

Technical Reference Data for Valves and Actuators



ORBIT[®]

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ADDITIONAL ORBIT INFORMATION

The Company and it's Products
Dimensional Data, Valves and Actuators
Automated Valve Packages
Standard Instrumentation Packages
Installation and Maintenance
Parts List and Ordering Instructions

STANDARD FEATURES

FRICTION FREE OPENING & CLOSING

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

INJECTABLE PACKING

For in service maintenance, stem packing material is injected through the packing fitting, giving complete control of fugitive emissions. (Available on all enclosed bonnet models.)

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 design has performance advantages that reduce plant outage and minimize the cost of ownership.

LOW TORQUE OPERATION

Characterized by their small handwheels and the absence of gear boxes on all but the largest sizes, Orbit valves turn easily because seal rubbing is eliminated.

WEAR RESISTANT HARD FACING ON CORE

The core face is a hard, polished material that will endure the most difficult service, without loss of sealing integrity.

OPTIMUM FLOW

Full Port or Reduced Port openings give high C_v figures. System pumping efficiency is enhanced and erosion problems are minimized.

TOP ENTRY DESIGN

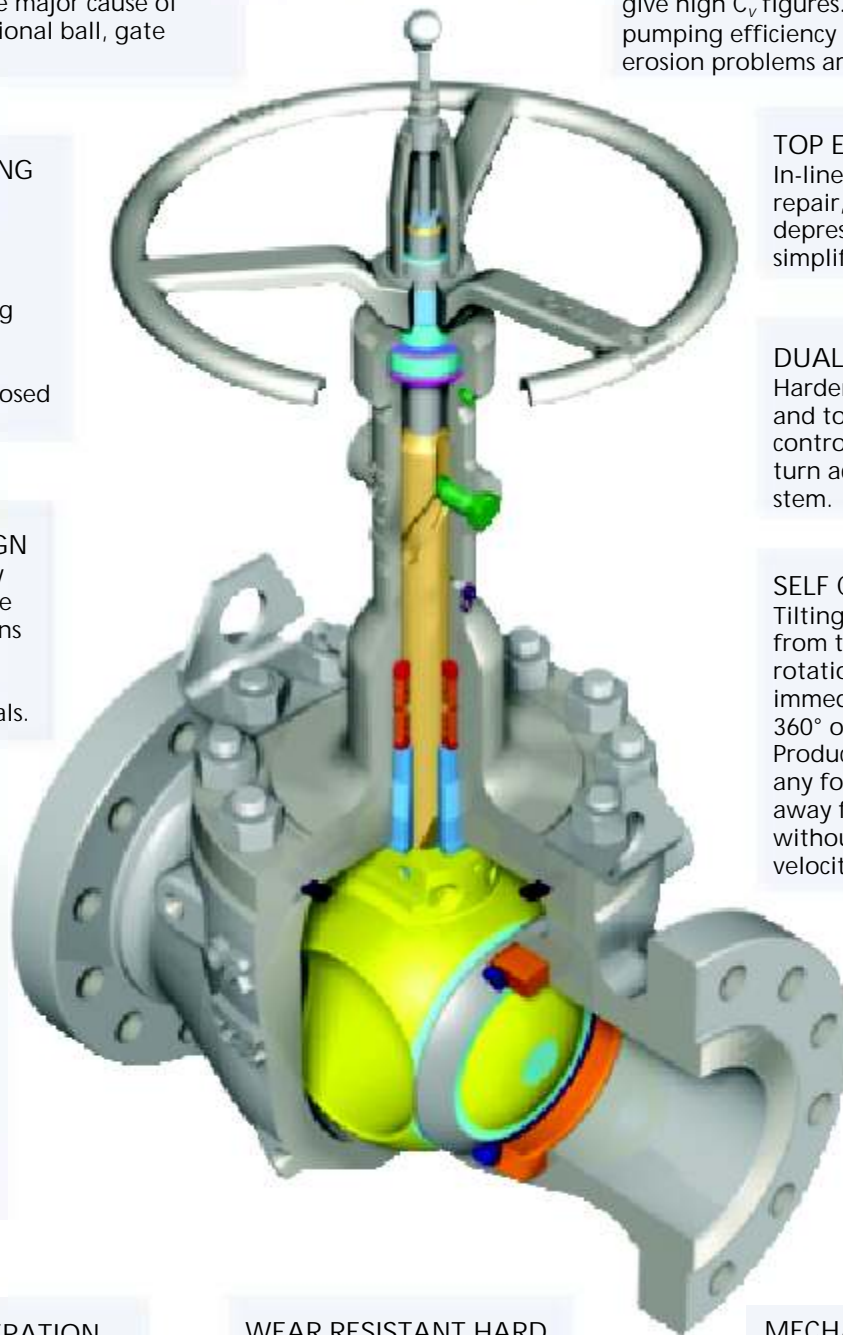
In-line inspection and repair, after system depressurizing, simplifies maintenance.

DUAL STEM GUIDES

Hardened stem slots and tough guide pins control the lift 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.



MECHANICAL CAM CLOSURE

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

NOTE: Never remove any part from an Orbit valve unless specifically instructed to do so in Orbit literature, or without first consulting an Orbit Representative. Incorrect procedure could result in personal injury and/or property damage.

