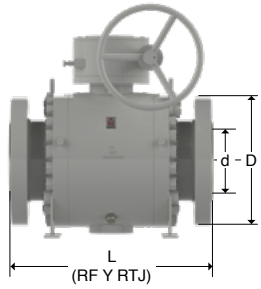
WALWORTH® Since 1842

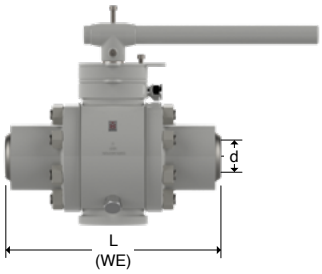
FULL PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 600.

Design features

- Three-piece design (Side Entry).
- Full constant port.
- ASME Class 600.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seals option (PMSS).
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







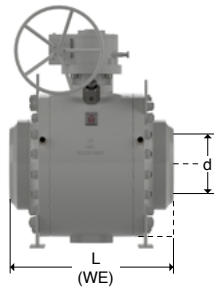


Figure No.		End types
HANDLE	GEARS	
8612	8622	Raised Face (RF)
8613	8623	Ring Type Joint (RTJ)
8614	8624	Welding Ends (WE)

HANDLE OPERATED			
DN NPS	mm (in)	50 2"	80 3"
d	mm (in)	49 1.94	74 2.94
D	mm (in)	165 6.50	210 8.25
L (RF)	mm (in)	292 11.50	356 14.00
L (RTJ)	mm (in)	295 11.63	359 14.13
L (WE)	mm (in)	292 11.50	356 14.00
Peso (RF, RTJ)	Kg (Lb)	34 75	65 143
Peso (WE)	Kg (Lb)	27 59	49 108

GEAR OPERATED														
mm (in)	100 4"	150 6"	200 8"	250 10"	300 12"	350 14"	400 16"	450 18"	500 20"	600 24"	700 28"	750 30"	800 32"	900 36"
mm (in)	100 3.94	150 5.94	201 7.94	252 9.94	303 11.94	334 13.19	385 15.19	436 17.19	487 19.19	589 23.19	684 26.94	735 28.94	779 30.69	874 34.44
mm (in)	275 10.75	355 14.00	420 16.50	510 20.00	560 22.00	605 23.75	685 27.00	745 29.25	815 32.00	940 37.00	1075 42.25	1130 44.50	1195 47.00	1315 51.75
mm (in)	432 17.00	559 22.00	660 26.00	787 31.00	838 33.00	889 35.00	991 39.00	1092 43.00	1194 47.00	1397 55.00	1549 61.00	1651 65.00	1778 70.00	2083 82.00
mm (in)	435 17.13	562 22.13	664 26.13	791 31.13	841 33.13	892 35.13	994 39.13	1095 43.13	1200 47.25	1407 55.38	1562 61.50	1664 65.50	1794 70.63	2099 82.63
mm (in)	432 17.00	559 22.00	660 26.00	787 31.00	838 33.00	889 35.00	991 39.00	1092 43.00	1194 47.00	1397 55.00	1549 61.00	1651 65.00	1778 70.00	2083 82.00
Kg (Lb)	125 275	290 639	505 1112	740 1630	1020 2247	1380 3040	2250 4956	3400 7489	3850 8480	4900 10793	8300 18282	9413 20733	10325 22742	16170 35617
Kg (Lb)	95 209	250 551	418 921	680 1498	950 2093	1185 2610	1960 4317	3050 6718	3406 7502	4275 9416	7590 16718	8636 19022	9682 21326	15000 33040

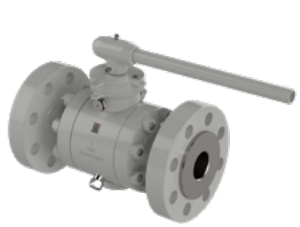
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, 3 and 4, dimension H1 does not include stands. 5) The 4 600 valve does not include stands

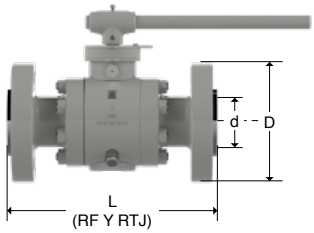
UPC = Upon Customer Request

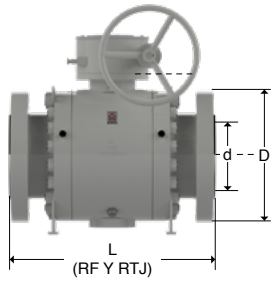
FULL PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 900.

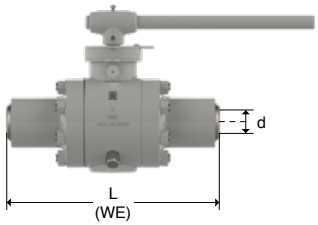
Design features

- Three-piece design (Side Entry).
- Full constant port.
- ASME Class 900.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.









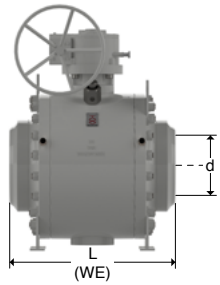


Figure No.		End types
HANDLE	GEARS	
8912	8922	Raised Face (RF)
8913	8923	Ring Type Joint (RTJ)
8914	8924	Welding Ends (WE)

HANDLE OPERATED			GEAR OPERATED											
DN NPS	mm (in)	50 2"	80 3"	100 4"	150 6"	200 8"	250 10"	300 12"	350 14"	400 16"	450 18"	500 20"	600 24"	750 30"	900 36"
d	mm (in)	49 1.94	74 2.94	100 3.94	150 5.94	201 7.94	252 9.94	303 11.94	322 12.69	373 14.69	423 16.69	471 18.56	570 22.44	712 28.06	855 33.69
D	mm (in)	215 8.50	240 9.50	290 11.50	380 15.00	470 18.50	545 21.50	610 24.00	640 25.25	705 27.75	785 31.00	855 33.75	1040 41.00	1230 48.50	1460 57.50
L (RF)	mm (in)	368 14.50	381 15.00	457 18.00	610 24.00	737 29.00	838 33.00	965 38.00	1029 40.50	1130 44.50	1219 48.00	1321 52.00	1549 61.00	1880 74.00	2286 90.00
L (RTJ)	mm (in)	371 14.63	384 15.13	460 18.13	613 24.13	740 29.13	841 33.13	968 38.13	1038 40.88	1140 44.88	1232 48.50	1334 52.50	1568 61.75	1902 74.88	2315 91.13
L (WE)	mm (in)	368 14.50	381 15.00	457 18.00	610 24.00	737 29.00	838 33.00	965 38.00	1029 40.50	1130 44.50	1219 48.00	1321 52.00	1549 61.00	1891 74.44	2286 90.00
Peso (RF, RTJ)	Kg (Lb)	70 154	87 192	155 341	380 837	702 1546	1100 2423	1350 2973	1890 4163	3100 6828	4300 9471	4950 10903	7100 15639	13770 30330	23000 50661
Peso (WE)	Kg (Lb)	65 143	80 176	120 264	350 771	680 1498	1000 2203	1145 2522	1650 3634	2750 6057	3875 8535	4410 9714	6485 14284	11500 25330	21000 46256

Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, and 3, dimension H1 does not include stands. 5) The 3 900 valve does not include stands

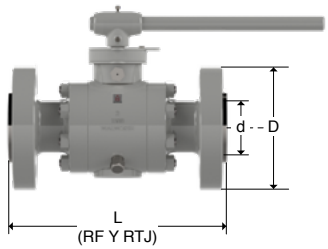
UPC = Upon Customer Request

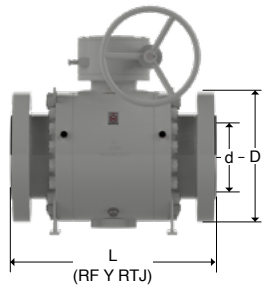
WALWORTH GROUP

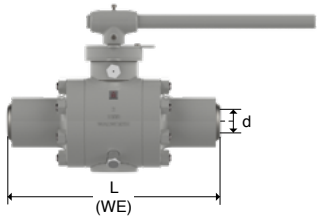
FULL PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 1500.

Design features

- Three-piece design (Side Entry).
- Full constant port.
- ASME Class 1500.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







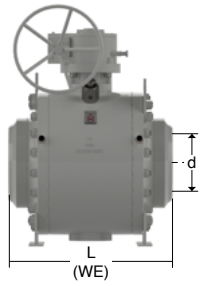


Figure No.		End types
HANDLE	GEARS	
8512	8522	Raised Face (RF)
8513	8523	Ring Type Joint (RTJ)
8514	8524	Welding Ends (WE)

HANDLE OPERATED		GEAR OPERATED										
DN NPS	mm (in)	50 2"	80 3"	100 4"	150 6"	200 8"	250 10"	300 12"	350 14"	400 16"	450 18"	500 20"	600 24"
d	mm (in)	49 1.94	74 2.94	100 3.94	144 5.69	192 7.56	239 9.44	287 11.31	315 12.44	360 14.19	406 16.00	454 17.88	546 21.50
D	mm (in)	215 8.50	265 10.50	310 12.25	395 15.50	485 19.00	585 23.00	675 26.50	750 29.50	825 32.50	915 36.00	985 38.75	1170 46.00
L (RF)	mm (in)	368 14.50	470 18.50	546 21.50	705 27.75	832 32.75	991 39.00	1130 44.50	1257 49.50	1384 54.50	1537 60.50	1664 65.50	---
L (RTJ)	mm (in)	371 14.63	473 18.63	549 21.63	711 28.00	841 33.13	1000 39.38	1146 45.13	1276 50.25	1407 55.38	1559 61.38	1686 66.38	1972 77.63
L (WE)	mm (in)	368 14.50	470 18.50	546 21.50	705 27.75	832 32.75	991 39.00	1130 44.50	1257 49.50	1384 54.50	1537 60.51	1664 65.51	1945 76.57
Peso (RF, RTJ)	Kg (Lb)	65 143	150 330	220 485	540 1189	1060 2335	1495 3293	2630 5793	3100 6828	4650 10242	6195 13645	9075 19989	14280 31454
Peso (WE)	Kg (Lb)	60 132	140 308	210 463	420 925	850 1872	1390 3062	2510 5529	2600 5727	3930 8656	4700 10352	7075 15584	12100 26652

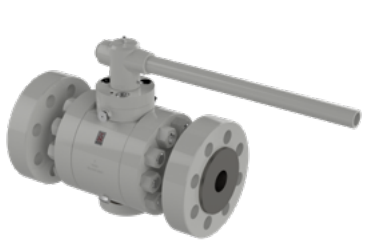
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, and 3, dimension H1 does not include stands. 5) The 3 1500 valve does not include stands

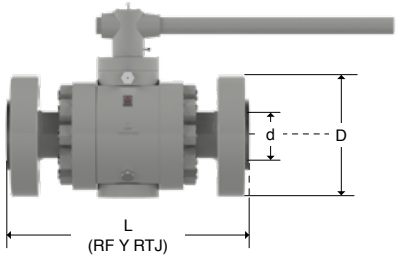
UPC = Upon Customer Request

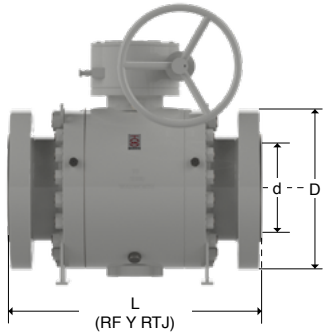
FULL PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 2500

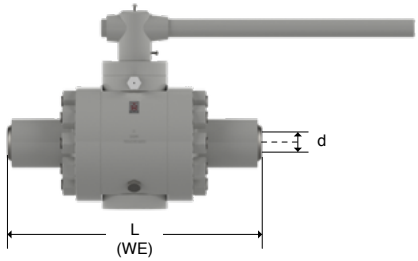
Design features

- Three-piece design (Side Entry).
- Full constant port.
- ASME Class 2500.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.









