Technical Specifications
Rev. K - 01/2026

Masoneilan™ 78400/18400 Series LincolnLog™

High-pressure, anti-cavitation control valves

Integrated smart engineered solutions for severe service applications

Baker Hughes

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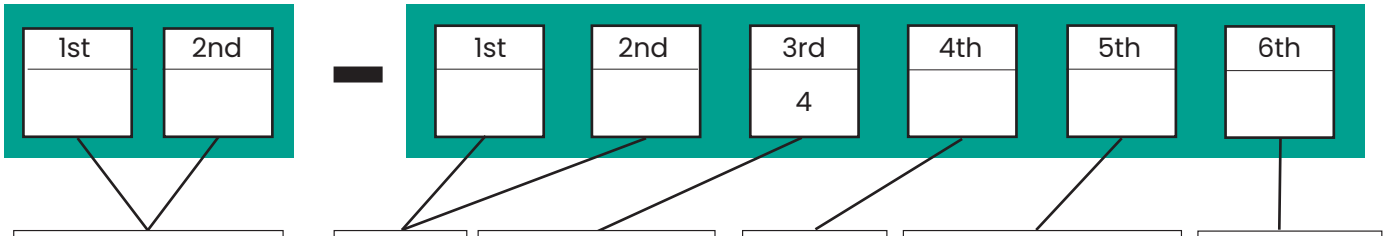
78400/18400 API 6A

Numbering System



Actuator Type	Body Series	Trim Type	No. of Stages[1]	Trim Size	Optional Configuration
20 Top Mounted Manual Handwheel	18 Globe	4 Axial Flow High Resistance (Downseating)	3 Three	0 Optional Trim	F Forged Body Design
87 Spring-Diaphragm Air to Close	78 Angle		4 Four	1 Trim A, Balanced Hard Seat	EB Extension Bonnet
88 Spring-Diaphragm Air to Open			6 Six	2 Trim B, Balanced Hard Seat	
51 Cylinder Double Acting				3 Trim C, Balanced Hard Seat	
52 Cylinder Spring Return (Air to Extend)				4 Trim A, Balanced Soft Seat	
53 Cylinder Spring Return (Air to Retract)				5 Trim B, Balanced Soft Seat	
				6 Trim C, Balanced Soft Seat	
				7 Trim A, Unbalanced Hard Seat	
				8 Trim B, Unbalanced Hard Seat	
				9 Trim C, Unbalanced Hard Seat	

1. Additional stages are available to meet specific operating conditions. Please consult Baker Hughes.

Note: See Appendix B for API options on page 33.

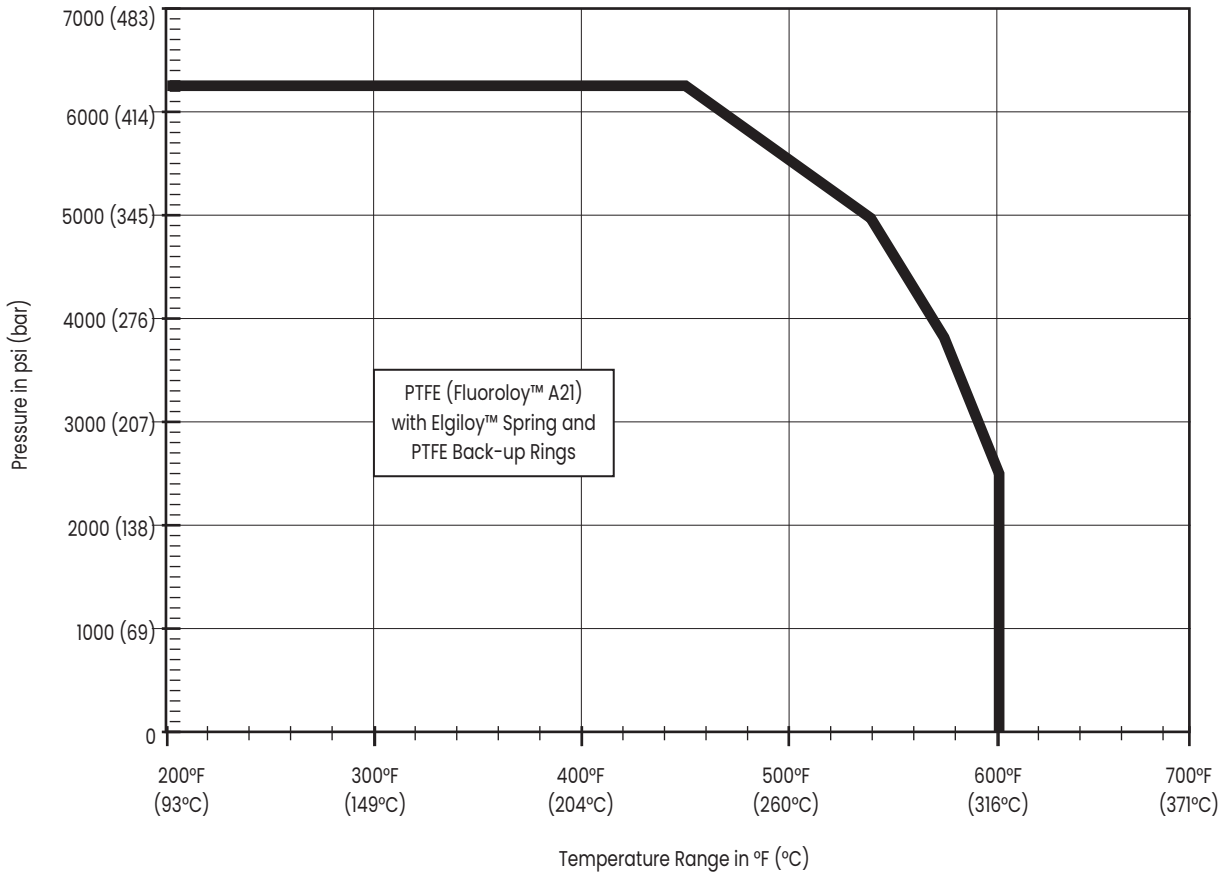
Temperature Range/Seat Leakage

Valve Sizes		Trim Type	Seat Type	Temperature Range[1]		Seat Leakage Class[2]
inches	DN			min.	max.[4]	
1	25	Unbalanced	Metal Seat	-20°F (-29°C)	600°F (316°C)	V[3]
1.5 to 8	40 to 200	Balanced	Metal Seat	-20°F (-29°C)	600°F (316°C)	
		Unbalanced	Metal Seat	-20°F (-29°C)	600°F (316°C)	
2 to 8	50 to 200	Balanced or Unbalanced	Soft Seat	-20°F (-29°C)	450°F (232°C)	VI

1. Designs for higher or lower temperatures are available. Please consult Baker Hughes.
2. Seat leakage class ratings per IEC 534-4 and ASME/FCI 70.2. Class V seat leakage is standard and Class VI is optional.
3. Optional block valve tight shutoff per MSS-SP-61 also available.
4. Max. temp. limit of 600°F (316°C) with unbalanced trim requires use of optional flexible graphite packing or an extension bonnet.

Balance Seal Pressure and Temperature limits

LincolnLog 78400/18400 Balance Seal Pressure-Temperature Application Range



Ratings/Connections

◆ RF Flanged ⎚ Socket Weld ⎘Threaded △ RT Joint ⇔ Butt Weld

Valve Size[1]		Pressure Class[2]			
inches	DN	600	900	1500	2500
1 and 1.5	25 and 40	◆⎚⎘△⇔	◆⎚⎘△⇔	◆⎚⎘△⇔	◆⎚⎘△⇔
2	50	◆⎚⎘△⇔	◆⎚⎘△⇔	◆⎚⎘△⇔	◆⎚⎘△⇔
3	80	◆ △ ⇔	◆ △ ⇔	◆ △ ⇔	◆ △ ⇔
4	100	◆ △ ⇔	◆ △ ⇔	◆ △ ⇔	◆ △ ⇔
6	150	◆ △ ⇔	◆ △ ⇔	◆ △ ⇔	◆ △ ⇔
8	200	◆ △ ⇔	◆ △ ⇔	◆ △ ⇔	◆ △ ⇔

1. Sizes, ratings and end connections are available in both globe and angle body styles.
2. Pressure classes shown represent ASME ratings and equivalent PN ratings.

Flow Capacity and F_L

Standard Capacity – 3-Stage Design

Flow Characteristic: Modified Linear

Valve Size		Orifice Diameter		Travel		Trim C		Min. Cont. C_V
inches	DN	inches	mm	inches	mm	C_V	F_L	
1	25	.70	17.8	.25	6.35	2.0	.98	.05
1.5	40	1.00	25.4	.25	6.35	3.8	.98	.10
2	50	1.50	38.1	.38	9.65	9.6	.98	.15
3	80	2.25	57.2	.62	15.7	24.5	.98	.25
4	100	2.88	73.2	.75	19.1	38	.98	.43
6	150	4.12	105	1.00	25.4	80	.98	.56
8	200	5.38	137	1.25	31.8	141.5	.98	1.0

Standard Capacity – 4-Stage Design

Flow Characteristic: Modified Linear

Valve Size		Orifice Diameter		Travel		Trim A		Trim B		Trim C		Min.Cont. C_V
inches	DN	inches	mm	inches	mm	C_V	F_L	C_V	F_L	C_V	F_L	
1	25	.70	17.8	.25	6.35	1.0	.996	1.4	.994	1.7	.991	.04
1.5	40	1.00	25.4	.25	6.35	1.9	.996	2.5	.994	3.2	.991	.08
2	50	1.50	38.1	.38	9.65	4.5	.996	7	.994	8.4	.991	.12
3	80	2.25	57.2	.62	15.7	10	.996	13	.994	21	.991	.20
4	100	2.88	73.2	.75	19.1	16.5	.996	22	.994	31.5	.991	.35
6	150	4.12	105	1.00	25.4	34	.996	45	.994	66	.991	.46
8	200	5.38	137	1.25	31.8	60	.996	97.5	.994	120	.991	.80

Standard Capacity – 6-Stage Design

Flow Characteristic: Modified Linear

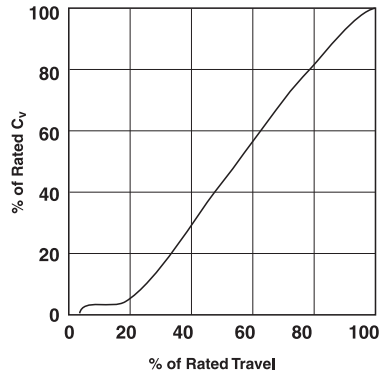
Valve Size		Orifice Diameter		Travel		Trim A		Trim B		Trim C		Min. Cont. C_V
inches	DN	inches	mm	inches	mm	C_V	F_L	C_V	F_L	C_V	F_L	
1	25	.70	17.8	.25	6.35	.80	.998	1.0	.997	1.4	.994	.03
1.5	40	1.00	25.4	.25	6.35	1.4	.998	1.8	.997	2.5	.994	.05
2	50	1.50	38.1	.38	9.65	3.5	.998	4.5	.997	6.5	.994	.08
3	80	2.25	57.2	.62	15.7	7.5	.998	9.5	.997	17	.994	.13
4	100	2.88	73.2	.75	19.1	12	.998	16	.997	25	.994	.22
6	150	4.12	105	1.00	25.4	25	.998	35	.997	52	.994	.30
8	200	5.38	137	1.25	31.8	39	.998	75.5	.997	93	.994	.65

Flow Characteristics

The LincolnLog trim provides a smooth modified linear control characteristic with "clearance flow" capacity over the initial 15 percent of valve travel as shown in the generic chart and table at right.

Incorporation of the multi-stage "clearance flow" design concept prevents high pressure drops across the LincolnLog seating area while throttling at low lifts. This feature helps to extend trim life significantly, resulting in dependable and tight shutoff whenever required. It also improves the throttling control stability and performance at low lifts, while providing smooth, accurate and continuous capacity control from 15 percent to 100 percent plug travel. Controllability extends from the Maximum Rated C_V to the Minimum Controllable C_V for any valve size resulting in typical turndown ratios of 50:1.

LincolnLog C_V vs. Travel



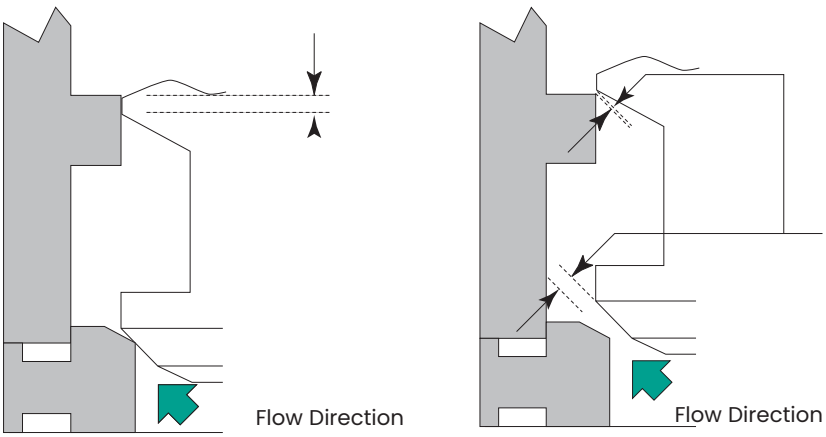
Percent Max. Opening	5	10	20	30	40	50	60	70	80	90	100
Percent Max. C_V	•	•	3	15	27	39	52	64	76	88	100

• Clearance Flow Only

Trim Seat Protection

The "clearance flow" feature described in the previous section is achieved through the trim overlap design illustrated below:

LincolnLog Trim Overlap Seat Protection Feature



0 - 15 percent of Plug Travel

Trim overlap with the valve in the closed or low lift positions.

15 - 100 percent of Plug Travel

There is much greater flow area through the valve seat versus the plug notches. As a result, pressure drop and velocities across the critical seating surfaces are controlled eliminating seat damage.

Valve Sizing Guidelines

General

LincolnLog multi-stage control valves can be sized using either standard IEC/ISA equations or using Baker Hughes latest Masoneilan sizing and selection software program.

Noise Predictions

Valve noise calculations can be performed using the Baker Hughes Masoneilan sizing and selection program based on the latest IEC equations. The serial stage construction of the LincolnLog design helps to significantly reduce trim noise. Calculating the noise at the last stage of the LincolnLog trim will closely approximate the overall valve noise produced. Pressure drop across the last stage can be derived from the table below and used in the noise calculations.

Trim Selection

As indicated in the table below, the LincolnLog is available in various standard trim types and number of stages. Each trim style provides different staging ratios and different pressure drop percentages per stage. Recommended limits for ΔP per stage are 800 psi (55 bar) for continuous duty cycle applications and up to 1000 psi (69 bar) ΔP per stage for intermittent service. The recommended operating throttling ΔP limits are also shown in the table below.

Engineered Solutions

For flashing service, the expansion ratio of the fluid will determine the appropriate staging ratio to apply. Non-standard staging ratios can be supplied for compressible two-phase flow or flashing conditions not covered by the standard trim. Please consult Baker Hughes for proper sizing and design of engineered solutions for these types of applications.

Staging ratios and pressure drop guidelines

Trim Type	No. of Stages	Staging Ratios[1 and 2]	Pressure Drop per Stage[3]		Maximum Recommended Throttling ΔP			
					Continuous Service		Intermittent Service	
			Stages	Fraction of Total ΔP	psi	bar	psi	bar
C	3	1-1-2	1 to 2	.44	1595	110	2030	140
			3	.11				
C	4	1-1-1-2	1 to 3	.31	2248	155	2900	200
			4	.08				
B	4	1-1-2-3	1 to 2	.42	1885	130	2320	160
			3	.11				
			4	.05				
A	4	1-1-2-4	1 to 2	.43	1885	130	2320	160
			3	.11				
			4	.03				
C	6	1-1-1-1-1-2	1 to 5	.19	3625	250	3625	250
			6	.05				
B	6	1-1-1-1-2-3	1 to 4	.23	3480	240	3625	250
			5	.06				
			6	.025				
A	6	1-1-1-1-2-4	1 to 4	.23	3408	235	3625	250
			5	.06				
			6	.014				

1. Staging ratios provide approximations of the relative area ratios for each specific trim type. As an example, a staging ratio of 1-1-2 indicates that the final stage for that trim type has approximately twice the area of the first two stages.
2. Staging ratios do not have any relative correlation between the different trim types.
3. Recommended limits for ΔP per stage are 800 psi (55 bar) for continuous duty cycle applications and up to 1000 psi (69 bar) ΔP per stage for intermittent service.

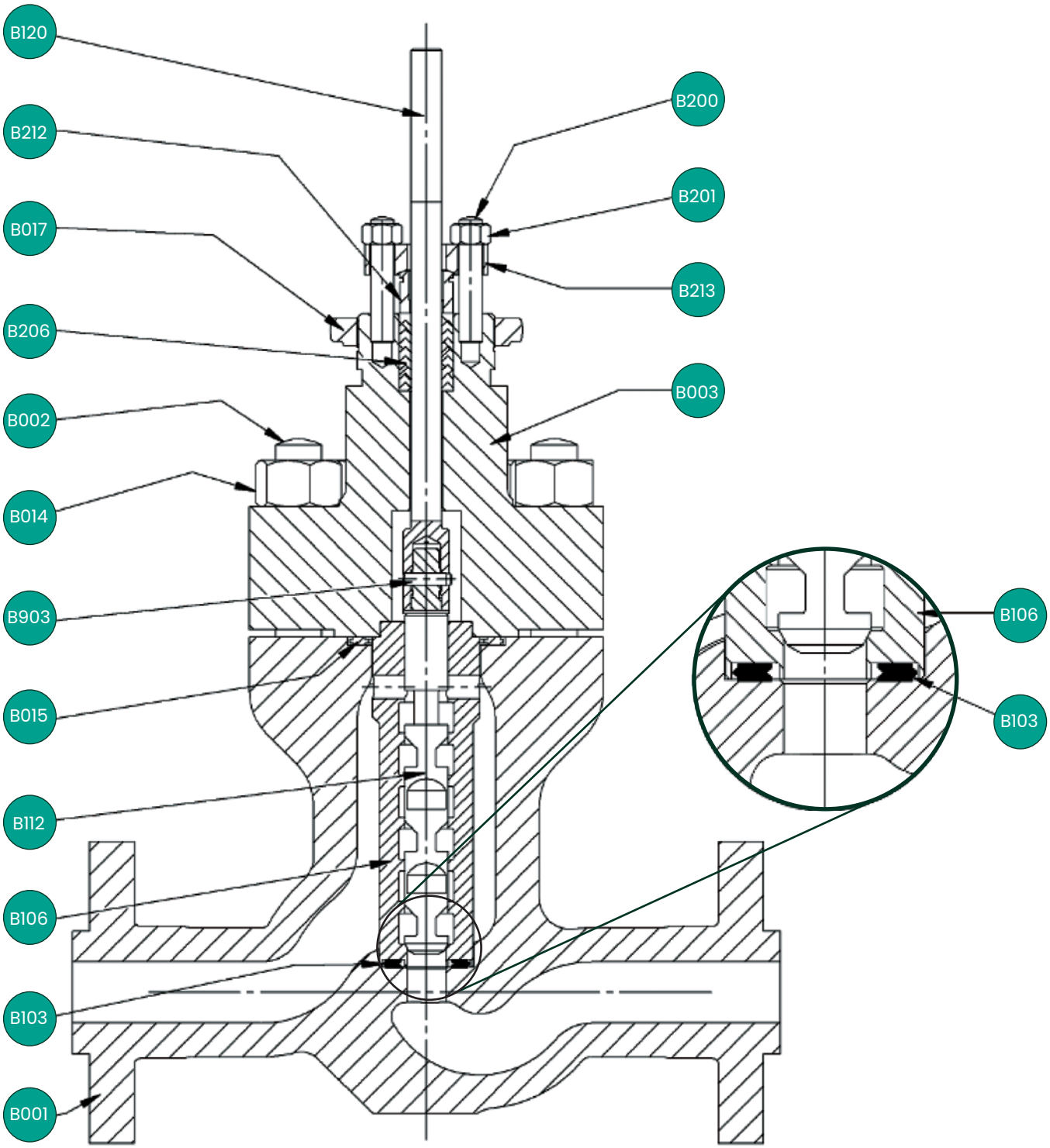
High Pressure Drop Trim

Trim Type	No. of Stages	Staging Ratios[(1)(2)]	Pressure Drop per Stage[(3)(4)]		Maximum Recommended Throttling ΔP	
					Continuous Service	
			Stages	Fraction of Total ΔP	Psi	Bar
C	6	1-1-1-1-1-2	1 to 5	0.19	5250	362
			6	0.05		

1. Staging ratios provide approximations of the relative area ratios for each specific trim type . As an example, a staging ratio of 1-1-2 indicates that the final stage for that trim type has approximately twice the area of the first two stages.
2. Staging ratios do not have any relative correlation between the different trim types.
3. Recommended limits for ΔP per stage are 1000 psi (69 bar) for continuous duty cycle applications.
4. Hardened Trim includes an Inconel 718/ St St 630 H900 / St St 630 H1150M / Duplex 2205 / Duplex S32760 / XM 19 base material with low temperature carburizing treatment for plug and liner.