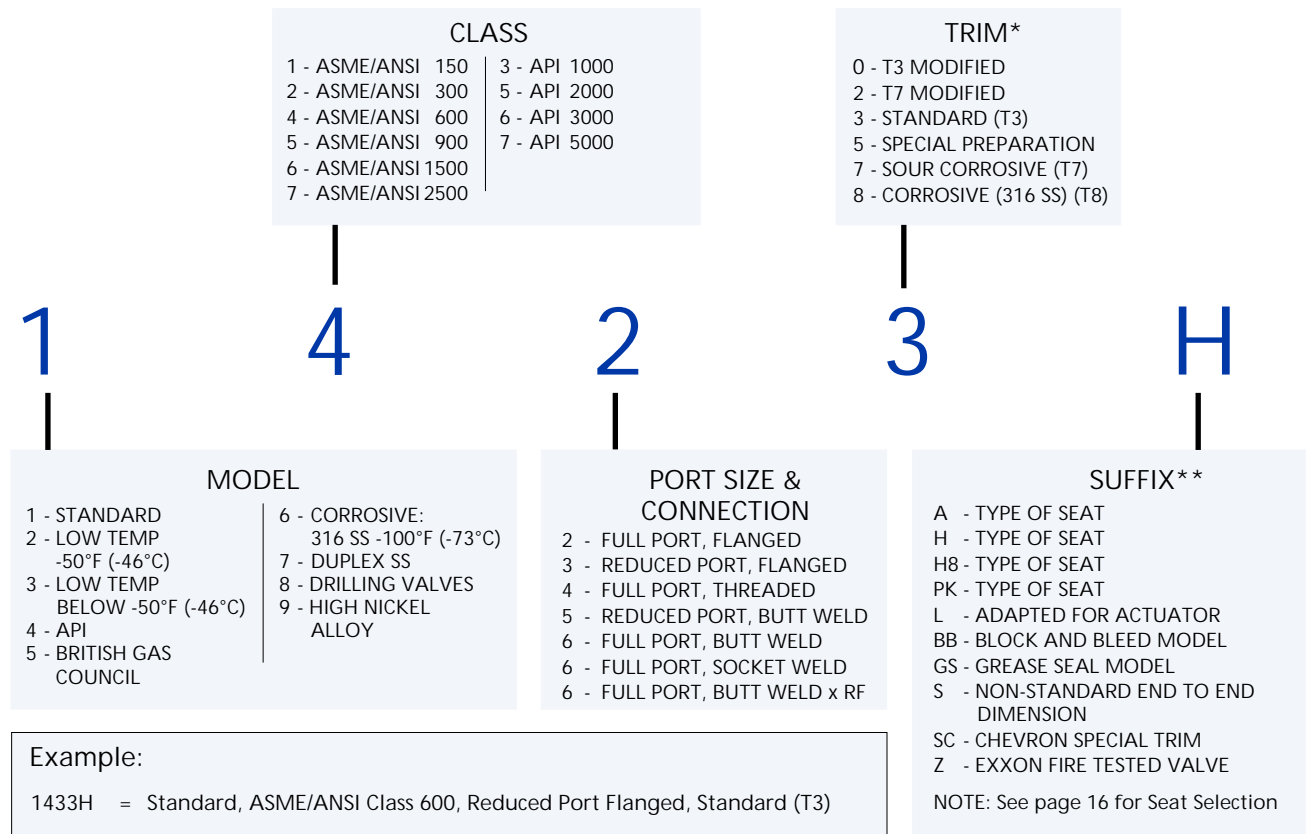
ORDERING INFORMATION

SIZES AVAILABLE

ASME CLASS (PN)	150 (20)	300 (50)	600 (100)	900 (150)	1500 (250)	2500 (420)
Reduced Port, Flanged	in. 2 thru 24 (mm) (50 thru 600)	2 thru 24 (50 thru 600)	2 thru 20 (50 thru 500)	3 thru 16 (80 thru 400)	3 thru 16 (80 thru 400)	3 thru 12 (80 thru 300)
Full Port, Flanged	1 thru 20 (25 thru 500)	1 thru 20 (25 thru 500)	1 thru 20 (25 thru 500)	1 thru 16 (25 thru 400)	1 thru 12 (25 thru 300)	2 thru 10 (50 thru 250)
Reduced Port, Butt Weld	3 thru 14 (80 thru 350)	3 thru 18 (80 thru 450)	3 thru 12 (80 thru 300)	3 thru 10 (80 thru 250)	3 thru 10 (80 thru 250)	
Full Port, Butt Weld	2 thru 16 (50 thru 400)	2 thru 16 (50 thru 400)	2 thru 16 (50 thru 400)	2 thru 12 (50 thru 300)	2 thru 6 (50 thru 150)	
Full Port, Butt Weld x Flanged			2 thru 16 (50 thru 400)			
Full Port, Socket Weld			1 thru 2 (25 thru 50)	1 thru 2 (25 thru 50)	1 thru 2 (25 thru 50)	
Full Port, Threaded			1 thru 3 (25 thru 80)	1 thru 3 (25 thru 80)	1 thru 2 (25 thru 50)	

ORDERING INFORMATION

How to develop figure numbers:

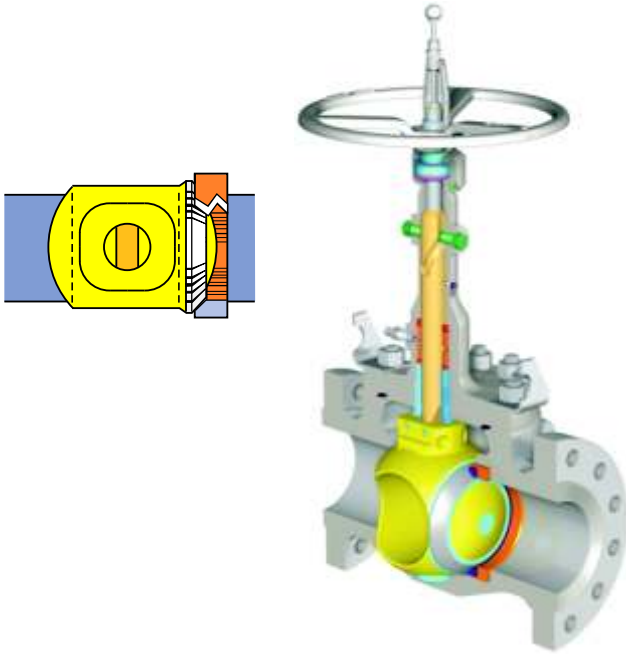


* For a more complete explanation of trims and figure numbers, consult your Orbit Representative.
 ** Valve Figure Number may use more than one suffix. Example 1433H8L

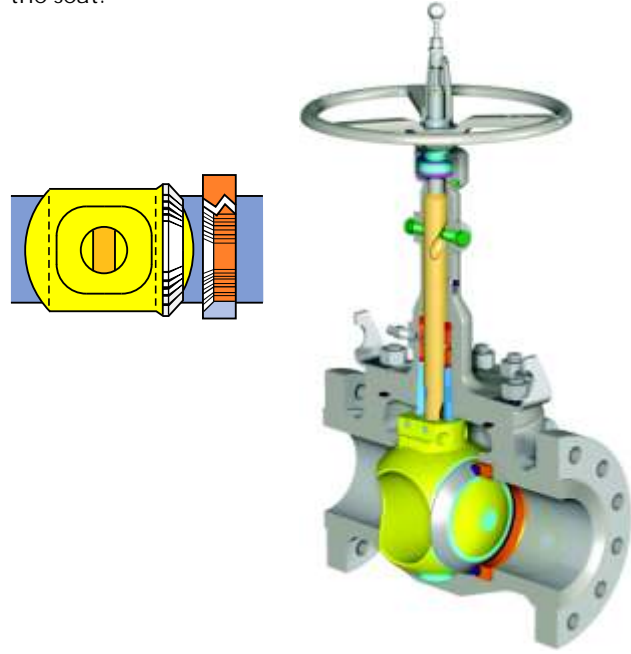
Cameron, Valves & Measurement reserves the right to substitute materials listed on the following pages with alternate materials for the designated service.

THE ORBIT PRINCIPAL OPENING SEQUENCE

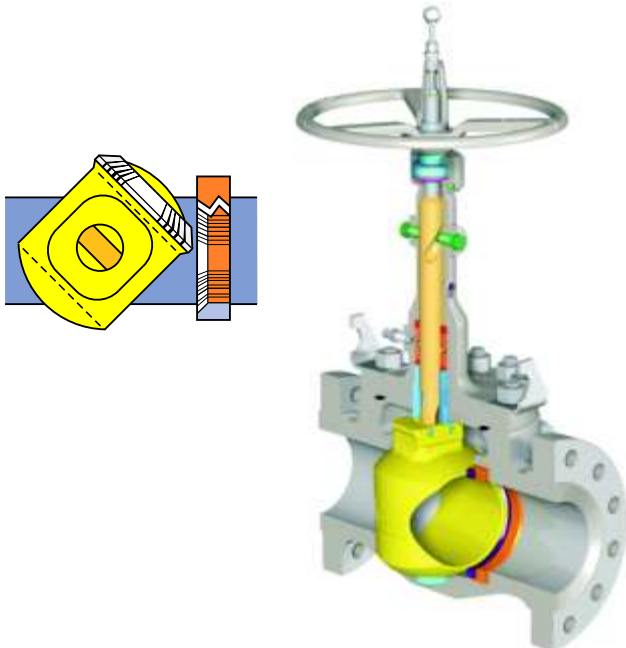
1 In the closed position, the core (yellow) is tightly pressed against the seat (orange) by the mechanical camming action of the stem (bronze).