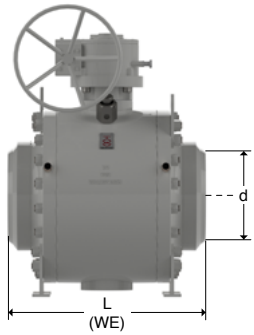


Figure No.		End types
HANDLE	GEARS	
8212	8222	Raised Face (RF)
8213	8223	Ring Type Joint (RTJ)
8214	8224	Welding Ends (WE)

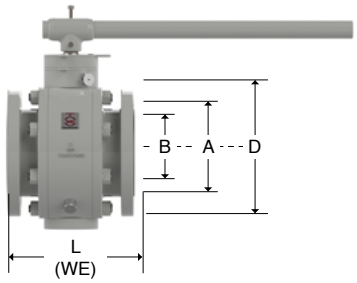
HANDLE OPERATED			GEAR OPERATED					
DN NPS	mm (in)	50 2"	80 3"	100 4"	150 6"	200 8"	250 10"	300 12"
d	mm (in)	42 1.69	62 2.44	87 3.44	131 5.19	179 7.06	223 8.81	265 10.44
D	mm (in)	235 9.25	305 12.00	355 14.00	485 19.00	550 21.75	675 26.50	760 30.00
L (RF)	mm (in)	451 17.75	578 22.75	673 26.50	914 36.00	1022 40.25	1270 50.00	1422 56.00
L (RTJ)	mm (in)	454 17.88	584 23.00	683 26.88	927 36.50	1038 40.88	1292 50.88	1445 56.88
L (WE)	mm (in)	451 17.75	578 22.75	673 26.50	914 36.00	1022 40.25	1270 50.00	1422 56.00
Peso (RF, RTJ)	Kg (Lb)	90 198	187 412	380 837	770 1696	1360 2996	2100 4626	3220 7093
Peso (WE)	Kg (Lb)	85 187	150 330	360 793	710 1564	1250 2753	1970 4339	3030 6674

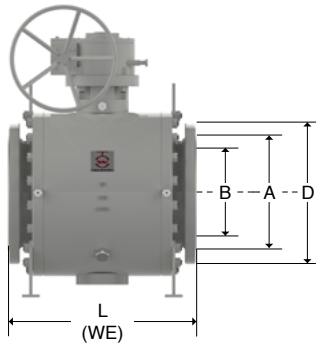
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, and 3, dimension H1 does not include stands.

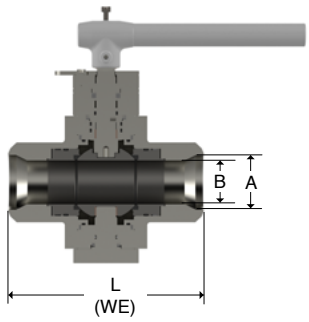
REDUCED PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 150.

Design features

- Three-piece design (Side Entry).
- Reduced Port.
- ASME Class 150.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







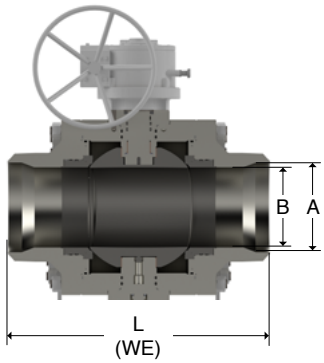


Figure No.		End types
HANDLE	GEARS	
8112-R	8122-R	Raised Face (RF)
8113-R	8123-R	Ring Type Joint (RTJ)
8114-R	8124-R	Welding Ends (WE)

HANDLE OPERATED				
DN NPS	mm (in)	50 X 40 2" X 1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"
A	mm	49	74	100
	(in)	1.94	2.94	3.94
B	mm	38	49	74
	(in)	1.50	1.94	2.94
D	mm	150	190	230
	(in)	6.00	7.50	9.00
L (RF)	mm	178	203	229
	(in)	7	8	9
L (RTJ)	mm	191	216	241
	(in)	7.5	8.50	9.50
L (WE)	mm	216	283	305
	(in)	8.5	11.13	12
Weight (RF, RTJ)	Kg	20	23	45
	(Lb)	44	51	99

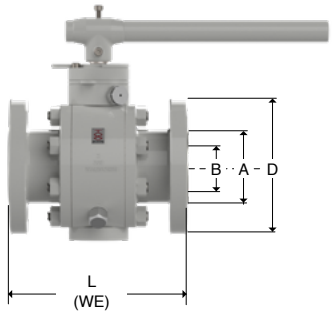
GEAR OPERATED												
150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"	300 X 250 12" X 10"	350 X 300 14" X 12"	400 X 350 16" X 14"	500 X 400 20" X 16"	500 X 450 20" X 18"	600 X 500 24" X 20"	700 X 600 28" X 24"	800 X 700 32" X 28"	900 X 750 36" X 30"	900 X 800 36" X 32"
150	201	252	303	334	385	487	487	589	684	779	874	874
5.94	7.94	9.94	11.94	13.19	15.19	19.19	19.19	23.19	26.94	30.69	34.44	34.44
100	150	201	252	303	334	385	436	487	589	684	735	779
3.94	5.94	7.94	9.94	11.94	13.19	15.19	17.19	19.19	23.19	26.94	28.94	30.69
280	345	405	485	535	595	700	700	815	925	1060	1170	1170
11.00	13.50	16.00	19.00	21.00	23.50	27.50	27.50	32.00	36.50	41.75	46.00	46.00
394	457	533	610	686	762	914	914	1067	1245	1372	1524	1524
15.5	18	21.00	24.00	27	30	36.00	36.00	42.00	49.00	54.00	60.00	60.00
406	470	546	622	699	775	927	927	1080	---	---	---	---
16.00	18.50	21.50	24.50	27.50	30.50	36.50	36.50	42.50				
457	521	559	635 25	762	838	991	991	1143	1346	1524	1727	1727
18	20.50	22.00		30.00	33.00	39.00	39.00	45.00	53.00	60.00	68.00	68.00
85	180	273	470	724	940	1300	1680	1980	3000	4440	6376	7800
187	396	601	1035	1595	2070	2863	3700	4361	6608	9780	14044	17181

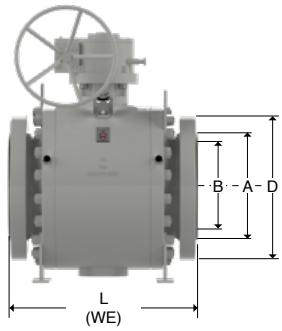
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, 3, 4, and 6, dimension H1 does not include stands.

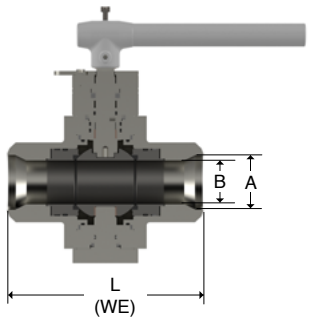
REDUCED PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 300.

Design features

- Three-piece design (Side Entry).
- Reduced Port.
- ASME Class 300.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75, or NACE MR-01-03 (ISO-15156, or ISO-17945). Fireproof certification under API-6FA & API-607.
- Low leakage certification under ISO- 15848-1. Hydrostatic, and Performance tests under API-6D, and ISO-5208.







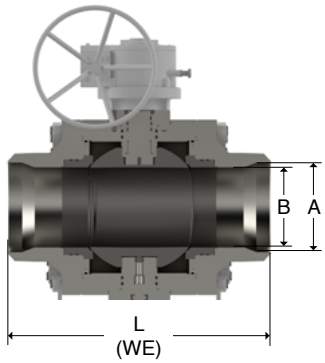


Figure No.		End types
MANERAL	ENGRANES	
8312-R	8322-R	Raised Face (RF)
8313-R	8323-R	Ring Type Joint (RTJ)
8314-R	8324-R	Welding Ends (WE)

HANDLE OPERATED				
DN NPS	mm (in)	50 X 40 2" X 1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"
A	mm (in)	49 1.94	74 2.94	100 3.94
B	mm (in)	38 1.50	49 1.94	74 2.94
D	mm (in)	165 6.50	210 8.25	255 9.00
L (RF)	mm (in)	216 8.50	283 11.13	305 12.00
L (RTJ)	mm (in)	232 9.13	298 11.75	321 12.63
L (WE)	mm (in)	216 8.50	283 11.13	305 12.00
Weight (RF, RTJ)	Kg (Lb)	20 44	28 62	58.4 129

GEAR OPERATED												
150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"	300 X 250 12" X 10"	350 X 300 14" X 12"	400 X 350 16" X 14"	500 X 400 20" X 16"	500 X 450 20" X 18"	600 X 500 24" X 20"	700 X 600 28" X 24"	800 X 700 32" X 28"	900 X 750 36" X 30"	900 X 800 36" X 32"
150 5.94	201 7.94	252 9.94	303 11.94	334 13.19	385 15.19	487 19.19	487 19.19	589 23.19	684 26.94	779 30.69	874 34.44	874 34.44
100 3.94	150 5.94	201 7.94	252 9.94	303 11.94	334 13.19	385 15.19	436 17.19	487 19.19	589 23.19	684 26.94	735 28.94	779 30.69
320 12.50	380 15.00	445 17.50	520 20.50	585 23.00	650 25.50	775 30.50	775 30.50	915 36.00	1035 40.75	1150 45.25	1270 50.00	1270 50.00
403 15.88	502 19.75	568 22.38	648 25.50	762 30.00	838 33.00	914 36.00	991 39.00	1143 45.00	1346 53.00	1524 60.00	1727 68.00	1727 68.00
419 16.50	518 20.38	584 23.00	664 26.13	778 30.63	854 33.63	930 36.63	1010 39.75	1165 45.88	1372 54.00	1553 61.13	1756 69.13	1756 69.13
457 18.00	521 20.50	559 22.00	635 25.00	762 30.00	838 33.00	914 36.00	991 39.00	1143 45.00	1346 53.00	1524 60.00	1727 68.00	1727 68.00
115 253	210 463	370 815	590 1300	807 1778	1045 2302	1545 3403	1900 4185	2550 5617	4300 9471	6500 14317	7250 15969	7800 17181

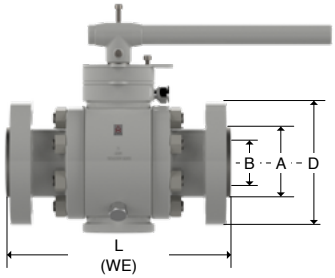
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, 3, 4, and 6, dimension H1 does not include stands.

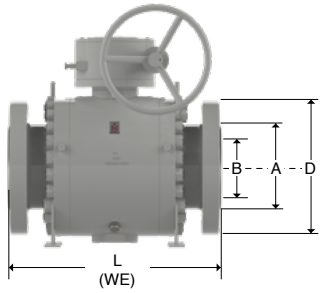
WALWORTH®
Since 1842

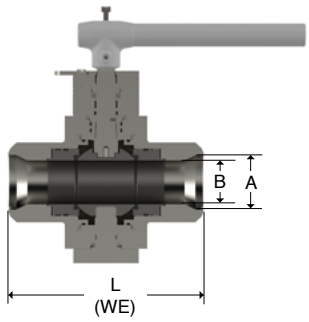
REDUCED PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 600.

Design features

- Three-piece design (Side Entry).
- Reduced Port.
- ASME Class 600.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







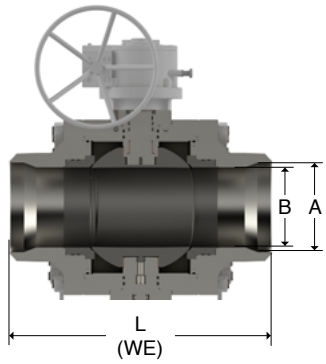


Figure No.		End types
HANDLE	GEARS	
8612-R	8622-R	Raised Face (RF)
8613-R	8623-R	Ring Type Joint (RTJ)
8614-R	8624-R	Welding Ends (WE)

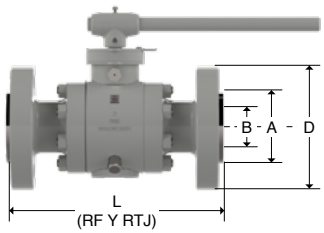
HANDLE OPERATED				GEAR OPERATED												
DN NPS	mm (in)	50X40 2"X1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"	150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"	300 X 250 12" X 10"	350 X 300 14" X 12"	400 X 350 16" X 14"	500 X 400 20" X 16"	500 X 450 20" X 18"	600 X 500 24" X 20"	700 X 600 28" X 24"	800 X 700 32" X 28"	900 X 750 36" X 30"	900 X 800 36" X 32"
A	mm	49	74	100	150	201	252	303	334	385	487	487	589	684	779	874	874
	(in)	1.94	2.94	3.94	5.94	7.94	9.94	11.94	13.19	15.19	19.19	19.19	23.19	26.94	30.69	34.44	34.44
B	mm	38	49	74	100	150	201	252	303	334	385	436	487	589	684	735	779
	(in)	1.50	1.94	2.94	3.94	5.94	7.94	9.94	11.94	13.19	15.19	17.19	19.19	23.19	26.94	28.94	30.69
D	mm	165	210	275	355	420	510	560	605	685	815	815	940	1075	1195	1315	1315
	(in)	6.50	8.25	10.75	14.00	16.50	20.00	22.00	23.75	27.00	32.00	32.00	37.00	42.25	47.00	51.75	51.75
L (RF)	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1549	1778	2083	2083
	(in)	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	61.00	70.00	82.00	82.00
L (RTJ)	mm	295	359	435	562	664	791	841	892	994	1095	1200	1407	1562	1794	2099	2099
	(in)	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	55.38	61.50	70.63	82.63	82.63
L (WE)	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1549	1778	2083	2083
	(in)	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	61.00	70.00	82.00	82.00
Weight (RF, RTJ)	Kg	30	44.5	97	168	347	550	834	1055	1445	2130	2500	3250	6100	8350	9375	11000
	(Lb)	66	98	214	371	764	1211	1838	2324	3183	4692	5507	7159	13436	18392	20650	24229

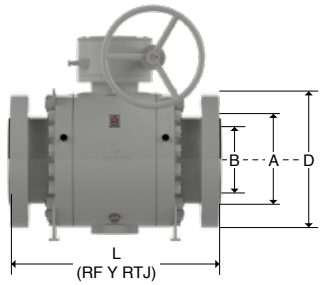
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, 3, 4, and 6, dimension H1 does not include stands.

