

Rising stem
ball valves

Orbit

Overview

One of the most trusted valves in the petroleum and natural gas industry for more than 90 years, the Cameron Orbit™ rising stem ball valve is a bidirectional, mechanically sealed, trunnion-mounted ball valve with a spherical body and superior stem seal compliant with the most stringent fugitive emission regulations. The valve's unique design enables friction-free tilt-and-turn functionality that increases service life, reduces leak paths, and supports high open and closed cycle counts.

Orbit valves are available in ASME pressure Classes 150 to 2500 [PN 20 to 420]. They can be specified from nominal pipe size (NPS) 1 to 30 in [DN 25 to 750]. Testing certificates available to API Standard 598, API Specification 6D, API Standard 607, and ISO 15848-1 and -2.

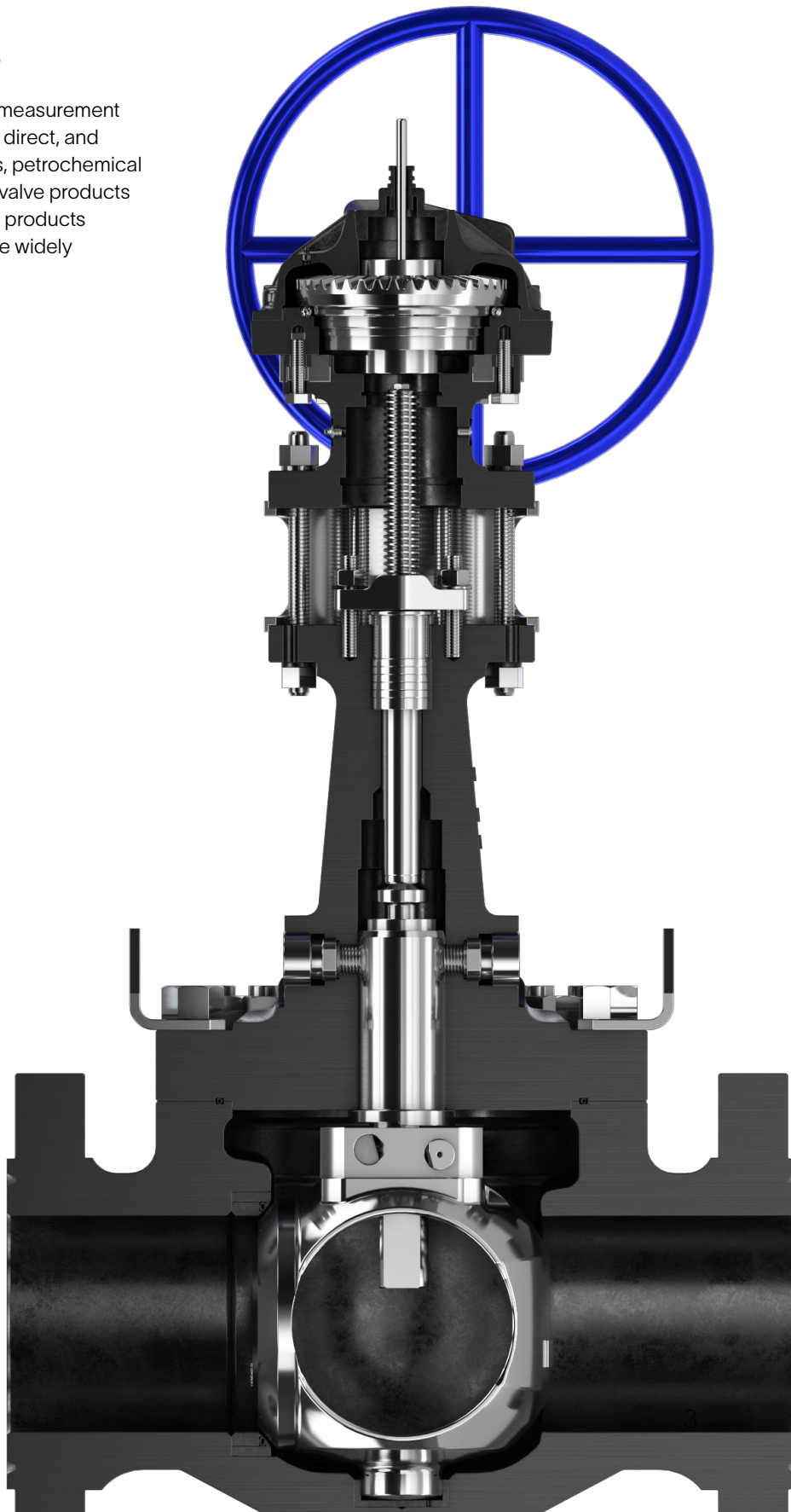
Engineered for heavy-duty, maintenance-free usage—there are Orbit valves still operating after more than 40 years of field service—the Orbit rising stem ball valve is commonly selected for several applications, including

- mol sieve dehydration switching valves
- block and bypass
- heat-transfer fluids or hot oil
- flowlines
- product segregation
- hydrogen service
- meter isolation
- emergency shutdown
- dryer switching
- suction and discharge isolation.

Innovative and reliable valves

SLB is a leading provider of valve, valve automation, and measurement systems to the oil and gas industry. Our products control, direct, and measure the flow of oil and gas as it is moved to refineries, petrochemical plants, and industrial centers for processing. We provide valve products that are sold through distributor networks worldwide. Our products are used in oil, gas, and industrial applications and include widely recognized brands such as

- Demco™ butterfly and gate valves
- Navco™ floating ball valves
- Nutron™ ball valves
- Orbit rising stem ball valves
- Thornhill Craver™ choke valves
- Tom Wheatley™ check valves
- Wheatley™ check valves
- WKM™ valves.



Features and benefits

Orbit rising stem ball valves are ideal for applications when zero leakage and frequent operation are demanded.

They are used globally in gas processing plants as switching valves on molecular sieve systems.

No rubbing between sealing surfaces

The tilt-and-turn action eliminates seal abrasion, which is the major cause of seat wear in conventional ball, gate, and plug valves.

Single-seat design

The single, stationary seat in the Orbit valve seals in both directions and avoids the problems of trapped pressure between seals.

Long life

Orbit valves replace troublesome ball valves, gate valves, globe valves, and plug valves. The Orbit valve design has performance advantages that reduce plant outage and the cost of ownership.

Optimum flow

Full port or reduced port openings give high flow coefficient (C_v) values. System pumping efficiency is enhanced and erosion problems are reduced.

Top-entry design

Inline inspection and repair, after system depressurizing, simplify maintenance.

Dual stem guides

Hardened stem slots and tough guide pins control the tilt-and-turn action of the stem.