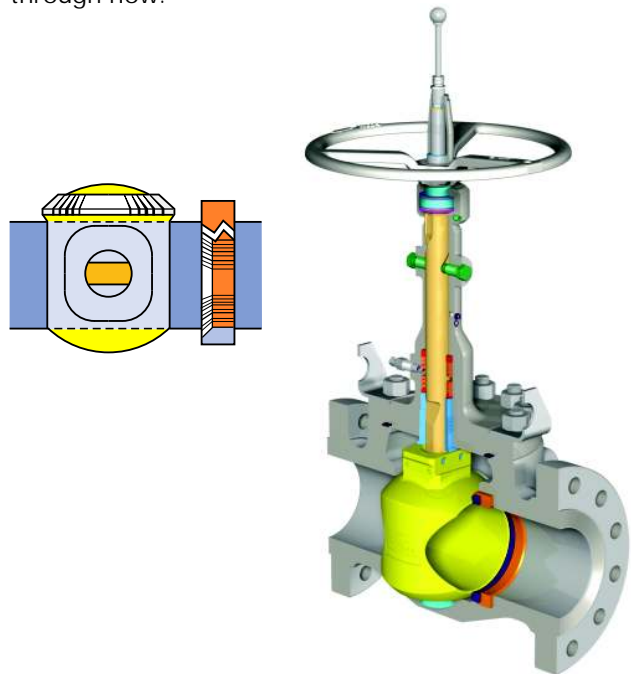
2 As the handwheel is turned counter-clockwise and the stem lifts upwards, an angled, flat surface on the lower end of the stem causes the core to tilt away from the seat.



3 As the stem continues to rise, the interaction of stem guides in the precision spiral grooves of the stem causes the core to begin its friction free rotation.

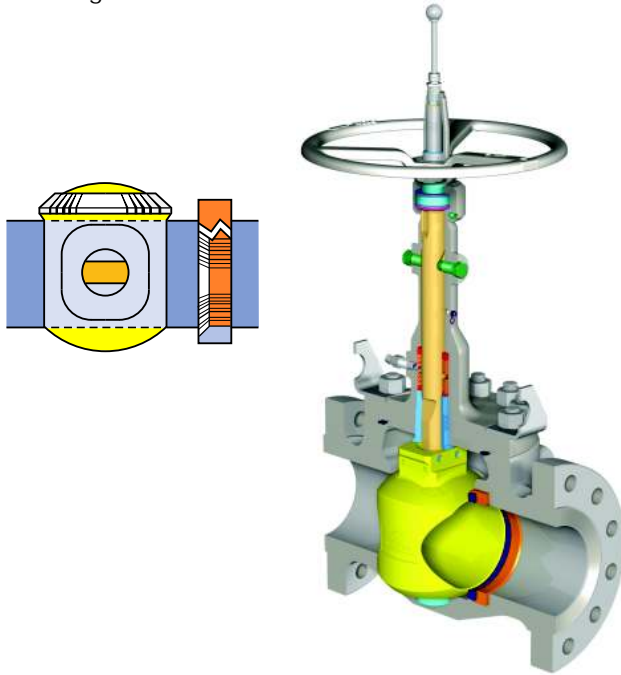


4 In the full open position, the stem has been raised to its limit and the core is positioned for straight through flow.

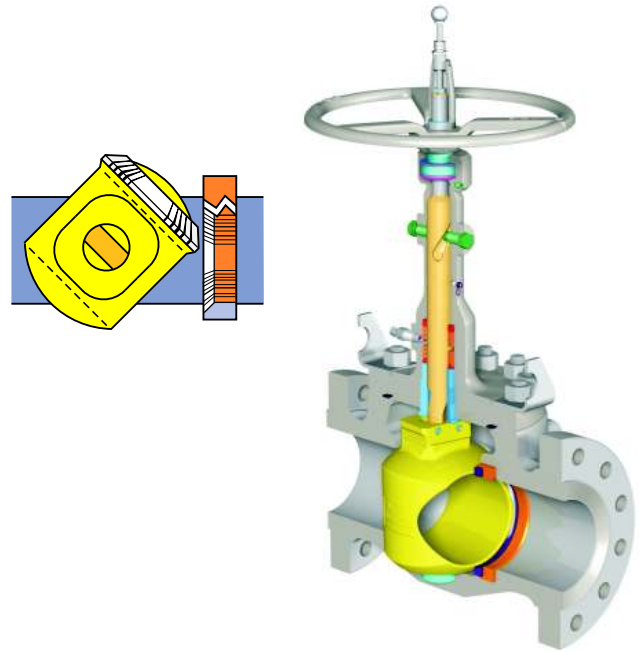


THE ORBIT PRINCIPAL CLOSING SEQUENCE

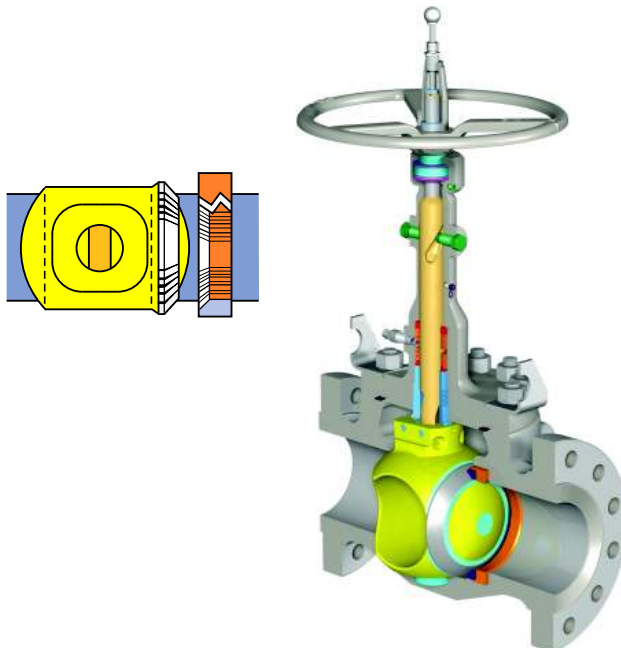
5 To close the valve, the handwheel is turned in a clockwise direction. The stem begins to lower and the core begins to rotate.



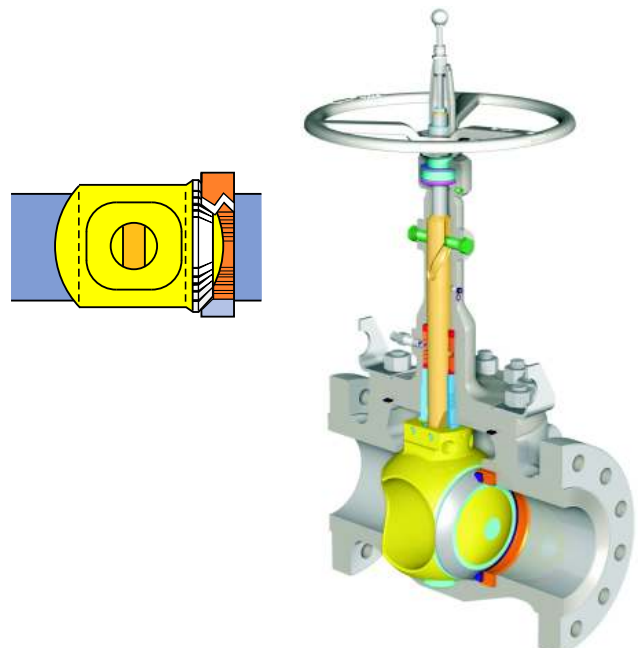
6 Continued turning of the handwheel causes the precision spiral grooves in the stem to act against the stem guides, rotating the stem and core 90 degrees.



7 Nearing the end of the closing cycle, the core has rotated a full 90 degrees without touching the seat.



8 Final turns of the handwheel cause an angled flat surface on the lower stem to mechanically wedge the core tightly against the seat.