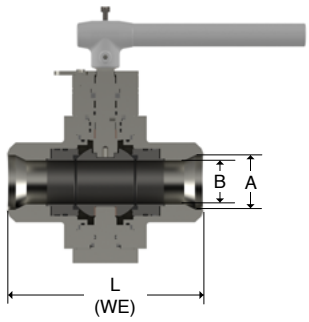
REDUCED PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 900.

Design features

- Three-piece design (Side Entry).
- Reduced Port.
- ASME Class 900.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







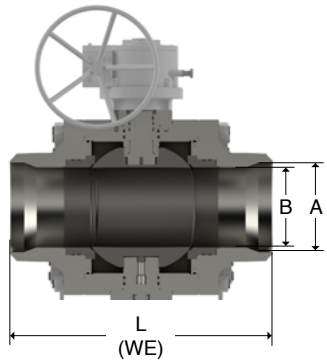


Figure No.		End types
HANDLE	GEARS	
8912-R	8922-R	Raised Face (RF)
8913-R	8923-R	Ring Type Joint (RTJ)
8914-R	8924-R	Welding Ends (WE)

HANDLE OPERATED			GEAR OPERATED													
DN NPS	mm (in)	50 X 40 2"X1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"	150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"	300 X 250 12" X 10"	350 X 300 14" X 12"	400 X 350 16" X 14"	500 X 400 20" X 16"	500 X 450 20" X 18"	600 X 500 24" X 20"	800 X 700 32" X 28"	900 X 750 36" X 30"	900 X 800 36" X 32"
A	mm (in)	49 1.94	74 2.94	100 3.94	150 5.94	201 7.94	252 9.94	303 11.94	322 12.69	373 14.69	423 16.69	471 18.56	570 22.44	760 29.94	855 33.69	855 33.69
B	mm (in)	38 1.50	49 1.94	74 2.94	100 3.94	150 5.94	201 7.94	252 9.94	303 11.94	322 12.69	373 14.69	423 16.69	471 18.56	665 26.19	712 28.03	760 29.94
D	mm (in)	215 8.50	240 9.50	290 11.50	380 15.00	470 18.50	545 21.50	610 24.00	640 25.25	705 27.75	855 33.75	855 33.75	1040 41.00	1315 51.75	1460 57.50	1460 57.50
L (RF)	mm (in)	368 14.50	381 15.00	457 18.00	610 24.00	737 29.00	838 33.00	965 38.00	1029 40.50	1130 44.50	1219 48.00	1321 52.00	1549 61.00	---	2286 90.00	2286 90.00
L (RTJ)	mm (in)	371 14.63	384 15.13	460 18.13	613 24.13	740 29.13	841 33.13	968 38.13	1038 40.88	1140 44.88	1232 48.50	1334 52.50	1568 61.75	---	2315 91.13	2315 91.13
L (WE)	mm (in)	368 14.50	381 15.00	457 18.00	610 24.00	737 29.00	838 33.00	965 38.00	1029 40.50	1130 44.50	1219 48.00	1321 52.00	1549 61.00	1480 58.27	---	2286 90.00
Weight (RF, RTJ)	Kg (Lb)	65 143	85 187	127 280	245 540	470 1035	800 1762	1250 2753	1612 3551	1916 4220	3140 6916	3860 8502	6250 13767	13770 30330	15575 34306	17100 37665

Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, 3 and 4, dimension H1 does not include stands.

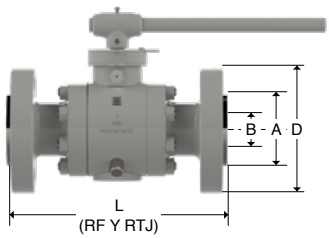
UPC = Upon Customer Request

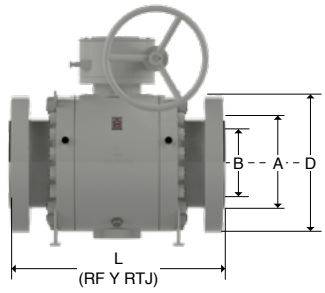
WALWORTH®
Since 1842

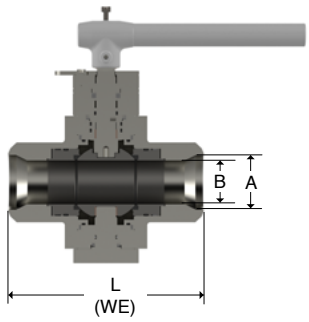
REDUCED PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 1500.

Design features

- Three-piece design (Side Entry).
- Reduced Port.
- ASME Class 1500.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







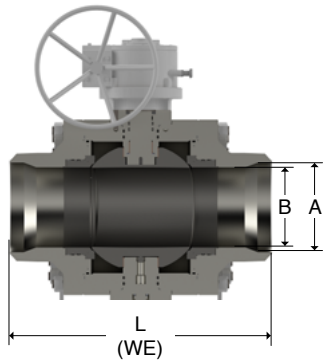


Figure No.		End types
HANDLE	GEARS	
8512-R	8522-R	Raised Face (RF)
8513-R	8523-R	Ring Type Joint (RTJ)
8514-R	8524-R	Welding Ends (WE)

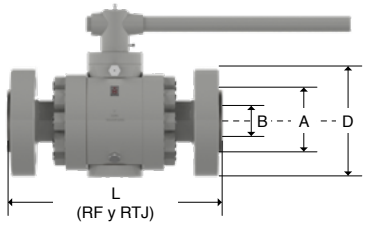
HANDLE OPERATED			GEAR OPERATED										
DN NPS	mm (in)	50 X 40 2"X1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"	150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"	300 X 250 12" X 10"	350 X 300 14" X 12"	400 X 350 16" X 14"	500 X 400 20" X 16"	500 X 450 20" X 18"	600 X 500 24" X 20"
A	mm	49	74	100	144	192	239	287	315	360	454	454	546
	(in)	1.94	2.94	3.94	5.69	7.56	9.44	11.31	12.44	14.19	17.88	17.88	21.50
B	mm	38	49	74	100	144	192	239	287	315	360	406	454
	(in)	1.50	1.94	2.94	3.94	5.69	7.56	9.44	11.31	12.44	14.19	16.00	17.88
D	mm	215	265	310	395	485	585	675	750	825	985	985	1170
	(in)	8.50	10.50	12.25	15.50	19.00	23.00	26.50	29.50	32.50	38.75	38.75	46.00
L (RF)	mm	368	470	546	705	832	991	1130	1257	1384	1664	1664	---
	(in)	14.49	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	65.50	65.50	
L (RTJ)	mm	371	473	549	711	841	1000	1146	1276	1407	1686	1686	1972
	(in)	14.61	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	66.38	66.38	77.63
L (WE)	mm	368	470	546	705	832	991	1130	1257	1384	---	---	---
	(in)	14.49	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50			
Weight (RF, RTJ)	Kg	53	100	175	330	705	1250	1762	2500	3245	5135	7500	10875
	(Lb)	117	220	385	727	1553	2753	3881	5507	7148	11311	16520	23954

Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, 3, and 3, dimension H1 does not include stands. UPC = Upon Customer Request

REDUCED PORT TRUNNION BALL VALVE
BOLTED BODY CLASS 2500.

Design features

- Three-piece design (Side Entry).
- Reduced Port.
- ASME Class 2500.
- Ejection-proof stem.
- Anti-static Device.
- Soft, Metal-to-Metal, or Dual seal options (PMSS).
- Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.



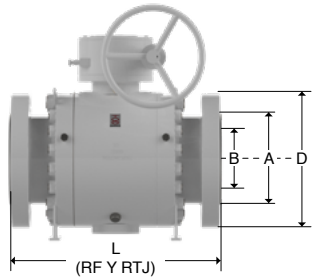
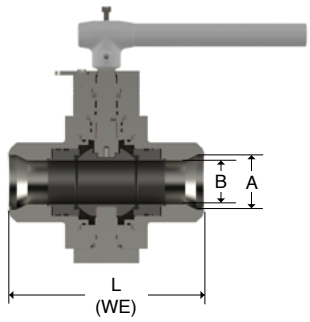
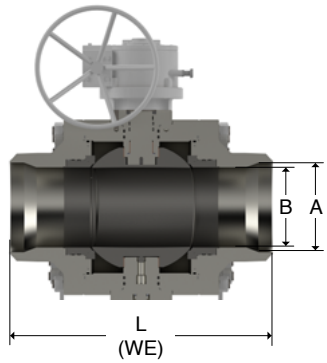


Figure No.		End types
MANERAL	ENGRANES	
8212-R	8222-R	Raised Face (RF)
8213-R	8223-R	Ring Type Joint (RTJ)
8214-R	8224-R	Welding Ends (WE)

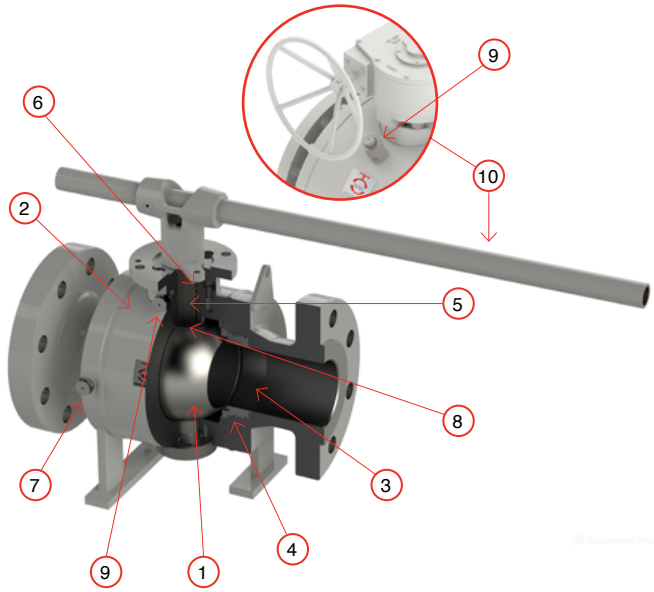




HANDLE OPERATED			GEAR OPERATED					
DN NPS	mm (in)	50 X 40 2"X1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"	150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"	300 X 250 12" X 10"
A	mm (in)	42 1.69	62 2.44	87 3.44	131 5.19	179 7.06	223 8.81	265 10.44
B	mm (in)	38 1.50	42 2.44	62 2.44	87 3.44	131 5.19	179 7.06	223 8.81
D	mm (in)	235 9.25	305 12.00	355 14.00	485 19.00	550 21.75	675 26.50	760 30.00
L (RF)	mm (in)	451 17.75	578 22.75	673 26.50	914 36.00	1022 40.25	1270 50.00	1422 56.00
L (RTJ)	mm (in)	454 17.88	584 23.00	683 26.88	927 36.50	1038 40.88	1292 50.88	1445 56.88
L (WE)	mm (in)	451 17.75	578 22.75	673 26.50	914 36.00	1022 40.25	1270 50.00	1422 56.00
Weight (RF, RTJ)	Kg (Lb)	85 187	190 419	290 639	580 1278	1400 3084	1890 4163	2900 6388

Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards 4) For sizes NPS 2, 3 and 4, dimension H1 does not include stands.

TRUNNION-MOUNTED BALL VALVE
THREE-PIECE WELDED BODY TYPE *(FULLY WELDED)*



- Design under API-6D and ISO-14313. Also meets the requirements of specification PEMEX-EST-0211/02-2017.
- Welded Body Three-piece design (Fully welded).
- Full Port through conduit.
- Ball (or sphere) type plug.
- Ejection-proof stem.
- Dynamic Seat Rings, Spring-loaded.
- Interior arrangement with soft seals, metal-to-metal seals, or dual seals (PMSS).
- Anti-static Device.
- Double block and bleed (DBB) function.
- Suitable to fit through tooling, or inspection equipment. (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed type DIB-1 for bidirectional seats, or DIB-1 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). For dimensions not listed in API-6D, the dimensions published in ASME B16.10 are used.
- RF, or RTJ flange dimensions under ASME B16.5 from NPS 1 to NPS 24; for NPS 26, and larger valves, ASME B16.47 Series A flanges.
- WE end dimensions under ASME B16.25.
- Suitable for sour service under NACE MR-01-75, or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof design under API-6FA (“Standard for Fire test for Valves”) and API-607 (”Fire Test for Quarter Turn Valves, and Valves Equipped with Nonmetallic Seals”).
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.
- Handle operated on small diameters and gear operated, on large diameters. Optional electric, pneumatic, gas over oil, bare stem, etc. actuator.