Materials of Construction

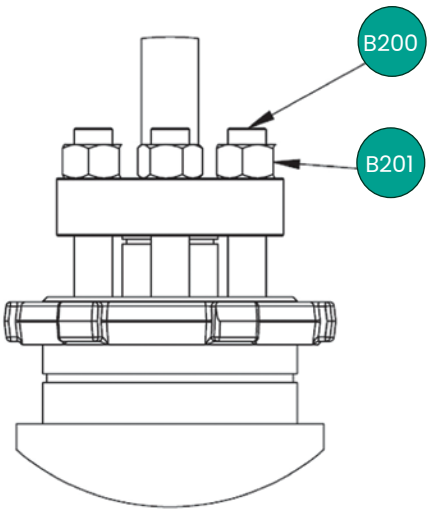
Standard Construction 1 to 1.5 inch



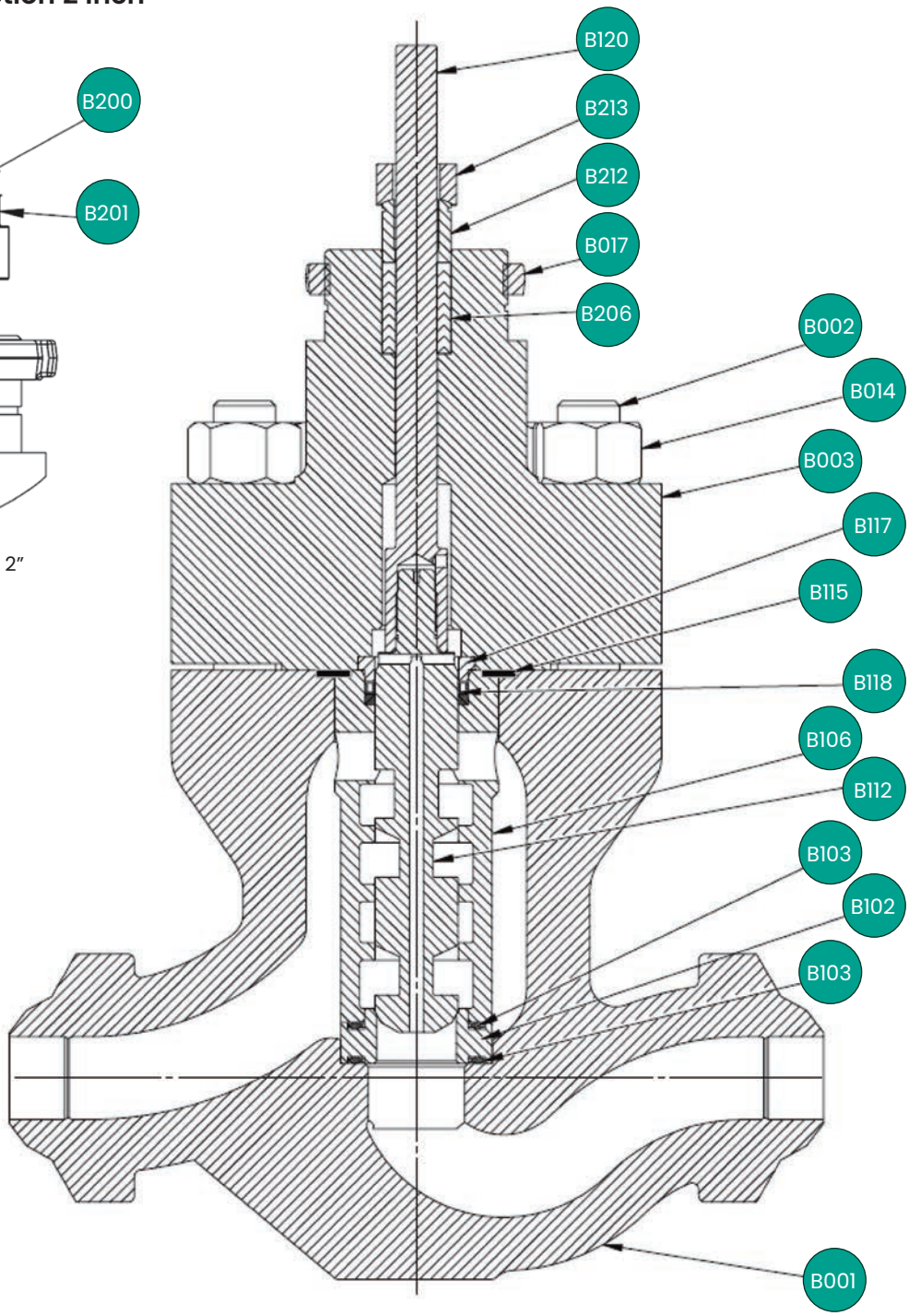
1” to 1.5” Standard Construction

Materials of Construction

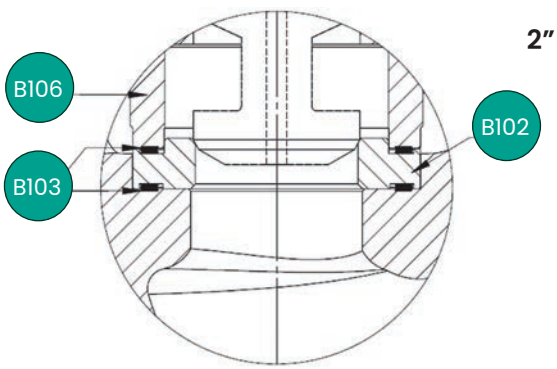
Standard Construction 2 inch



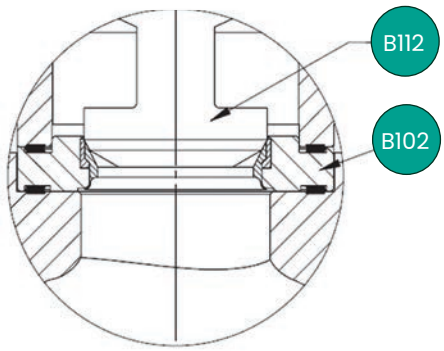
Details Segment for 2″ Construction



2″ Standard Construction



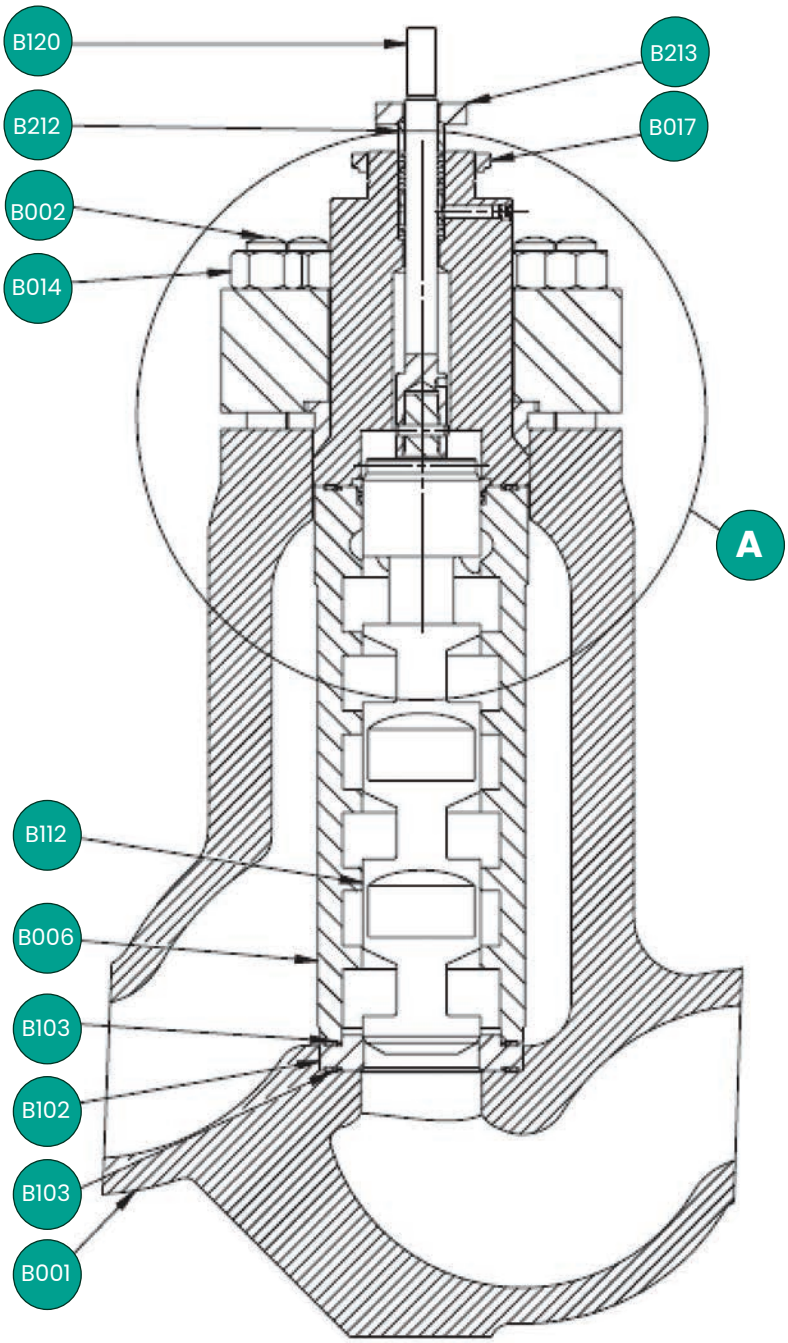
Details Segment for 2″ to 8″ Construction

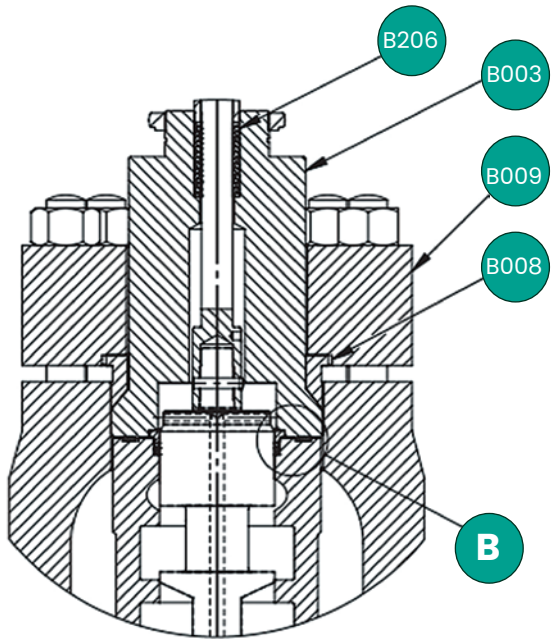


Details Segment for 2″ to 8″ Soft Seat Construction

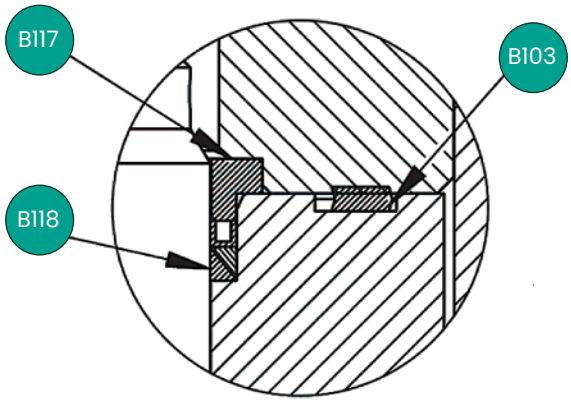
Materials of Construction

Standard Construction 3 to 8 inch





Detail A



Detail B

3” to 8” Standard Construction

Materials of Construction

Standard Construction Carbon Steel

Valve Sizes 1" -8" (DN 25-200) ASME Class 600-2500

Ref. No.	Temperature Range	-50°F (-45°C)	-20°F (-29°C)	450°F (232°C)	600°F (316°C)
	Description	Standard Materials			
B001	Body	A216 GRADE WCC/WCB/ EN 1.619/1.625 OR ASTM A105 / 1.0436 EN 10222-2			
		ASTM A352 GRADE LCC HRC 22 MAXIMUM OR ASTM A350 GRADE LF2 HRC 22 MAXIMUM			
B002	Body Studs	ASTM A193 GRADE B7/EN 1.7225			
		ASTM A320 Grade L7 (ASTM +PED)			
B003	Bonnet[6]	A216 GRADE WCC/WCB/ EN 1.619/1.625 OR ASTM A105 / 1.0436 EN 10222-2			
		ASTM A352 GRADE LCC HRC 22 MAXIMUM OR ASTM A350 GRADE LF2 HRC 22 MAXIMUM			
B008	Metal Seal [5]	STAINLESS STEEL TYPE 630 H1150M HRC 33 MAXIMUM PTFE COATED			STAINLESS STEEL TYPE 630 H1150M HRC 33 MAXIMUM SILVER COATED [7]
B009	Bonnet Flange [5] [6]	A216 GRADE WCC/WCB/ EN 1.619/1.625 OR ASTM A105 / 1.0436 EN 10222-2			
		ASTM A352 GRADE LCC HRC 22 MAXIMUM OR ASTM A350 GRADE LF2 HRC 22 MAXIMUM			
B014	Body Stud Nuts	ASTM A194 Grade 2H			
		ASTM A194 Grade 7 (ASTM +PED)			
B015	Bonnet Gasket	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER			
B017	Yoke Clamping Nut	LOW CARBON STEEL DICHROMATE ZINC PLATED			
B102	Seat Ring [3]	HARDFACING STELLITE NO.6 ON 316 STAINLESS STEEL			
B103	Seat Ring / Liner Gaskets	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER			
B106	Liner	STAINLESS STEEL TYPE 630 H900			
	Liner High Pressure Drop	STAINLESS STEEL TYPE 630 H900 + KOLSTERIZING KDUPLEX OR S3PM			
B112	Plug (Balanced)	HARDFACING STELLITE NO.6 ON 316 STAINLESS STEEL	410 STAINLESS STEEL QT HRC 35 MIN with CHROMEPLATE OR 410 STAINLESS STEEL QT HRC 35 MIN		
	Plug (Unbalanced)		410 STAINLESS STEEL QT HRC 35 MIN		
	Plug (balanced and Unbalanced) High Pressure Drop	ASTM A479 TYPE XM-19 - HRC 35 MAXIMUM. HARDNESS COMPLIANCE WITH NACE MR0103 SHALL BE CERTIFIED + KOLSTERISATION K33 OR S3PA	STAINLESS STEEL TYPE 630 H900 + KOLSTERIZING KDUPLEX OR S3PM		
B117	Seal Retainer [1]	SOLUTION ANNEALED 316 STAINLESS STEEL			
B118	Balance Seal [1] [2] [4]	PRESSURE ENERGIZED POLYMERIC			
B120	Stem	17-4 PH STAINLESS STEEL H1075			
B200	Packing Flange Studs	ASTM A193 GRADE B8 CLASS 2			
B201	Packing Flange Nuts	ASTM A194 GRADE 8			
B206	Packing Set	Carbon Core Braided PTFE			
B212	Packing Follower	SOLUTION ANNEALED 316L STAINLESS STEEL			
B213	Packing Flange	SOLUTION ANNEALED 316L STAINLESS STEEL	LOW CARBON STEEL DICHROMATE ZINC PLATED		
B903	Plug Pin	SOLUTION ANNEALED 316 STAINLESS STEEL			

1. The seal and retainer are not required for 1" (DN 25) size.
2. The balance seal is not required for the unbalanced construction.
3. Seat is integral witwh Liner on 1" -1.5" (DN 25-40) valves.
4. See table on page 5 for pressure and temperature limits.
5. 3" - 8" (DN 80-200) valves.
6. Bonnet and bonnet flange can be manufactured from either casting or forging.
7. Material with silver plate is not applicable to nuclear application.

Review use of optional materials and configurations for temperature ranges indicated. Standard materials listed may still be applicable depending on specific service conditions. Consult Baker Hughes for appropriate material combinations.

Materials of Construction

Standard Construction Stainless Steel

Valve Sizes 1" -8" (DN 25-200) ASME Class 600-2500

Ref. No.	Temperature Range	-20°F (-29°C)	450°F (232°C)	600°F (316°C)
	Description	Standard Materials		
B001	Body	ASTM A351 GRADE CF8M / EN 1.4408 OR ASTM A182 GRADE F316 / EN 1.4401		
		ASTM A351 GRADE CF3M /EN 14408 C:0.03/14409 HRC 22 MAXIMUM OR ASTM A182 GRADE F316/F316L / 1.4401/1.4404 EN 10222-5		
B002	Body Studs	ASTM A193 GRADE B7/EN 1.7225 - ZINC PLATING		
B003	Bonnet [6]	ASTM A351 GRADE CF8M / EN 1.4408 OR ASTM A182 GRADE F316 / EN 1.4401		
		ASTM A351 GRADE CF3M /EN 14408 C:0.03/14409 HRC 22 MAXIMUM OR ASTM A182 GRADE F316/F316L / 1.4401/1.4404 EN 10222-5		
B008	Metal Seal [5]	STAINLESS STEEL TYPE 630 H1150M HRC 33 MAXIMUM PTFE COATED		STAINLESS STEEL TYPE 630 H1150M HRC 33 MAXIMUM SILVER COATED [7]
B009	Bonnet Flange [5] [6]	ASTM A351 GRADE CF8M / EN 1.4408 OR ASTM A182 GRADE F316 / EN 1.4401		
		ASTM A351 GRADE CF3M /EN 14408 C:0.03/14409 CMS-1040 HRC 22 MAXIMUM OR ASTM A182 GRADE F316/F316L / 1.4401/1.4404 EN 10222-5		
B014	Body Stud Nuts	ASTM A194 GRADE 2H - ZINC PLATING		
B015	Bonnet Gasket	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER		
B017	Yoke Clamping Nut	LOW CARBON STEEL DICHROMATE ZINC PLATED		
B102	Seat Ring [3]	HARDFACING STELLITE NO. 6 ON 316 STAINLESS STEEL		
B103	Seat Ring / Liner Gaskets	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER		
B106	Liner	ASTM A479 TYPE XM-19		
	Liner High Pressure Drop	ASTM A479 TYPE XM-19 - HRC 35 MAXIMUM.HARDNESS COMPLIANCE WITH NACE MR0103 SHALL BE CERTIFIED + KOLSTERISATION K33 OR S3PA		
	Plug (Unbalanced)	STAINLESS STEEL TYPE 630 H1150M WITH CHROMEPLATE		
	Plug (Balanced and Unbalanced High Pressure Drop)	STAINLESS STEEL TYPE 630 H1150M HRC 33 MAXIMUM. HARDNESS COMPLIANCE WITH NACE MR0103 AND MR0175 SHALL BE CERTIFIED + KOLSTERIZING KDUPLEX OR S3PM		
B112	Plug (Balanced)	STAINLESS STEEL TYPE 630 H1150M WITH CHROMEPLATE		
	Plug (Unbalanced)	STAINLESS STEEL TYPE 630 H1150M WITH CHROMEPLATE		
	Plug (Balanced and Unbalanced High Pressure Drop)	STAINLESS STEEL TYPE 630 H1150M HRC 33 MAXIMUM. HARDNESS COMPLIANCE WITH NACE MR0103 AND MR0175 SHALL BE CERTIFIED + KOLSTERIZING KDUPLEX OR S3PM		
B117	Seal Retainer [1]	SOLUTION ANNEALED 316 STAINLESS STEEL		
B118	Balance Seal [1] [2] [4]	PRESSURE ENERGIZED POLYMERIC		
B120	Stem	ASTM A479 TYPE XM-19		
B200	Packing Flange Studs	ASTM A193 GRADE B8 CLASS 2		
B201	Packing Flange Nuts	ASTM A194 GRADE 8		
B206	Packing Set	CARBON CORE BRAIDED PTFE		
B212	Packing Follower	SOLUTION ANNEALED 316L STAINLESS STEEL		
B213	Packing Flange	LOW CARBON STEEL DICHROMATE ZINC PLATED		
B903	Plug Pin	SOLUTION ANNEALED 316 STAINLESS STEEL		

1. The seal and retainer are not required for 1" (DN 25) size.
2. The balance seal is not required for the unbalanced construction.
3. Seat is integral with liner on 1" (DN 25) and 1 1/2" (DN 40) valves.
4. See table on page 5 for pressure and temperature limits.
5. 3" (DN 80) - 8" (DN 200) valves.
6. Bonnet and bonnet flange can be manufactured from either casting or forging.
7. Material with silver plate is not applicable to nuclear application.