Self-cleaning

Tilting the core away from the seat before rotation causes immediate flow around 360° of the core face. Product flow flushes any foreign material away from the seat without localized high-velocity erosive flow.

Low-torque operation

Orbit valves turn easily because seal rubbing is eliminated.

Wear-resistant hard facing on core

The core face is a hard, polished material that endures difficult service without loss of sealing integrity.

Mechanical cam closure

The cam angle at the lower end of the stem provides a mechanically energized seal.

Adjustable stem packing

For in-service maintenance, stem packing can be adjusted to provide complete control of fugitive emissions. (Injectable packing is available on enclosed bonnet models.)

Note: Never remove any part from an Orbit valve unless specifically instructed to do so in the literature or without first consulting an SLB representative. Incorrect procedure could result in personal injury, property damage, or both.

Quality assurance

Specifications and compliances

Orbit rising stem ball valves are tested and certified per the customer's specified service requirements:

- API Specification 6D
- ISO 9001: 2015
- PED 2014/68/EU
- ATEX directive 2014/34/EU
- GOST
- Russian EAC
- ISO 15848-1 (fugitive emission-type testing)
- Shell DVT (MESC SPE 77/300A) qualified and Technically Accepted Manufacturers and Products (TAMAP) two-star rating
- ASME B16.34
- API Standard 598
- API Standard 607 (fire testing)

Our manufacturing philosophy and the standard 36-month warranty ensure that the design, materials, and manufacturing of all Orbit valve products result in years of dependable operation.

Certifications for hydrostatic test results and material properties are available on request.

Orbit valves are ideal where frequent cycling and a positive shutoff are required, conditions that are prevalent in molecular sieve applications in gas processing plants.



Operating principle

Every Orbit valve incorporates a proven tilt-and-turn operation that eliminates seal rubbing, which is the primary cause of valve failure.

When an Orbit valve is closed, the core is mechanically wedged tightly against the seat, ensuring positive shutoff.

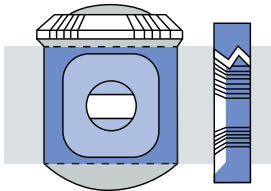
When an Orbit valve begins to open, the core tilts away from the seat and line flow passes uniformly around the core face. This eliminates the localized high-velocity flow that typically creates uneven seat wear in ordinary ball, gate, and plug valves. The core then rotates to the fully open position.

The absence of seal rubbing during both opening and closing means easy, low-torque valve operation and long-term reliable performance.

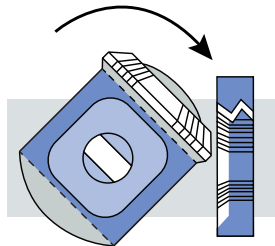
When valve leakage cannot be tolerated, our Orbit valve operating principle can be relied upon to deliver a positive shutoff.

To close an Orbit valve

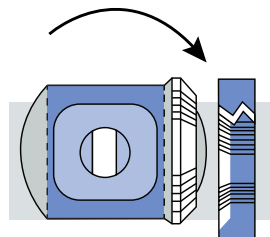
As the handwheel is turned, the stem begins to lower.



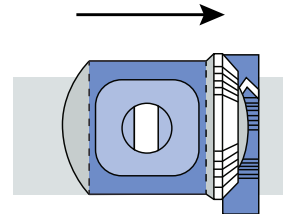
Precision spiral grooves in the stem act against fixed guide pins, causing the stem and core to rotate.



Continued turning of the handwheel rotates the core and stem a full 90° without the core touching the seat.



Final turns of the handwheel mechanically wedge the stem down, pressing the core firmly against the seat.



Market operations

Orbit valves are ideally suited for

- Mol sieve dehydration switching valves
- Flowlines
- Meter isolation
- Dryer switching
- Block and bypass
- Product segregation
- Emergency shutdown
- Suction and discharge isolation
- Heat-transfer fluids and hot oil
- Hydrogen service
- Many additional applications



The Orbit valve's top-entry design provides convenient access for inline inspection and repairs when required. For environmental protection, outside screw and yolk (OS&Y) packing can be replenished while valves are under full line pressure on enclosed bonnet models.



This Orbit valve model is on display in a valve showroom.

Product range and options

Orbit valves are manufactured in a variety of materials, sizes, and trims to meet specific requirements.

Materials

Carbon steel, stainless steel (SS), duplex SS, high-nickel alloys, and other special materials are used as service conditions require.

External protective coatings are available for added durability in corrosive environments.

Seats

Soft- or metal-seated options are selected for the intended service. Because the seals in the valves do not rub and because they are mechanically compressed shut, they survive in high-temperature and abrasive situations.

Operation

Hand or power operation can be selected. Orbit valves offer double-acting, spring-close, and spring-open pneumatic actuators. User-selected electric and hydraulic actuators are available. Instrumentation choices also are offered.

Customizing

Handwheel extensions, safety interlocks, position indicator limit switches, thermal jackets, custom painting, and special inspection can be provided.

Maintenance and repairs

Our services include inspection, maintenance, and repairs for all Orbit valve products.