(1) Ball mounted on trunnions. For all diameters and classes, the ball is mounted on trunnions (lower and upper).

(2) Body. Three-piece design for easy disassembly for maintenance; made of forged steel. Its cylindrical configuration reduces the amount of sludge and debris that accumulates in the lower part of the valve.

(3) Dynamic seats that are spring-loaded at all times to keep them sealing against the plug.

(4) Fireproof Seals. Gaskets, packings, and machining designed so that in case of fire, the valve can withstand the high temperatures and keep the valve sealing to control the emergency.

(5) Ejection-proof stem. Due to its bottom interference fit design, the stem is constrained by other assembly components such as the trunnion, preventing it from being ejected in case of over-pressure in the center cavity.

(6) Stem seal. To prevent leakage to the atmosphere through the packing chamber, O-rings and a graphite gasket are placed to keep the valve sealing.

(7) Grease injectors. Giant button head style, lubricating grease injectors are installed to keep the seat boxes lubricated, prevent the O-rings from drying out and to allow the seats to float at all times.

An inner check valve prevents fluid pressure from escaping to the atmosphere through the grease injectors (starting at NPS 8 class 150, class 300, NPS 4 class 600, NPS 3 class 900, NPS 3 class 1500 and 3 class 2500, this accessories are available). In case of emergency due to leakage through the O-rings, the inserts or wear, these injectors can be used to put sealant in to achieve a temporary seal, which will allow the system to continue operating until a scheduled shutdown is programmed..

(8) Anti-static Device. An Inconel X-750 spring is placed between the stem and the ball to reduce the friction coefficient when operating the valve, which can generate electrostatic charges (electric sparks) that can lead to fire when mixed with fluids.

(9) Double Block and Bleed (DBB) Plug. In closed position, the valve is able to block the fluid; with this function, it is possible to isolate the central cavity to allow the drainage of the dirty fluid, especially in the lower part of the valve, where sludge and stones that are dragged by the process accumulate. The vent valve serves to verify that the valve is performing the DBB function correctly.

(10) Handle and Gear Operator. In small sizes, a handle-operated valve is supplied, while in medium, and large sizes it is supplied with a gear operator.

Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards. 3) Walworth® reserves the right to supply valves according to the design in stock.

TRUNNION-MOUNTED BALL VALVE

THREE-PIECE WELDED BODY TYPE (*FULLY WELDED*) HANDLE OPERATED.

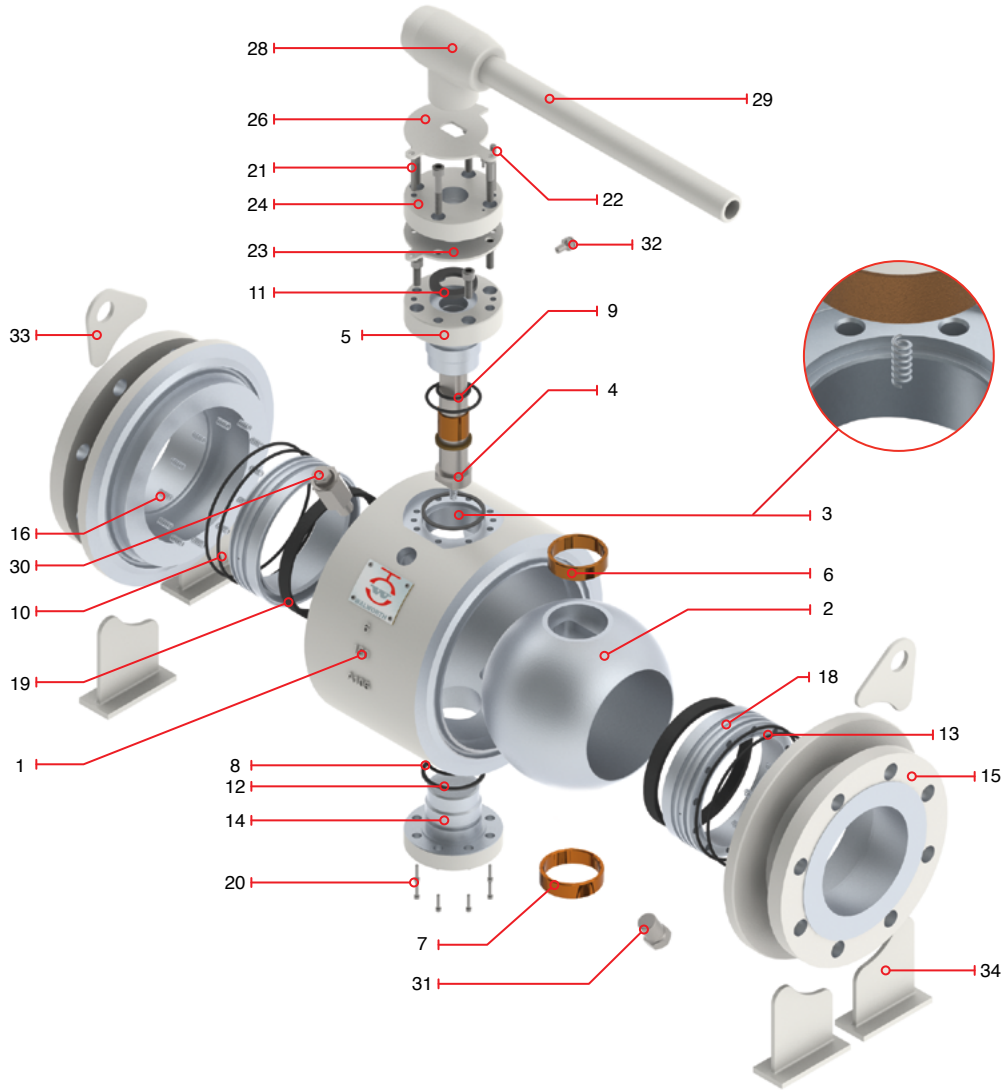
Bill of materials

No.	Description
1	Body
2	Ball
3	Anti-static Spring
4	Stem
5	Trunnion / Top bonnet
6	Top bearing*
7	Bottom bearing*
8	Bottom O'-ring*
9	Top O'-ring
10	Seat O'-ring
11	Stem fireproof seal
12	Trunnion fireproof seal

No.	Description
13	Seat fireproof seal
14	Bottom Trunnion*
15	Welded Ends
16	Seat spring*
17	Back Seat Ring*
18	Seat ring
19	Seat Insert
20	Bottom case screw*
21	Top case screw
22	Bolt*
23	Lock device
24	Adapter plate

No.	Description
25	Screw *
26	Stop collar*
27	Retainer *
28	Handle Nut
29	Handle
30	Vent Valve
31	Drain Valve
32	Sealant Injector*
33	Lifting Lug*
34	Stand*

* Not shown



Notes: 1. The drawings shown here are a representation of various designs Walworth® has developed. 2. Valve configurations may change according to Walworth® standards. 3. Walworth® reserves the right to supply valves according to the design in stock.

WALWORTH GROUP

TRUNNION-MOUNTED BALL VALVE

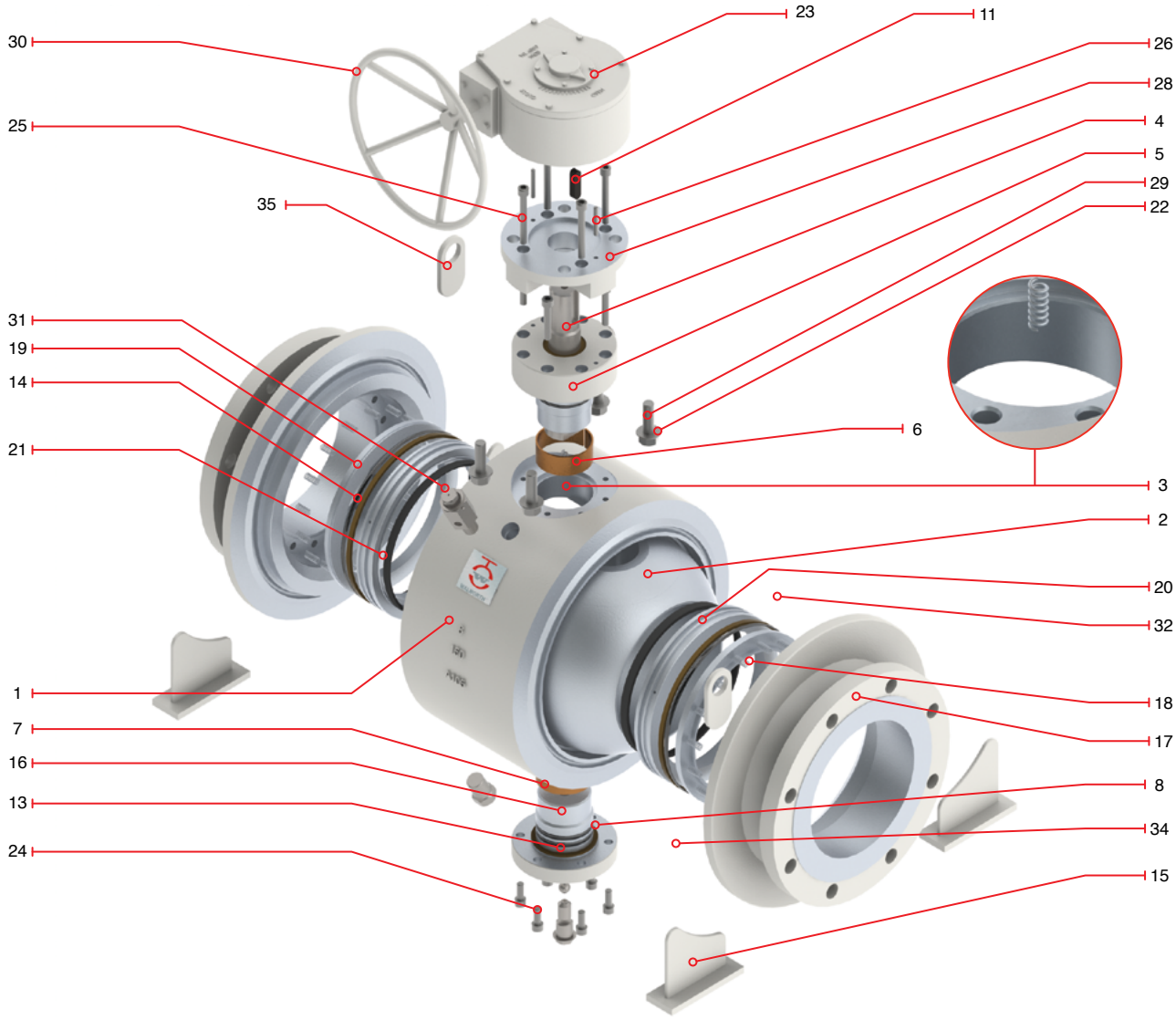
THREE-PIECE WELDED BODY TYPE (*FULLY WELDED*) GEAR OPERATED.

Bill of materials

No.	Description
1	Body
2	Ball
3	Anti-static Spring
4	Stem
5	Trunnion / Top bonnet
6	Top bearing*
7	Bottom bearing*
8	Bottom O'-ring*
9	Stem O'-ring
10	Seat O'-ring*
11	Wrench / Shim
12	Top fireproof seal*

No.	Description
13	Bottom fireproof seal
14	Seat fireproof seal
15	Stand
16	Bottom Trunnion*
17	Flanged ends
18	Seat springs
19	Back Seat Ring*
20	Seat ring
21	Seat Insert
22	Spring lock washer*
23	Gearbox
24	Bottom case screw*

No.	Description
25	Top case screw
26	Bolt*
27	Adapter plate bushing*
28	Adapter plate
29	Screw
30	Handwheel
31	Vent Valve
32	Drain Valve
33	Stem Grease Injector
34	Flange Grease Injector
35	Lifting Lug



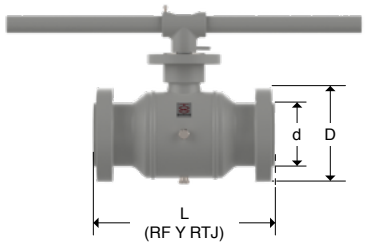
* Not shown

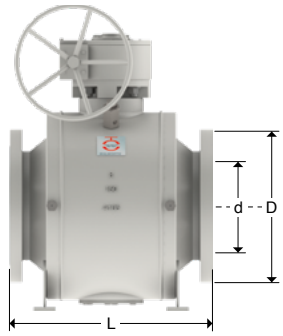
Notes: 1. The drawings shown here are a representation of various designs Walworth® has developed. 2. Valve configurations may change according to Walworth® standards. 3. Walworth® reserves the right to supply valves according to the design in stock.

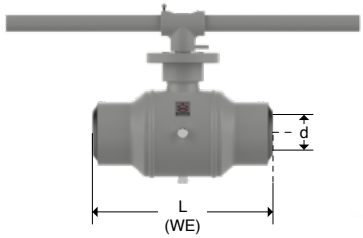
FULL PORT TRUNNION BALL VALVE
FULLY WELDED CLASS 150.