Materials of Construction

Standard NACE Construction Carbon Steel

Valve Sizes 1" -8" (DN 25-200) ASME Class 600-2500

Ref. No.	Temperature Range	-50°F (-45°C)	-20°F (-29°C)	450°F (232°C)	600°F (316°C)
	Description	Standard Materials			
B001	Body	CARBON STEEL OR CHROME-MOLY ARE APPLICABLE			
		LOW TEMPERATURE CARBON STEEL			
B002	Body Studs	ASTM A193 GRADE B7/EN 1.7225 [7] (NON-EXPOSED)			
		ASTM A320 Grade L7 (ASTM + PED) [7] (NON-EXPOSED)			
		ASTM A193 GRADE B7M (ASTM +PED) [8] [10] (EXPOSED)			
		ASTM A320 Grade L7M, ELECTROLESS NICKEL PLATING (ASTM + PED) [8] [9] (EXPOSED)			
B003	Bonnet [6]	CARBON STEEL OR CHROME-MOLY ARE APPLICABLE			
		LOW TEMPERATURE CARBON STEEL			
B008	Metal Seal [5]	HARDENED ASTM A638 GRADE 660 PTFE COATED			HARDENED ASTM A638 GRADE 660 SILVER COATED [10]
B009	Bonnet Flange [5] [6]	CARBON STEEL OR CHROME-MOLY ARE APPLICABLE			
		LOW TEMPERATURE CARBON STEEL			
B014	Body Stud Nuts	ASTM A194 GRADE 2H [9] (NON-EXPOSED)			
		ASTM A194 GRADE 7 (ASTM +PED) [7] (NON-EXPOSED)			
		ASTM A194 GRADE 2HM NO PLATING ALLOWED (ASTM+PED) [8] [9] (EXPOSED)			
		ASTM A194 GRADE 7M, ELECTROLESS NICKEL PLATING (ASTM+PED) [8] [9] (EXPOSED)			
B015	Bonnet Gasket	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER			
B017	Yoke Camping Nut	LOW CARBON STEEL DICHROMATE ZINC PLATED			
B102	Seat Ring [3]	HARDFACING STELLITE NO. 6 ON 316 STAINLESS STEEL			
B103	Seat Ring / Liner Gaskets	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER			
B106	Liner	FERRALIUM ALLOY 255			
	Liner High Pressure Drop	ASTM B637 GRADE NO7718 HRC 40 MAXIMUM. HARDNESS COMPLIANCE WITH NACE MR0103 SHALL BE CERTIFIED + KOLSTERISATION Double K33 OR S3PM			
B112	Plug (Balanced)	STAINLESS STEEL TYPE 630 H1150M WITH CHROMEPLATE			
	Plug (Unbalanced)	STAINLESS STEELTYPE 630 H1150M WITH CHROMEPLATE			
	Plug (Balanced and unbalanced High Pressure Drop)	STAINLESS STEEL TYPE 630 H1150M HRC 33 MAXIMUM. HARDNESS COMPLIANCE WITH NACE MR0103 & MR0175 SHALL BE CERTIFIED + KOLSTERIZING KDUPLEX OR S3PM			
B117	Seal Retainer [1]	SOLUTION ANNEALED 316 STAINLESS STEEL			
B118	Balance Seal [1] [2] [4]	PRESSURE ENERGIZED POLYMERIC			
B120	Stem	ASTM A479 TYPE XM-19			
B200	Packing Flange Studs	ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING			
B201	Packing Flange Nuts	ASTM A194 GRADE 2HM ELECTROLESS NICKEL PLATING			
B206	Packing Set	CARBON CORE BRAIDED PTFE			
B212	Packing Follower	316L STAINLESS STEEL			
B213	Packing Flange	SOLUTION ANNEALED 316L STAINLESS STEEL			
B903	Plug Pin	SOLUTION ANNEALED 316 STAINLESS STEEL			

1. The seal and retainer are not required for 1" (DN 25) size.
2. The balance seal is not required for the unbalanced construction.
3. Seat is integral with Liner on 1" (DN 25) and 1 1/2" (DN 40) valves.
4. See table on page 5 for pressure and temperature limits.
5. 3" (DN 80) - 8" (DN 200) valves.
6. Bonnet and bonnet flange can be manufactured from either casting or forging.
7. NACE Non-Exposed (Class III).
8. NACE Exposed (Class I & II).
9. Bolting must be checked by the engineering department.
10. Material with silver plate is not applicable to nuclear application.

Materials of Construction

Standard NACE Construction Stainless Steel

Valve size 1" to 8" (DN 25 to 200) ASME Class 600-2500

Ref. No.	Temperature Range	-20°F (-29°C)	450°F (232°C)	600°F (316°C)
	Description	Standard Materials		
B001	Body	ASTM A351 GRADE CF8M / EN 1.4408 OR ASTM A182 GRADE F316 / EN 1.4401		
		ASTM A351 GRADE CF3M /EN 14408 C:0.03/14409 HRC 22 MAXIMUM OR ASTM A182 GRADE F316/F316L / 1.4401/1.4404 EN 10222-5		
B002	Body Studs	ASTM A193 GRADE B7/EN 1.7225 - ZINC PLATING [7] (NON-EXPOSED)		
		ASTM A193 GRADE B7M, ELECTROLESS NICKEL PLATING (ASTM+PED) [8] [9] (EXPOSED)		
B003	Bonnet [6]	ASTM A351 GRADE CF8M / EN 1.4408 OR ASTM A182 GRADE F316/ EN 1.4401		
		ASTM A351 GRADE CF3M /EN 14408 C:0.03/14409 HRC 22 MAXIMUM [162M] OR ASTM A182 GRADE F316/F316L / 1.4401/1.4404 EN 10222-5		
B008	Metal Seal [5]	HARDENED ASTM A638 GRADE 660 PTFE COATED		HARDENED ASTM A638 GRADE 660 SILVER COATED [10]
B009	Bonnet Flange [5] [6]	ASTM A351 GRADE CF8M / EN 1.4408 OR ASTM A182 GRADE F316/ EN 1.4401		
		ASTM A351 GRADE CF3M /EN 14408 C:0.03/14409 HRC 22 MAXIMUM OR ASTM A182 GRADE F316/F316L / 1.4401/1.4404 EN 10222-5		
B014	Body Stud Nuts	ASTM A194 GRADE 2H - ZINC PLATING [7] (NON-EXPOSED)		
		ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING (ASTM+PED) [8] [9] (EXPOSED)		
B015	Bonnet Gasket	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER		
B017	Yoke Clamping Nut	LOW CARBON STEEL DICHROMATE ZINC PLATED		
B102	Seat Ring [3]	HARDFACING STELLITE NO. 6 ON 316 STAINLESS STEEL		
B103	Seat Ring / Liner Gaskets	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER		
B106	Liner	ASTM A479 TYPE XM-19		
	Liner High Pressure Drop	ASTM A479 TYPE XM-19 - HRC 35 MAXIMUM. HARDNESS COMPLIANCE WITH NACE MR0103 SHALL BE CERTIFIED + KOLSTERISATION K33 OR S3PA		
B112	Plug (Balanced)	STAINLESS STEEL TYPE 630 H1150M WITH CHROMEPLATE		
	Plug (Unbalanced)	STAINLESS STEEL TYPE 630 H1150M WITH CHROMEPLATE		
	Plug (Balanced and unbalanced High Pressure Drop)	STAINLESS STEEL TYPE 630 H1150M HRC 33 MAXIMUM. HARDNESS COMPLIANCE WITH NACE MR0103 & MR0175 SHALL BE CERTIFIED + KOLSTERIZING KDUPLEX OR S3PM		
B117	Seal Retainer [1]	SOLUTION ANNEALED 316 STAINLESS STEEL		
B118	Balance Seal [1] [2] [4]	PRESSURE ENERGIZED POLYMERIC		
B120	Stem	ASTM A479 TYPE XM-19		
B200	Packing Flange Studs	ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING		
B201	Packing Flange Nuts	ASTM A194 GRADE 2HM ELECTROLESS NICKEL PLATING		
B206	Packing Set	CARBON CORE BRAIDED PTFE		
B212	Packing Follower	316L STAINLESS STEEL		
B213	Packing Flange	SOLUTION ANNEALED 316L STAINLESS STEEL		
B903	Plug Pin	SOLUTION ANNEALED 316 STAINLESS STEEL		

1. The seal and retainer are not required for 1" (DN 25) size.
2. The balance seal is not required for the unbalanced construction.
3. Seat is integral with liner on 1" (DN 25) and 1 1/2" (DN 40) valves.
4. See table on page 5 for pressure and temperature limits.
5. 3" (DN 80) - 8" (DN 200) valves.
6. Bonnet and Bonnet Flange can be manufactured from either casting or forging.
7. NACE Non-Exposed (Class III.
8. NACE Exposed (Class I & II).
9. Bolting must be checked by the engineering department.
10. Material with silver plate is not applicable to nuclear application.

Materials of Construction

Cryogenic Construction

Valve size 1" to 8" (DN 25 to 200) ASME Class 600-2500

Ref. No.	Temperature Range	-320°F (-196°C) 212°F (100°C)
	Description	Standard Materials
B001	Body	ASTM A351 GRADE CF8M / EN 1.4408 [5] OR ASTM A182 GRADE F316/ EN 1.4401
B002	Body Studs [5]	ASTM A193 Grade B8 Class 2 (ASTM + PED) OR ASTM A453 Grade 660 Class A OR B (ASTM + PED)
B003	Bonnet [4]	ASTM A351 GRADE CF8M / EN 1.4408 [5] OR ASTM A182 GRADE F316/ EN 1.4401 [5]
B008	Metal Seal [3]	HARDENED ASTM A638 GRADE 660 with PTFE COAT
B009	Bonnet Flange [3] [4]	ASTM A351 GRADE CF8M / EN 1.4408 [5] OR ASTM A182 GRADE F316/ EN 1.4401
B014	Body Stud Nuts [5]	ASTM A 194 GRADE 8 (ASTM+PED) OR ASTM A453 Grade 660 Class A OR B (ASTM + PED)
B015	Bonnet Gasket	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER
B017	Yoke Clamping Nut	LOW CARBON STEEL DICHROMATE ZINC PLATED
B102	Seat Ring [2]	HARDFACING STELLITE NO. 6 ON 316 STAINLESS STEEL
B103	Seat Ring / Liner Gaskets	316L STAINLESS STEEL SPIRAL WOUND GASKET WITH GRAPHITE FILLER
B106	Liner	CHROMIUM PLATED SOLUTION ANNEALED 316 STAINLESS STEEL
B112	Plug (Unbalanced)	HARDFACING STELLITE NO. 6 ON 316 STAINLESS STEEL
		HARDFACING STELLITE NO. 6 ON ASTM A479 TY XM-19 STAINLESS STEEL
B117	Seal Retainer [1]	SOLUTION ANNEALED 316 STAINLESS STEEL
B118	Balance Seal	UNBALANCED
B120	Stem	SOLUTION ANNEALED 316 STAINLESS STEEL
		HARDENED ASTM A638 GRADE 660
B200	Packing Flange Studs	ASTM A193 GRADE B8 CLASS 2
B201	Packing Flange Nuts	ASTM A194 GRADE 8
B206	Packing Set	CARBON CORE BRAIDED PTFE
B212	Packing Follower	SOLUTION ANNEALED 316L STAINLESS STEEL
B213	Packing Flange	SOLUTION ANNEALED 316L STAINLESS STEEL
B903	Plug Pin	SOLUTION ANNEALED 316 STAINLESS STEEL

1. The retainer is not required for 1" (DN 25) size.
2. Seat is integral with liner on 1" (DN 25) and 1 1/2" (DN 40) valves.
3. 3" (DN 80) - 8" (DN 200) valves.
4. Bonnet and bonnet flange can be manufactured from either casting or forging.
5. Bolting must be checked by the engineering department.

Materials of Construction

78400/18400 Series Optional Materials

Ref. No.	Temperature Range	-20°F (-29°C)	450°F (232°C)	600°F (316°C)
	Description	Standard Materials		
B001	Valve Body [5]	316 STAINLESS STEEL ASTM A351 GRADE CF8M OR ASTM A182 GRADE F316 (FORGING)		
		CHROME-MOLY STEEL ASTM A217 GRADE WC9 OR ASTM A182 GRADE F22 (FORGING)		
B003	Valve Bonnet [5]	316 STAINLESS STEEL ASTM A351 GRADE CF8M		
		CHROME-MOLY STEEL ASTM A217 GRADE WC9		
B102	Seat Ring - Soft [6]	SEAT RING: STAINLESS STEEL TYPE 630 H1150M		
		SEAT INSERT: FLUOROGOLD		
		SLIDING COLLAR: STAINLESS STEEL TYPE 630 H1150M		
B112	Plug [2]	440B OR 440C STAINLESS STEEL ASTM A276		
B206	Packing Set [3]	LOW-E PACKING[4]		
		PTFE WITH CARBON FIBER		
		FLEXIBLE GRAPHITE		

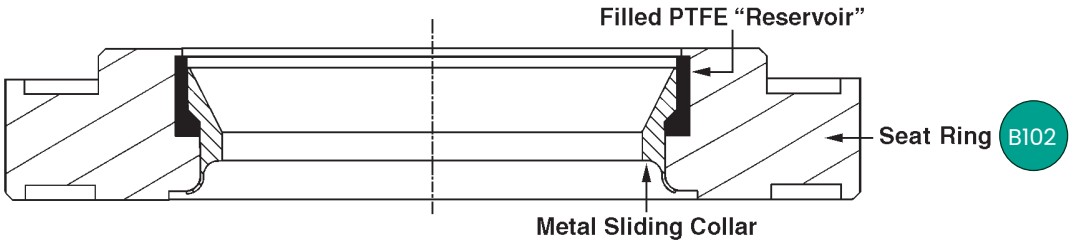
1. Consult Baker Hughes for material combinations for temperatures below –20°F (-29°C) or above 600°F (316°C).
2. Optional plug designs using hardened 440B or 440C requires stems with male threads and plugs with female threads.
3. Teflon-based packing can also be applied up to 600°F (316°C) with an extension bonnet.
4. Low-E Packing for low emissions applications is limited to maximum operating pressure of 1500 psig (104 bar).
5. Consult factory for trim material requirements for 316 St. St. body and bonnet assemblies relative to application service conditions.
6. 2" [DN 50] - 8" [DN 200] valves, limited to 3000 psi [206 bar].

Review use of optional materials and configurations for temperature ranges indicated. Standard materials listed may still be applicable depending on specific service conditions. Consult Baker Hughes for appropriate material combinations.

Soft seat design

The LincolnLog is available with an optional soft seat design in valve sizes 2” to 8” (DN 50 to DN 200) providing bubble tight Class VI shutoff seat leakage. This soft seat design includes a patented sliding metal collar feature as shown below.

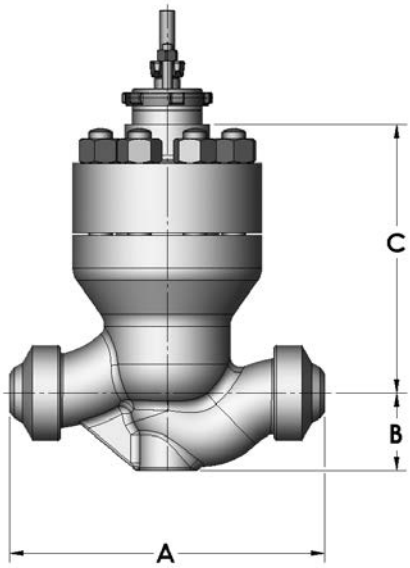
The metal collar holds the PTFE soft seat element in place and prevents it from extruding out during operation. Fluid pressure acts to push the collar up to protect the elastomer seat as the valve is throttling. As the valve plug returns to the closed position, it moves the metal collar down to expose the filled PTFE “Reservoir” creating the soft seat interface. Combined with the LincolnLog trim overlap feature, the soft seat design will provide long-term dependable tight shutoff with minimal maintenance. The filled PTFE “Reservoir” will also compensate for any potential wear in the seating surfaces.



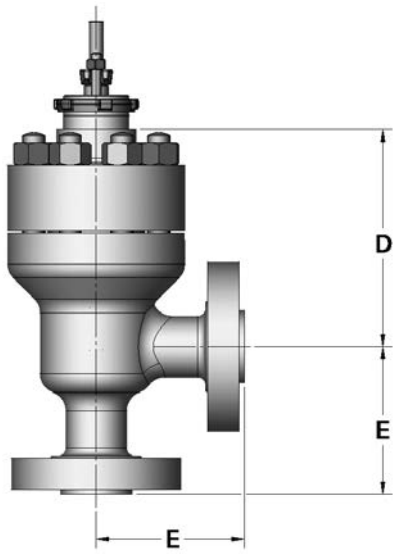
Soft Seat Option

Dimensions (inches)

Cast Globe Style



Cast Angle Style



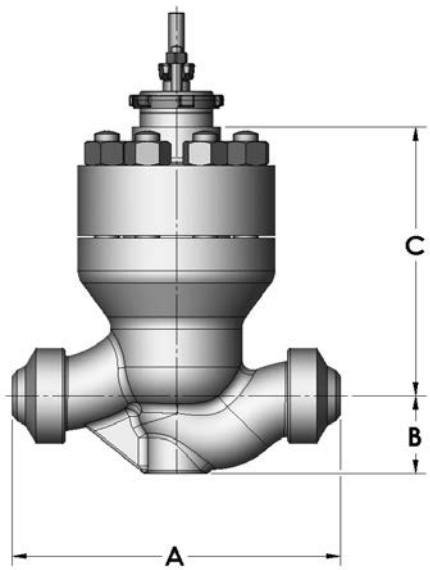
18400/78400 Series Cast Body Dimensions (inches)
ASME Class 600 through 2500 and equivalent PN

Valve Size (inches)	A													
	ASME Class 600-900		ASME Class 1500		ASME Class 2500		ASME Class 600		ASME Class 900		ASME Class 1500		ASME Class 2500	
	BW	SW and THD	BW	SW and THD	BW	SW and THD	RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ
1	7.75	7.75	7.75	7.75	8.50	8.50	11.50	11.50	11.50	11.50	11.50	11.50	12.12	12.12
1.5	9.25	9.25	9.25	9.25	10.25	10.25	12.25	12.25	12.25	12.25	12.25	12.25	14.12	14.12
2	14.75	14.75	14.75	14.75	14.75	14.75	14.75	14.87	14.75	14.87	14.75	14.87	16.25	16.37
3	17.38	-	18.12	-	19.62	-	17.38	17.50	17.38	17.50	18.12	18.24	19.62	19.75
4	20.12	-	20.87	-	22.62	-	20.12	20.25	20.12	20.25	20.87	21.00	29.00	29.38
6	30.25	-	30.25	-	32.25	-	30.25	30.37	30.25	30.37	30.25	30.62	32.25	32.75
8	32.75	-	32.75	-	40.25	-	36.00	36.12	36.00	36.12	38.25	38.62	40.25	40.87