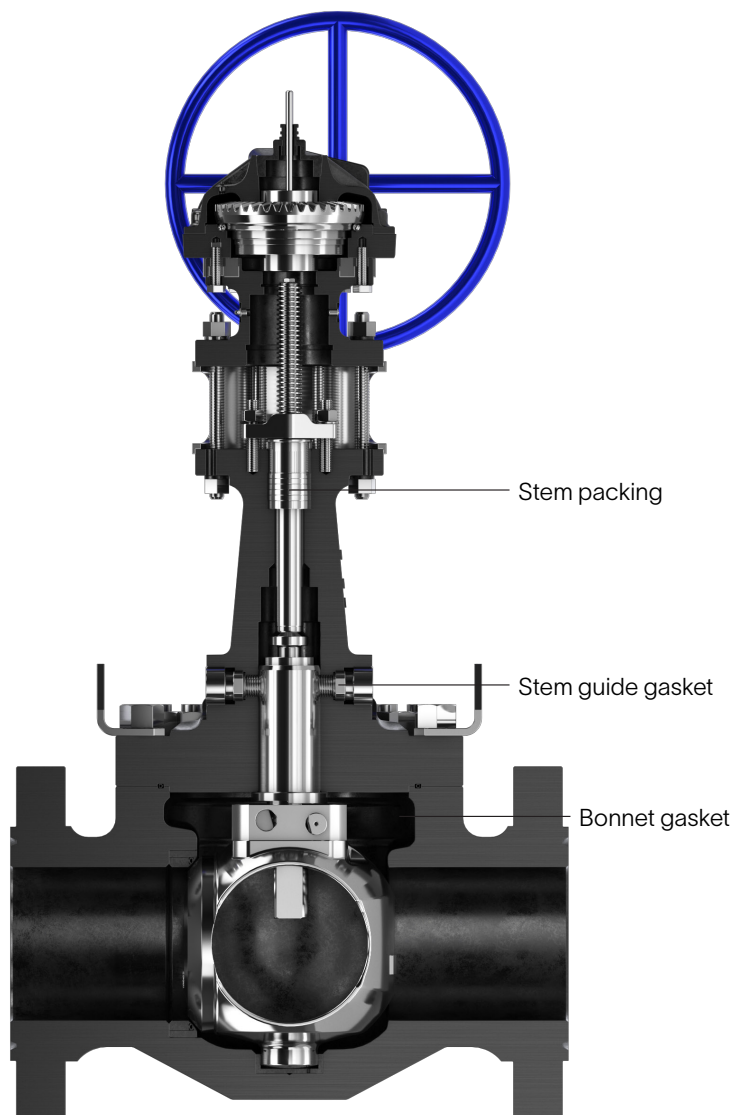


The Orbit valve line offers complete packages that can include valves, actuators, and instrumentation.

Orbit Low-E certified low emissions valve

Because the key sources of fugitive emissions (FE) within a typical valve are the stem packing, body joints, and fittings, SLB performed extensive in-house testing on these critical sealing elements to develop the Orbit Low-E™ certified low emissions valve. Orbit Low-E valves are certified to the highest level of FE tightness for both high- and low-temperature applications.

All Orbit rising stem ball valves can be easily converted to Orbit Low-E low emissions valves by changing out the sealing elements of the stem packing and the bonnet gasket and stem guide gasket with the enhanced sealing elements to achieve industry-leading FE performance.



ISO 15848-1 FE type testing and certification

The ISO 15848-1 Industrial Valves—Measurement, Test and Qualification Procedures for Fugitive Emissions standard was used for the certification of Orbit Low-E valves because it meets or exceeds the most stringent tightness requirements in local or regional regulations.

Although ISO 15848-1 specifies methane or helium as the test media for three endurance classes, three tightness classes, multiple temperature classes, and different detection methods, SLB selected helium for the test medium because of its safety benefits and smaller atomic size. Helium is monoatomic sized and a high-velocity penetrating gas as opposed to the larger methane molecules, which makes helium the most stringent medium available for testing to the three ISO 15848-1 tightness classes. The leak rates defining the tightness classes are differentiated by orders of magnitude.

The rising stem ball valve design of the Orbit Low-E valves achieved the best possible ISO 15848-1 tightness class rating of AH at the limits of the valve design temperature (400 and -50 degC).

Advanced low-FE sealing enhancements

- High- and low-temperature packings are certified to the most stringent ISO-15848-1 Tightness Class AH.
- Stem packings meet API Standard 22 and achieve validated leak rates below 10 ppmv.
- Bonnet gasket and stem guide gasket employ spring-energized metallic seals to maintain low FE (<50 ppmv) through thermal cycles.

How to order

Example

E1423H-RF = Orbit Low-E certified low emissions valve, carbon steel, ASME Class 600, full opening with flanged end and hub end, T3 standard trim, raised face end connection

E1423H-RF

Low Emissions Certification

None	Standard valve
E	Orbit Low-E certified low emissions valve

Type

1	Carbon steel (ASME B16.34)
2	Low-temperature carbon steel
3	Low-alloy steel (e.g., WC6, WC9, C5)
4	API Specification 6A*
5	British Gas Council (min. -50 degF)
6	Stainless steel
7	Duplex stainless steel
8	Drilling applications
9	High-alloy steel (e.g., MONEL®, HASTELLOY®, INCONEL®, 6MO)

Pressure or ASME Class (PN)

	API Spec 6A Rating* Working Pressure,** psi	ASME Class (PN)
1	-	150 (20)
2	-	300 (50)
3	1,000†	400‡ (64)
4	-	600 (100)
5	2,000 Block-and-bleed model	900 (150)
6	3,000	1500 (250)
7	5,000	2500 (420)
8	-	-(500)

Trim

0	T3 modified
2	T7 modified§
3	Standard (T3)
4	T8 modified§, ††
7	Sour corrosive (T7)
8	Corrosive (316 SS) (T8)

Valve Opening and Connections

2	Full opening and flanged end and hub end
3	Reduced port and flanged end and hub end
4	Full opening and threaded end
5	Reduced port and butt weld and socket weld
6	Full opening and butt weld, socket weld, or butt weld x flanged end
7	Full opening and special
8	Reduced port and special

End Connection

RTJ	Ring-type joint
RF	Raised face
RFM	Raised face with modified finish
BW	Butt weld
SW	Socket weld
LFF	Large female face
8V	API line pipe thread (2- to 4-in port)
115	11½ API line pipe (1- to 2-in port)
115	11½ sharp tubing thread (nonupset) (2½- to 3-in port)

Seat

BB	Block and bleed (max. 250 degF)
GS	Grease seal (max. 250 degF)
L	Valves prepared for actuators
H	Type H (Teflon® insert) (max. 500 degF)
H8	Type H8 (max. 800 degF)
PK	Type PK (PEEK insert) (max. 570 degF)

* Monogramming of API Specification 6A wellhead valves was discontinued when the 15th edition was issued, April 1986.

** At -20 to 250 degF.

† Pressure class not recognized by API Specification 6A and is not monogrammed.

‡ Class no longer offered.

§ T7 modified and T8 modified trim valves are not in compliance with NACE MR0175 unless both the pressure containing and trim components comply. Not all grades of duplex stainless steel comply with NACE MR0175. Materials also must be in a specific condition for compliance.

†† T8 modified trim can also be used for duplex stainless-steel or high-alloy (generally high-nickel alloy) valves.

How to order (cont.)