Design features

- Three-piece design (Side Entry)
- Full constant port
- ASME Class 150
- Ejection-proof stem.
- Anti-static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS)
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







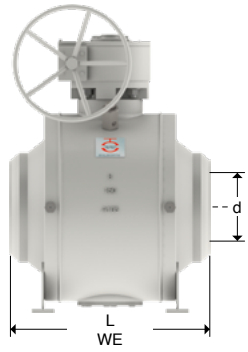


Figure No.		End types
HANDLE	GEARS	
8112-W	8122-W	Raised Face (RF)
8113-W	8123-W	Ring Type Joint (RTJ)
8114-W	8124-W	Welding Ends (WE)

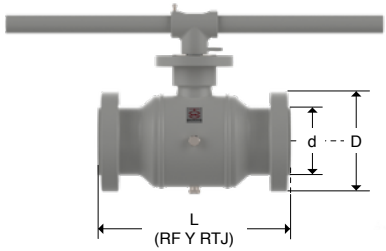
		HANDLE OPERATED			GEAR OPERATED												
DN NPS	mm (in)	50 2	80 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24	700 28	750 30	800 32	900 36
d	mm (in)	49 1.94	74 2.94	100 3.94	150 5.94	201 7.94	252 9.94	303 11.94	334 13.19	385 15.19	436 17.19	487 19.19	589 23.19	684 26.94	735 28.94	779 30.69	874 34.44
D	mm (in)	150 6.00	190 7.50	230 9.00	280 11.00	345 13.50	405 16.00	485 19.00	535 21.00	595 23.50	635 25.00	700 27.50	815 32.00	925 36.50	985 38.75	1060 41.35	1170 46.00
L (RF)	mm (in)	178 7	203 8	229 9	394 15.5	457 18	533 21.00	610 24.00	686 27	762 30	864 34.00	914 36.00	1067 42.00	1245 49.00	1295 51.00	1372 54.00	1524 60.00
L (RTJ)	mm (in)	191 7.5	216 8.50	241 9.50	406 16.00	470 18.50	546 21.50	622 24.50	699 27.50	775 30.50	876 34.50	927 36.50	1080 42.50	Upon request	Upon request	Upon request	Upon request
L (WE)	mm (in)	216 8.5	283 11.13	305 12	457 18	521 20.50	559 22.00	635 25	762 30.00	838 33.00	914 36.00	991 39.00	1143 45.00	1346 53.00	1397 55.00	1524 60.00	1727 68.00
Peso (RF, RTJ)	Kg (Lb)	19 42	31 68	54 119	117 258	215 474	348 767	515 1134	563 1240	860 1894	1214 2674	1568 3454	2427 5346	3716 8185	4451 9804	5314 11705	6892 15181
Peso (WE)	Kg (Lb)	15 33	25 55	46 101	110 242	209 460	320 705	515 1134	563 1240	852 1877	1267 2791	1562 3441	2417 5324	3747 8253	4670 10286	5575 12280	7275 16024

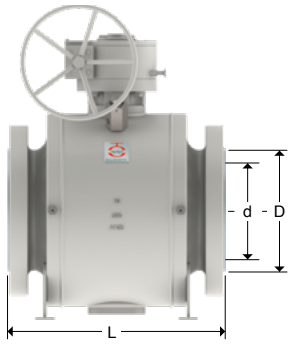
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

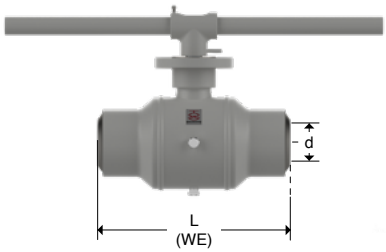
FULL PORT TRUNNION BALL VALVE
FULLY WELDED CLASS 300.

Design features

- Three-piece design (Side Entry)
- Full constant port
- ASME Class 300
- Ejection-proof stem.
- Anti-static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS)
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







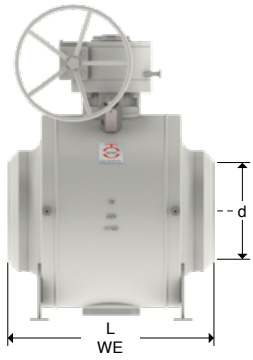


Figure No.		Tipo de extremos
HANDLE	GEARS	
8312-W	8322-W	Raised Face (RF)
8313-W	8323-W	Ring Type Joint (RTJ)
8314-W	8324-W	Welding Ends (WE)

HANDLE OPERATED				
DN NPS	mm (in)	50 2	80 3	100 4
d	mm (in)	49 1.94	74 2.94	100 3.94
D	mm (in)	165 6.50	210 8.25	255 9.00
L (RF)	mm (in)	216 8.50	283 11.13	305 12.00
L (RTJ)	mm (in)	232 9.13	298 11.75	321 12.63
L (WE)	mm (in)	216 8.50	283 11.13	305 12.00
"Peso (RF, RTJ)"	Kg (Lb)	24 53	43 95	71 156
"Peso (WE)"	Kg (Lb)	18 40	31 68	51 112

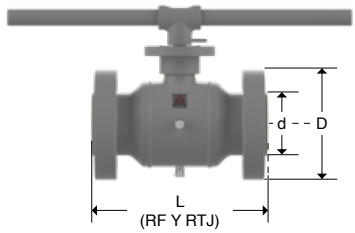
GEAR OPERATED												
150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24	700 28	750 30	800 32	900 36
150 5.94	201 7.94	252 9.94	303 11.94	334 13.19	385 15.19	436 17.19	487 19.19	589 23.19	684 26.94	735 28.94	779 30.69	874 34.44
320 12.50	380 15.00	445 17.50	520 20.50	585 23.00	650 25.50	710 28.00	775 30.50	915 36.00	1035 40.75	1090 43.00	1150 45.25	1270 50.00
403 15.88	502 19.75	568 22.38	648 25.50	762 30.00	838 33.00	914 36.00	991 39.00	1143 45.00	1346 53.00	1397 55.00	1524 60.00	1727 68.00
419 16.50	518 20.38	584 23.00	664 26.13	778 30.63	854 33.63	930 36.63	1010 39.75	1165 45.88	1372 54.00	1422 56.00	1553 61.13	1756 69.13
457 18.00	521 20.50	559 22.00	635 25.00	762 30.00	838 33.00	914 36.00	991 39.00	1143 45.00	1346 53.00	1397 55.00	1524 60.00	1727 68.00
127 280	256 564	407 896	623 1372	717 1579	1042 2295	1458 3211	1851 4077	2842 6260	4388 9665	5450 12004	6563 14456	8357 18407
110 242	209 460	320 705	500 1101	600 1322	852 1877	1267 2791	1562 2441	2417 5324	3747 8253	4728 10414	5695 12544	7275 16024

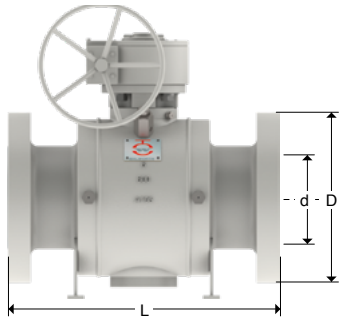
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

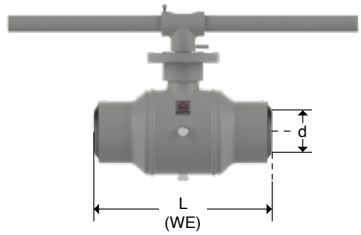
FULL PORT TRUNNION BALL VALVE
FULLY WELDED CLASS 600.

Design features

- Three-piece design (Side Entry)
- Full constant port
- ASME Class 600
- Ejection-proof stem.
- Anti-Static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS)
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







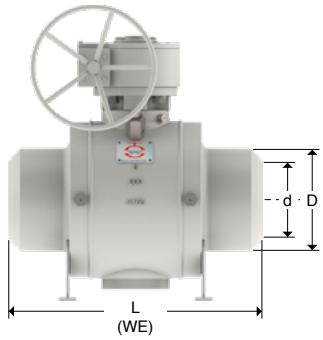


Figure No.		End types
HANDLE	GEARS	
8612-W	8622-W	Raised Face (RF)
8613-W	8623-W	Ring Type Joint (RTJ)
8614-W	8624-W	Welding Ends (WE)

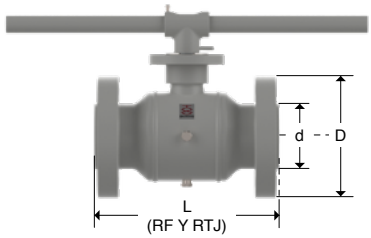
HANDLE OPERATED				GEAR OPERATED												
DN NPS	mm (i n)	50 2	80 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24	700 28	750 30	800 32	900 36
d	mm (in)	49 1.94	74 2.94	100 3.94	150 5.94	201 7.94	252 9.94	303 11.94	334 13.19	385 15.19	436 17.19	487 19.19	589 23.19	684 26.94	735 28.94	779 30.69	874 34.44
D	mm (in)	165 6.50	210 8.25	275 10.75	355 14.00	420 16.50	510 20.00	560 22.00	605 23.75	685 27.00	745 29.25	815 32.00	940 37.00	1075 42.25	1130 44.50	1195 47.00	1315 51.75
L (RF)	mm (in)	292 11.50	356 14.00	432 17.00	559 22.00	660 26.00	787 31.00	838 33.00	889 35.00	991 39.00	1092 43.00	1194 47.00	1397 55.00	1549 61.00	1651 65.00	1778 70.00	2083 82.00
L (RTJ)	mm (in)	295 11.63	359 14.13	435 17.13	562 22.13	664 26.13	791 31.13	841 33.13	892 35.13	994 39.13	1095 43.13	1200 47.25	1407 55.38	1562 61.50	1664 65.50	1794 70.63	2099 82.63
L (WE)	mm (in)	292 11.50	356 14.00	432 17.00	559 22.00	660 26.00	787 31.00	838 33.00	889 35.00	991 39.00	1092 43.00	1194 47.00	1397 55.00	1549 61.00	1651 65.00	1778 70.00	2083 82.00
Peso (RF, RTJ)	Kg (Lb)	30 67	51 112	160 352	242 533	416 916	612 1348	789 1738	1020 2247	1410 3106	1868 4115	2466 5432	3780 8326	5520 12159	6176 13604	7990 17599	10026 22084
Peso (WE)	Kg (Lb)	22 48	44 96	130 286	180 396	336 740	472 1040	629 1385	820 1806	1140 2511	1503 3311	2042 4498	3176 6996	4745 10452	5176 11401	6877 15148	8660 19075

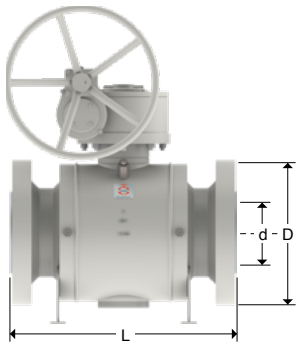
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

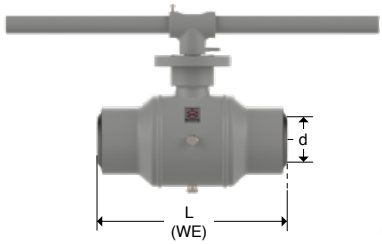
FULL PORT TRUNNION BALL VALVE
FULLY WELDED CLASS 900.

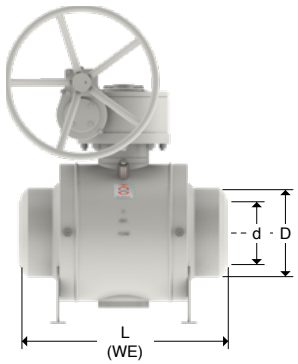
Design features

- Three-piece design (Side Entry)
- Full constant port
- ASME Class 900
- Ejection-proof stem.
- Anti-Static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS)
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.