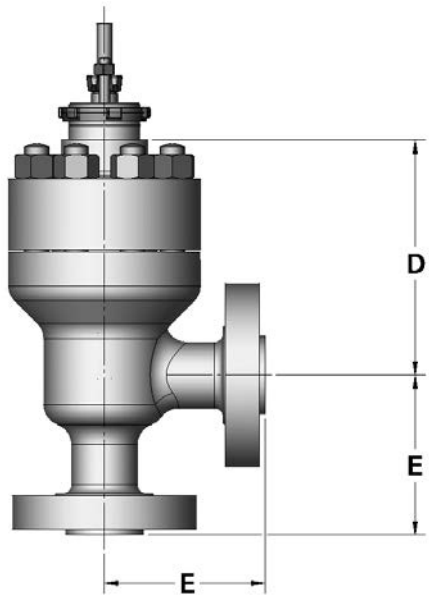
Valve Size (inches)	B							
	ASME Class 600-1500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	1.97	1.97	1.97	1.97	2.44	2.94	2.94	3.13
1.5	2.62	2.62	2.62	2.62	3.06	3.50	3.50	4.00
2	3.64	3.64	3.64	3.64	3.25	4.25	4.25	4.63
3	5.31	-	5.37	-	4.13	4.75	5.25	6.00
4	6.28	-	7.07	-	5.37	5.75	6.12	7.00
6	8.94	-	8.94	-	7.00	7.50	7.75	9.50
8	10.63	-	10.63	-	8.25	9.25	9.50	10.87

Dimensions (inches)

Cast Globe Style



Cast Angle Style



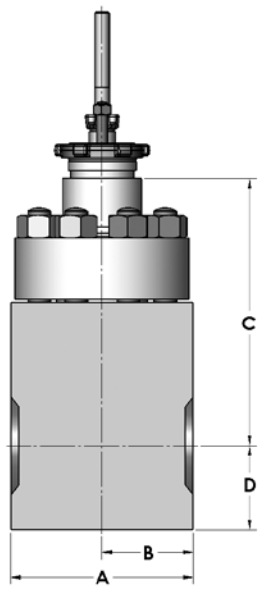
18400/78400 Series Cast Body Dimensions (inches)
ASME Class 600 through 2500 and equivalent PN

Valve Size (inches)	C				D			
	Standard Bonnet		Extension Bonnet		Standard Bonnet		Extension Bonnet	
	ASME Class 600-2500		ASME Class 600-2500		ASME Class 600-2500		ASME Class 600-2500	
	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage
1	8.50	9.88	12.52	13.90	7.13	8.50	11.14	12.52
1.5	8.44	9.82	12.46	13.83	7.13	8.50	11.14	12.52
2	12.56	14.69	17.70	19.82	10.85	12.98	15.98	18.11
3	16.62	19.86	22.30	25.55	14.11	17.36	19.79	23.05
4	19.69	23.70	24.63	28.63	15.94	19.94	20.88	24.88
6	25.48	30.98	29.48	34.98	19.91	25.41	23.91	29.41
8	30.17	36.52	33.69	40.03	23.88	30.22	27.39	33.74

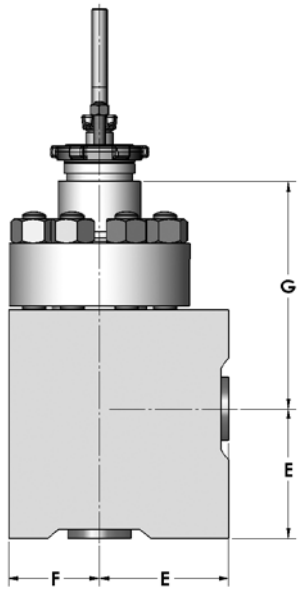
Valve Size (inches)	E													
	ASME Class 600-900		ASME Class 1500		ASME Class 2500		ASME Class 600		ASME Class 900		ASME Class 1500		ASME Class 2500	
	BW	SW and THD	BW	SW and THD	BW	SW and THD	RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ
1	3.87	3.87	3.87	3.87	4.25	4.25	5.75	5.75	5.75	5.75	5.75	5.75	6.06	6.06
1.5	4.63	4.63	4.63	4.63	5.13	5.13	6.13	6.13	6.13	6.13	6.13	6.13	7.06	7.12
2	7.38	7.38	7.38	7.38	7.38	7.38	7.38	7.44	7.38	7.44	7.38	7.44	8.13	8.19
3	8.69	–	9.06	–	9.81	–	8.69	8.75	8.69	8.75	9.06	9.12	9.81	9.87
4	10.06	–	10.44	–	11.31	–	10.06	10.13	10.06	10.13	10.44	10.50	14.50	14.68
6	15.13	–	15.13	–	16.13	–	15.13	15.19	15.13	15.19	15.13	15.31	16.13	16.37
8	16.37	–	16.37	–	20.13	–	18.00	18.06	18.00	18.06	19.13	19.31	20.13	20.44

Dimensions (inches)

Forged Globe Style



Forged Angle Style



18400F Series Forged Globe Style Body Dimensions (inches)
ASME Class 600 through 2500 and equivalent PN

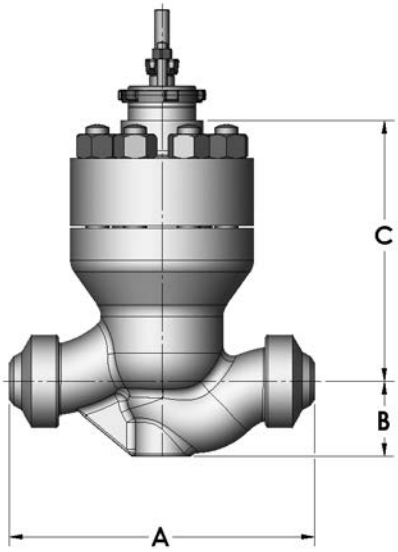
Valve Size (inches)	A		B		C				D	
	ASME Class 600-2500		ASME Class 600-2500		Standard Bonnet		Extension Bonnet		ASME Class 600-2500	
					ASME Class 600-2500		ASME Class 600-2500			
	RF, RTJ and BW	SW and THD	RF, RTJ and BW	SW and THD	3 and 4 STAGE	6 STAGE	3 and 4 STAGE	6 STAGE	RF, RTJ and BW	SW and THD
1	6.00	6.00	3.00	3.00	8.82	10.20	11.26	14.22	2.78	2.78
1.5	8.50	8.50	4.25	4.25	9.61	10.98	13.62	15.00	3.49	3.49
2	10.00	10.00	5.00	5.00	13.43	15.55	18.56	20.69	3.76	3.76
3	13.50	–	6.75	–	18.18	21.43	23.85	27.10	5.59	–
4	18.00	–	9.00	–	21.70	25.70	26.63	30.64	6.25	–
6	24.00	–	12.00	–	28.87	34.37	32.86	38.36	8.73	–
8	36.00	–	18.00	–	33.67	40.02	37.19	43.53	10.50	–

78400F Series Forged Angle Style Body Dimensions (inches)
ASME Class 600 through 2500 and equivalent PN

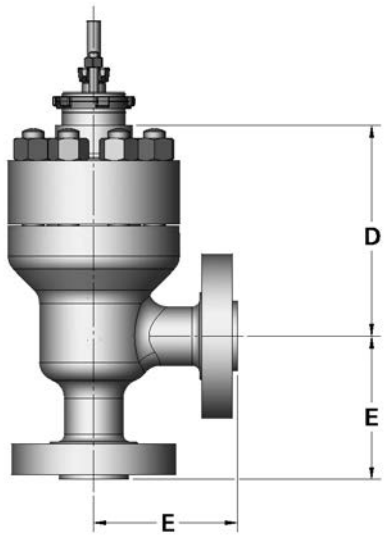
Valve Size (inches)	E		F		G			
	ASME Class 600-2500		ASME Class 600-2500		Standard Bonnet		Extension Bonnet	
					ASME Class 600-2500		ASME Class 600-2500	
	RF, RTJ and BW	SW and THD	RF, RTJ and BW	SW and THD	3 and 4 STAGE	6 STAGE	3 and 4 STAGE	6 STAGE
1	4.12	4.12	2.89	2.89	7.24	8.62	11.26	12.63
1.5	4.94	4.94	3.56	3.56	7.15	8.53	11.17	12.55
2	5.75	5.75	4.49	4.49	10.61	12.36	15.57	17.50
3	7.50	–	53.50	–	13.61	16.88	19.32	22.59
4	9.00	–	6.50	–	15.95	19.95	20.89	24.89
6	12.00	–	8.50	–	18.60	24.11	22.59	28.11
8	14.00	–	10.25	–	24.70	31.04	28.22	34.56

Dimensions (mm)

Cast Globe Style



Cast Angle Style



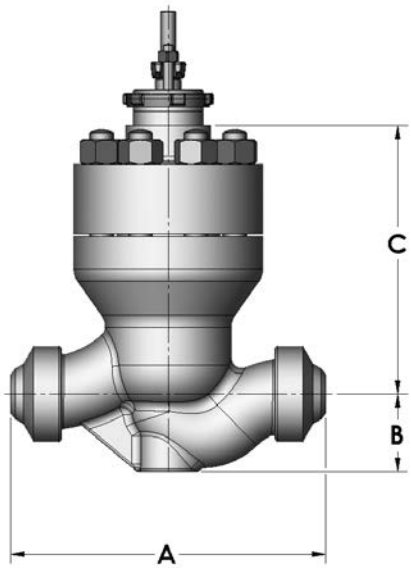
18400/78400 Series Cast Body Dimensions (mm)
ASME Class 600 through 2500 and equivalent PN

Valve Size (inches)	A													
	ASME Class 600-900				ASME Class 2500				ASME Class 900		ASME Class 1500		ASME Class 2500	
	BW	SW and THD	BW	SW and THD	BW	SW and THD	RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ
1	197	197	197	197	216	216	292	292	292	292	292	292	308	308
1.5	235	235	235	235	260	260	311	311	311	311	311	311	359	359
2	375	375	375	375	375	375	375	378	375	378	375	378	413	416
3	441	–	460	–	498	–	441	455	441	445	460	463	498	502
4	511	–	530	–	575	–	511	514	511	514	530	533	737	746
6	768	–	769	–	819	–	768	771	768	771	768	778	819	832
8	832	–	832	–	1022	–	914	917	914	917	972	981	1022	1038

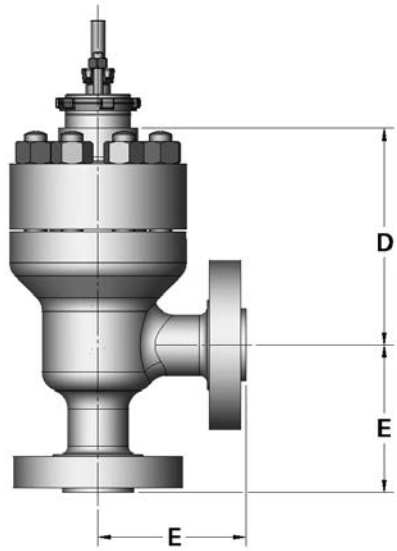
Valve Size (inches)	B							
	ASME Class 600-2500		ASME Class 600-2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	50	50	50	50	62	75	75	80
1.5	67	67	67	67	78	89	89	102
2	92	92	92	92	83	108	108	118
3	135	–	136	–	105	121	133	152
4	160	–	180	–	136	146	155	178
6	227	–	227	–	178	191	197	241
8	270	–	270	–	210	235	241	276

Dimensions (mm)

Cast Globe Style



Cast Angle Style



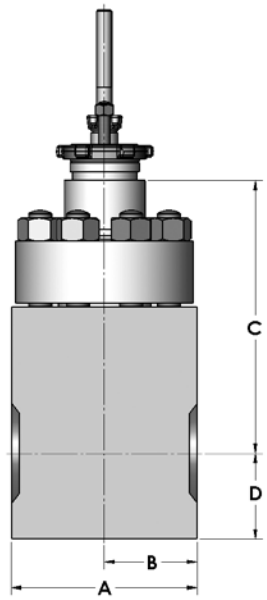
18400/78400 Series Cast Body Dimensions (mm)
ASME Class 600 through 2500 and equivalent PN

Valve Size (inches)	C				D			
	Standard Bonnet		Extension Bonnet		Standard Bonnet		Extension Bonnet	
	ASME Class 600-2500		ASME Class 600-2500		ASME Class 600-2500		ASME Class 600-2500	
	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage
1	216	251	318	353	181	216	283	318
1.5	214	249	316	351	181	216	283	318
2	319	373	450	503	276	330	406	460
3	422	504	566	649	358	441	503	585
4	500	602	626	727	405	506	530	632
6	647	787	749	888	506	645	607	747
8	766	928	856	1017	607	768	696	857

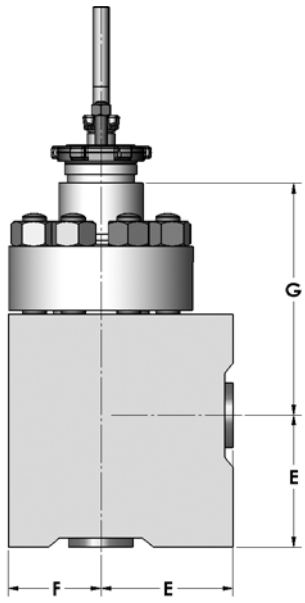
Valve Size (inches)	E													
	ASME Class 600-900		ASME Class 1500		ASME Class 2500		ASME Class 600		ASME Class 900		ASME Class 1500		ASME Class 2500	
	BW	SW and THD	BW	SW and THD	BW	SW and THD	RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ
1	98	98	98	98	108	108	146	146	146	146	146	146	154	154
1.5	118	118	118	118	130	130	156	156	156	156	156	156	179	181
2	187	187	187	187	187	187	187	189	187	189	187	189	207	208
3	221	–	230	–	249	–	221	222	221	222	230	232	249	251
4	256	–	265	–	287	–	256	257	256	257	265	267	368	373
6	384	–	384	–	410	–	384	386	384	386	384	389	410	416
8	416	–	416	–	511	–	457	459	457	459	486	490	511	519

Dimensions (mm)

Forged Globe Style



Forged Angle Style



18400F Series Forged Globe Style Body Dimensions (mm)
ASME Class 600 through 2500 and equivalent PN

Valve Size (inches)	A		B		C				D	
	ASME Class 600-2500		ASME Class 600-2500		Standard Bonnet		Extension Bonnet		ASME Class 600-2500	
					ASME Class 600-2500		ASME Class 600-2500			
	RF, RTJ and BW	SW and THD	RF, RTJ and BW	SW and THD	3 and 4 STAGE	6 STAGE	3 and 4 STAGE	6 STAGE	RF, RTJ and BW	SW and THD
1	152	152	76	76	224	259	286	361	71	71
1.5	216	216	108	108	244	279	346	381	89	89
2	254	254	127	127	341	395	471	526	96	96
3	343	–	171	–	462	544	606	688	142	–
4	457	–	229	–	551	653	676	778	159	–
6	610	–	305	–	733	873	835	974	222	–
8	914	–	457	–	855	1017	945	1106	267	–

78400F Series Forged Angle Style Body Dimensions (mm)
ASME Class 600 through 2500 and equivalent PN

Valve Size (inches)	E		F		G			
	ASME Class 600-2500		ASME Class 600-2500		Standard Bonnet		Extension Bonnet	
					ASME Class 600-2500		ASME Class 600-2500	
	RF, RTJ and BW	SW and THD	RF, RTJ and BW	SW and THD	3 and 4 STAGE	6 STAGE	3 and 4 STAGE	6 STAGE
1	105	105	73	73	184	219	286	321
1.5	125	125	90	90	182	217	284	319
2	146	146	114	114	269	314	395	445
3	191	–	140	–	346	429	491	574
4	229	–	165	–	405	507	531	632
6	305	–	216	–	472	612	574	714
8	356	–	260	–	627	788	717	878

Weights (lbs)

18400 Series Cast Globe Body Sub Assembly with Standard Bonnet (lbs)

Valve Size (inches)	3 and 4 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	44	45	46	46	52	61	61	68
1.5	47	48	51	52	62	73	73	97
2	167	169	182	185	179	206	206	242
3	244	–	293	–	264	284	311	420
4	440	–	565	–	481	500	534	804
6	1104	–	1275	–	1215	1262	1332	1794
8	2204	–	2745	–	2401	2501	2661	3490

Valve Size (inches)	6 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	47	47	48	48	55	64	64	70
1.5	51	52	55	55	65	76	76	101
2	176	178	194	197	189	214	216	254
3	278	–	331	–	298	320	345	457
4	499	–	631	–	541	559	594	866
6	1287	–	1518	–	1398	1445	1514	2036
8	2513	–	3206	–	2714	2813	2966	3950

18400 Series Cast Globe Body Sub Assembly with Extension Bonnet (lbs)

Valve Size (inches)	3 and 4 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	50	51	52	52	59	67	67	74
1.5	53	54	57	57	68	78	78	103
2	185	186	198	203	197	223	223	260
3	258	–	307	–	278	298	325	434
4	461	–	585	–	503	521	556	825
6	1137	–	1307	–	1249	1296	1365	1828
8	2275	–	2815	–	2473	2572	2732	3560

Valve Size (inches)	6 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	52	53	54	54	61	70	70	76
1.5	57	57	61	61	71	82	82	107
2	194	196	210	215	207	232	232	271
3	292	–	343	–	312	334	359	472
4	525	–	651	–	566	585	619	892
6	1320	–	1550	–	1431	1478	1548	2070
8	2584	–	3278	–	2785	2884	3036	4020

Weights (lbs)

78400 Series Cast Angle Body Sub Assembly with Standard Bonnet (lbs)

Valve Size (inches)	3 and 4 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	42	44	43	44	51	60	60	66
1.5	46	48	48	49	60	71	71	94
2	159	164	172	176	172	197	198	233
3	230	–	272	–	250	269	297	405
4	421	–	457	–	462	481	516	750
6	1029	–	1114	–	1140	1187	1256	1691
8	2070	–	2423	–	2271	2370	2530	3354

Valve Size (inches)	6 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	45	46	46	46	53	62	62	69
1.5	49	51	52	52	64	74	74	98
2	169	174	183	187	182	208	208	244
3	264	–	310	–	284	304	331	443
4	481	–	543	–	522	540	576	815
6	1214	–	1355	–	1322	1369	1442	1934
8	2382	–	2882	–	2583	2682	2843	3814

78400 Series Cast Angle Body Sub Assembly with Extension Bonnet (lbs)

Valve Size (inches)	3 and 4 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	48	50	49	50	57	65	65	72
1.5	51	53	54	54	66	76	76	100
2	177	180	190	194	189	215	215	250
3	242	–	287	–	264	284	311	419
4	443	–	495	–	484	502	538	770
6	1063	–	1145	–	1173	1220	1290	1725
8	2141	–	2493	–	2342	2441	2601	3425

Valve Size (inches)	6 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	51	52	52	52	59	68	68	74
1.5	55	56	57	58	69	80	80	104
2	187	189	201	205	199	225	225	262
3	276	–	325	–	298	318	345	457
4	506	–	563	–	547	565	600	841
6	1247	–	1390	–	1356	1403	1475	1967
8	2453	–	2952	–	2654	2754	2914	3884

Weights (kg)

18400 Series Cast Globe Body Sub Assembly with Standard Bonnet (kg)

Valve Size (inches)	3 and 4 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	20	20	21	21	24	28	28	31
1.5	21	22	23	24	28	33	33	44
2	76	77	83	84	81	94	94	110
3	111	–	134	–	120	129	141	191
4	200	–	258	–	218	227	242	364
6	501	–	578	–	552	573	605	814
8	1001	–	1246	–	1090	1135	1208	1582

Valve Size (inches)	6 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	21	21	22	22	25	29	29	32
1.5	23	24	25	25	30	35	35	46
2	80	81	88	89	86	97	98	115
3	126	–	151	–	135	145	157	207
4	227	–	287	–	246	254	270	393
6	584	–	688	–	635	656	687	924
8	1141	–	1455	–	132	1277	1347	1791

18400 Series Cast Globe Body Sub Assembly with Extension Bonnet (kg)

Valve Size (inches)	3 and 4 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	23	3	24	24	27	30	30	34
1.5	24	36	26	26	31	35	35	47
2	84	84	90	92	89	101	101	118
3	117	–	140	–	126	135	148	198
4	209	–	268	–	228	237	252	373
6	516	–	594	–	567	588	620	829
8	1033	–	1278	–	1123	1168	1240	1614