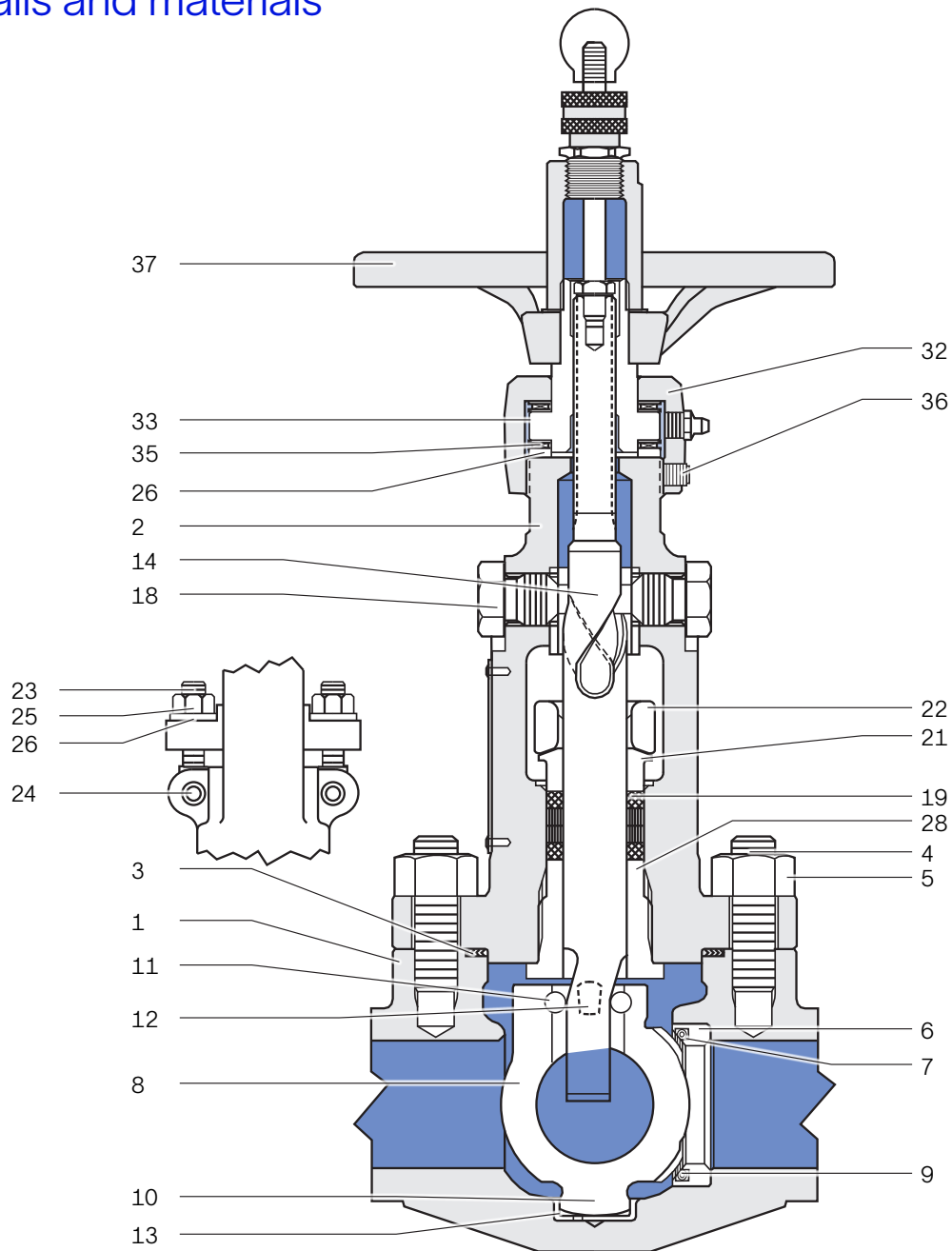
Sizes Available

ASME Class (PN)	150 (20)	300 (50)	600 (100)	900 (150)	1500 (250)	2500 (420)
Reduced port, flanged, in [mm]	2-30 [50-750]	2-30 [50-750]	2-30 [50-750]	3-24 [80-600]	3-20 [80-500]	3-16 [80-400]
Full port, flanged, in [mm]	1-24 [25-600]	1-24 [25-600]	1-24 [25-600]	1-20 [25-500]	1-16 [25-400]	2-12 [50-300]
Reduced port, butt weld, in [mm]	3-20 [80-500]	3-20 [80-500]	3-20 [80-500]	3-20 [80-500]	3-20 [80-500]	3-12 [80-300]
Full port, butt weld, in [mm]	2-16 [50-400]	2-16 [50-400]	2-16 [50-400]	2-16 [50-400]	2-16 [50-400]	2-10 [50-250]
Full port, socket weld, in [mm]	-	-	1-2 [25-50]	1-2 [25-50]	1-2 [25-50]	1 [25]
Full port, threaded, in [mm]	-	-	1-3 [25-80]	1-3 [25-80]	1-2 [25-50]	1 [25]

Contact SLB for full port, butt weld x flange options.

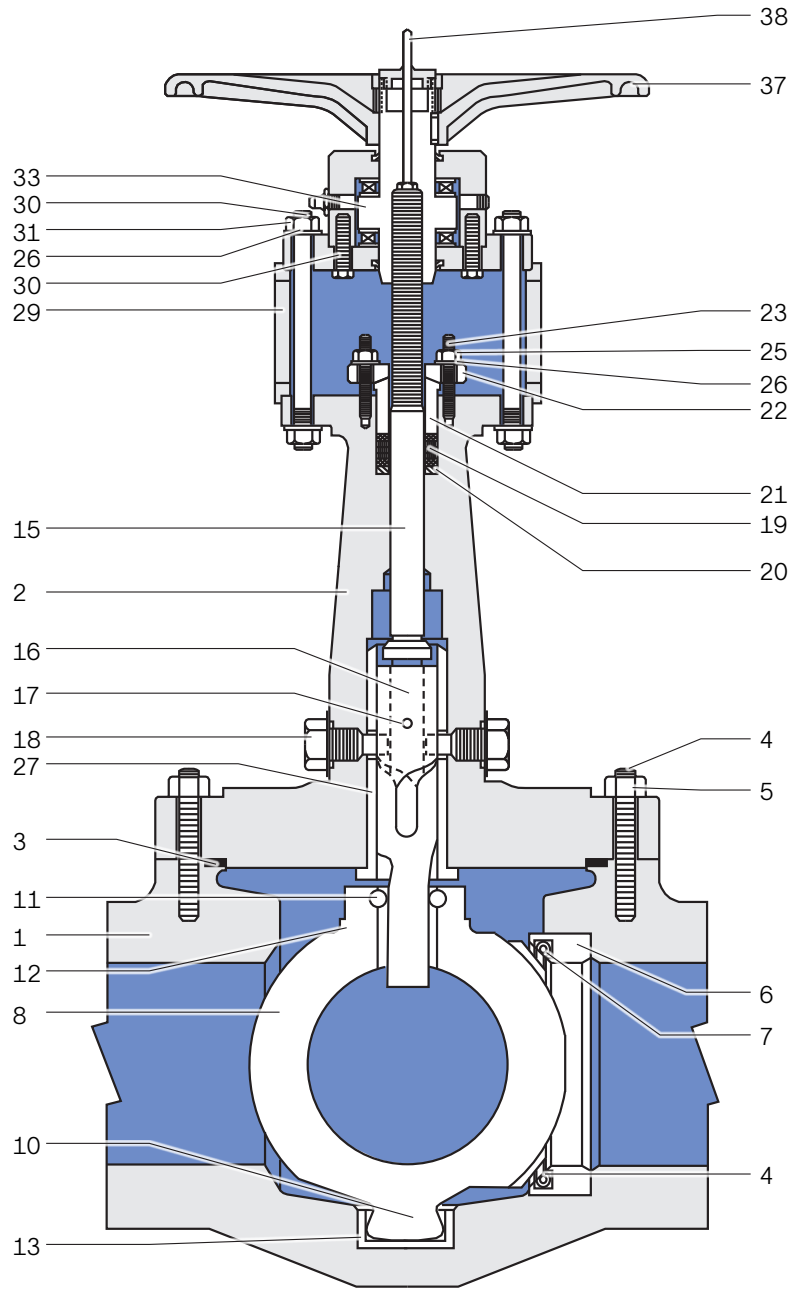
One-piece stem, outside screw and yoke (OS&Y) bonnet valves