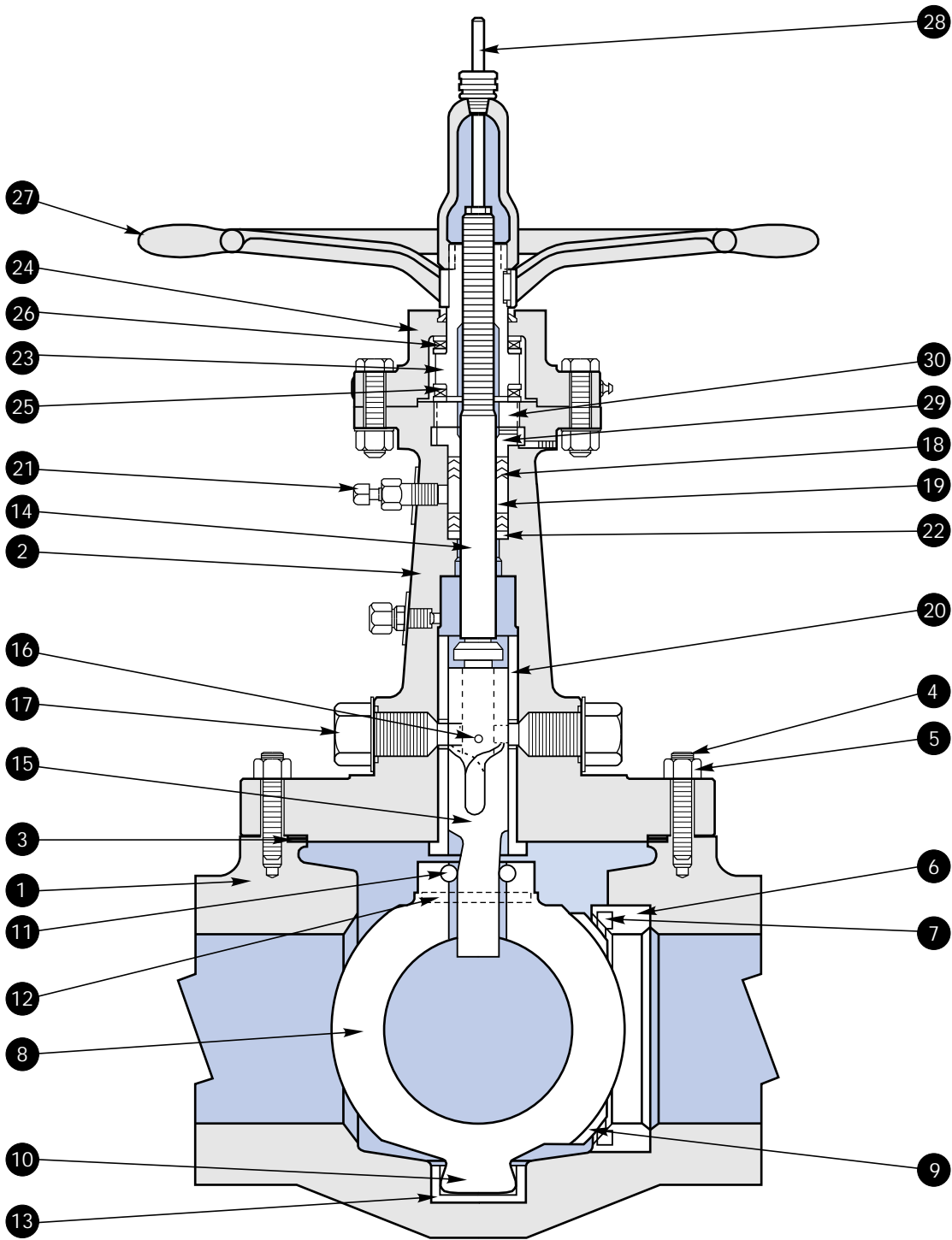
ONE PIECE STEM VALVES ENCLOSED BONNET

MATERIALS LIST

PARTS DESCRIPTION	STANDARD T3 -20°F/+500°F -29°C/+260°C	STANDARD T7 -20°F/+500°F -29°C/+260°C	LOW TEMP T3 -50°F/+500°F -46°C/+260°C	LOW TEMP T7 -50°F/+500°F -46°C/+260°C
1 Body	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A352 Gr. LCC	ASTM A352 Gr. LCC
2 Bonnet	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A352 Gr. LCC	ASTM A352 Gr. LCC
3 Gasket	Stainless Steel & Graphite	Stainless Steel & Graphite	Stainless Steel & Graphite	Stainless Steel & Graphite
4 Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B7	ASTM A320 Gr. L7	ASTM A320 Gr. L7M
5 Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 2H	ASTM A194 Gr. 4 or 7	ASTM A194 Gr. 7M
6 Seat Body	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
7 Seat Insert	Teflon	Teflon	Teflon	Teflon
8 Core	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
9 Core Face	Nickel	Nickel Based CRA	Nickel	Nickel Based CRA
10 Trunnion Overlay	-	Nickel Based CRA	-	Nickel Based CRA
11 Core Pin	Stainless Steel	Nickel Based CRA	Stainless Steel	Stainless Steel
12 Support Pin	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
13 Trunnion Bushing	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
14 Stem	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
15 Stem Guide	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
16 Packing Rings	Teflon	Teflon	Teflon	Teflon
17 Injectable Packing	Orbit GP6	Orbit GP6	Orbit GP6	Orbit GP6
18 Bonnet Bushing	Stainless Steel	Monel	Stainless Steel	Monel
19 Bonnet Nut	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
20 Packing Fitting	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
21 Packing Chamber Bushing	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
22 Drive Nut	Ductile Iron	Alloy Steel	Alloy Steel	Alloy Steel
23 Bearing	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
24 Bearing Race	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
25 Handwheel	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron
26 Set Screw	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel

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

TWO PIECE STEM VALVES
ENCLOSED BONNET



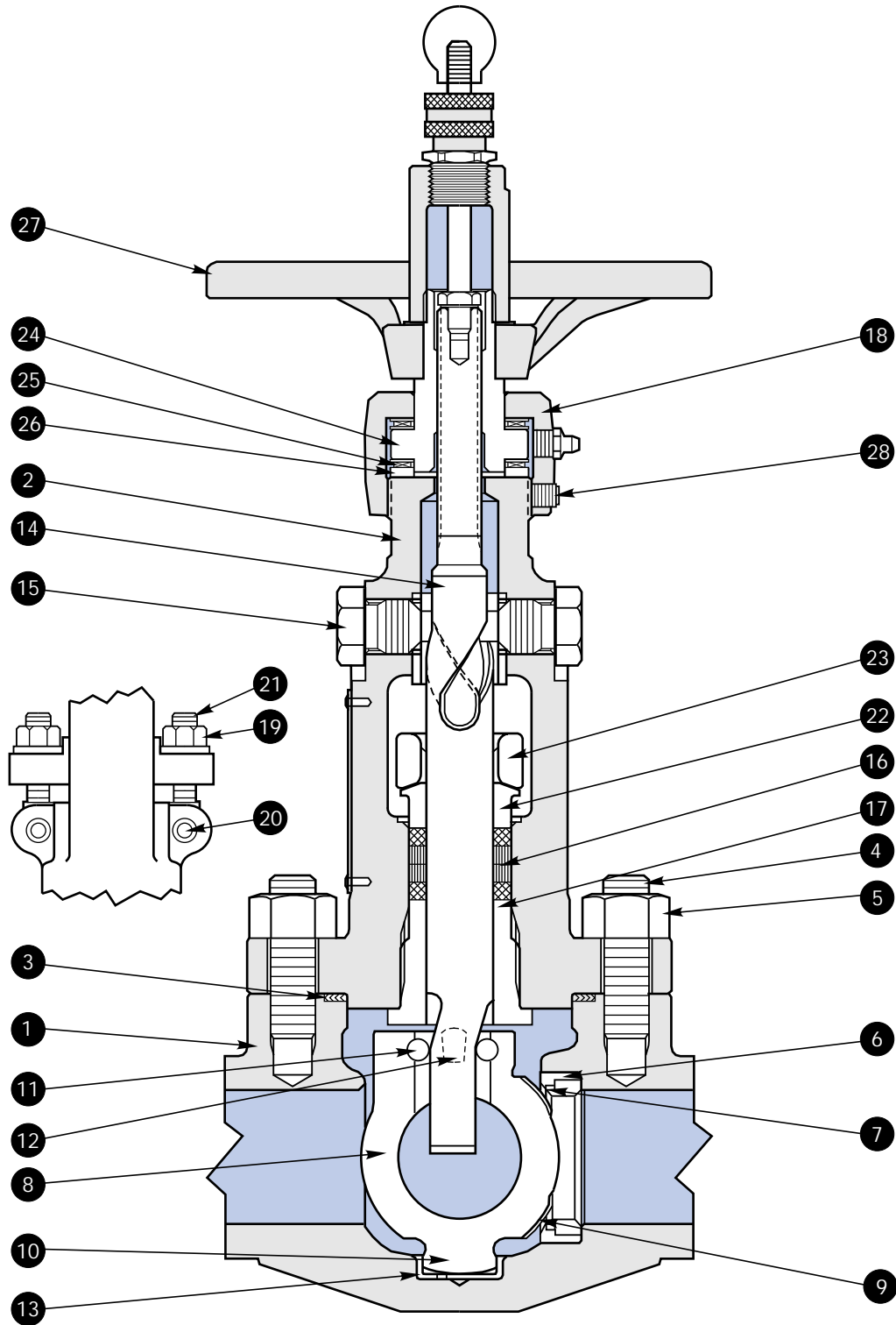
TWO PIECE STEM VALVES ENCLOSED BONNET

MATERIALS LIST

PARTS DESCRIPTION		STANDARD T3 -20°F/+500°F -29°C/+260°C	STANDARD T7 -20°F/+500°F -29°C/+260°C	LOW TEMP T3 -50°F/+500°F -46°C/+260°C	LOW TEMP T7 -50°F/+500°F -46°C/+260°C
1	Body	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A352 Gr. LCC	ASTM A352 Gr. LCC
2	Bonnet	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A352 Gr. LCC	ASTM A352 Gr. LCC
3	Gasket	Stainless Steel & Graphite	Stainless Steel & Graphite	Stainless Steel & Graphite	Stainless Steel & Graphite
4	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B7M	ASTM A320 Gr. L7	ASTM A320 Gr. L7M
5	Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 2HM	ASTM A194 Gr. 7	ASTM A194 Gr. 7M
6	Seat Body	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
7	Seat Insert	Teflon	Teflon	Teflon	Teflon
8	Core	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
9	Core Face	Nickel	Nickel Based CRA	Nickel	Nickel Based CRA
10	Trunnion Overlay	-	Nickel Based CRA	-	Nickel Based CRA
11	Core Pin	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
12	Support Pin	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
13	Trunnion Bushing	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
14	Stem	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
15	Stem Cam	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
16	Stem Pin	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
17	Stem Guide	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
18	Packing Rings	Teflon	Teflon	Teflon	Teflon
19	Injectable Packing	Orbit GP6	Orbit GP6	Orbit GP6	Orbit GP6
20	Bonnet Bushing	Stainless Steel	Monel	Stainless Steel	Monel
21	Packing Fitting	Alloy Steel	Stainless Steel	Alloy Steel	Stainless Steel
22	Packing Chamber Bushing	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
23	Drive Nut	Aluminum Bronze	Alloy Steel	Alloy Steel	Alloy Steel
24	Drive Nut Retainer	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
25	Bearing	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
26	Bearing Race	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
27	Handwheel	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron
28	Position Indicator Rod	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
29	Packing Gland	Aluminum Bronze	Carbon Steel	Carbon Steel	Carbon Steel
30	Packing Gland Retainer	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel

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

ONE PIECE STEM VALVES
O.S. & Y. BONNET



ONE PIECE STEM VALVES

O.S. & Y. BONNET

MATERIALS LIST

PARTS DESCRIPTION		STANDARD T3 -20°F/+800°F -29°C/+427°C	STANDARD T7 -20°F/+650°F -29°C/+343°C
1	Body	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
2	Bonnet	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
3	Gasket	Stainless Steel & Graphite	Stainless Steel & 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 A 216 Gr. WCC
9	Core Face	Nickel	Cobalt Alloy
10	Trunnion Overlay	-	Nickel Based CRA
11	Core Pin	Stainless Steel	Stainless Steel
12	Support Pin	Stainless Steel	Stainless Steel
13	Trunnion Bushing	Stainless Steel	Stainless Steel
14	Stem	Stainless Steel	Stainless Steel
15	Stem Guide	Alloy Steel	Stainless Steel
16	Packing Rings	Graphite & Carbon	Graphite & 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 Iron	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

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

TWO PIECE STEM VALVES O.S. & Y. BONNET

MATERIALS LIST

PARTS DESCRIPTION		STANDARD T3 -20°F/+800°F -29°C/+427°C	STANDARD T7 -20°F/+650°F -29°C/+343°C
1	Body	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
2	Bonnet	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
3	Gasket	Stainless Steel & Graphite	Stainless Steel & 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 A 216 Gr. WCC
9	Core Face	Nickel	Cobalt Alloy
10	Trunnion Overlay	-	Nickel Based CRA
11	Core Pin	Stainless Steel	Stainless Steel
12	Support Pin	Stainless Steel	Stainless Steel
13	Trunnion Bushing	Stainless Steel	Stainless Steel
14	Stem	Stainless Steel	Stainless Steel
15	Stem Cam	Stainless Steel	Stainless Steel
16	Stem Pin	Alloy Steel	Stainless Steel
17	Stem Guide	Stainless Steel	Stainless Steel
18	Packing Chamber Bushing	Carbon Steel	Carbon Steel
19	Packing Gland	Ductile Iron	Ductile Iron
20	Packing Gland Retainer	ASTM A216 Gr. WCC	ASTM A216 Gr. WCC
21	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B7M
22	Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 2HM
23	Washer	Carbon Steel	Carbon Steel
24	Packing Rings	Graphite & Carbon	Graphite & Carbon
25	Bonnet Sleeve	Stainless Steel	Stainless Steel
26	Drive Nut	Aluminum Bronze	Alloy Steel
27	Bearing	Alloy Steel	Alloy Steel
28	Bearing Race	Alloy Steel	Alloy Steel
29	Packing Access Sleeve	Carbon Steel	Carbon Steel
30	Stud	ASTM A193 Gr. B7	ASTM A193 Gr. B7
31	Nut	ASTM A194 Gr. 2H	ASTM A194 Gr. 2H
32	Handwheel	Ductile Iron	Ductile Iron
33	Position Indicator Rod	Stainless Steel	Stainless Steel