Valve Size (inches)	6 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	24	24	25	25	28	32	32	35
1.5	26	26	28	28	32	37	37	49
2	88	89	95	98	94	105	105	123
3	133	–	157	–	142	163	163	214
4	238	–	297	–	257	281	281	405
6	599	–	703	–	650	703	703	940
8	1173	–	1490	–	1264	1378	1378	1823

Weights (kg)

78400 Series Cast Angle Body Sub Assembly with Standard Bonnet (kg)

Valve Size (inches)	3 and 4 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	19	20	20	20	23	27	27	30
1.5	21	22	22	22	27	32	32	43
2	72	74	78	80	78	89	90	106
3	104	–	124	–	114	122	135	184
4	191	–	216	–	210	218	234	341
6	467	–	506	–	518	539	570	767
8	940	–	1098	–	1031	1076	1149	1521

Valve Size (inches)	6 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	20	21	21	21	24	28	28	31
1.5	22	23	24	24	29	34	34	44
2	77	79	83	85	83	94	94	111
3	120	–	141	–	129	138	150	210
4	218	–	245	–	237	245	262	370
6	551	–	615	–	600	622	655	877
8	1081	–	1308	–	1173	1218	1291	1730

78400 Series Cast Angle Body Sub Assembly with Extension Bonnet (kg)

Valve Size (inches)	3 and 4 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	22	23	22	23	26	30	30	33
1.5	23	24	25	25	30	35	35	45
2	80	82	86	88	86	98	98	114
3	110	–	131	–	120	129	141	191
4	201	–	226	–	220	228	244	350
6	483	–	520	–	533	554	586	773
8	972	–	1130	–	1063	1108	1181	1553

Valve Size (inches)	6 Stage Design							
	ASME Class 600-2500		ASME Class 2500		ASME Class 600	ASME Class 900	ASME Class 1500	ASME Class 2500
	BW	SW and THD	BW	SW and THD	RF and RTJ	RF and RTJ	RF and RTJ	RF and RTJ
1	23	24	24	24	27	31	31	34
1.5	25	25	26	26	31	36	36	47
2	85	86	91	93	90	102	102	119
3	125	–	147	–	135	144	157	207
4	230	–	256	–	248	257	272	381
6	566	–	631	–	616	637	670	892
8	1114	–	1340	–	1205	1250	1323	1762

Weights (lbs and kg)

18400F Series Forged Globe Body Sub Assembly

Valve Size (inches)	Weight (lbs)				Weight (kg)			
	Standard Bonnet		Extension Bonnet		Standard Bonnet		Extension Bonnet	
	ASME Class 600-2500		ASME Class 600-2500		ASME Class 600-2500		ASME Class 600-2500	
	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage
1	86	98	92	104	39	44	42	47
1.5	156	178	162	184	71	81	74	84
2	344	392	362	410	156	178	164	186
3	748	874	762	886	340	397	346	402
4	1402	1636	1424	1658	637	743	646	753
6	3212	3764	3242	3790	1458	1709	1472	1721
8	6960	8086	7031	8132	3160	3671	3192	3692

78400F Series Forged Angle Body Sub Assembly

Valve Size (inches)	Weight (lbs)				Weight (kg)			
	Standard Bonnet		Extension Bonnet		Standard Bonnet		Extension Bonnet	
	ASME Class 600-2500		ASME Class 600-2500		ASME Class 600-2500		ASME Class 600-2500	
	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage	3 and 4 Stage	6 Stage
1	96	110	102	116	44	50	46	53
1.5	140	162	150	167	64	74	68	76
2	330	374	350	390	150	170	159	177
3	626	746	640	758	284	339	291	344
4	1060	1264	1082	1286	481	574	491	584
6	2120	2584	2154	2610	962	1173	978	1185
8	4050	4734	4122	4802	1839	2149	1871	2180

Accessories and options

- Extension Bonnets
- Environmental Capabilities (Low-E Packing)
- Lubricator and Isolation Valve
- Other Flange Facings
- Limit Stops
- Body Drain Plug
- Reducer and Nipple Connections
- U.O.P. Trim Materials
- High Temperature Materials
- Cryogenic Service Materials
- Electric Actuators

For additional accessories and options, consult Baker Hughes.

Appendix A:
Available Engineered to Order Trim

The trim configurations in the tables below are available upon request in addition to our standard trim configuration offering.

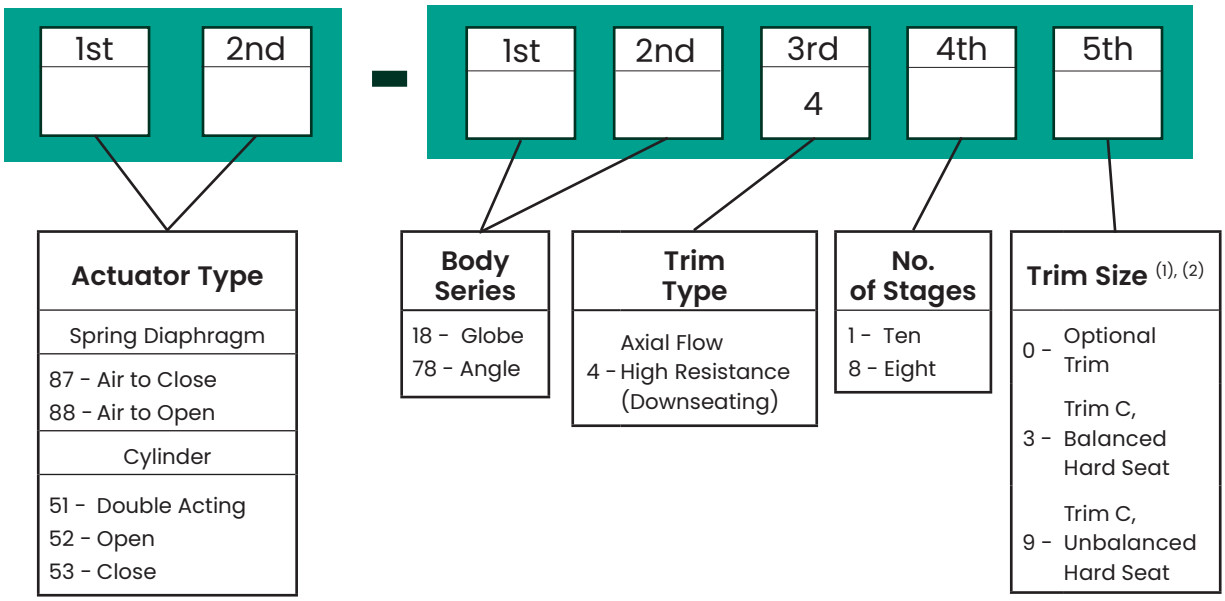
4 Stage Design		Flow Charcteristic : Modified Linear							
Valve Size		Orifice Diameter		Travel		Trim		Min Cont.	Remarks
inches	DN	inches	mm	inches	mm	C_V	F_L	C_V	
1	25	0.2	5.08	0.125	3.175	0.1	0.991	0.04	Flow to Close, Trim C
1	25	0.375	9.525	0.25	6.35	0.2	0.996	0.04	Flow to Close, Trim A
1	25	0.5	12.7	0.25	6.35	0.4	0.996	0.04	Trim A
1	25	0.5	12.7	0.25	6.35	0.6	0.991	0.04	Trim C

6 Stage Design		Flow Charcteristic : Modified Linear							
Valve Size		Orifice Diameter		Travel		Trim		Min Cont.	Remarks
inches	DN	inches	mm	inches	mm	C_V	F_L	C_V	
1	25	0.12	3.048	0.125	3.175	0.02	0.998	0.004	Flow to Close, Trim A
1	25	0.2	5.08	0.125	3.175	0.04	0.998	0.008	Flow to Close, Trim A
1	25	0.2	5.08	0.125	3.175	0.08	0.994	0.016	Flow to Close, Trim C
1	25	0.3	7.62	0.25	6.35	0.2	0.994	0.03	Flow to Close, Trim C
1	25	0.5	12.7	0.25	6.35	0.3	0.998	0.024	Trim A
1	25	0.5	12.7	0.25	6.35	0.4	0.998	0.03	Trim A
1	25	0.5	12.7	0.25	6.35	0.5	0.994	0.03	Trim C

Appendix B:
78400/18400 API 6A Series LincolnLog

The 78400/18400 API 6A Series severe service control valves are designed to meet API 6A standard for high pressure applications.

Numbering system



Notes:

1. Balanced Trim not available for 1" 78400/18400 API 6A Series valves.
2. Unbalanced Trim not available for 1.5", 2", 3", 4" and 6" 78400/18400 API 6A Series valves.

General Information

Body:

- Type:
  - Forged Globe Body
  - Forged Angle Body
- Materials:
  - F6NM Martensitic Stainless Steel
  - F51 Duplex Stainless Steel
  - F55 Duplex Stainless Steel
  - Nickel-Alloy Inconel 718

Trim

- Plug Type:
  - Balanced
  - Unbalanced
- Trim Type:
  - C
- Capacity:
  - Full Area
  - Reduced Area C_V 0.4 (1" Size Only)
  - Reduced Area C_V 0.2 (1" Size Only)
- C_V Ratio:
  - See "Staging Ratios and Pressure Drop Guidelines" Tables
- Flow Characteristic:
  - Modified Linear

Actuator

- Type:
  - Spring Diaphragm (standard 87/88) or Cylinder (51/52/53)
- Handwheel
  - Optional

API 6A Temperature Ratings and Seat Leakage

Temp. Class	Temperature Range (1)(2)				Seat Leakage Class IEC 60534-4 / ANSI/FCI 70-2	
	°C		°F			
	Min.	Max.	Min.	Max.		
K	-60	82	-75	180	IV	V
L	-46	82	-50	180		
N	-46	60	-50	140		
P	-29	82	-20	180		
S	-18	60	0	140		
T	-18	82	0	180		
U	-18	121	0	250		
V	2	121	35	250		
X	-18	180	0	350		

Notes:

1. Valve end size complies with API 6A standard for 6BX flanges.
2. For temperature rating selection, fluid temperature and ambient temperature should be compared and the minimum value of those two should be used to select the proper temperature rating.
   - If min $T°_{fluid}$ > min $T°_{ambient}$ → min $T°_{Class}$ = min $T°_{ambient}$
   - If min $T°_{fluid}$ < min $T°_{ambient}$ → min $T°_{Class}$ = min $T°_{fluid}$

Ratings / Connections

Valve end connections are designed to meet the API 6A standard for API 6BX printed flange.

Valve Body Size (in)	Valve Ends Size in (mm)	Pressure Class	
NPS	6BX (1)	API 10K (1)	API 15K (1)
1	1"-13/16 (1.8125)	X	X
1.5	1"-13/16 (1.8125)	X	X
2	2"-1/16 (2.0625)	X	X
3	3"-1/16 (3.0625)	X	X
4	4"-1/16 (4.0625)	X	X
6	7"-1/16 (7.0625)	X	X

1. API 6BX printed flanges are standard. Consult factory for availability of other end connection options.

C_V and F_L Versus Travel

API 6A 10K and 15K

Sizes 1" to 6", 8-stage Modified Linear – Flow to Open

Travel (Percent)							10	20	30	40	50	60	70	80	90	100
						F_L	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994
Valve Body Size (NPS)		Orifice Dia.		Travel		Trim	Minimum Operable C_V	Rated C_V								
Inch	mm	inch	mm	inch	mm											
1	25.4	0.7	17.78	0.25	6.35	Full	0.019	0.071	0.18	0.32	0.46	0.67	0.88	1.11	1.28	1.34
						Micro C_V 0.4	0.014	0.043	0.06	0.11	0.17	0.22	0.29	0.35	0.41	0.47
						Micro C_V 0.2	0.012	0.019	0.03	0.06	0.09	0.11	0.14	0.16	0.19	0.21
1.5	38.1	1	25.4	0.25	6.4	Full	0.003	0.006	0.13	0.51	0.99	1.47	1.87	2.15	2.3	2.1
2	50.8	1.5	38.1	0.38	9.7	Full	0.02	0.02	0.35	0.73	1.3	2.1	2.93	3.75	4.45	5.5
3	76.2	2.25	57.2	0.62	15.47	Full	0.03	1.1	2.96	4.82	6.67	8.07	9.82	11.53	13.21	14
4	101.6	2.88	73.2	0.75	19.1	Full	0.06	0.54	2.27	4.72	7.62	10.9	14.7	16.8	19.3	21
6	152.4	4.12	104.6	1	25.4	Full	0.133	1.7	6.0	11.5	17.0	23.6	30.2	36.8	38.1	39.5

Note: Throttling at or below minimum operable Cv levels for extended periods of time can result in trim damage.

API 6A 10K and 15K

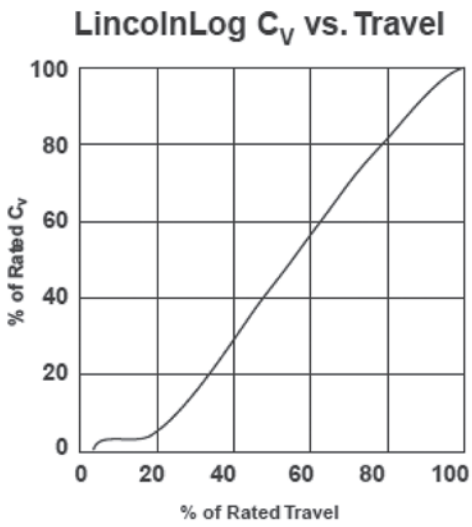
Sizes 1" to 6", 10-stage Modified Linear – Flow to Open

Travel (Percent)							10	20	30	40	50	60	70	80	90	100
						F_L	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994
Valve Body Size (NPS)		Orifice Dia.		Travel		Trim	Minimum Operable C_V	Rated C_V								
Inch	mm	inch	mm	inch	mm											
1	25.4	0.7	17.78	0.25	6.35	Full	0.016	0.07	0.17	0.31	0.44	0.63	0.81	1.00	1.10	1.19
						Micro C_V 0.4	0.011	0.02	0.05	0.09	0.14	0.19	0.25	0.30	0.36	0.41
						Micro C_V 0.2	0.009	0.02	0.03	0.05	0.07	0.09	0.12	0.14	0.16	0.19
1.5	38.1	1	25.4	0.25	6.4	Full	0.002	0.003	0.07	0.34	0.71	1.13	1.48	1.8	1.9	1.9
2	50.8	1.5	38.1	0.38	9.7	Full	0.02	0.02	0.35	0.73	1.3	2.1	2.93	3.75	4.45	4.9
3	76.2	2.25	57.2	0.62	15.47	Full	1	2.34	3.5	4.67	5.84	7.69	9.03	10.41	11.84	13
4	101.6	2.88	73.2	0.75	19.1	Full	0.06	0.73	2.42	4.71	7.38	10.41	13.7	15.81	17.5	19
6	152.4	4.12	104.6	1	25.4	Full	0.11	1.8	5.4	10.3	15.2	21.0	26.9	32.7	34.2	35.7

Note: Throttling at or below minimum operable Cv levels for extended periods of time can result in trim damage. Additional sizes are available, consult factory.

Flow Characteristics

The LincolnLog trim provides a smooth modified linear control characteristic with “clearance flow” capacity over the initial 15% of valve travel as shown in the generic chart at right. Incorporation of the multistage “clearance flow” design concept prevents high pressure drops across the LincolnLog seating area while throttling at low lifts. This feature helps to extend trim life significantly, resulting in dependable and tight shutoff whenever required. It also improves the throttling control stability and performance at low lifts, while providing smooth, accurate and continuous capacity control from 15% to 100% plug travel. Controllability extends from the Maximum Rated C_V to the Minimum Controllable C_V for any valve size resulting in typical turndown ratios of 50:1.



Staging Ratios and Pressure Drop Guidelines

Trim Type	Qty of Stages	Maximum Recommended Throttling ΔP [1]			
		Continuous Service		Intermittent Service	
		psi	bar	psi	bar
C	8	5800	400	7250	500
C	10	7400	510	9140	630

Notes:

1. Recommended limits for ΔP per stage are 800 psi (55 bar) for continuous duty cycle applications and up to 1000 psi (69 bar) ΔP per stage for intermittent service.

Staging Ratios and Pressure Drop Guidelines for Upgraded Trim [1]

Trim Type	Qty of Stages	Maximum Recommended Throttling ΔP	
		Continuous Service	
		psi	bar
C	8	7250	500
C	10	9140	630

Notes:

1. Upgraded trim includes a Kolsterised Inconel 718 plug and liner (API 6A CRA).

Materials and Temperatures

Temperature Rating versus Material of Construction

Temperature Ratings	Temperature Range[1]				Material of Construction Availability			
	Min °C	Max °C	Min °F	Max °F	Martensitic	Duplex	Super Duplex	Inconel 718
K	-60	82	-75	180	X			X
L	-46	82	-50	180	X	X	X	X
N	-46	60	-50	140	X	X	X	X
P	-29	82	-20	180	X	X	X	X
S	-18	60	0	140	X	X	X	X
T	-18	82	0	180	X	X	X	X
U	-18	121	0	250	X	X	X	X
V	2	121	35	250	X	X	X	X
X	-18	180	0	350	X	X	X	X

Note:

1. Minimum temperature of valve design is defined as the minimum between fluid temperature and ambient temperature.
   - If min $T°_{fluid}$ > min $T°_{ambient}$ → min $T°_{Class}$ = min $T°_{ambient}$
   - If min $T°_{fluid}$ < min $T°_{ambient}$ → min $T°_{Class}$ = min $T°_{fluid}$

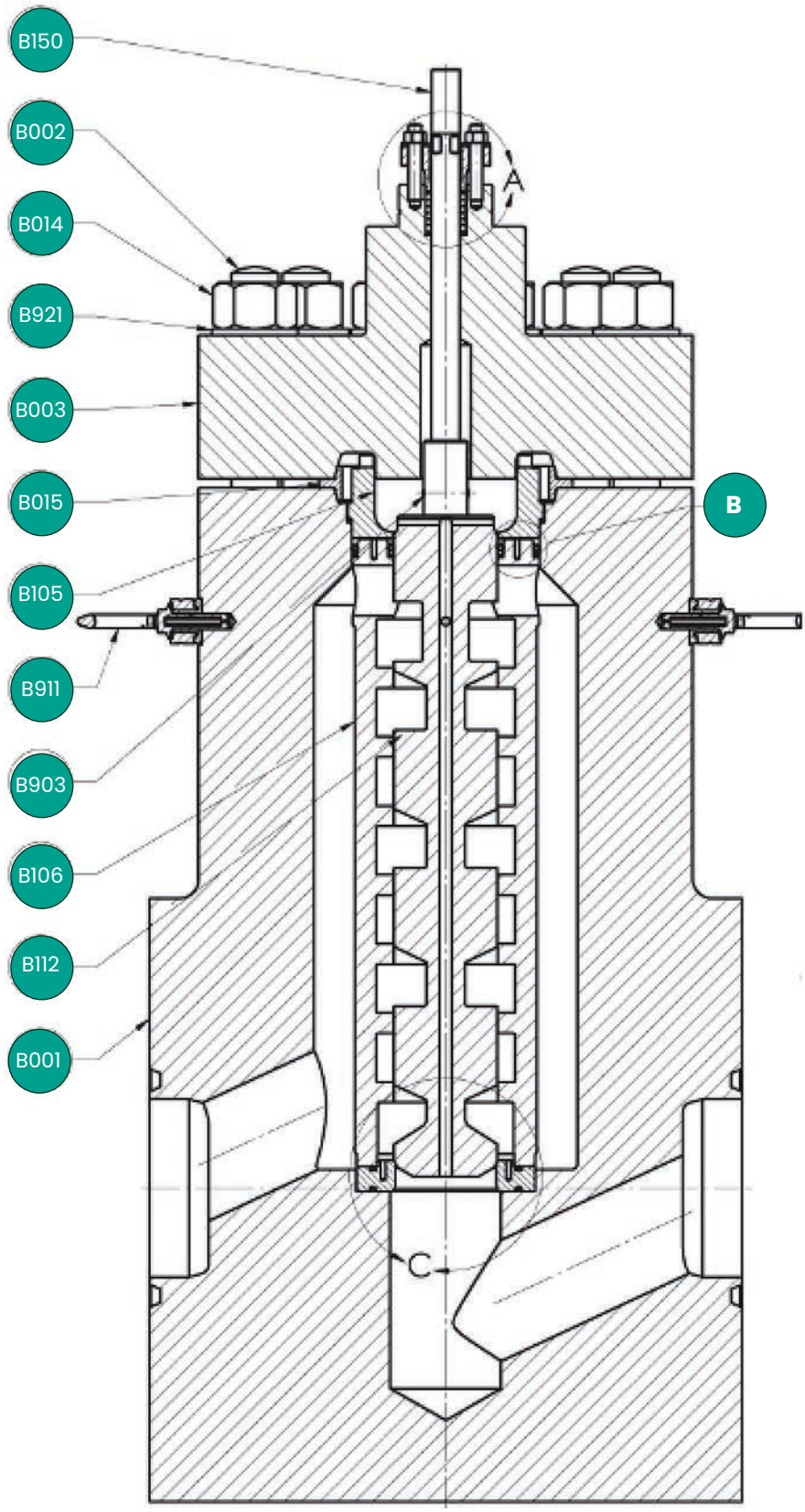
Operating Pressure versus Material of Construction