Details and materials



Two-piece stem, OS&Y bonnet valves

Details and materials



Materials list for one- and two-piece stem, OS&Y bonnet valves

No.	Parts Description	Standard T3	Standard T7
		–20 to 800 degF [–29 to 427 degC]	–20 to 650 degF [–29 to 343 degC]
1	Body	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
2	Bonnet	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
3	Gasket	Stainless steel and graphite	Stainless steel and graphite
4	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B7M
5	Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 2HM
6	Seat body	Stainless steel	Stainless steel
7	Seat insert	Stainless steel	Stainless steel
8	Core	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
9	Core face	Nickel	Cobalt alloy
10	Trunnion overlay	–	Nickel-based chromium-resistant alloy (CRA)
11	Core pin	Stainless steel	Nickel-based CRA
12	Support pin	Stainless steel	Stainless steel
13	Trunnion bushing	Stainless steel	Stainless steel
14	Stem	Alloy steel	Stainless steel
15	Stem guide	Alloy steel	Stainless steel
16	Packing rings	Graphite and carbon	Graphite and carbon
17	Bonnet bushing	Stainless steel	Stainless steel
18	Bonnet nut	Carbon steel	Carbon steel
19	Packing eyebolt nut	ASTM A194 Gr. 2H	ASTM A193 Gr. 2HM
20	Packing eyebolt pin	Stainless steel	Stainless steel
21	Packing eyebolt	Stainless steel	Stainless steel
22	Packing gland	Ductile iron	Ductile iron
23	Packing gland retainer	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
24	Drive nut	Ductile ni-resist	Alloy steel
25	Bearing	Alloy steel	Alloy steel
26	Bearing race	Alloy steel	Alloy steel
27	Handwheel	Ductile iron	Ductile iron
28	Set screw	Alloy steel	Alloy steel
29	Packing gland	Aluminum bronze	Carbon steel
30	Packing gland retainer	Carbon steel	Carbon steel

NOTE: Actual materials of construction will depend on the valve size, pressure class, end configuration, and service conditions. Consult SLB for a detailed materials list. This is a partial list of material options. Many alternatives can be provided to match the actual service requirements.

End flange bolting dimensions

Class 150							Class 300					
Valve Size, in	Number of Fasteners per Valve	Fastener Diameter, in	Length of Studs, in				Number of Fasteners per Valve	Fastener Diameter, in	Length of Studs, in			
			RF		RG				RF		RG	
			Through Hole*	Threaded Hole**	Through Hole*	Threaded Hole**			Through Hole*	Threaded Hole**	Through Hole*	Threaded Hole**
1	8	1/2	3	–			8	5/8	3 1/4		3 1/2	
1 1/2	8	1/2	2 3/4				8	3/4	3 1/2		4	
2 × 1 1/2 × 2	8	5/8	3 1/4				16	5/8	3 1/2		4	
2	8	5/8	3 1/4				16	5/8	3 1/2		4	
3 × 2 × 3	8	5/8	3 1/2				16	3/4	4 1/4		4 3/4	
3	8	5/8	–	2 1/2	–	3	16	3/4	4 1/4		4 3/4	–
4 × 3 × 4	16	5/8	–	2 3/4			16	3/4	4 1/2		5	
4*	16	5/8	–	2 3/4			12	3/4	4 1/2	–	5	–
							4	3/4	–	3 1/2	–	4
6 × 4 × 6	16	3/4	4				24	3/4	4 3/4		5 1/2	
6*	16	3/4	–	3 1/4			16	3/4	4 3/4	–	5 1/2	–
							8	3/4	–	3 3/4	–	4 1/4
8 × 6 × 8	16	3/4	4 1/4				24	7/8	5 1/2		6	–
8*	12	3/4	4 1/4	–	4 3/4	–	16	7/8	5 1/2		6	
	4	3/4	–	3 1/4	–	3 3/4	8	7/8	–	4 1/4	–	4 3/4
10 × 8 × 10*	20	7/8	4 1/2	–			28	1	6 1/4	–	6 3/4	–
	4	7/8	–	3 3/4			4	1	–	5 1/4	–	6 1/4
10	24	7/8	4 1/2		5		32	1	6 1/4		6 3/4	
12 × 10 × 12	24	7/8	4 3/4				32	1 1/8	6 3/4		7 1/4	
12	24	7/8	4 3/4				32	1 1/8	6 3/4		7 1/4	
14 × 12 × 14	24	1	5 1/4				40	1 1/8	7			
14	24	1	5 1/4		5 3/4		40	1 1/8	7			
16 × 12 × 16	32	1	5 1/4				40	1 1/4	7 1/2			
16	32	1	5 1/4				40	1 1/4	7 1/2		8	
18 × 16 × 18	32	1 1/8	7 3/4				48	1 1/4	7 3/4			
20 × 16 × 20	40	1 1/8	6 1/4				48	1 1/4	8			
18	32	1 1/8	5 3/4									
20*							48	1 1/4	8			
24 × 20 × 24							48	1 1/2	9			
24	40	1 1/4	6 3/4				48	1 1/2	9			
26 × 24 × 26												
30 × 24 × 30							56	1 3/4	11 1/4			

NOTE: RF = raised face, RG = ring groove, RTJ = ring-type joint

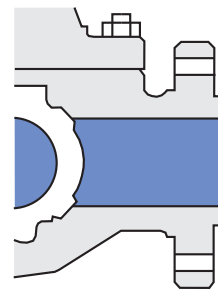
* For valve flange through hole, stud length is sized for a nut behind both the valve and pipe flanges.

** For valve flange threaded hole, stud length is sized for threading into valve flange and a nut behind the pipe flange.

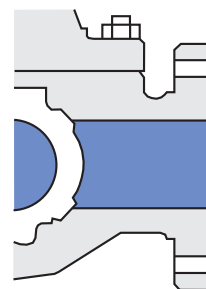
End flange bolting dimensions (cont.)