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

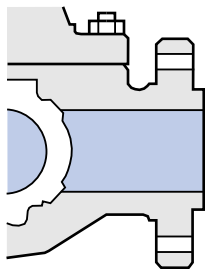
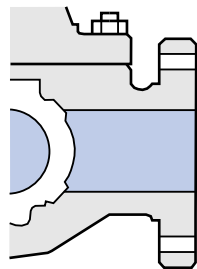
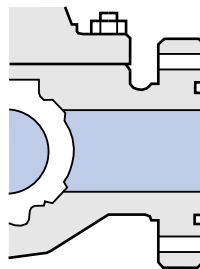
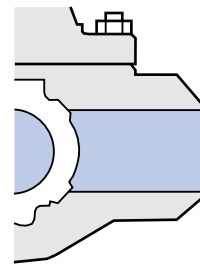
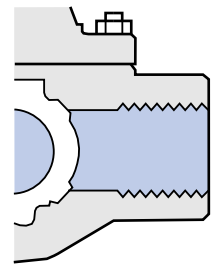
END FLANGE BOLTING DIMENSIONS

ASME/ANSI	CLASS 150				CLASS 300				CLASS 600				
Valve Size in.	Number of Fasteners Per Valve	Fastener Diameter in.	Length of Studs in.	*Length of Capscrews in.	Number of Fasteners Per Valve	Fastener Diameter in.	Length of Studs in.	*Length of Capscrews in.	Number of Fasteners Per Valve	Fastener Diameter in.	Length of Stud RF in.	Length of Stud RTJ in.	*Length of Capscrew in.
1	8	1/2	3	-	8	5/8	3 1/4	-	8	5/8	3 1/2	3 1/2	-
1 1/2	8	1/2	3 1/4	-	8	3/4	3 1/2	-	8	3/4	4 1/4	4 1/4	-
2 x 1 1/2 x 2	8	5/8	3 1/4	-	16	5/8	3 1/2	-	16	5/8	4 1/4	4 1/4	-
2	8	5/8	2 1/2	-	8	5/8	3 1/2	-	16	5/8	4 1/4	4 1/4	-
2 BB/GS*	8	5/8	3 1/2	1 1/2	-	-	-	-	-	-	-	-	-
3 x 2 x 3	8	5/8	2 1/2	-	16	3/4	4 1/4	-	16	3/4	5	5	-
3*	8	5/8	2 1/2	1 1/2	16	3/4	4 1/4	-	16	3/4	5	5	-
4 x 3 x 4*	16	5/8	2 3/4	1 3/4	16	3/4	4 1/2	-	16	7/8	5 3/4	5 3/4	-
4*	16	5/8	2 3/4	1 3/4	12	3/4	4 1/2	-	16	7/8	5 3/4	5 3/4	-
	-	-	-	-	4	3/4	-	2 1/4	-	-	-	-	-
6 x 4 x 6	16	3/4	4	-	24	3/4	4 3/4	-	24	1	6 3/4	6 3/4	-
6*	16	3/4	3	2	16	3/4	4 3/4	-	24	1	6 3/4	6 3/4	-
	-	-	-	-	8	3/4	-	2 1/2	-	-	-	-	-
8 x 6 x 8	16	3/4	4 1/4	-	24	7/8	5 1/2	-	24	1 1/8	7 1/2	7 3/4	-
8*	12	3/4	4 1/4	1 1/2	16	7/8	5 1/2	-	24	1 1/8	7 1/2	7 3/4	-
	4	3/4	-	2	8	7/8	-	3	-	-	-	-	-
10 x 8 x 10*	20	7/8	4 1/2	-	28	1	6 1/4	-	32	1 1/4	8 1/2	8 1/2	-
	4	7/8	4 1/2	2 1/4	4	1	-	3 3/4	-	-	-	-	-
10	24	7/8	4 1/2	-	32	1	6 1/4	-	32	1 1/4	8 1/2	8 1/2	-
12 x 10 x 12	24	7/8	4 3/4	-	32	1 1/8	6 3/4	-	40	1 1/4	8 3/4	8 3/4	-
12	24	7/8	4 3/4	-	32	1 1/8	6 3/4	-	40	1 1/4	8 3/4	8 3/4	-
14 x 12 x 14	24	1	5 1/4	-	40	1 1/8	7	-	40	1 3/8	9 1/4	9 1/4	-
14	-	-	-	-	40	1 1/8	7	-	40	1 3/8	9 1/4	9 1/4	-
16 x 12 x 16	-	-	-	-	-	-	-	-	40	1 1/2	10	10	-
16 x 14 x 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	-	40	1 1/2	10	10	-
18 x 16 x 18	32	1 1/8	5 3/4	-	48	1 1/4	7 3/4	-	40	1 5/8	10 3/4	11	-
20 x 16 x 20	40	1 1/8	6 1/4	-	48	1 1/4	8	-	48	1 5/8	11 1/4	11 1/2	-
18	32	1 1/8	6 1/4	-	-	-	-	-	-	-	-	-	-
20*	-	-	-	-	48	1 1/4	7 3/4	-	36	1 5/8	11 1/4	11 1/2	-
	-	-	-	-	-	-	-	-	12	1 5/8	-	-	5 3/4
24 x 20 x 24	-	-	-	-	48	1 1/2	9	-	48	1 7/8	13	13 1/4	-

* Space limitations prevent the use of through bolts in some of the holes in the end flanges on these valves. These holes are drilled and tapped so that a shorter stud bolt or capscrew can be used.

END FLANGE BOLTING DIMENSIONS

ASME/ANSI	CLASS 900				CLASS 1500				CLASS 2500			
Valve Size in.	Number of Fasteners Per Valve	Fastener Diameter in.	Length of Studs RF in.	Length of Studs RTJ in.	Number of Fasteners Per Valve	Fastener Diameter in.	Length of Studs RF in.	Length of Studs RTJ in.	Number of Fasteners Per Valve	Fastener Diameter in.	Length of Studs RF in.	Length of Studs RTJ in.
1	8	3/4	5	5	8	7/8	5	5	-	-	-	-
1 1/2	8	1	5 1/2	5 1/2	8	1	5 1/2	5 1/2	-	-	-	-
2	16	7/8	5 3/4	5 3/4	16	7/8	5 3/4	5 3/4	16	1	7	7
3 x 2 x 3	16	7/8	5 3/4	5 3/4	16	1 1/8	7	7	16	1 1/4	9	9 1/4
3	16	7/8	5 3/4	5 3/4	16	1 1/8	7	7	16	1 1/4	9	9 1/4
4 x 3 x 4	16	1 1/8	6 3/4	6 3/4	16	1 1/4	7 3/4	7 3/4	16	1 1/2	10 1/4	10 3/4
4	16	1 1/8	6 3/4	6 3/4	16	1 1/4	7 3/4	7 3/4	16	1 1/2	10 1/4	10 3/4
6 x 4 x 6	24	1 1/8	7 1/2	7 1/2	24	1 3/8	10 1/4	10 1/2	16	2	13 3/4	14 1/2
6	24	1 1/8	7 1/2	7 1/2	24	1 3/8	10 1/4	10 1/2	16	2	13 3/4	14 1/2
8 x 6 x 8	24	1 3/8	8 3/4	8 3/4	24	1 5/8	11 1/2	12 3/4	24	2	15 1/4	16
8	24	1 3/8	8 3/4	8 3/4	24	1 5/8	11 1/2	12 3/4	24	2	15 1/4	16
10 x 8 x 10	-	-	-	-	24	1 7/8	13 1/4	13 1/2	24	2 1/2	19 1/2	20 1/2
10	32	1 3/8	9 1/4	9 1/4	24	1 7/8	13 1/4	13 1/2	-	-	-	-
12 x 10 x 12	-	-	-	-	32	2	14 3/4	15 1/4	-	-	-	-
12	40	1 3/8	10	10	32	2	14 3/4	15 1/4	-	-	-	-
14 x 12 x 14	40	1 1/2	10 3/4	11	-	-	-	-	-	-	-	-
16 x 12 x 16	-	-	-	-	32	2 1/2	17 1/2	18 1/2	-	-	-	-
16 x 14 x 16	40	1 5/8	11 1/4	11 1/2	-	-	-	-	-	-	-	-