No. de Figura		End types
HANDLE	GEARS	
8912-W	8922-W	Raised Face (RF)
8913-W	8923-W	Ring Type Joint (RTJ)
8914-W	8924-W	Welding Ends (WE)

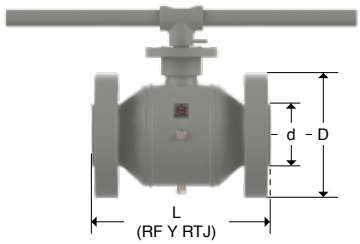
HANDLE OPERATED			GEAR OPERATED													
DN NPS	mm (in)	50 2	80 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24	750 30	800 32	900 36	1200 48
d	mm (in)	49 1.94	74 2.94	100 3.94	150 5.94	201 7.94	252 9.94	303 11.94	322 12.69	373 14.69	423 16.69	471 18.56	570 22.44	712 28.06	760 29.94	855 33.69	1149 45.25
D	mm (in)	215 8.50	240 9.50	290 11.50	380 15.00	470 18.50	545 21.50	610 24.00	640 25.25	705 27.75	785 31.00	855 33.75	1040 41.00	1230 48.50	1315 51.75	1460 57.50	1785 70.25
L (RF)	mm (in)	368 14.50	381 15.00	457 18.00	610 24.00	737 29.00	838 33.00	965 38.00	1029 40.50	1130 44.50	1219 48.00	1321 52.00	1549 61.00	1880 74.00	2014 79.29	2286 90.00	2450 96.45
L (RTJ)	mm (in)	371 14.49	384 15.13	460 18.13	613 24.13	740 29.13	841 33.13	968 38.13	1038 40.88	1140 44.88	1232 48.50	1334 52.50	1568 61.75	1902 74.88	2036 80.16	2315 91.13	2480 97.6
L (WE)	mm (in)	368 14.49	381 15.00	457 18.00	610 24.00	737 29.00	838 33.00	965 38.00	1029 40.50	1130 44.50	1219 48.00	1321 52.00	1549 61.00	1660 65.35	1884 69.29	1900 74.8	2380 93.7
Peso (RF, RTJ)	Kg (Lb)	49 108	115 253	135 297	259 570	477 1051	749 1650	1098 2419	1318 2903	1772 3903	2333 5139	3037 6689	5192 11436	7539 16606	11674 25714	14049 30945	30323 66791
Peso (WE)	Kg (Lb)	30 66	92 203	98 216	189 416	351 773	559 1231	809 1782	998 2198	1409 3104	1910 4207	2412 5313	3697 8143	5782 12736	7868 17330	11359 25020	24871 54782

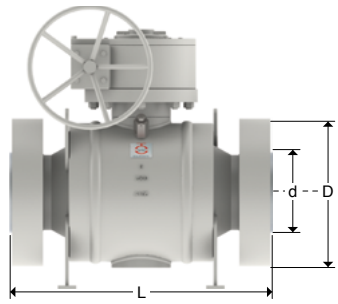
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

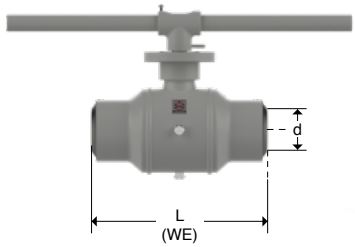
FULL PORT TRUNNION BALL VALVE
FULLY WELDED CLASS 1500.

Design features

- Three-piece design (Side Entry)
- Full constant port
- ASME Class 1500
- Ejection-proof stem.
- Anti-static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS)
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







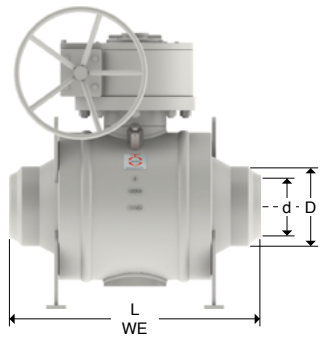


Figure No.		End types
HANDLE	GEARS	
8512-W	8522-W	Raised Face (RF)
8513-W	8523-W	Ring Type Joint (RTJ)
8514-W	8524-W	Welding Ends (WE)

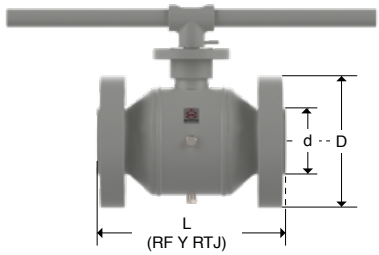
HANDLE OPERATED			GEAR OPERATED										
DN NPS	mm (in)	50 2	80 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24
d	mm (in)	49 1.94	74 2.94	100 3.94	144 5.69	192 7.56	239 9.44	287 11.31	315 12.44	360 14.19	406 16.00	454 17.88	546 21.50
D	mm (in)	215 8.50	265 10.50	310 12.25	395 15.50	485 19.00	585 23.00	675 26.50	750 29.50	825 32.50	915 36.00	985 38.75	1170 46.00
L (RF)	mm (in)	368 14.50	470 18.50	546 21.50	705 27.75	832 32.75	991 39.00	1130 44.50	1257 49.50	1384 54.50	1537 60.50	1664 65.50	1703 67.04
L (RTJ)	mm (in)	371 14.63	473 18.63	549 21.63	711 28.00	841 33.13	1000 39.38	1146 45.13	1276 50.25	1407 55.38	1559 61.38	1686 66.38	1972 77.63
L (WE)	mm (in)	368 14.50	470 18.50	546 21.50	705 27.75	832 32.75	991 39.00	1130 44.50	1257 49.50	1384 54.50	1341 52.80	1453 57.20	1704 67.09
Peso (RF, RTJ)	Kg (Lb)	49 108	65 143	133 293	321 707	465 1024	890 1960	1429 3147	1318 2903	1772 3903	2333 5139	3037 6689	5192 11436
Peso (WE)	Kg (Lb)	30 66	21 46	67 147	171 377	229 504	494 1088	823 1813	998 2198	1409 3104	1910 4207	2410 5308	3697 8143

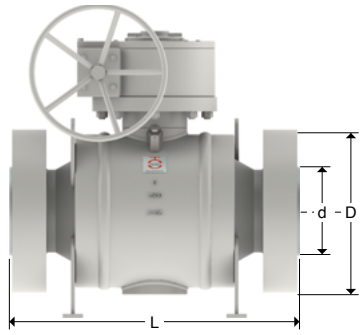
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

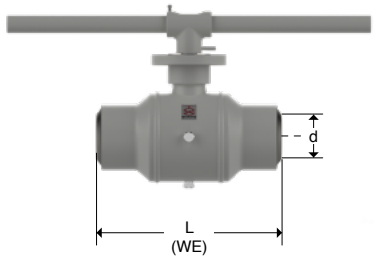
FULL PORT TRUNNION BALL VALVE
FULLY WELDED CLASS 2500.

Design features

- Three-piece design (Side Entry)
- Full constant port
- ASME Class 2500
- Ejection-proof stem.
- Anti-static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS)
- Double block, and bleed (DBB).
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







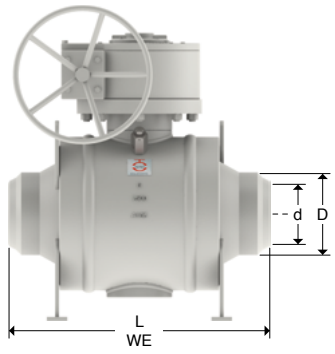


Figure No.		End types
HANDLE	GEARS	
8212-W	8222-W	Raised Face (RF)
8213-W	8223-W	Ring Type Joint (RTJ)
8214-W	8224-W	Welding Ends (WE)

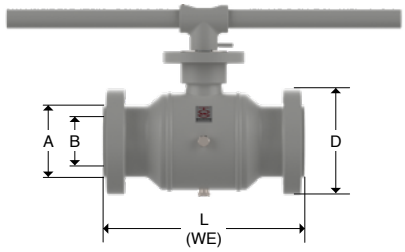
HANDLE OPERATED			GEAR OPERATED					
DN NPS	mm (n)	50 2	80 3	100 4	150 6	200 8	250 10	300 12
d	mm (in)	42 1.69	62 2.44	87 3.44	131 5.19	179 7.06	223 8.81	265 10.44
D	mm (in)	235 9.25	305 12.00	355 14.00	485 19.00	550 21.75	675 26.50	760 30.00
L (RF)	mm (in)	451 17.75	578 22.75	673 26.50	914 36.00	1022 40.25	1270 50.00	1422 56.00
L (RTJ)	mm (in)	454 17.88	584 23.00	683 26.88	927 36.50	1038 40.88	1292 50.88	1445 56.88
L (WE)	mm (in)	451 17.75	578 22.75	673 26.50	914 36.00	1022 40.25	1270 50.00	1422 56.00
Peso (RF, RTJ)	Kg (Lb)	82 181	174 383	367 808	747 1645	1262 2780	2037 4487	3114 6859
Peso (WE)	Kg (Lb)	47 104	99 218	252 555	454 1000	822 1811	1197 2637	1934 4260

Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

REDUCED PORT TRUNNION BALL VALVE
FULLY WELDED CLASS 150.

Design features

- Three-piece design (Side Entry)
- Reduced Port
- ASME Class 150
- Ejection-proof stem.
- Anti-static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS)
- Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.



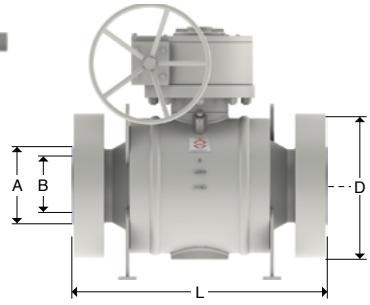
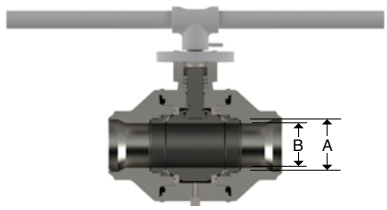
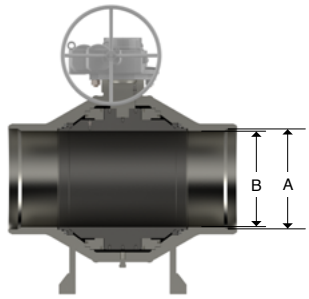


Figure No.		End types
HANDLE	GEARS	
8112-RW	8122-RW	Raised Face (RF)
8113-RW	8123-RW	Ring Type Joint (RTJ)
8114-RW	8124-RW	Welding Ends (WE)





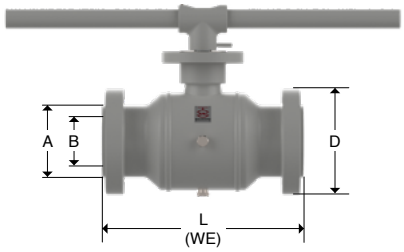
		HANDLE OPERATED			GEAR OPERATED											
DN NPS	mm (in)	50 X 40 2"X1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"	150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"	300 X 250 12" X 10"	350 X 300 14" X 12"	400 X 350 16" X 14"	500 X 400 20" X 16"	500 X 450 20" X 18"	600 X 500 24" X 20"	700 X 600 28" X 24"	800 X 700 32" X 28"	900 X 750 36" X 30"	900 X 800 36" X 32"
A	mm	49	74	100	150	201	252	303	334	385	487	487	589	684	779	874	874
	(in)	1.94	2.94	3.94	5.94	7.94	9.94	11.94	13.19	15.19	19.19	19.19	23.19	26.94	30.69	34.44	34.44
B	mm	38	49	74	100	150	201	252	303	334	385	436	487	589	684	735	779
	(in)	1.50	1.94	2.94	3.94	5.94	7.94	9.94	11.94	13.19	15.19	17.19	19.19	23.19	26.94	28.94	30.69
D	mm	150	190	230	280	345	405	485	535	595	700	700	815	925	1060	1170	1170
	(in)	6.00	7.50	9.00	11.00	13.50	16.00	19.00	21.00	23.50	27.50	27.50	32.00	36.50	41.75	46.00	46.00
L (RF)	mm	178	203	229	394	457	533	610	686	762	914	914	1067	1245	1372	1524	1524
	(in)	7	8	9	15.5	18	21.00	24.00	27	30	36.00	36.00	42.00	49.00	54.00	60.00	60.00
L (RTJ)	mm	191	216	241	406	470	546	622	699	775	927	927	1080	Upon	Upon	Upon	Upon
	(in)	7.5	8.50	9.50	16.00	18.50	21.50	24.50	27.50	30.50	36.50	36.50	42.50	request	request	request	request
L (WE)	mm	216	283	305	457	521	559	635	762	838	991	991	1143	1346	1524	1727	1727
	(in)	8.5	11.13	12	18	20.50	22.00	25	30.00	33.00	39.00	39.00	45.00	53.00	60.00	68.00	68.00
Peso (RF, RTJ)	Kg	20	25	43	140	145	256	398	584	660	964	1412	1760	2776	4371	5190	6009
	(Lb)	44	55	95	308	319	564	877	1286	1454	2123	3110	3877	6115	9628	11432	13236

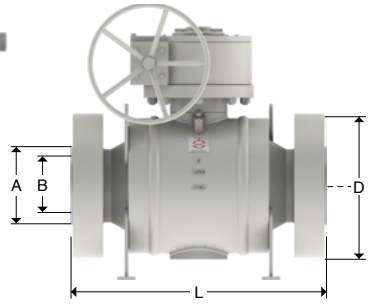
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

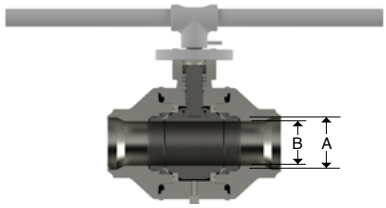
REDUCED PORT TRUNNION BALL VALVE
FULLY WELDED CLASS 300.