ASME/ANSI Class 600

Valve Size, in	Number of Fasteners per Valve	Fastener Diameter, in	Length of Studs, in			
			RG		RF	
			Through Hole*	Threaded Hole**	Through Hole*	Threaded Hole**
1	8	5/8	3 1/2		3 1/2	
1 1/2	8	3/4	4 1/4		4 1/4	
2 × 1 1/2 × 2	16	5/8	4 1/4		4 1/4	
2	16	5/8	4 1/4		4 1/4	
3 × 2 × 3	16	3/4	5		5	
3	16	3/4	5		5	
4 × 3 × 4	16	7/8	5 3/4		5 3/4	
4*	16	7/8	5 3/4		5 3/4	
6 × 4 × 6	24	1	6 3/4		6 3/4	
6*	24	1	6 3/4		6 3/4	
8 × 6 × 8	24	1 1/8	7 1/2		7 3/4	
8*	24	1 1/8	7 1/2		7 3/4	
	24	1 1/8	7 1/2		7 3/4	
10 × 8 × 10*	32	1 1/4	8 1/2		8 1/2	
10	32	1 1/4	8 1/2		8 1/2	
12 × 10 × 12	40	1 1/4	8 3/4		8 3/4	
12	40	1 1/4	8 3/4		8 3/4	
14 × 12 × 14	40	1 3/8	9 1/4		9 1/4	
14	40	1 3/8	9 1/4		9 1/4	
16 × 12 × 16	40	1 1/2	10		10	
16	40	1 1/2	10		10	
18 × 16 × 18	40	1 5/8	10 3/4		10 3/4	
20 × 16 × 20	48	1 5/8	11 1/4		11 1/2	
18			–			
20*	36	1 5/8	11 1/4	–	11 1/2	
	12	1 5/8	–	7 3/4		8
24 × 20 × 24	48	1 7/8	13		13 1/4	
24	48	1 7/8	13		13 1/4	
26 × 24 × 26	56	1 7/8	14			
30 × 24 × 30	56	2	14 1/2			



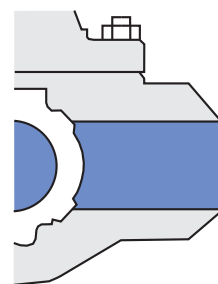
ASME/ANSI raised face flange



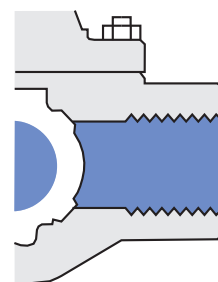
ASME/ANSI flat face flange



RTJ ring groove flange



Butt weld

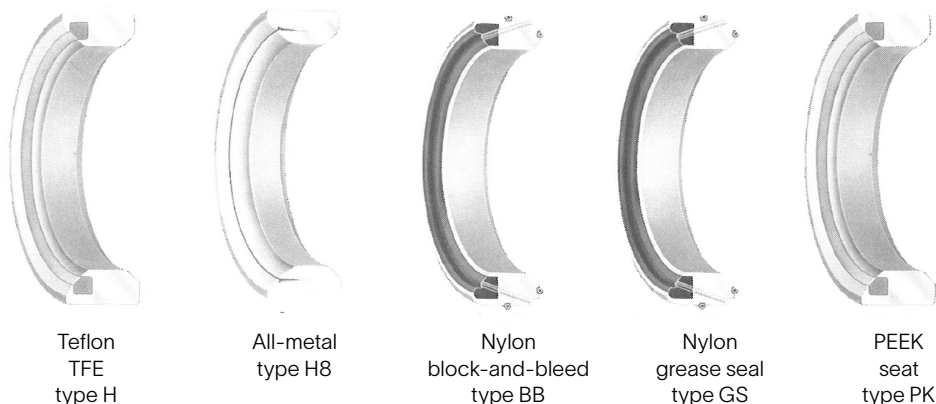


Socket weld or threaded

End flange bolting dimensions (cont.)

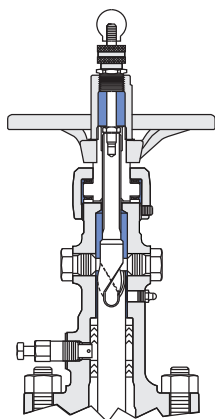
ASME/ANSI Class 900					Class 1500				Class 2500			
Valve Size, in	Number of Fasteners per Valve	Fastener Diameter, in	Length of Studs		Number of Fasteners per Valve	Fastener Diameter, in	Length of Studs		Number of Fasteners per Valve	Fastener Diameter, in	Length of Studs	
			RF, in	RTJ, in			RF, in	RTJ, in			RF, in	RTJ, in
1	8	7/8	5	5	8	7/8	5	5				
1½	8	1	5½	5½	8	1	5½	5½				
2	16	7/8	5¾	5¾	16	7/8	5¾	5¾	16	1	7	7
3 × 2 × 3	16	7/8	5¾	5¾	16	1½	7	7	16	1¼	8¾	9
3	16	7/8	5¾	5¾	16	1½	7	7	16	1¼	8¾	9
4 × 3 × 4	16	1½	6¾	6¾	16	1¼	7¾	7¾	16	1½	10	10¼
4*	16	1½	6¾	6¾	16	1¼	7¾	7¾	16	1½	10	10¼
6 × 4 × 6	24	1½	7½	7¾	24	1¾	10¼	10½	16	2	13½	14
6*	24	1½	7½	7¾	24	1¾	10¼	10½	16	2	13½	14
8 × 6 × 8	24	1¾	8¾	8¾	24	1⅝	11½	11¾	24	2	15	15½
8*	24	1¾	8¾	8¾	24	1⅝	11½	11¾	24	2	15	15½
	24	1¾	8¾	8¾	24	1⅝	11½	11¾	24	2	15	15½
10 × 8 × 10*	32	1¾	9¼	9¼	24	1⅞	13¼	13½	24	2½	19¼	20
10	32	1¾	9¼	9¼	24	1⅞	13¼	13½	24	2½	19¼	20
12 × 10 × 12	40	1¾	10	10	32	2	14¾	15¼	24	2¾	21¼	22
12	40	1¾	10	10	32	2	14¾	15¼				
14 × 12 × 14	40	1½	10¾	11	32	2¼	16	16¾				
14												
16 × 12 × 16	40	1⅝	11¼	11½	32	2½	17½	18½				
16	40	1⅝	11¼	11½	32	2½	17½	18½				
18 × 16 × 18	40	1⅞	12¾	13¼	32	2¾	19½	20¾				
20 × 16 × 20	40	2	13¾	14¼	32	3	21¼	22¼				
18					32	2¾	19½	20¾				
20*	40	2	13¾	14¼	32	3	21¼	22¼				
24 × 20 × 24	40	2½	17¼	18	32	3½	24¼	25½				
24	40	2½	17¼	18								