 ASME/ANSI
RAISED FACE
FLANGED

 ASME/ANSI
FLAT FACE
FLANGED

 RTJ
(RG)
FLANGED

 BUTT
WELD

 SOCKET WELD
OR
THREADED

SEAT AND STEM PACKING SELECTION

SEAT SELECTION



Teflon®
TFE
Type H

All
Metal
Type H8

Nylon®
Type A

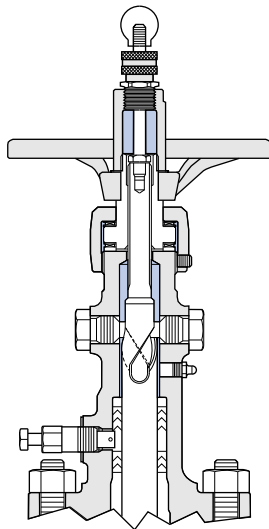
Nylon®
Block & Bleed
Type BB

Nylon®
Grease Seal
Type GS

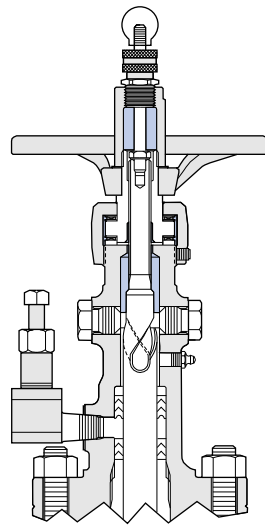
PEEK®
Seat
Type PK

Temperature	Insert Material	Support Ring	Bore Sizes (in.)	Seat Options
-50°F to 250°F (-46°C to 121°C)	Nylon®	Carbon Steel	1 to 16	Type A, BB, GS
-50°F to 250°F (-46°C to 121°C)	Nylon®	Stainless Steel	6 to 20	Type A, BB, GS
-50°F to 500°F (-46°C to 260°C)	Teflon® TFE	Stainless Steel	1 to 20	Type H
-150°F to 800°F (-101°C to 427°C)	None	Stainless Steel	1	Type H8
-150°F to 800°F (-101°C to 427°C)	Stainless Steel Tube	Stainless Steel	1 1/2 to 20	Type H8
-50°F to 570°F (-46°C to 300°C)	PEEK®	Stainless Steel	2 to 12	Type PK

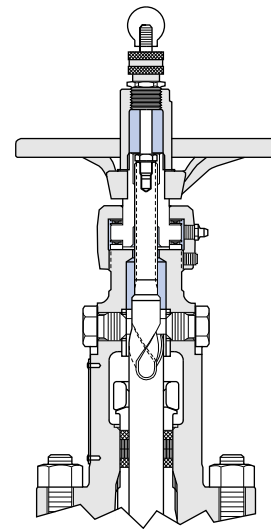
STEM PACKING SELECTION



STANDARD INJECTABLE PACKING



LOW TEMPERATURE INJECTABLE PACKING







O.S. & Y. PACKING

Temperature/Service	Packing Material	Orbit Designation
-50°F to 500°F (-46°C to 260°C)	Injectable Teflon® Packing with Firesafe Graphite Top Ring	GP6
-50°F to 800°F (-46°C to 427°C) Carbon Steel Valve	Graphite Rings	GP20
-30°F to 550°F (-34°C to 288°C) Ammonia Service	Injectable Teflon® Packing with Firesafe Graphite Top Ring	GP19
-20°F to 400°F (-29°C to 204°C) M.T.B.E. Service	Injectable Teflon® Packing with Teflon® Rings	GP27
-30°F to 275°F (-34°C to 135°C) Oxygen Service	Injectable Teflon® Packing with Teflon® Rings	GP7

Other Packing Materials Available.

MARKINGS

ORBIT VALVE			STANDARD TRIM	
LITTLE ROCK, ARK				
SIZE	3" 900 CL		END TO END	15"
FIG	1523H RF		1995 MOP AT	+500F
	SN 110091620001		2250 MOP AT	-20F 
PKG	GP6		STEM AS	
SEAT	CR13 TEF		BODY STEEL WCC	
MFG	6D-0073		CORE TRIM 17-4	
DATE	04/01 ISO 14313		CORE FACE NI	
IMPACTTEMP	-50F		TEMP -20/+500F	

NAMEPLATE MARKINGS FOR VALVE TRIM

AS	Alloy Steel
15-6	Carpenter 450 [®] Stainless Steel
660	A-638 (Grade 660)
HF-C	Hardfacing Hastelloy C [®] and C-276
C-276	Hastelloy C-276 [®]
MP35N	Latrobe [®]
CO-U	Cobalt-Based-Ultime [®]
NICU	Monel [®]
NI	Nickel
COCR	Stellite [®]
17-4	17-4PH Stainless Steel
CR13	410 Stainless Steel (13% Chrome)
718	Inconel 718 [®]
316	Stainless Steel
NYL	Nylon
PEEK [®]	Poly-Ether-Ether-Ketone
TEF	Teflon [®]

NAMEPLATE MARKINGS FOR STEM PACKING

GP-6	General Service
GP-7	Oxygen Service
GP-19	Ammonia Service
GP-27	MTBE Service
GP-20	Graphite O.S. & Y. Service

BODY MARKINGS-ASME/ANSI VALVE

The serial number is stamped into the side of the valve body or the outside diameter of the flange.

If the valve has ring joint facings, the ring gasket number is stamped into the O.D. of the flange.

Preferred Pressure End and seat size code are stamped on the O.D. 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.

PRESSURE TESTING AND PRESSURE DROP FORMULAS

TEST PRESSURES FOR ASME B16.34*, API 6D*

ASME/ANSI Class	150	300	600	900	1500	2500
CWP Rating						
psig	290	750	1500	2250	3750	6250
BAR	20	52	103	155	259	431
Seat Test						
psig Min.	325	825	1650	2475	4125	6875
BAR	22	57	114	171	284	474
Shell Test						
psig	450	1125	2250	3375	5625	9375
BAR	31	78	155	233	382	646

Seat Leakage Criteria: For Soft-Seated Valves, Zero. For Metal Seated Valves, 1/2 API 598.

TEST PRESSURES FOR API 6A (WELLHEAD) VALVES

API Flange	2000	3000	5000
Dimensionally Comparable ASME/ANSI Flange Class	600	900	1500
CWP (Seat Test)			
psig	2000	3000	5000
BAR	138	207	345
Shell Test			
psig	4000	6000	10000
BAR	276	414	690

DURATION OF PRESSURE TESTS FOR ASME B16.34*, API 6D*

VALVE SIZE in.	mm	Shell Test	Seat Test
1 - 4	25 - 100	2 minutes	2 minutes
6 - 10	150 - 250	5 minutes	5 minutes
12 - 18	300 - 450	15 minutes	5 minutes
20	500	30 minutes	5 minutes

* For valves of WCC material. Times shown are for API 6D valves
ASME B16.34 valves test times are less than values shown.

For each Orbit valve there is a flow coefficient C_v . This is defined as the flow in gallons per minute of water at 60°F with a pressure drop of 1 psi across the valve. By using the following simplified formulas, the pressure drop for a given set of flow conditions may be calculated: (Refer to Bulletin FCI 62-1 of Fluid Controls Institute, Inc. for additional information.)