Design features

- Three-piece design (Side Entry)
- Reduced Port
- ASME Class 300
- Ejection-proof stem.
- Anti-static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS)
- Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







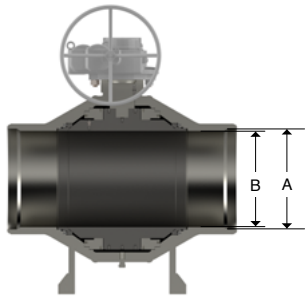


Figure No.		End types
HANDLE	GEARS	
8312-RW	8322-RW	Raised Face (RF)
8313-RW	8323-RW	Ring Type Joint (RTJ)
8314-RW	8324-RW	Welding Ends (WE)

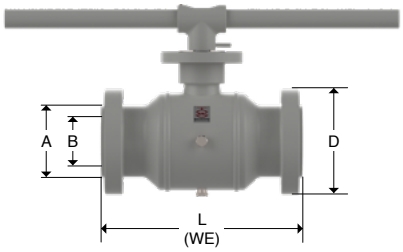
HANDLE OPERATED					GEAR		
DN NPS	mm (in)	50 X 40 2"X1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"	150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"
A	mm (in)	49 1.94	74 2.94	100 3.94	150 5.94	201 7.94	252 9.94
B	mm (in)	38 1.50	49 1.94	74 2.94	100 3.94	150 5.94	201 7.94
D	mm (in)	165 6.50	210 8.25	255 9.00	320 12.50	380 15.00	445 17.50
L (RF)	mm (in)	216 8.50	283 11.13	305 12.00	403 15.88	502 19.75	568 22.38
L (RTJ)	mm (in)	232 9.13	298 11.75	321 12.63	419 16.50	518 20.38	584 23.00
L (WE)	mm (in)	216 8.50	283 11.13	305 12.00	457 18.00	521 20.50	559 22.00
Peso (RF, RTJ)	Kg (Lb)	20 44	30 66	66 145	170 374	184 405	361 795

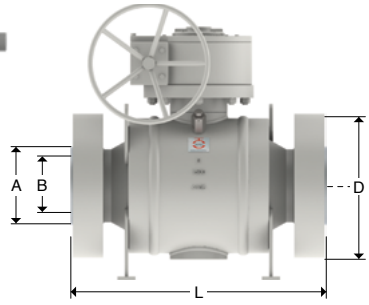
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

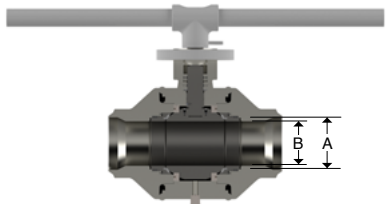
REDUCED PORT TRUNNION BALL VALVE
FULLY WELDED CLASE 600.

Design features

- Three-piece design (Side Entry)
- Reduced Port
- ASME Class 600
- Ejection-proof stem.
- Anti-static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS) Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seats options.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







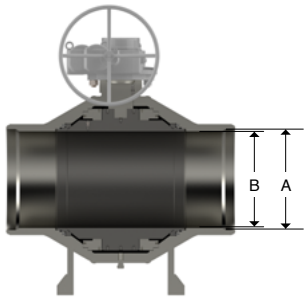


Figure No.		End types
HANDLE	GEARS	
8612-RW	8622-RW	Raised Face (RF)
8613-RW	8623-RW	Ring Type Joint (RTJ)
8614-RW	8624-RW	Welding Ends (WE)

HANDLE OPERATED				GEAR OPERATED												
DN NPS	mm (in)	50 X 40 2"X1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"	150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"	300 X 250 12" X 10"	350 X 300 14" X 12"	400 X 350 16" X 14"	500 X 400 20" X 16"	500 X 450 20" X 18"	600 X 500 24" X 20"	700 X 600 28" X 24"	800 X 700 32" X 28"	900 X 750 36" X 30"	900 X 800 36" X 32"
A	mm	49	74	100	150	201	252	303	334	385	487	487	589	684	779	874	874
	(in)	1.94	2.94	3.94	5.94	7.94	9.94	11.94	13.19	15.19	19.19	19.19	23.19	26.94	30.69	34.44	34.44
B	mm	38	49	74	100	150	201	252	303	334	385	436	487	589	684	735	779
	(in)	1.50	1.94	2.94	3.94	5.94	7.94	9.94	11.94	13.19	15.19	17.19	19.19	23.19	26.94	28.94	30.69
D	mm	165	210	275	355	420	510	560	605	685	815	815	940	1075	1195	1315	1315
	(in)	6.50	8.25	10.75	14.00	16.50	20.00	22.00	23.75	27.00	32.00	32.00	37.00	42.25	47.00	51.75	51.75
L (RF)	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1549	1778	2083	2083
	(in)	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	61.00	70.00	82.00	82.00
L (RTJ)	mm	295	359	435	562	664	791	841	892	994	1095	1200	1407	1562	1794	2099	2099
	(in)	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	55.38	61.50	70.63	82.63	82.63
L (WE)	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1549	1778	2083	2083
	(in)	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	61.00	70.00	82.00	82.00
Peso (RF, RTJ)	Kg (Lb)	25 55	38 84	118 260	233 523	347 764	584 1286	831 1830	1041 2293	1316 2899	1991 4385	2390 5264	3206 7072	4918 10833	6748 14863	7334 16154	9086 20013

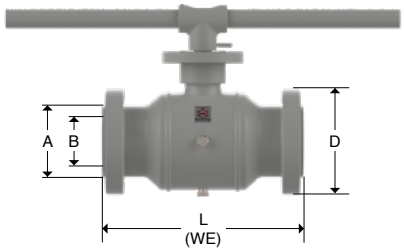
Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

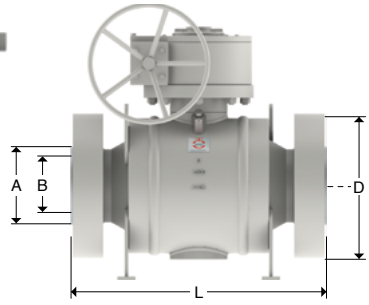
WALWORTH®
Since 1842

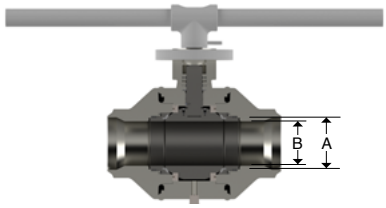
REDUCED PORT TRUNNION BALL VALVE
FULLY WELDED CLASS 900.

Design features

- Three-piece design (Side Entry)
- Reduced Port
- ASME Class 900
- Ejection-proof stem.
- Anti-static Device
- Soft, Metal-to-Metal, or Dual Seal options (PMSS)
- Double block, and bleed (DBB).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seat option.
- Double block, and bleed types DIB-1 for bidirectional seats, or DIB-2 for mixed seats.
- Face-to-face dimension (RF), or end-to-end dimension (RTJ or WE) under API-6D (Table C3). Dimensions not listed, published in ASME B16.10.
- RF, or RTJ flange dimensions per ASME B16.5 from NPS 2 to 24; for NPS 26, and larger, ASME B16.47 Series A. WE end dimensions, ASME B16.25.
- Sour service NACE MR-01-75 or NACE MR-01-03 (ISO-15156, or ISO-17945).
- Fireproof certification under API-6FA, and API-607.
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.







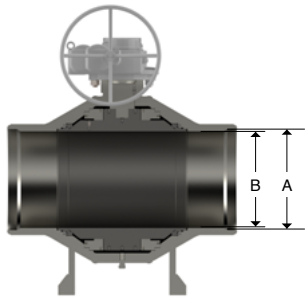


Figure No.		End types
HANDLE	GEARS	
8912-RW	8922-RW	Raised Face (RF)
8913-RW	8923-RW	Ring Type Joint (RTJ)
8914-RW	8924-RW	Welding Ends (WE)

HANDLE OPERATED			GEAR OPERATED												
DN NPS	mm (in)	50 X 40 2"X1 1/2"	80 X 50 3" X 2"	100 X 80 4" X 3"	150 X 100 6" X 4"	200 X 150 8" X 6"	250 X 200 10" X 8"	300 X 250 12" X 10"	350 X 300 14" X 12"	400 X 350 16" X 14"	500 X 400 20" X 16"	500 X 450 20" X 18"	600 X 500 24" X 20"	800 X 700 32" X 28"	900 X 750 36" X 30"	900 X 800 36" X 32"
A	mm	49	74	100	150	201	252	303	322	373	423	471	570	760	855	855
	(in)	1.94	2.94	3.94	5.94	7.94	9.94	11.94	12.69	14.69	16.69	18.56	22.44	29.94	33.69	33.69
B	mm	38	49	74	100	150	201	252	303	322	373	423	471	665	712	760
	(in)	1.50	1.94	2.94	3.94	5.94	7.94	9.94	11.94	12.69	14.69	16.69	18.56	26.19	28.03	29.94
D	mm	215	240	290	380	470	545	610	640	705	785	855	1040	1315	1460	1460
	(in)	8.50	9.50	11.50	15.00	18.50	21.50	24.00	25.25	27.75	30.91	33.75	41.00	51.75	57.50	57.50
L (RF)	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	2014	2286	2286
	(in)	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	79.29	90.00	90.00
L (RTJ)	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1568	2036	2315	2315
	(in)	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	61.75	80.16	91.13	91.13
L (WE)	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1884	2286	2286
	(in)	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	58.27	90.00	90.00
Peso (RF, RTJ)	Kg (Lb)	36 79	95 209	115 253	174 383	300 661	495 1090	779 1716	1049 2311	1291 2844	1950 4295	2366 5211	3490 7687	7526 16577	8714 19194	10746 23670

Notes: 1) The drawings shown here are a representation of various designs Walworth® has developed. 2) Valve configurations may change according to Walworth® standards.

TRUNNION-MOUNTED BALL VALVE
TECHNICAL DATA.

Walworth® brand trunnion-mounted ball valves are designed to be operated with a handle or gearbox as standard; however, they can be supplied with mounting plates under ISO-5211 for installation of electric, pneumatic, gas over oil, hydraulic, etc. actuators. The dimensional control of the assembly components allows the operating torque to be the minimum required to operate the valve with no stress on the gear operator or actuator and with no loss of the required tightness.

Handle

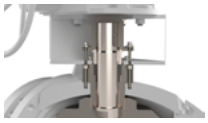
Gear Operator

Electric Actuator

Pneumatic Actuator

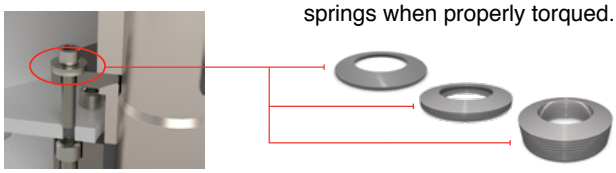
Gas over Oil Actuator

Walworth® has the technology to design, manufacture, and supply valves for underground service, including stem extension, pipe pups, lubrication vanes to lubricate the seats, and packing chamber, as well as opening the vent valve and/or drain valves from the surface.



Live Load System

The live-loading fitting is designed to include preformed graphite packing's in the packing chamber area in addition to the primary seal (O'-rings). A yoke design allows the installation of a gasket-press flange and Belleville washer-style springs that are powered to exert pressure on the gaskets: over time, the gaskets can lose their clamp load; the live-loading system allows compensating for those losses with the additional thrust provided by the Belleville springs when properly torqued.



Pressure Relief Device

In fluid conveyance systems where liquids are handled and a bidirectional seat valve is required, a pressure regulating device must be installed to prevent pressure entrapment in the central cavity (safety and relief valve, valve, pressure regulator, by-pass, etc.).

Check with your nearest sales representative when this scenario occurs so that they can advise you on the most appropriate selection.

DESIGN STANDARDS

Walworth® valves are designed to one or more of the following standards (where applicable):

API — **Instituto Americano del Petróleo:**

- **API-6D** "Specification for Pipeline and Pipeline Valves".
- **API-598** "Valve Inspection and Testing".
- **API-6FA** "Specification for Fire Test for Valves".
- **API-607** "Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetllic Seats".

ASME — **American Society of Mechanical Engineers**

- **ANSI B-16.34** "Valves – Flanged, Threaded. and Welding End".
- **ASME B16.5** "Pipe Flanges and Flanged Fittings".
- **ANSI B-16.10** "Face-To-Face and End-To-End Valve Dimensions of Valves".
- **ANSI B-16.25** "Buttwelding Ends".
- **ANSI B-18.2.1** "Square, Hex, Heavy Hex and askew Head Bolts".
- **ANSI B-16.47** "Large Diameter Steel Flanges NPS 26 Through NPS 60".
- **ASME B31.3** "Process Piping".

ISO — **International Organization for Standardization.**

- **ISO-14313** "Petroleum and Natural Gas Industries – Pipeline Transportation Systems – Pipeline Valves".
- **ISO-5208** "Industrial Valves – Pressure Testing of Metallic Valves".
- **ISO-15848-1** "Industrial Valves – Measurement, Test and Qualification Procedures for Fugitive Emissions – Part 1: Classification Systems and Qualification Procedures for Type Testing of Valves".
- **ISO-15156** "Petroleum and Gas Industries - Materials for use in H_2S - Containing enviroments in Oil & Gas production".
- **ISO-17945** "Petroleum, Petrochemical and Gas Industries – Metallic Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments".