Seat and stem packing selection

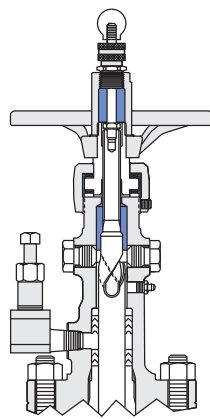


Seat Selection

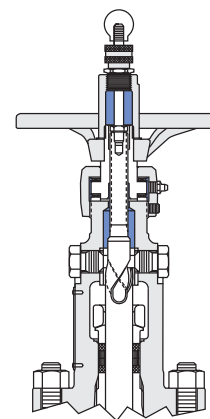
Temperature, degF [degC]	Insert Material	Support Ring	Bore Sizes, in	Seat Options
-50 to 250 [-46 to 121]	Nylon	Carbon steel	2 to 16	Type BB and GS
-50 to 250 [-46 to 121]	Nylon	Stainless steel	2 to 16	Type BB and GS
-155 to 500 [-104 to 260]	Teflon TFE	Stainless steel	1 to 24	Type H
-155 to 800 [-104 to 427]	-	Stainless steel	1	Type H8
-155 to 800 [-104 to 427]	Stainless steel tube	Stainless steel	1½ to 24	Type H8
-50 to 570 [-46 to 300]	PEEK	Stainless steel	2 to 12	Type PK



Standard injectable packing



Low-temperature injectable packing



OS&Y packing

Stem Packing Selection

Temperature or Service, degF [degC]	Packing Material	Orbit Valve Designation
OS&Y packings		
-155 to 800 [-104 to 427]	Graphite rings	GRPH
-155 to 500 [-104 to 260]	Graphite rings with Teflon	GRPH/TEF
Closed bonnet injectable packings		
-50 to 500 [-46 to 260]	Injectable Teflon packing with fire-safe graphite top ring	GP-6
-30 to 550 [-34 to 288]	Injectable Teflon with fire-safe top ring for ammonia service	GP-19
-20 to 400 [-29 to 204]	Injectable Teflon with Teflon rings for MTBE service	GP-27

Markings

Orbit		Standard Trim	
Size	NPS 4X3 CL900	End to End	15"
FIG	1523H RF	PKG	GP6
SN	110091620001	Seat	CR13 TEF
MOP at Max T:	1995 PSI at +500F	Stem	AS
MOP at Min T:	2250 PSI at -20F	Body Steel	WCC
MFG	B16.34	Core Trim	CR13
DATE	04/01	Core Face	NI
PPE	2250	Impact	-50 F
SE	1500		

Nameplate markings for valve trim

AS	Alloy steel
15-6	CarTech® Custom 450® stainless steel
660	A-638 (Grade 660)
HF-C	HASTELLOY C and C-276
C-276	HASTELLOY C-276†
MP35N®	Latrobe Steel Company
NICU	MONEL
NI	Nickel
COCR	Stellite®
17-4	17-4-PH® stainless steel
CR13	410 and 420 stainless steel (13% chrome)
718	INCONEL 718
316	316 stainless steel
NYL	Nylon
PEEK	Polyetheretherketone
TEF	Teflon

Nameplate markings for stem packing

OS&Y	Bonnet packings
GRPH	Graphite
GRPH/TEF	Graphite with Teflon
Closed bonnet packings	
GP-6	General service
GP-19	Ammonia service
GP-27	MTBE service

Body markings—ASME/ANSI valve

The serial number is stamped into the side of the valve body or the OD of the flange. If the valve has ring joint facings, the ring gasket number is stamped into the OD of the flange. Preferred pressure end and seat size code are stamped on the OD of flanged valves and on the hub end of butt weld and threaded valves. The end connection size and class are stamped or cast on the body.

How to order

Diaphragm actuator

Double-acting style

164100-280

Nominal Size of Diaphragm × 10

8	Approximately 80 in ²
16	Approximately 160 in ²
42	Approximately 420 in ²

Mounting Configuration

0	Threaded adapter sleeve
4	Flange on lower diaphragm case casting

Stem Thread Size and Adaptation*

625	5/8-7 left-handed
100	1-6 left-handed
1125	1 1/8-7

Accessories

275	Manual close mechanism for spring open
280	Two-way manual mechanism for spring open
287	Positive close locking mechanism for spring close
291	Two-way manual mechanism for spring close
301	Snubber
376	Snubber and manual close mechanism for spring open
381	Snubber and two-way manual mechanism for spring open

Spring-return style

62585-275

Stem Thread Size and Adaptation*

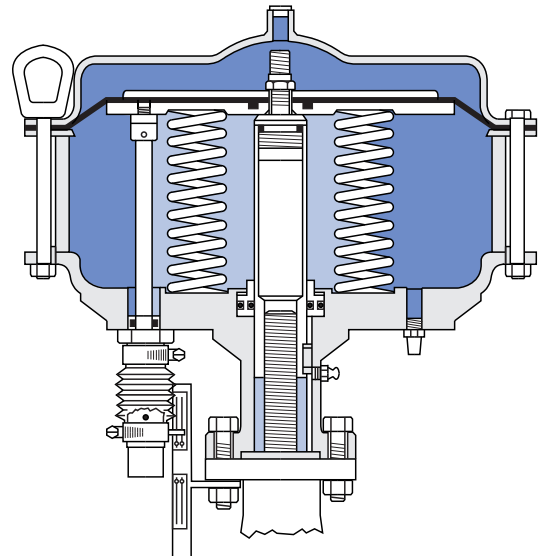
625	5/8-7 left-handed
100	1-6 left-handed
1125	1 1/8-7 left-handed

Nominal Size of Diaphragm × 10

8	Approximately 80 in ²
16	Approximately 160 in ²
42	Approximately 420 in ²

Spring Action Type and Mounting Configuration

0	Spring close with threaded adapter sleeve
3	Spring open with threaded adapter sleeve
4	Spring close with flange on lower diaphragm case casting
5	Spring open with flange on lower diaphragm case casting
7	Same as 4 with increased spring rate
8	Same as 5 with increased spring rate (6 die springs)



*Additional options based on mounting onfiguration

How to order

Piston actuator

LS-185-D-5-X-S

Cylinder Supply Pressure (Maximum)

L Low pressure (0–80 psi)

Actuator Type

G Linear actuator with double-cylinder damping or no damping

S Liner actuator with single-cylinder damping (gas-over-oil tank or hydraulic snubber)