FOR LIQUIDS:

$$\Delta P = G(Q/C_v)^2$$

- ΔP = psi Drop across valve
- G = Specific gravity of liquid (water = 1.0)
- Q = Flow in gpm
- C_v = Valve coefficient (GPM water flow at 1 psi pressure drop across valve at 60°F)

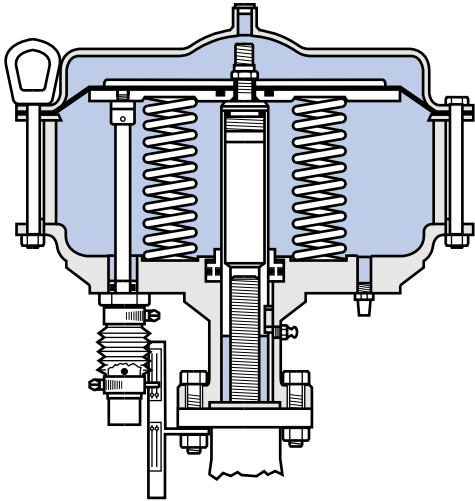
FOR GASES:

$$\Delta P = 541 \times 10^{-9} \left(\frac{Q}{C_v} \right)^2 \left(\frac{GT}{P} \right)$$

- ΔP = psi Drop across valve
- G = Specific gravity (air @ 14.7psi & 60°F = 1.0)
- T = Absolute temperature (F + 460)
- P = Line pressure psia (psi absolute - psi Gage + 14.7)
- Q = Flow standard cubic feet per hour @ 14.7 psi and 60°F
- C_v = Valve coefficient (GPM water flow at 1psi pressure drop across valve at 60°F)

ACTUATOR FIGURE NUMBERS

DIAPHRAGM ACTUATOR



Double Acting Style:
Example: 164100-280

1st Figures (8, 16 or 42)
Nominal size of diaphragm) x 10
8 = approximately 80 sq. in.
16 = approximately 160 sq. in.
42 = approximately 420 sq. in.

2nd Figure
(0)(4) etc. = Actuator/valve
mounting configuration
(See page 21).

3rd Figures
(100)(625)(1125) etc. = Valve stem
thread size.

4th Figures
Available accessories
275 = Manual close mechanism
280 = Two-way manual mechanism
301 = Snubber etc.

Spring Return Style:
Example: 62585-275

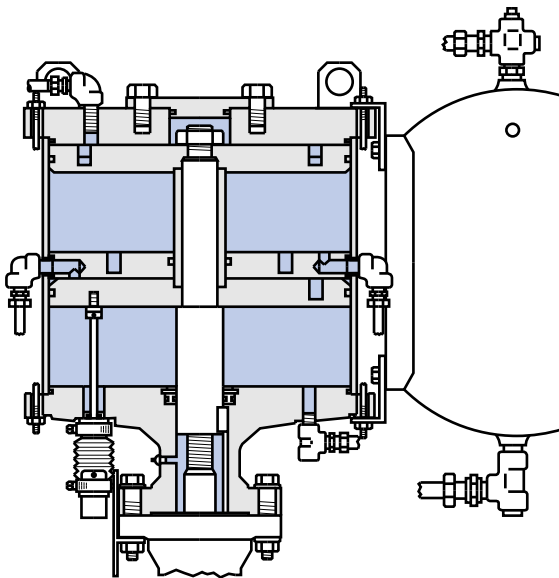
1st Figures
(100)(625)(1125) etc. = Valve stem
thread size.

2nd Figure (8, 16 or 42)
Nominal size of diaphragm) x 10
8 = approximately 80 sq. in.
16 = approximately 160 sq. in.
42 = approximately 420 sq. in.

3rd Figures
Type of spring action and mounting
configuration.
0 = Spring close, threaded adapter
3 = Spring open, threaded adapter
4 = Spring close, flange adapter
5 = Spring open, flange adapter etc.

4th Figures
Available accessories
275 = Manual close mechanism for
spring open
280 = Two-way manual mechanism
for spring open
301 = Snubber etc.

PISTON ACTUATOR



Example: LS-185-D-5-X-S

1st Figure
L = Low pressure cylinder actuator,
80 psi maximum pressure

2nd Figure
G = Double cylinder damping or no damping
S = Single cylinder damping

3rd Figures
(12)(18)(20) etc. = Nominal diameter of
actuator piston (inches)

4th Figure
(3)(4)(5) etc. = Nominal piston stroke (inches)

5th Figure
(D)(T) etc. = Number of cylinders
(Double/Triple etc.)

6th Figures
(1)(2)(3) etc. - Actuator/valve mounting
configuration. (Consult Orbit for specific
details)

7th Figure
Accessory Features
C = Mechanical override-close
H = Hydraulic override-open, Mechanical
override close
L = Positive close locking device
M (N) = Mechanical override open and close
X = No accessory features

8th Figure
S = Spring Return

ACTUATOR FIGURE NUMBERS

These are typical selections of actuators for soft seated valves with standard T3 trim and pipeline pressure from the preferred end. The correct choice of actuator will depend on pressure direction, temperature, flow conditions, valve trim and valve end connections.

Consult Orbit for specific actuator/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	Spring Open Actuator	Double Acting Actuator	Spring Close Actuator	Spring Open Actuator	Double Acting Actuator	Spring Close Actuator	Spring Open Actuator
1	84625	62584	62588	84625	62584	62588	84625	62584	62588
1 1/2	84625	62584	62588	84625	62584	62588	84625	62584	62588
2	84625	62584	62588	84625	62584	62588	84625	62584	62588
3	84100	100164	100165	84100	100164	100165	164100	100164	100165
4	84100	100164	100165	84100	100164	100165	164100	100167	100165
6	164100	100167	100167	164100	100167	*	164100	123424	*
8	164100	123424	*	164100	123424	*	424125-301	LS-185-D-25-X-S	*
10	424125-301	125424	*	424125-301	LS-185-D-25-X-S	*	LS-185-D-5	LS-205-D-5-X-S	*
12	LS-185-D-5	LS-185-D-5-X-S	*	LS-185-D-5	LS-205-D-5-X-S	*	LS-205-D-6	LS-205-D-6-X-S	*
14	-	-	-	LS-185-D-5	LS-205-D-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	-	-	-	LS-2611-T-29	-	-	LS-2611-T-29	-	-

*Consult Factory

ASME/ANSI	CLASS 900			CLASS 1500			CLASS 2500		
Valve Size in.	Double Acting Actuator	Spring Close Actuator	Spring Open Actuator	Double Acting Actuator	Spring Close Actuator	Spring Open Actuator	Double Acting Actuator	Spring Close Actuator	Spring Open Actuator
1	84625	62584	62588	84625	62584	62588	84625	62584	62588
1 1/2	164100	100164	*	164100	100164	*	-	-	-
1 3/4	-	-	-	-	-	-	164100	100164	*
2	164100	100164	100165	164100	100164	100165	-	-	-
3	164100	100164	100165	164100	100167	*	164101	120424	*
4	164100	100167	*	164100	121424	*	424125-301	125424	*
6	424125-301	LS-185-D-25-X-S	*	LS-185-D-5	LS-205-D-5-X-S	*	LS-185-D-5	LS-205-D-5-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-205-D-16-X-S	*	LS-269-D-32	*	*	-	-	-
12	LS-267-D-19	LS-267-D-19-X-S	*	LS-2611-T-29	*	*	-	-	-
16	LS-2611-T-29	-	-	-	-	-	-	-	-

*Consult Factory

ELECTRIC ACTUATORS - Orbit Valve Company 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 Orbit so that field performance of the entire valve assembly can be assured.

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