Max Operating Pressure	Max Inlet Pressure		Material of Construction Availability			
	bar	kPSI	Martensitic	Duplex	Super Duplex	Inconel 718
API 10K	690	10	X	X	X	X
API 15K	1034	15	X		X	X

Material Class versus Material of Construction

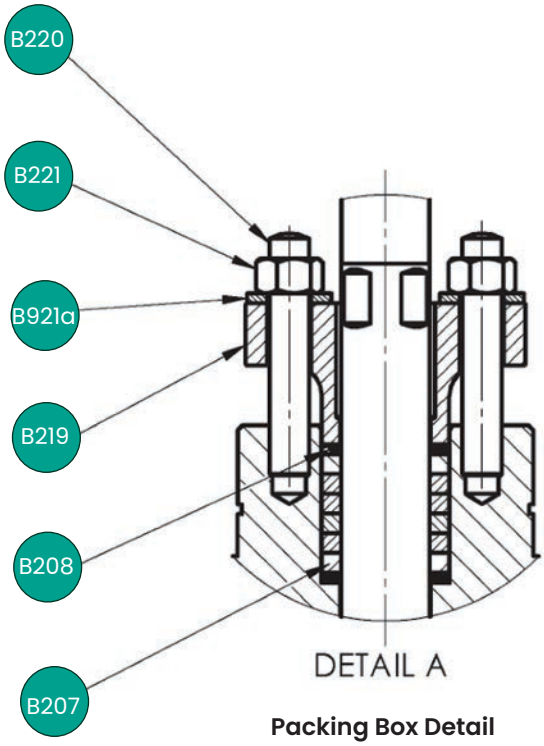
Material Class		NACE MR0175/ISO 15156	Material of Construction Availability			
			Martensitic NACE Non-Exposed	Duplex NACE Non-Exposed	Super Duplex NACE Non-Exposed	Inconel 718 NACE Non-Exposed
AA	General Service	Non-Exposed	X	X	X	X
BB	General Service	Non-Exposed	X	X	X	X
CC	General Service	Non-Exposed	X	X	X	X
Material Class		**NACE MR0175/ISO 15156**	**Material of Construction Availability**			
			Martensitic NACE Exposed	**Duplex NACE Exposed**	**Super Duplex NACE Exposed**	**Inconel 718 NACE Exposed**
DD	Sour Service	Exposed				X
EE	Sour Service	Exposed				X
FF	Sour Service	Exposed	X	X	X	X
HH	Sour Service	Exposed				X

Standard Construction Assembly

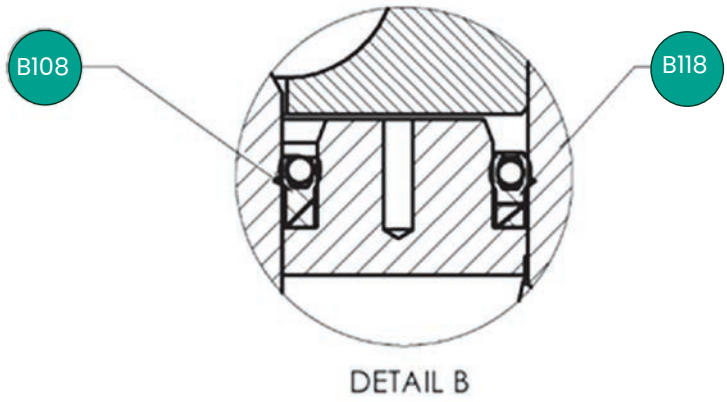


18400 Series API 6A Design

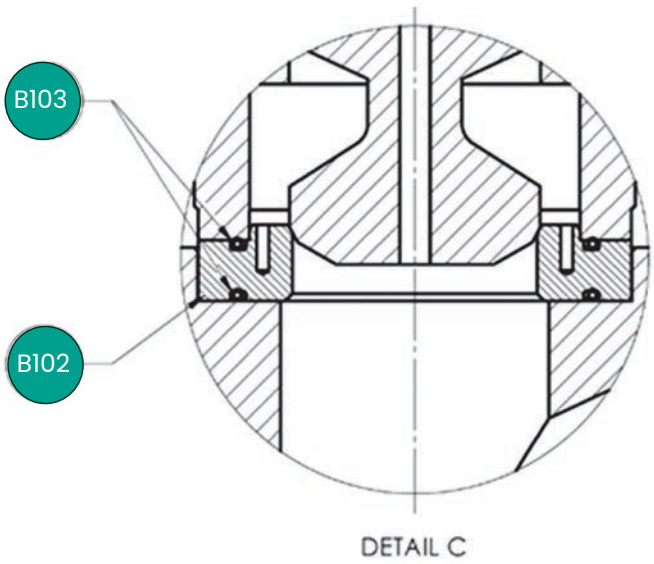
Standard Construction Assembly



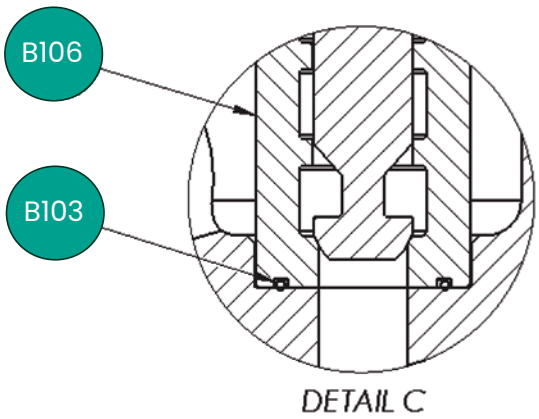
Packing Box Detail



Static and Dynamic Seals Design
(Balanced Design Only)



Seat Ring Detail - 1.5" up to 6"



Seat Ring Detail - 1"

Materials of Construction

78400/18400 API 6A Martensitic Stainless Steel Construction:

- Max operating pressure up to 15 kPSI [1034 bar]
- Temperature ratings: K/L/N/P/S/T/U/V/X (see page 35)
- Material classes: AA/BB/CC/FF (see page 35)

Ref. No.	Temperature Range	-60°C [-76°F]	29°C [20°F]	121°C [250°F]	180°C [356°F]
	Description	Materials			
B001	Valve Body	ASTM A182 GRADE F6NM			
B002	Body Stud		ASTM A193 GRADE B7 ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
			ASTM A320 Gr L7 ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
B003	Bonnet	ASTM A182 GRADE F6NM			
B014	Body Nut		ASTM A 194 GRADE 2H ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
			ASTM A194 Gr 7 ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A194 Gr 7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
B015	Body Gasket	ALLOY 718 + MOS2 COATING			
B102	Seat Ring	HARDFACING STELLITE NO. 6 ON 6NM			
B103	Seat Ring Gasket	INCONEL 718 + SILVER PLATING			
B105	Retainer	SUPER AUSTENITIC STAINLESS STEEL UNS S20910 (NITRONIC 50) 35 HRC MAXIMUM			
B106	Liner	CA6NM CL. B STAINLESS STEEL 23 HRC MAXIMUM HARDNESS WITH “DIFFUSED KANIGEN” NICKEL COATING			
B108	Liner Gasket	FLUOROPOLYMER JACKET/ COBALT NICKEL ALLOY SPRING			
B112	Plug (Balanced)	CA6NM CL. B STAINLESS STEEL 23 HRC MAXIMUM HARDNESS WITH “DIFFUSED KANIGEN” NICKEL COATING			
	Plug (Unbalanced)				
B118	Plug Balanced Seal	PRESSURE ENERGIZED POLYMERIC			
B150	Plug Stem	ASTM A182 GRADE F6NM			
B207	Packing Ring	CARBON CORE PTFE (4)			
B208	Anti Extrusion Ring	CARBON-GRAPHITE BRAIDED (4)			
B219	Packing Flange/ Follower	ASTM A182 GRADE F6NM			
B220	Packing Stud		ASTM A193 GRADE B7 ZINC PLATED (1)		
			ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING (2)		
			ASTM A320 Gr L7 ZINC PLATED (1)		
			ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING (2)		
B221	Packing Nut		ASTM A 194 GRADE 2H ZINC PLATED (1)		
			ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING (2)		
			ASTM A194 GRADE 7 ZINC PLATED (1)		
			ASTM A194 GRADE 7M ELECTROLESS NICKEL PLATING (2)		
B903	Plug Pin	SOLUTION ANNEALED 316 STAINLESS STEEL HRC 22 MAXIMUM			
B921	Body plain Washer	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			
B921a	Packing Plain Washer	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			

1. For General Service only: Nace Non-Exposed per ANSI/NACE MR0175/ISO 15156-1.
2. For Sour Service only: Nace Exposed per ANSI/NACE MR0175/ISO 15156-1.
3. Blue is the standard coating color.
4. No equivalents allowed to maintain fugitive emissions certification and performance.

Materials of Construction

18400/78400 API 6A Duplex F51 Stainless Steel Construction:

- Max operating pressure up to 10 kPSI [690 bar]
- Temperature class: L/N/P/S/T/U/V/X (see page 35)
- Material class: AA/BB/CC/FF (see page 35)

Ref. No.	Temperature Range	-46°C [-50°F]	29°C [20.2°F]	121°C [250°F]	180°C [356°F]
	Description	Materials			
B001	Valve Body	ASTM A182 GRADE F51			
B002	Body Stud	ASTM A193 GRADE B7 ZINC PLATED + PTFE COATING (3)			
		ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)			
		ASTM A320 Gr L7 ZINC PLATED + PTFE COATING (1 and 3)			
		ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)			
B003	Bonnet	ASTM A182 GRADE F51			
B014	Body Nut	ASTM A 194 GRADE 2H ZINC PLATED + PTFE COATING (1 and 3)			
		ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)			
		ASTM A194 Gr 7 ZINC PLATED + PTFE COATING (1 and 3)			
		ASTM A194 Gr 7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)			
B015	Body Gasket	ALLOY 718 + MOS2 COATING			
B102	Seat Ring	2205 ST. ST. (DUPLEX) HRC 28 MAXIMUM + HARDFACING STELLITE NO. 6			
B103	Seat Ring Gasket	INCONEL 718 + SILVER PLATING			
B105	Retainer	SUPER AUSTENITIC STAINLESS STEEL UNS S20910 (NITRONIC 50) 35 HRC MAXIMUM			
B106	Liner	SOLUTION ANNEALED 2205 STAINLESS STEEL (DUPLEX) 28 HRC MAXIMUM + ELECTROLESS NICKEL PLATING			
B108	Liner Gasket	FLUOROPOLYMER JACKET/ COBALT NICKEL ALLOY SPRING			
B112	Plug (Balanced)	SOLUTION ANNEALED 2205 STAINLESS STEEL (DUPLEX) 28 HRC MAXIMUM + ELECTROLESS NICKEL PLATING			
	Plug (Unbalanced)				
B118	Plug Balanced Seal	PRESSURE ENERGIZED POLYMERIC			
B150	Plug Stem	ASTM A182 GRADE F5			
B207	Packing Ring	CARBON CORE PTFE (4)			
B208	Anti Extrusion Ring	CARBON-GRAPHITE BRAIDED (4)			
B219	Packing Flange/ Follower	ASTM A182 GRADE F51			
B220	Packing Stud	ASTM A193 GRADE B7 ZINC PLATED (1)			
		ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING (2)			
		ASTM A320 Gr L7 ZINC PLATED (1)			
		ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING (2)			
B221	Packing Nut	ASTM A 194 GRADE 2H ZINC PLATED (1)			
		ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING (2)			
		ASTM A194 GRADE 7 ZINC PLATED (1)			
		ASTM A194 GRADE 7M ELECTROLESS NICKEL PLATING (2)			
B903	Plug Pin	SOLUTION ANNEALED 2205 STAINLESS STEEL (DUPLEX) HRC 28 MAXIMUM			
B921	Body plain Washer	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			
B921a	Packing Plain Washer	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			

1. For General Service only: Nace Non-Exposed per ANSI/NACE MR0175/ISO 15156-1.
2. For Sour Service only: Nace Exposed per ANSI/NACE MR0175/ISO 15156-1.
3. Blue is the standard coating color.
4. No equivalents allowed to maintain fugitive emissions certification and performance.

Materials of Construction

18400/78400 API 6A Super Duplex F55 Stainless-Steel Construction:

- Max operating pressure up to 15 kPSI [1034 bar]
- Temperature class: L/N/P/S/T/U/V/X (see page 35)
- Material class: AA/BB/CC/FF (see page 35)

Ref. No.	Temperature Range	-46°C [-50°F]	29°C [20.2°F]	121°C [250°F]	180°C [356°F]
	Description	Materials			
B001	Valve Body	ASTM A182 GRADE F55			
B002	Body Stud		ASTM A193 GRADE B7 ZINC PLATED + PTFE COATING API 6A (1 and 3)		
			ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
		ASTM A320 Gr L7 ZINC PLATED + PTFE COATING (1 and 3)			
		ASTM A320 GRADE L7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)			
B003	Bonnet	ASTM A182 GRADE F55			
B014	Body Nut		ASTM A 194 GRADE 2H ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
		ASTM A194 GRADE 7 ZINC PLATED + PTFE COATING (1 and 3)			
		ASTM A194 GRADE 7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)			
B015	Body Gasket	ALLOY 718 + MOS2 COATING			
B102	Seat Ring	HARDFACING STELL NO. 6 ON SOLUTION ANNEALED SUPER DUPLEX AUSTENO-FERRITIQUE STAINLESS STEEL (TYPE UNS S32760) HRC 32 MAXIMUM			
B103	Seat Ring Gasket	INCONEL 718 + SILVER PLATING			
B105	Retainer	SUPER AUSTENITIC STAINLESS STEEL UNS S20910 (NITRONIC 50) 35 HRC MAXIMUM			
B106	Liner	SUPER DUPLEX AUSTENO-FERRITIQUE STAINLESS STEEL (TYPE UNS S32760) HRC 32 MAXIMUM + HARD ELECTROLESS NICKEL PLATING			
B108	Liner Gasket	FLUOROPOLYMER JACKET/ COBALT NICKEL ALLOY SPRING			
B112	Plug (Balanced)	SUPER DUPLEX AUSTENO-FERRITIQUE STAINLESS STEEL (TYPE UNS S32760) HRC 32 MAXIMUM + HARD ELECTROLESS NICKEL PLATING			
	Plug (Unbalanced)				
B118	Plug Balanced Seal	PRESSURE ENERGIZED POLYMERIC			
B150	Plug Stem	ASTM A182 GRADE F55			
B207	Packing Ring	CARBON CORE PTFE (4)			
B208	Anti Extrusion Ring	CARBON-GRAPHITE BRAIDED (4)			
B219	Packing Flange/ Follower	ASTM A182 GRADE F55			
B220	Packing Stud		ASTM A193 GRADE B7 ZINC PLATED(1)		
			ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING(2)		
		ASTM A320 GRADE L7 ZINC PLATED (1)			
		ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING (2)			
B221	Packing Nut		ASTM A 194 GRADE 2H ZINC PLATED (1)		
			ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING (2)		
		ASTM A194 GRADE 7 ZINC PLATED (1)			
		ASTM A194 GRADE 7M ELECTROLESS NICKEL(2)			
B903	Plug Pin	SUPER DUPLEX AUSTENO-FERRITIQUE STAINLESS STEEL (TYPE UNS S32760) HRC 32 MAXIMUM			
B921	Body plain Washer	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			
B921a	Packing Plain Washer	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			

1. For General Service only: Nace Non-Exposed per ANSI/NACE MR0175/ISO 15156-1.
2. For Sour Service only: Nace Exposed per ANSI/NACE MR0175/ISO 15156-1.
3. Blue is the standard coating color.
4. No equivalents allowed to maintain fugitive emissions certification and performance.

Materials of Construction

18400/78400 API 6A CRA Inconel 718 Construction:

- Max operating pressure Is up to 15 kPSI [1034 bar]
- Temperature class: K/L/N/P/S/T/U/V/X (see page 35)
- Material class: AA/BB/CC/DD/EE/FF/HH (see page 35)

Ref. No.	Temperature Range	-60°C [-76°F]	29°C [20.2°F]	121°C [250°F]	180°C [356°F]
	Description	Materials			
B001	Valve Body	UNS N07718			
B002	Body Stud		ASTM A193 GRADE B7 ZINC PLATED + PTFE COATING API6A (1 and 3)		
			ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
			ASTM A320 GRADE L7 ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A320 GRADE L7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
B003	Bonnet	UNS N07718			
B014	Body Nut		ASTM A 194 GRADE 2H ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
			ASTM A194 GRADE 7 ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A194 GRADE 7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
B015	Body Gasket	ALLOY 718 + MOS2 COATING			
B102	Seat Ring	UNS N07718			
B103	Seat Ring Gasket	INCONEL 718 + SILVER PLATING			
B105	Retainer	SUPER AUSTENITIC STAINLESS STEEL UNS S20910 (NITRONIC 50) 35 HRC MAXIMUM			
B106	Liner	UNS N07718			
B108	Liner Gasket	FLUOROPOLYMER JACKET/ COBALT NICKEL ALLOY SPRING			
B112	Plug (Balanced, Unbalanced)	UNS N07718			
B118	Plug Balanced Seal	PRESSURE ENERGIZED POLYMERIC			
B150	Plug Stem	UNS N07718			
B207	Packing Ring	CARBON CORE PTFE (4)			
B208	Anti Extrusion Ring	CARBON-GRAPHITE BRAIDED (4)			
B219	Packing Flange/ Follower	UNS N07718 + ELECTROLESS NICKEL PLATING			
B220	Packing Stud		ASTM A193 GRADE B7 ZINC PLATED (1)		
			ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING (2)		
			ASTM A320 GRADE L7 ZINC PLATED (1)		
			ASTM A320 GRADE L7M ELECTROLESS NICKEL PLATING (2)		
B221	Packing Nut		ASTM A 194 GRADE 2H ZINC PLATED (1)		
			ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING (2)		
			ASTM A194 GRADE 7 ZINC PLATED (1)		
			ASTM A194 GRADE 7M ELECTROLESS NICKEL PLATING (2)		
B903	Plug Pin	ASTM B637 GRADE NO7718 (UNS 07718) HRC 40 MAXIMUM HARDNESS COMPLIANCE WITH NACE MR0103 SHALL BE CERTIFIED			
B921	Body plain Washer	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			
B921a	Packing Plain Washer	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			

1. For General Service only: NACE Non-Exposed per ANSI/NACE MR0175/ISO 15156-1.
2. For Sour Service only: NACE Exposed per ANSI/NACE MR0175/ISO 15156-1.
3. Blue is the standard coating color.
4. No equivalents allowed to maintain fugitive emissions certification and performance.