MSS — **Manufacturers Standardization Society of the Valve, and Fittings Industry.**

- **MSS-SP-6** "Standard Finishes for Contact Faces of Pipe Flanges".
- **MSS-SP-9** "Spot Facing for Bronze, Iron and Steel Flanges".
- **MSS-SP-25** "Standard Marking System for Valves, Fittings and Unions".
- **MSS-SP-44** "Steel Pipeline Flanges".
- **MSS-SP-45** "Drain and Bypass Connections".
- **MSS-SP-55** "Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components – Visual Method for Evaluation of Surface Irregularities".

ASTM — **American Society for Testing, and Materials.**

- **ASTM A105** "Especificación Estándar para Forjas de Acero al Carbono para Aplicaciones de Tubería" (Standard Specification for Carbon Steel Forgings For Piping Applications).
- **ASTM A193** "Standard Specification for Alloy Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications".
- **ASTM A194** "Standard Specification for Alloy Steel and Stainless Steel Nuts for Bolting for High Temperature or High Pressure Service, or Both).
- **ASTM A216** "Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service".
- **ASTM A182** "Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service".
- **ASTM A276** "Standard Specification for Stainless Steel Bars and Shapes".
- **ASTM A351** "Standard Specification for Castings, Austenitic, for Pressure-Containing Parts".
- **ASTM A352** "Standard Specification for Steel Castings, Ferritic and Martensitic, for Pressure-Containing Parts, Suitable for Low Temperature Service".
- **ASTM A516** "Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service".

NACE — **National Association of Corrosion Engineers.**

- **NACE MR-01-75** "Petroleum and Gas Industries – Materials for Use in H_2S- Containing Environments in Oil and Gas Production).
- **NACE MR-01-03** "Petroleum, Petrochemical and Gas Industries – Metallic Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments".

ASME PVC — **BOILER AND PRESSURE VESSEL CODE, AMERICAN SOCIETY OF MECHANICAL ENGINEERS.**

- **ASME PVC SECCION II** "Materials and Specifications".
- **ASME PVC SECCION V** "Non Destructive Examination".
- **ASME PVC SECCION VIII Div. 1** "Rules for Construction of Pressure Vessels".
- **ASME PVC SECCION IX** "Welding, Brazing, and Fusing Qualifications".

FIGURE CODE FOR TRUNNION MOUNTED BALL VALVES (TRUNNION BALL)

WALWORTH® valves are identified by a figure number that describes their main features. The identification process is intended to assist customers in identifying the type of valve required according to their specific needs.

Model	ASME class	Operation type	End types	Accessories
8: Fireproof Trunnion Ball Valve.	1: 150 3: 300 6: 600 9: 900 5: 1500 2: 2500	1: Handle. 2: Gearbox. 3: Actuator 4: Double Speed Gear Box. 5: Bare Stem.	2: Raised Face (RF) 3: Ring Type Joint (RTJ). 4: Welding Ends (WE)	No code: Full Port and Unidirectional Seats. R: Reduced Port W: Welded Body B: Bidirectional seats. M: Mixed seats.

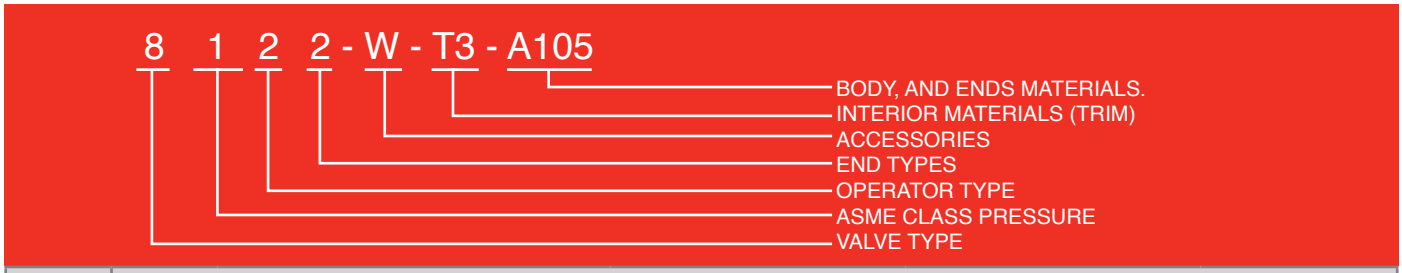
Examples:

8112: Fireproof Trunnion-Mounted Ball Valve, Class 150, Handle Operated, Flanged ends with raised face (RF), Full constant port with Unidirectional Seats.

8223-R: Fireproof Trunnion-Mounted Ball Valve, Class 2500, Gearbox operated, Ring Joint Ends (RTJ), Reduced port with Unidirectional Seats.

8644-WB: Fireproof Trunnion-Mounted Ball Valve, Class 600, Double Speed Gearbox Operated, Welded Ends (WE), Full constant port, Welded Body with Unidirectional Seats.

HOW TO ORDER A TRUNNION MOUNTED BALL VALVE



NPS (DN)	Base figure 8= trunnion ball valve					
	Class	Operation	Ends	Accesories	Most common interior design	CPO-EXT material.
2 (50)	1:1500	1: Handle	2: Raised Face (RF)	NOT LISTED: Bolted Body, Full Port, Unidirectional Seats	T1: A105/ENP Soft Seals	AST A105
3 (100)	3:300	2: Gearbox			T2: 410/ENP Soft Seals	ASTM A216WCB
4 (150)	6:600	3: Actuator	3: Ring Type Joint (RTJ)		T3: 316/ENP Soft Seals	ASTM A350 LF2
6 (200)	9:900	4: Gearbox		R: Reduced Port	T5: LF2-410-4130/ENP Soft Seals	ASTM A352 LCB
8 (400)	5:1500	5: Bare Stem	4: Welding Ends (WE)	W: Welded Body (Fully Welded)	T6: A105/4140 +Tungsten carbide metal-to-metal seals	ASTM A182 F316
10 (500)	2:2500			B: Bidirectional seats.		ASTM A351 CF8M
12 (600)				M: Mixed seats.	T7: LF2 + Tungsten carbide metal-to-metal seals	ASTM A182 F51 (STAINLESS)
14 (700)				GO: Gear Operator		
16 (800)				POV: Pneumatic Actuator	T8: 410 + Tungsten carbide metal-to-metal seals	ASTM A 182 F53 (SUPER DUPLEX)
18 (900)				MOV: Electric Actuator		
20 (1000)				Id: Lock device	T9: F51 + Tungsten carbide metal-to-metal seals	
22 (1100)				NACE-MR-01-75		
24 (1200)				NACE-MR-01-03	T10: A105/4140 + Stellite 6 metal-to-metal seals	
26 (1300)				SP: Special Paint		
28 (1400)				SG: Special Gasket	T11: LF2 + Stellite 6 metal-to-metal seals	
30 (1500)				SPK: Special Packing		
32 (1600)				VOC: Volatile Emissions Certificate	T12: 410 + Stellite 6 metal-to-metal seals	
34 (1700)					T13: F51 + Stellite 6 metal-to-metal seals	
36 (1800)						
48 (2400)					T35: LF2-410-4130/ENP Soft Seals	
60 (3000)					T40: F60-410-4140/ENP Soft SEALS	

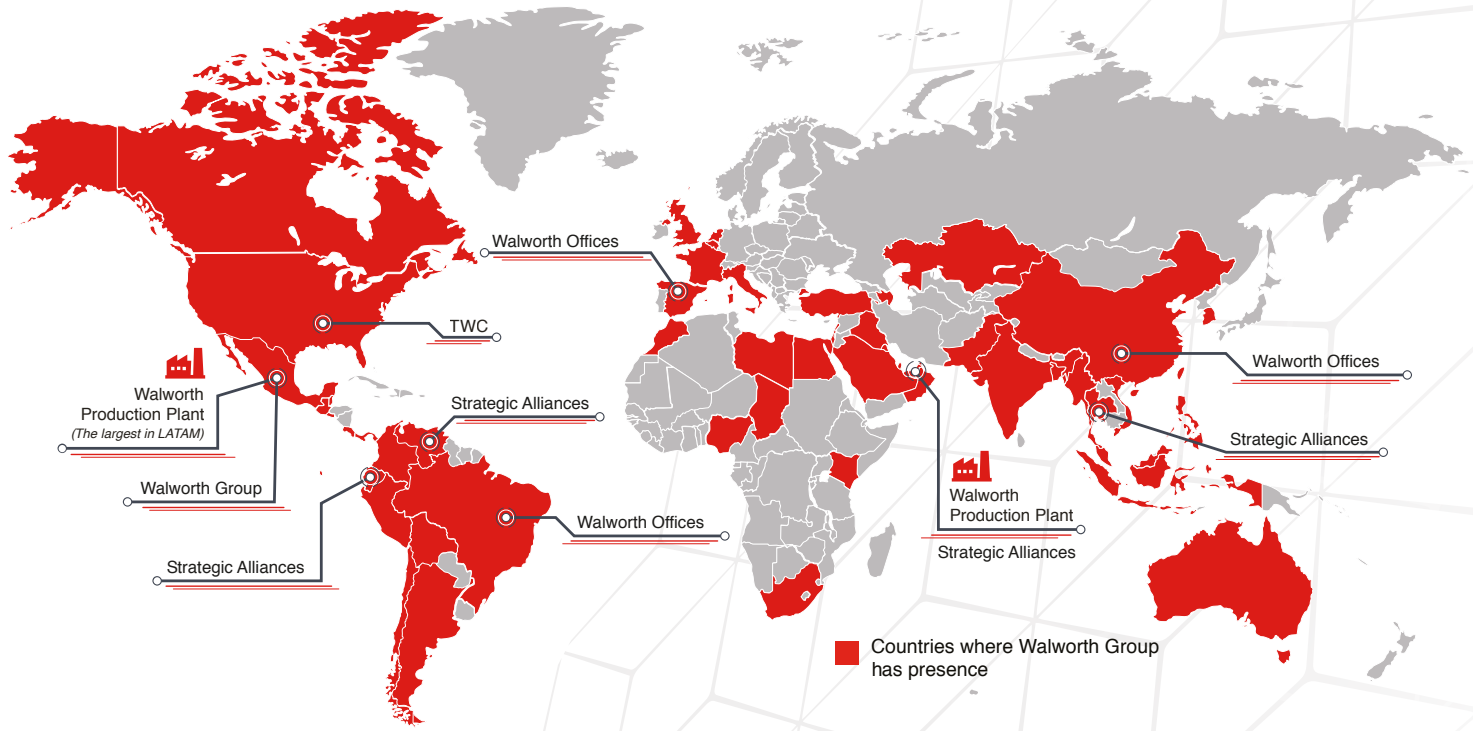
Note: End-body materials, interior arrangements (trim), Special additional requirements are available upon request; please contact your nearest sales representative.

WARRANTY POLICY

WALWORTH® will replace without charge or return funds at the purchase price of manufactured products shown to be defective in materials or workmanship, provided it is shown that the product was properly handled, installed and used in the service for which it was designed. The Customer must file a written claim, specifying the defect found, in which case WALWORTH® accepts no liability for claims for a) Labor, expense or other damages caused by the defective products or b) For consequential or incidental damages.

THE WARRANTY SET FORTH IN THIS PARAGRAPH IS ISSUED IN ACCORDANCE WITH WALWORTH® TERMS AND CONDITIONS SET FORTH IN THE PURCHASE ORDER AND APPLIES FOR A PERIOD OF 12 (TWELVE) MONTHS IN OPERATION OR 18 (EIGHTEEN) MONTHS IN STORAGE WHICHEVER OCCURS FIRST FROM THE DATE OF DELIVERY OF THE PRODUCT. IT SUPERSEDES ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED. WITH RESPECT TO WARRANTIES THIS PARAGRAPH SETS FORTH THE REMEDIES FOR BUYER AND SELLER'S LIABILITY, DESIGN, ETC.

WALWORTH® reserves the right to change design, materials and/or specifications without notice. There will be a charge for modifications to an order after it has been entered when such change or modification will result in additional engineering or clerical work for both WALWORTH® and its suppliers.



North America

- Mexico
- U.S.A.
- Canada

Central America

- Guatemala
- Costa Rica
- Belize
- El Salvador
- Panama

South America

- Venezuela
- Colombia
- Ecuador
- Peru
- Brazil
- Argentina
- Bolivia
- Chile

Africa

- Morocco
- Nigeria
- Egypt

Asia

- China
- Malaysia
- Thailand
- South Korea
- Indonesia
- Vietnam
- Singapore
- Philippines

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- Qatar
- Kuwait
- Lebanon
- Pakistan
- United Arab Emirates
- Bahrain
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- Azerbaijan
- Kazakhstan

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- Turkey

Oceania

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