Nominal Sylder Diameter

12 12 in

18 18 in

20 20 in

26 26 in

42 42 in

Number of Cylinders

D Double cylinder

T Tripple cylinder

Nominal Stroke

4 4 in

5 5 in

6 6 in

7 7 in

8 8 in

9 9 in

11 11 in

14 14 in

Spring Return

S Spring return

Mounting Configuration

Consult SLB

Accessories

C Mechanical override to close

H Hydraulic override to open and mechanical override to close

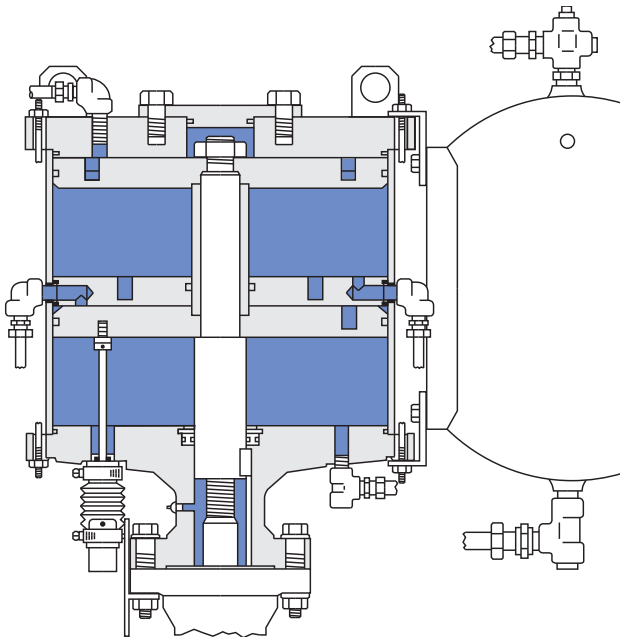
L Positive close locking mechanism

M Mechanical override to open and close (double acting and LS-205 spring close override)

N Mechanical override to open and close (LS-124 and LS-185 spring close override)

O Hydraulic override to open and close (e.g., LG02611-T-29-O)

X Used only with spring-closed actuator with no accessories



Typical actuator order numbers

These are typical selections of actuators for soft-seated OS&Y valves with standard T3 trim and pipeline pressure from the preferred end. The correct choice of actuator depends on pressure direction, temperature, flow conditions, valve trim, and valve end connections. Consult SLB for the specific actuator and valve combination that is most suitable for the intended service.

ASME/

ANSI	Class 150		Class 300		Class 600	
Valve Size, in	Double-Acting Actuator	Spring-Close Actuator	Double-Acting Actuator	Spring-Close Actuator	Double-Acting Actuator	Spring-Close Actuator
1	84625-301	62584	84625-301	62584	84625-301	62584
1½	84625-301	62584	84625-301	62584	84625-301	62584
2	84625-301	62584	84625-301	62584	84625-301	62584
3	84100-301	100164	84100-301	100164	164100-301	100164
4	164100-301	100167	164100-301	100167	164100-301	100167
6	164100-301	122424	164100-301	122424	164100-301	123424
8	164100-301	LS-185-D-24-X-S	424124-301	LS-185-D-24-X-S	424126-301	LS-205-D-26-X-S
10	424126-301	LS-185-D-26-X-S	424126-301	LS-185-D-26-X-S	LS-185-D-15	LS-205-D-15-X-S
12	LS-185-D-15	LS-185-D-15-X-S	LS-185-D-15	LS-205-D-15-X-S	LS-205-D-16	LS-267-D-16-X-S
14	–	–	LS-185-D-15	LS-205-D-15-X-S	LS-267-D-19	LS-267-D-19-X-S
16	LS-207-D-19	LS-267-D-X-S	LS-207-D-19	LS-267-D-19-X-S	LS-267-D-19	LS-267-D-19-X-S
18	LS-267-D-19	–*	–	–	–	–
20	–	–	LG-2611-T-29	–*	LG-2611-T-29	–*
24	–	–	LG-4214-D-33	–*	LG-4214-D-33	–*

ASME/

ANSI	Class 900		Class 1500		Class 2500	
Valve Size, in	Double-Acting Actuator	Spring-Close Actuator	Double-Acting Actuator	Spring-Close Actuator	Double-Acting Actuator	Spring-Close Actuator
1	84625-301	62584	84625-301	62584	84625-301	62584
1½	164100-301	100164	164100-301	100164	–	–
2	164100-301	100164	164100-301	100164	164100-301	122424
3	164100-301	100164	164100-301	100167	424126-301	–*
4	164100-301	122424	LS-185-D-26	LS-185-D-26-X-S	LS-185-D-26	LS-185-D-26-X-S
6	424126-301	LS-185-D-26-X-S	LS-185-D-15	LS-185-D-15-X-S	LS-185-D-15	LS-185-D-15-X-S
8	LS-185-D-15	LS-205-D-15-X-S	LS-208-D-31	–*	LS-269-D-32	–*
10	LS-205-D-16	LS-267-D-16-X-S	LS-269-D-32	–*	–	–
12	LS-267-D-19	LS-267-D-19-X-S	LG-2611-T-29	–*	–	–
14	–	–	–	–	–	–
16	LG-2611-T-29	–*	LG-4214-D-33	–*	–	–
18	–	–	LG-4214-D-33	–*	–	–
20	LG-4214-D-33	–*	–*	–*	–	–
24	LG-4214-D-33	–*	–	–	–	–

* Consult SLB

Electric actuators

SLB supplies electric-actuated valve packages using many of the commercially available power actuators built by other companies. The electric actuator is selected, mounted, adjusted, and tested by SLB so that field performance of the entire valve assembly can be ensured.

Hydraulic actuators

Commercially available hydraulic actuators built by other vendors are available upon request.

Services for valves and actuation

We build it. We back it.

Global network and local support

SLB is well-positioned to deliver total aftermarket support, quickly and efficiently, with unmatched OEM expertise. Our highly skilled engineers and technicians are available around the clock, seven days a week, to respond to customer queries, troubleshoot problems, and offer reliable solutions.

Easily accessible parts and spare valves

- OEM spare valves, actuators, and parts (including non-SLB brands)
- Handling, storage, packaging, and delivery
- Dedicated stocking program

Comprehensive aftermarket services portfolio

- Parts and spare valves
- Repair
- Field services
- Preventative maintenance
- Equipment testing and diagnostics
- Remanufacturing
- Asset preservation
- Customer property management
- Training and recertification services
- Warranty

Customized total valve care programs

Customized asset management plans that optimize uptime, availability, and dedicated services.

- Engineering consultancy
- Site management
- Flange management
- Startup and commissioning
- Spare parts and asset management
- Operational support

**Ideal for applications
when zero leakage
and frequent operation
are demanded**

The bidirectional,
mechanically sealed,
trunnion-mounted
Orbit rising stem ball
valve complies with the
most stringent fugitive
emission requirements.

slb.com/Orbit