Materials of Construction

High Pressure (>800 psi/Stage) API 6A CRA Inconel 718 Construction:

- Max operating pressure Is up to 15 kPSI [1034 bar]
- Temperature class: K/L/N/P/S/T/U/V/X (see page 35)
- Material class: AA/BB/CC/DD/EE/FF/HH(see page 35)

Ref. No.	Temperature Range	-60°C [-76°F]	29°C [20.2°F]	121°C [250°F]	180°C [356°F]
	Description	Materials			
B001	Valve Body	UNS N07718			
B002	Body Stud (4)		ASTM A193 GRADE B7 ZINC PLATED PTFE COATING API 6A (1 and 3)		
			ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING PTFE COATING (2 and 3)		
			ASTM A320 GRADE L7 ZINC PLATED PTFE COATING (1 and 3)		
			ASTM A320 GRADE L7M ELECTROLESS NICKEL PLATING PTFE COATING (2 and 3)		
B003	Bonnet	UNS N07718			
B014	Body Nut (4)		ASTM A 194 GRADE 2H ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING PTFE COATING (2 and 3)		
			ASTM A194 GRADE 7 ZINC PLATED + PTFE COATING (1 and 3)		
			ASTM A194 GRADE 7M ELECTROLESS NICKEL PLATING + PTFE COATING (2 and 3)		
B015	Body Gasket	ALLOY 718 + MOS2 COATING			
B102	Seat Ring	UNS N07718 + KOLSTERISATION			
B103	Seat Ring Gasket	INCONEL 718 + SILVER PLATING			
B105	Retainer	SUPER AUSTENITIC STAINLESS STEEL UNS S20910 (NITRONIC 50) 35 HRC MAXIMUM			
B106	Liner	UNS N07718 + KOLSTERISATION			
B108	Liner Gasket	FLUOROPOLYMER JACKET / COBALT NICKEL ALLOY SPRING			
B112	Plug (Balanced, Unbalanced)	UNS N07718 + OLSTERISATION			
B118	Plug Balanced Seal	PRESSURE ENERGIZED POLYMERIC			
B150	Plug Stem (3)	UNS N07718			
B207	Packing Ring	CARBON CORE PTFE (4)			
B208	Anti Extrusion Ring	CARBON-GRAPHITE BRAIDED (4)			
B219	Packing Flange/ Follower (3)	UNS N07718			
B220	Packing Stud (4)		ASTM A193 GRADE B7 ZINC PLATED (1)		
			ASTM A193 GRADE B7M ELECTROLESS NICKEL PLATING (2)		
			ASTM A320 GRADE L7 ZINC PLATED (1)		
			ASTM A320 GRADE L7M ELECTROLESS NICKEL PLATING (2)		
B221	Packing Nut (4)		ASTM A 194 GRADE 2H ZINC PLATED (1)		
			ASTM A194 GRADE 2HM, ELECTROLESS NICKEL PLATING (2)		
			ASTM A194 GRADE 7 ZINC PLATED (1)		
			ASTM A194 GRADE 7M ELECTROLESS NICKEL PLATING (2)		
B903	Plug Pin	ASTM B637 GRADE NO7718 (UNS 07718) HRC 40 MAXIMUM			
B921	Body plain Washer (4)	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			
B921a	Packing Plain Washer (4)	ASTM F436 ZINC PLATED			
		410 STAINLESS STEEL HRC 35-45			

1. For General Service only: Nace Non-Exposed per ANSI/NACE MR0175/ISO 15156-1.
2. For Sour Service only: Nace Exposed per ANSI/NACE MR0175/ISO 15156-1.
3. Blue is the standard coating color.
4. No equivalents allowed to maintain fugitive emissions certification and performance.

Materials of Construction

Common Parts

Ref. No.	Description	-60°C [-76°F] Materials 180°C [356°F]
B017	Drive Nut	SOLUTION ANNEALED 316 STAINLESS STEEL HRC 22 MAXIMUM
B703	Serial Plate	GENERAL SERVICE ANNEALED 316L STAINLESS STEEL HRC 22 MAXIMUM
B704	Flow Arrow	AUSTENITIC STAINLESS STEEL
B902	Drive Screw	AUSTENITIC STAINLESS STEEL
B911	Lifting Lugs	STAINLESS STEEL
B913	Yoke/Bonnet Screw	A4-80 (ISO 3506) 316L

Dimensions

API 10K and 15K Body Sub Assembly dimensions (inch)

Valve body Size (NPS)	Valve Ends Size (NPS)	Body Type	Pressure Class	Number of Stages	Stem Dia.	Inlet Dia.	Outlet Dia.	Spud Dia.	A	A1	B	C	D
1	1"-13/16 (1.8125)	78400 Angle	API 10K	8	0.5	1.83	1.83	2.25-16 UN	7.28	6.73	4.93	10.8	3.64
				10								12.2	
			API 15K	8						7.28	5.56	10.8	
				10								12.2	
		18400 Globe	API 10K	8						6.73	3.91	10.8	
				10								12.2	
			API 15K	8						7.28	4.65	10.8	
				10								12.2	
1.5	1"-13/16 (1.8125)	78400 Angle	API 10K	8	0.5	1.82	1.82	2.25-16 UN	7.36	7.36	5.3	12.38	3.68
				10					7.36	7.36	5.71	13.56	3.68
			API 15K	8					8.19	8.19	5.9	12.38	4.09
				10					8.19	8.19	6.01	13.56	4.09
		18400 Globe	API 10K	8					7.36	7.36	4.53	12.38	3.68
				10					7.36	7.36	4.53	13.56	3.68
			API 15K	8					8.19	8.19	4.53	12.38	4.09
				10					8.19	8.19	4.33	13.56	4.09
2	2"-1/16 (2.0625)	78400 Angle	API 10K	8	0.75	2.08	2.08	3-5/16-16 UN	11.02	9.05	5.04	15.7	5.51
				10						9.05	5.3	17.8	
			API 15K	8						10	6.22	15.7	
				10						10	5.98	17.77	
		18400 Globe	API 10K	8						9.05	4.41	19	
				10						9.05	4.25	21.11	
			API 15K	8						10	4.37	18.87	
				10						10	4.41	21.11	
3	3"-1/16 (3.0625)	78400 Angle	API 10K	8	1	2.25	2.25	3"3/4-12 UN	14.2	10.6	7.48	20.7	7.1
				10					14.2	10.6	7.48	24	7.1
			API 15K	8					14.2	11.8	7.48	20.7	7.1
				10					14.2	11.8	7.48	24	7.1
		18400 Globe	API 10K	8					14.2	10.6	5.51	25.5	7.1
				10					14.2	10.6	5.51	28.7	7.1
			API 15K	8					14.2	11.8	5.51	25.5	7.1
				10					14.2	11.8	5.51	28.7	7.1

API 10K and 15K Body Sub Assembly dimensions (inch)

Valve body Size (NPS)	Valve Ends Size (NPS)	Body Type	Pressure Class	Number of Stages	Stem Dia.	Inlet Dia.	Outlet Dia.	Spud Dia.	A	A1	B	C	D
1	1"-13/16 (1.8125)	78400 Angle	API 10K	8	0.5	1.83	1.83	2.25-16 UN	7.28	6.73	4.93	10.8	3.64
				10								12.2	
			API 15K	8						7.28	5.56	10.8	
				10								12.2	
		18400 Globe	API 10K	8						6.73	3.91	10.8	
				10								12.2	
			API 15K	8						7.28	4.65	10.8	
				10								12.2	
1.5	1"-13/16 (1.8125)	78400 Angle	API 10K	8	0.5	1.82	1.82	2.25-16 UN	7.36	7.36	5.3	12.38	3.68
				10					7.36	7.36	5.71	13.56	3.68
			API 15K	8					8.19	8.19	5.9	12.38	4.09
				10					8.19	8.19	6.01	13.56	4.09
		18400 Globe	API 10K	8					7.36	7.36	4.53	12.38	3.68
				10					7.36	7.36	4.53	13.56	3.68
			API 15K	8					8.19	8.19	4.53	12.38	4.09
				10					8.19	8.19	4.33	13.56	4.09
2	2"-1/16 (2.0625)	78400 Angle	API 10K	8	0.75	2.08	2.08	3-5/16-16 UN	11.02	9.05	5.04	15.7	5.51
				10						9.05	5.3	17.8	
			API 15K	8						10	6.22	15.7	
				10						10	5.98	17.77	
		18400 Globe	API 10K	8						9.05	4.41	19	
				10						9.05	4.25	21.11	
			API 15K	8						10	4.37	18.87	
				10						10	4.41	21.11	
3	3"-1/16 (3.0625)	78400 Angle	API 10K	8	1	2.25	2.25	3"3/4-12 UN	14.2	10.6	7.48	20.7	7.1
				10					14.2	10.6	7.48	24	7.1
			API 15K	8					14.2	11.8	7.48	20.7	7.1
				10					14.2	11.8	7.48	24	7.1
		18400 Globe	API 10K	8					14.2	10.6	5.51	25.5	7.1
				10					14.2	10.6	5.51	28.7	7.1
			API 15K	8					14.2	11.8	5.51	25.5	7.1
				10					14.2	11.8	5.51	28.7	7.1
4	4"-1/16 (4.0625)	78400 Angle	API 10K	8	1	4.05	4.05	3"3/4-12 UN	17.72	9.05	5.04	15.7	8.86
				10						14.96	9.44	28.88	
			API 15K	8						14.96	8.65	32.82	
				10						15.75	9.83	28.88	
		18400 Globe	API 10K	8						15.75	9.04	32.82	
				10						14.96	9.45	28.88	
			API 15K	8						14.96	9.45	32.82	
				10						15.75	9.45	28.88	
6	7"-1/16 (7.0625)	78400 Angle	API 10K	8	1.125	7.09	7.09	3.75-12 UN	23.6	19.6	11.81	38.7	12
				10								44.2	
			API 15K	8						20.7		38.7	
				10								44.2	
		18400 Globe	API 10K	8						19.6	12.48	38.7	
				10								44.2	
			API 15K	8						20.7	12.51	38.7	
				10								44.2	

API 10K and 15K Body Sub Assembly dimensions (millimeter)

Valve body Size (NPS)	Valve Ends Size (NPS)	Body Type	Pressure Class	Number of Stages	Stem Dia.	Inlet Dia.	Outlet Dia.	Spud Dia.	A	A1	B	C	D
1	1"-13/16 (1.8125)	78400 Angle	API 10K	8	12.7	46.5	46.5	2.25-16 UN	185	171	125	274	92.5
				10								309	
			API 15K	8						185	141	274	
				10								309	
		18400 Globe	API 10K	8						171	99	274	
				10								309	
			API 15K	8						185	118	274	
				10								309	
1.5	1"-13/16 (1.8125)	78400 Angle	API 10K	8	12.7	46.5	46.5	2.25-16 UN	187	187	135	314.4	93.5
				10					187	187	145	344.4	93.5
			API 15K	8					208	208	150	314.4	104
				10					208	208	155	344.4	104
		18400 Globe	API 10K	8					187	187	115	314.3	93.5
				10					187	187	115	344.4	93.5
			API 15K	8					208	208	115	314.3	104
				10					208	208	110	344.4	104
2	2"-1/16 (2.0625)	78400 Angle	API 10K	8	19.05	52.75	52.75	3"5/16-16 UN	280	230	128	398.4	140
				10						230	134	452.4	
			API 15K	8						254	158	398.4	
				10						254	152	451.4	
		18400 Globe	API 10K	8						230	112	482.4	
				10						230	108	536.4	
			API 15K	8						254	111	479.4	
				10						254	112	536.4	
3	3"-1/16 (3.0625)	78400 Angle	API 10K	8	25.4	57.2	57.2	3"3/4-12 UN	360	270	190	527	180
				10					360	270	190	609	180
			API 15K	8					360	300	190	527	180
				10					360	300	190	609	609
		18400 Globe	API 10K	8					360	270	140	647	180
				10					360	270	140	729	180
			API 15K	8					360	300	140	647	180
				10					360	300	140	729	180
4	4"-1/16 (4.0625)	78400 Angle	API 10K	8	25.4	103.1	103.1	3"3/4-12 UN	450	380	239.7	733.53	225
				10						380	219.7	833.53	
			API 15K	8						400	249.7	733.53	
				10						400	229.7	833.53	
		18400 Globe	API 10K	8						380	240	733.53	
				10						380	240	33.53	
			API 15K	8						400	240	733.53	
				10						400	240	833.53	
6	7"-1/16 (7.0625)	78400 Angle	API 10K	8	28.6	180.1	180.1	3.75-12 UN	600	497	300	983	300
				10								1123	
			API 15K	8						525		983	
				10								1123	
		18400 Globe	API 10K	8						497	317	983	
				10								1123	
			API 15K	8						525	318	983	
				10								1123	

Weights and Center of Gravity

Body Sub Assembly (lbs) / Center of Gravity (inches)

Valve Body Size (NPS)	Valve Ends Size (NPS)	Body Type	Number of Stages	API 10K			API 15K		
				6BX Printed Flange			6BX Printed Flange		
				G	H	Mass	G	H	Mass
1	1"-13/16 (1.8125)	78400 Angle	8	1.81	0.04	143	1.18	0.04	181
			10	1.73	0.03	178	1.65	0.04	190
		18400 Globe	8	2.27	-	141	1.79	-	161
			10	2.81	-	150	2.32	-	170
1.5	1"-13/16 (1.8125)	78400 Angle	8	2.11	0	200.1	1.73	0	256.2
			10	2.40	0	216.5	2.10	0	271.4
		18400 Globe	8	2.85	-	179.5	2.74	-	220
			10	3.33	-	188.8	3.35	-	228
2	2"-1/16 (2.0625)	78400 Angle	8	3.148	0	377.5	2.7	0	471.4
			10	3.85	0	411.8	3.7	0	497.3
		18400 Globe	8	5.37	-	423.3	5.72	-	476,6
			10	6.29	-	446.6	168.3	-	515.4
3	3"-1/16 (3.0625)	78400 Angle	8	3.82	0	812	3.78	0	899
			10	5.35	0	936	5.28	0	1038
		18400 Globe	8	5.77	-	860	5.48	-	971
			10	7.36	-	983	7.07	-	1109
4	4"-1/16 (4.0625)	78400 Angle	8	5.85	0.64	1884.9	8.67	0.7	2101
			10	8.08	0.55	2085.35	8.47	0.73	2318.6
		18400 Globe	8	6.84	-	1746.05	7.55	-	1913.38
			10	8.5	-	2020.53	9.06	-	2225.12
6	7"-1/16 (7.0625)	78400 Angle	8	7.91	0.14	4111	9.16	0.13	4661
			10	10.06	0.13	4440	11.57	0.12	5107
		18400 Globe	8	5.28	-	3666	9.13	-	4636
			10	7.6	-	4032	11.69	-	5079

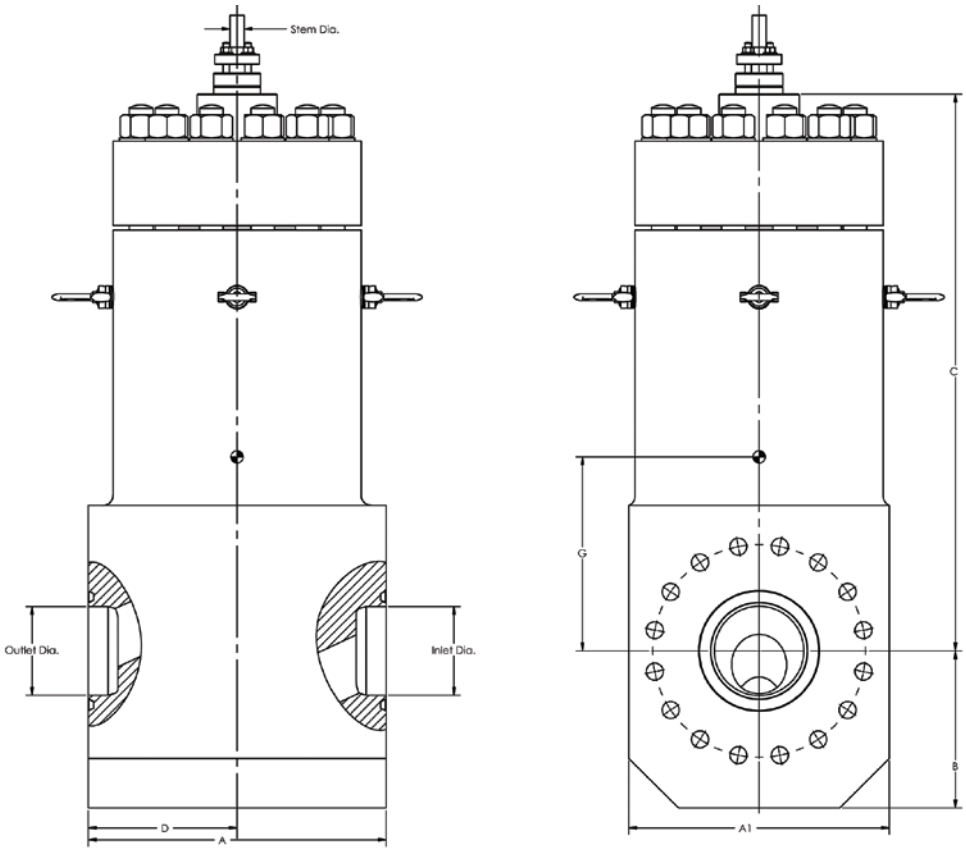
Note: Values in this table are estimates. Consult factory for detailed data.

Body Sub Assembly (kg) / Center of Gravity (mm)

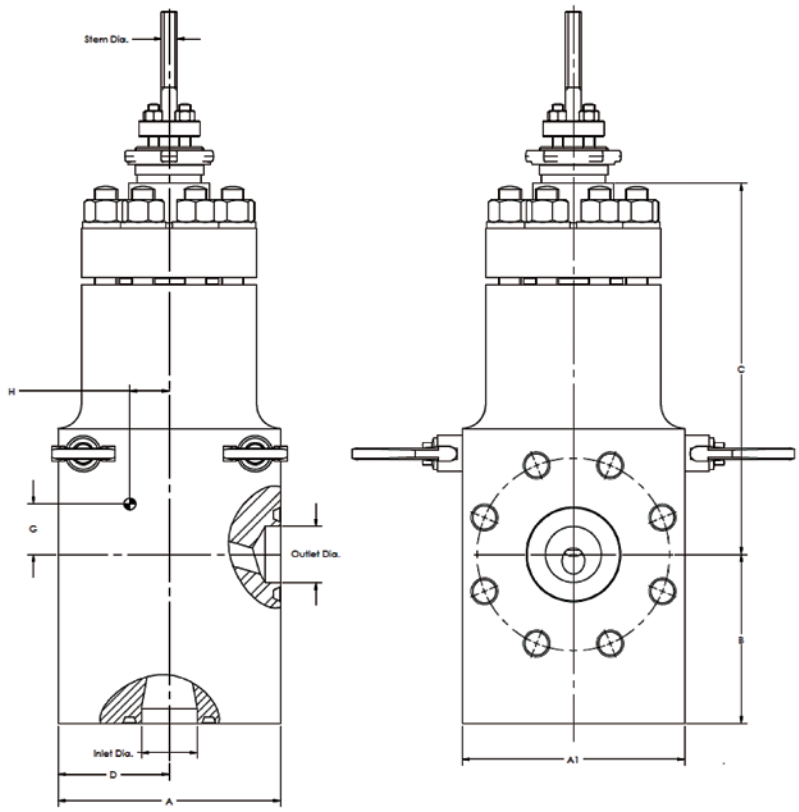
Valve Body Size (NPS)	Valve Ends Size (NPS)	Body Type	Number of Stages	API 10K			API 15K		
				6BX Printed Flange			6BX Printed Flange		
				G	H	Mass	G	H	Mass
1	1"-13/16 (1.8125)	78400 Angle	8	46	1.0	65	30	1.1	82
			10	44	0.9	81	42	1.1	86
		18400 Globe	8	58	-	64	46	-	73
			10	161	-	68	59	-	77
1.5	1"-13/16 (1.8125)	78400 Angle	8	53,7	0	90.8	43.9	0	116.2
			10	60.7	0	98.2	53.27	0	123.1
		18400 Globe	8	72.5	-	81.4	69.6	-	99.8
			10	84.62	-	85.7	85.2	-	103.4
2	2"-1/16 (2.0625)	78400 Angle	8	80	0	171.2	69.7	0	213.8
			10	97.84	0	186.8	94.8	0	225.6
		18400 Globe	8	136.5	-	192	145.4	-	216.2
			10	159.8	-	202.6	168.3	-	233.8
3	3"-1/16 (3.0625)	78400 Angle	8	97	0	368	3.78	0	408
			10	135.6	0	424	134.2	0	471
		18400 Globe	8	146.5	-	390	139.2	-	440
			10	187	-	446	179.6	-	503
4	4"-1/16 (4.0625)	78400 Angle	8	148.41	1.62	855	220	1.77	953
			10	205.34	1.40	945.9	215.1	1.85	1051.7
		18400 Globe	8	173.65	-	792.1	191.77	-	867.9
			10	215.67	-	916.5	230.21	-	1009.3
6	7"-1/16 (7.0625)	78400 Angle	8	201	3.5	1865	233	3.3	2114
			10	256	3.3	2014	294	3	2316
		18400 Globe	8	134	-	1663	232	-	2103
			10	193	-	1829	297	-	2304

Note: Values in this table are estimates. Consult factory for detailed data.

Dimensions

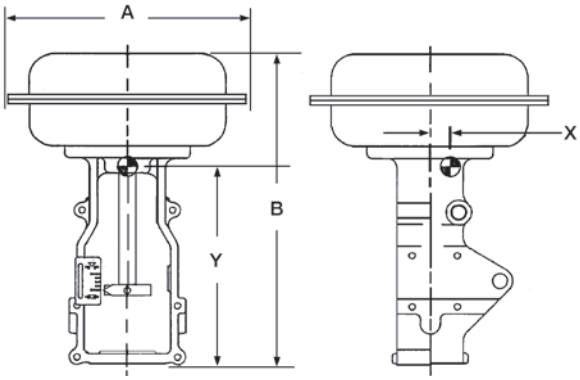


18400 Series API 6A Dimensions

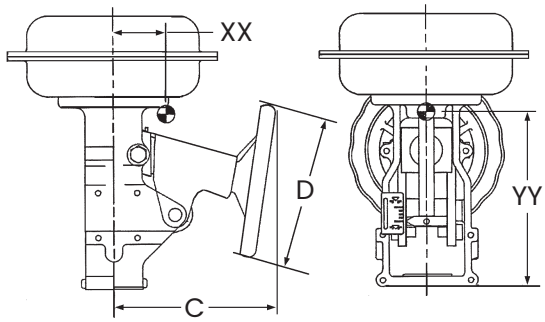


78400 Series API 6A Dimensions

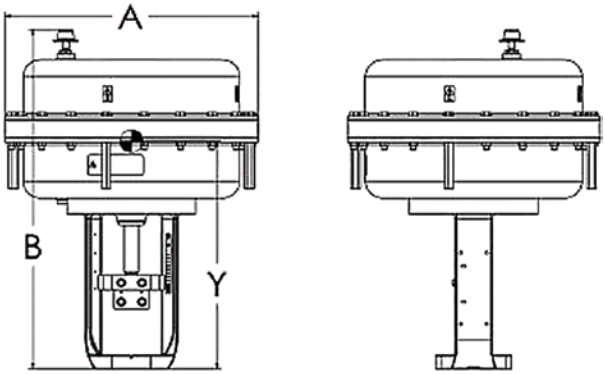
87/88 Series Actuator Weights and Dimensions (inches)



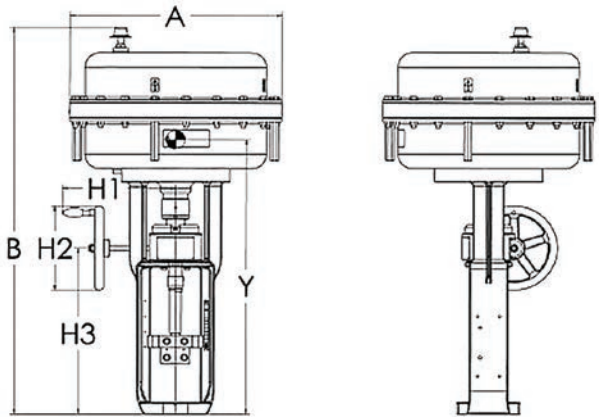
Shown without optional Handwheel



Shown with optional Handwheel



23L Shown without optional Handwheel



23L Shown with optional Handwheel

Dimensions and Weights

Actuator Size	Spring Range	Actuator Dimensions (inches)				H1	H2	Weights (lbs.)	
		A	B (Model 88)	C	D			Standard	w/Handwheel
6	All	11.5	15.54 (17.52)	10	9	-	-	45	60
10	All	14.5	19.58 (21.54)	10.9	12	-	-	85	105
16	All	18.75	28.22 (30.79)	14	18	-	-	210	245
23	All	21.63	30.71 (33.27)	16	18	-	-	265	320
23L	3-15, 6-30	21.63	27.8 (30.00)	-	-	11.5	8.9	375	417
23L	11-23, 21-45	21.63	38.55 (40.75)	-	-	11.5	8.9	507	549

Actuator Removal Clearance = 6 inches

Center of Gravity (inches)

Without Handwheel

Size	X	Y
6	0.2	9.8
10	0.0	12.9
16	0.1	18.5
23	0.1	21.1
23L[1]	0.0	20.1
23L[2]	0.0	21.9

1. Nominal spring ranges 3-15 and 6-30
2. Nominal spring ranges 11-23 and 21-45

With Handwheel

Size	XX	YY
6	1.3	9.1
10	0.9	12.0
16	1.4	16.7
23	1.4	19.0
23L[1]	0.0	28.9
23L[2]	0.0	30.7

87/88 Series Actuator Weights and Dimensions (inches)

Limit Stops (inches)

Up Stop

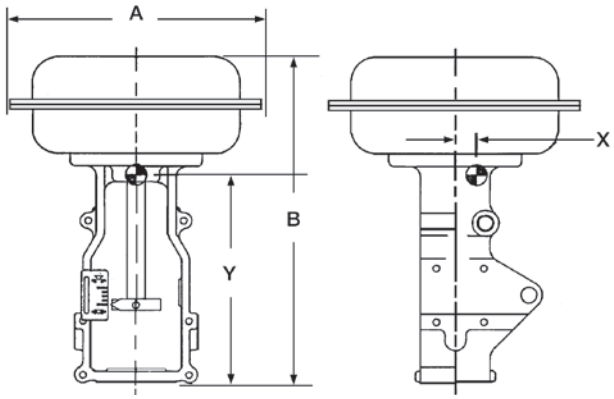
Size	Spring Range	Model	Overall Height B
6	All	87	19.5
10	All		25.4
16	All		36.4
23	All		38.8
23L[1]	3-15, 6-30		38.4
23L[1]	11-23, 21-45		41.3
23L[2]	3-15, 6-30		49.1
23L[2]	11-23, 21-45		52.1
6	All	88	19.2
10	All		25.1
16	All		35.5
23	All		35.5
23L[1]	3-15, 6-30		38.4
23L[1]	11-23, 21-45		41.3
23L[2]	3-15, 6-30		49.1
23L[2]	11-23, 21-45		52.1

1. Without Handwheel
2. With Handwheel

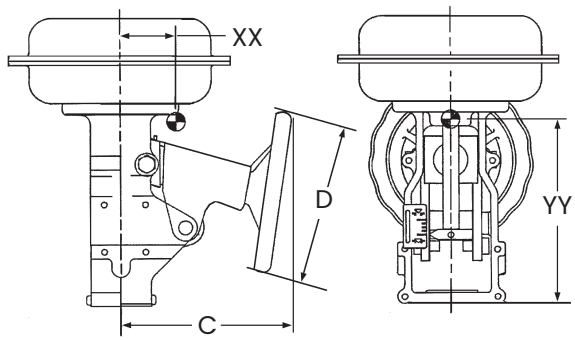
Down Stop

Size	Spring Range	Model	Overall Height B
6	All	87	19.8
10	All		26.0
16	All		37.2
23	All		39.9
23L[1]	3-15, 6-30		39.9
23L[1]	11-23, 21-45		42.8
23L[2]	3-15, 6-30		50.6
23L[2]	11-23, 21-45		53.6
6	All	88	19.7
10	All		25.9
16	All		37.5
23	All		40.3
23L[1]	3-15, 6-30		39.9
23L[1]	11-23, 21-45		42.8
23L[2]	3-15, 6-30		50.6
23L[2]	11-23, 21-45		53.6

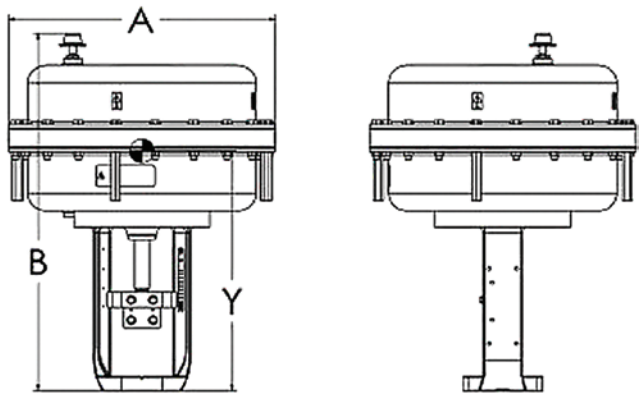
87/88 Series Actuator Weights and Dimensions (mm)



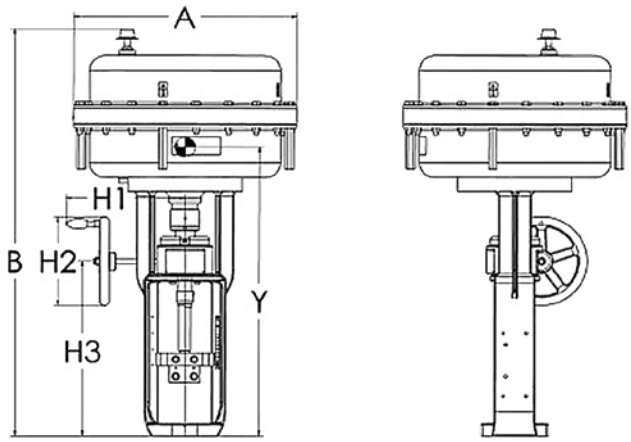
Shown without optional Handwheel



Shown with optional Handwheel



23L Shown without optional Handwheel



23L Shown with optional Handwheel

Dimensions and Weights

Actuator Size	Spring Range	Actuator Dimensions (mm)				H1	H2	Weights (kg)	
		A	B (Model 88)	C	D			Standard	w/Handwheel
6	All	302	395 (445)	254	229	-	-	20	27
10	All	373	497 (547)	277	305	-	-	39	48
16	All	476	717 (782)	356	457	-	-	95	111
23	All	549	780 (845)	406	457	-	-	120	145
23L	3-15, 6-30	549	706 (762)	-	-	292	225	170	189
23L	11-23, 21-45	549	781 (837)	-	-	292	225	230	249

Actuator Removal Clearance = 150 mm

Center of Gravity (mm)

Without Handwheel

Size	X	Y
6	5	248
10	0	327
16	3	470
23	2	537
23L[1]	0	511
23L[2]	0	557

1. Nominal spring ranges 3-15 and 6-30
2. Nominal spring ranges 11-23 and 21-45

With Handwheel

Size	XX	YY
6	32	232
10	22	305
16	35	425
23	35	483
23L[1]	0	734
23L[2]	0	780

87/88 Series Actuator Weights and Dimensions (mm)

Limit Stops (mm)

Up Stop

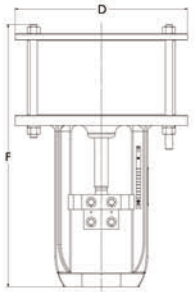
Size	Spring Range	Model	Overall Height B
6	All	87	494
10	All		646
16	All		925
23	All		987
23L[1]	3-15, 6-30		975
23L[1]	11-23, 21-45		1050
23L[2]	3-15, 6-30		1248
23L[2]	11-23, 21-45		1323
6	All	88	487
10	All		636
16	All		901
23	All		982
23L[1]	3-15, 6-30		975
23L[1]	11-23, 21-45		1050
23L[2]	3-15, 6-30		1248
23L[2]	11-23, 21-45		1323

1. Without Handwheel
2. With Handwheel

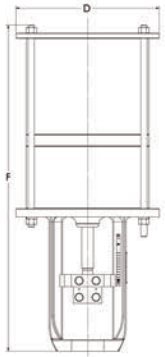
Down Stop

Size	Spring Range	Model	Overall Height B
6	All	87	503
10	All		660
16	All		945
23	All		1014
23L[1]	3-15, 6-30		1013
23L[1]	11-23, 21-45		1088
23L[2]	3-15, 6-30		1286
23L[2]	11-23, 21-45		1361
6	All	88	501
10	All		657
16	All		952
23	All		1024
23L[1]	3-15, 6-30		1013
23L[1]	11-23, 21-45		1088
23L[2]	3-15, 6-30		1286
23L[2]	11-23, 21-45		1361

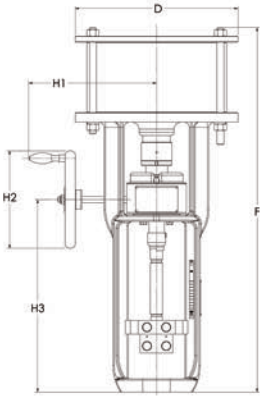
51/52/53 Series Actuator Weights and Dimensions



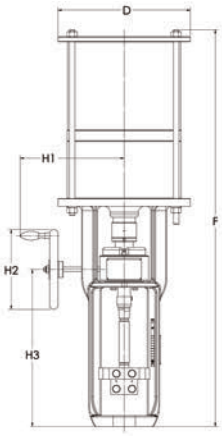
Without Handwheel
Without Volume Chamber



Without Handwheel
With Volume Chamber



With Handwheel
Without Volume Chamber



With Handwheel
With Volume Chamber

Model 51 Dimensional Data

Inches (mm)

Size	D	H1	H2	H3
12	14.7 (373)	11.5 (292)	8.9 (225)	17.4 (443)
16	18.1 (461)	13.4 (340)	11 (280)	21.7 (553)
20	22.6 (573)	13.4 (340)	11 (280)	22.1 (563)
24	18.1 (461)	13.4 (340)	11 (280)	22.1 (563)
28	22.6 (573)	13.4 (340)	11 (280)	22.1 (563)
32	26.4 (670)	13.4 (340)	11 (280)	22.2 (564)

Actuator Type	Actuator Size	Dimension F inches (mm)					
		Nominal Actuator Travel inches (mm)					
		2.5 (63.5)	4 (101.6)	6 (152.4)	8 (203.2)	10 (254)	12 (304.8)
Standard	12	-	23.0 (584)	-	-	-	-
	16	24.7 (628)	26.2 (666)	28.2 (717)	36.2 (920)	38.2 (971)	42.2 (1073)
	20	25.4 (645)	26.9 (683)	28.9 (734)	36.7 (931)	38.7 (982)	45.0 (1142)
	24	33.1 (842)	36.1 (918)	40.1 (1020)	48.1 (123)	52.1 (1324)	60.2 (1528)
	28	34.3 (870)	37.3 (946)	52.2 (1326)	49.3 (1251)	53.3 (1353)	61.3 (1556)
	32	42.7 (1085)	45.7 (1161)	49.7 (1262)	57.8 (1467)	61.8 (1569)	69.8 (1773)
Standard with Integral Volume Tank	12	-	34.0 (864)	-	-	-	-
	16	35.8 (908)	37.3 (946)	39.3 (997)	-	-	-
	20	36.0 (915)	37.5 (953)	39.5 (1004)	-	-	-
Standard with Handwheel	12	-	33.7 (857)	-	-	-	-
	16	40.6 (1031)	42.1 (1069)	44.1 (1119)	59.3 (1506)	61.3 (1557)	69.3 (1760)
	20	41.2 (1048)	42.7 (1086)	44.7 (1136)	59.6 (1513)	61.6 (1564)	69.6 (1767)
	24	48.2 (1224)	51.2 (1301)	55.2 (1402)	71.2 (1808)	75.2 (1910)	85.2 (2164)
	28	49.2 (1249)	52.2 (1326)	53.2 (1427)	72.1 (1831)	76.1 (1933)	86.1 (2187)
	32	56.6 (1440)	59.7 (1516)	63.7 (1617)	79.7 (2025)	83.7 (2126)	93.7 (2381)
Standard with Integral Volume Tank and Handwheel	12	-	44.8 (1137)	-	-	-	-
	16	51.6 (1311)	53.1 (1349)	55.1 (1399)	-	-	-
	20	51.9 (1318)	53.4 (1356)	55.4 (1406)	-	-	-

51/52/53 Series Actuator Weights and Dimensions

Model 52 and 53 Dimensional Data

Inches (mm)

Size	D	H1	H2	H3
12	14.69 (373)	11.50 (292)	8.86 (225)	17.44 (443)
16	18.15 (461)	13.39 (340)	11.02 (280)	21.77 (553)
20	22.56 (573)	13.39 (340)	11.02 (280)	22.17 (563)

Actuator Type	Actuator Size	Dimension F in (mm)		
		Nominal Actuator Travel In. (mm)		
		2.5 (63.5)	4 (101.6)	6 (152.4)
Standard	12	-	39.1 (993.8)	-
	16	39.5 (1003)	44 (1117)	50 (1269)
	20	41.1 (1045)	45.6 (1159)	51.6 (1311)
Standard with Handwheel	12	-	49.9 (1267)	-
	16	55.3 (1406)	59.8 (1520)	65.8 (1671)
	20	64.6 (1642)	69.1 (1756)	75.11 (1908)

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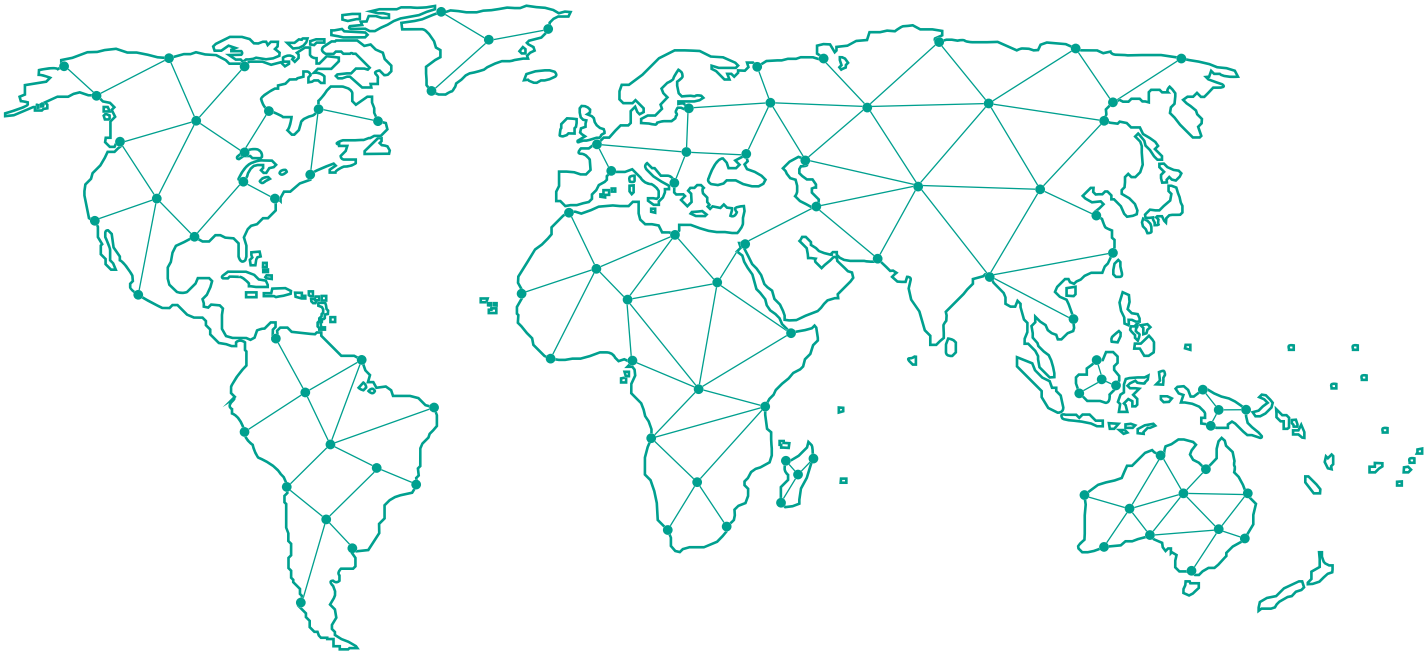

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