

Masoneilan[®] 78400/18400 Series LincolnLog[®] Control Valves

Specification Data

CP78400

02/07

High Pressure
Anti-Cavitation
Control Valves



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Features

The Masoneilan LincolnLog is the premier high-pressure liquid letdown valve in the process control industry. It is a field proven severe service solution for cavitating and erosive applications in various industries. The LincolnLog is uniquely designed to operate reliably in harsh environments and dirty liquids. Key design features of the LincolnLog include:

Cavitation Elimination

The multi-step flow path created by the LincolnLog trim design, reduces the pressure drop in multiple stages without allowing the local pressure to drop below the fluid vapor pressure thus preventing cavitation. These active stages throttle in unison to avoid taking the full pressure drop across any individual stage.

Dirt Tolerant

Wide flow paths in the LincolnLog allow free passage of large particles through the unique trim and body design without causing any damage or loss of capacity. This ensures continuous and efficient operation by eliminating concerns of potential clogging due to entrained particles. The LincolnLog is a proven problem solver in dirty service applications.

Heavy Plug Guiding

Guiding is provided along the full length of the plug by a hardened liner, which minimizes any vibration effects and results in excellent dynamic stability. This helps to improve product yield through accurate and smooth process control.

Versatile Trim Options

Standard LincolnLog trim is available in 3, 4 and 6 stages with different staging ratios to cover the vast majority of high-pressure liquid letdown services. Masoneilan can also provide engineered solutions consisting of additional stages

to satisfy specific application requirements. The LincolnLog is available with both balanced and unbalanced plug designs for greater application flexibility.

Protected Seat Design

Overlap is designed into the trim at low lift to keep high velocity flow away from the valve seat. This helps to avoid seat erosion and extends the operating life under high pressure drop conditions.

Reliable Tight Shutoff

Standard seat leakage rating for the LincolnLog meets IEC 534-4 and ANSI/FCI 70.2 Class V shutoff. An optional soft seat design provides Class VI bubble tight shutoff. It includes a patented sliding metal collar design, which protects the soft seat from extruding and serves as a back-up seating surface. The LincolnLog can also be supplied with block valve tight shutoff per MSS-SP-61.

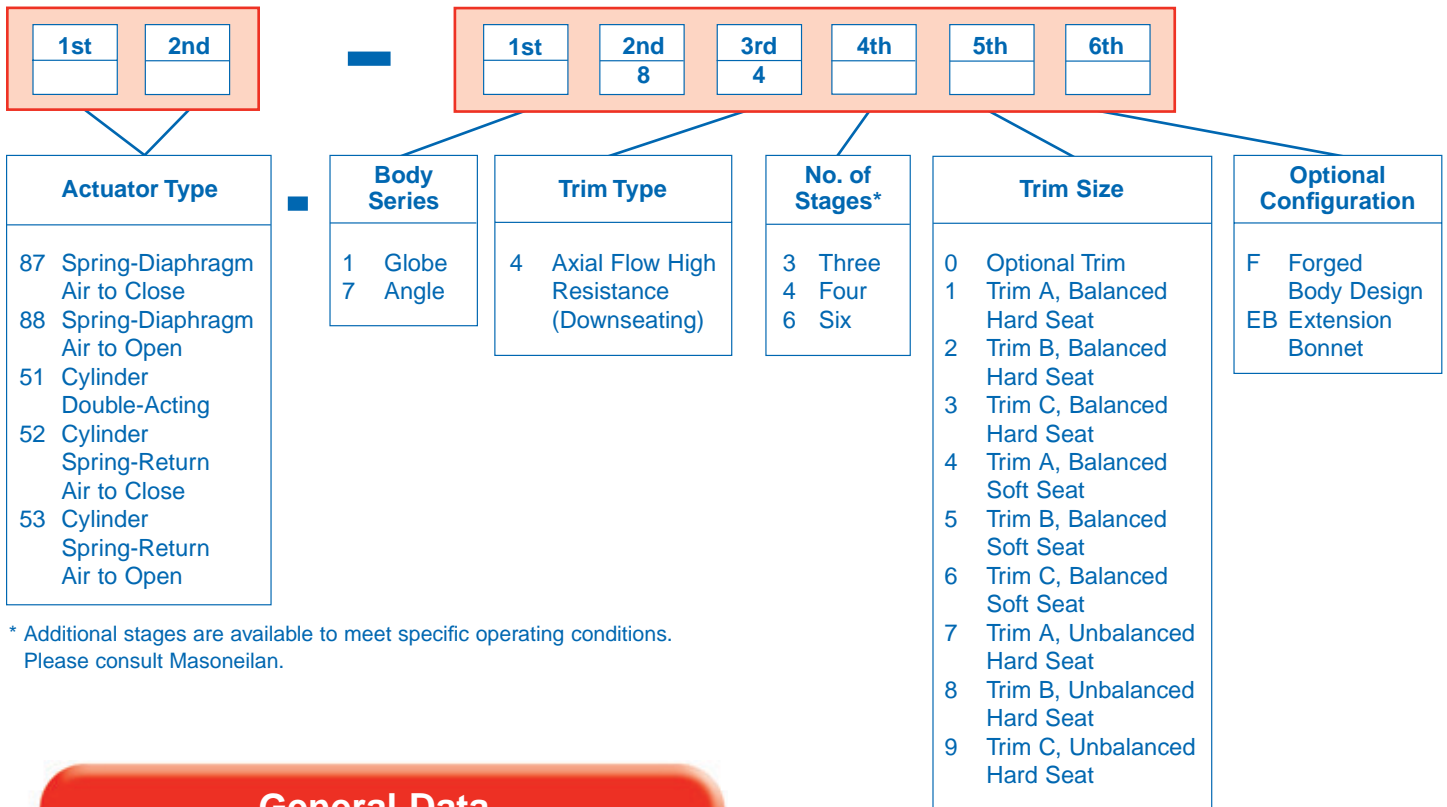
Ease of Maintenance

LincolnLog's simple top-entry design includes quick change trim for easy access and removal. The integral liner and seat ring also reduces the number of components and simplifies assembly and disassembly.

NACE and PED Compliance

The LincolnLog is available for Sour Service Applications using the design and construction methods defined in NACE Standard MR 0103. Product configurations for applications requiring compliance to MRO175 - 2003 or ISO 15156 are also available upon request. The LincolnLog is also designed for compliance with Pressure Equipment Directives (PED) requirements.

Numbering System



General Data

- **Flow Direction**

standard: flow-to-open

- **Body**

type: cast or forged globe style
cast or forged angle style

sizes: 1" to 8" (DN 25 to DN 200)

ratings: ANSI Class 600 to 2500
(ISO PN 100 to 420)
API 5000 to 10000

end connections: RFF, RTJ, socket weld,
butt weld, threaded
print flanges (forgings)

- **Bonnet**

type: bolted
standard
extension

- **Body and Bonnet**

materials: carbon steel
316 stainless steel
chrome-moly
others

- **Trim**

plug type: multi-step axial flow
(3, 4 and 6 stages)

seat type: quick change
integral with plug liner (1" & 1.5" sizes)
metal seat
soft seat

guide: heavy top guided (liner)

C_v ratio: see Flow Capacity tables (page 5)

flow characteristics: modified linear (see page 6)

- **Actuator**

type: spring-diaphragm
spring-return cylinder
double-acting cylinder

handwheel: optional

Optional designs are also available, such as larger sizes, higher pressure ratings, special materials, or additional trim stages as required. Consult factory for design details and specifications.

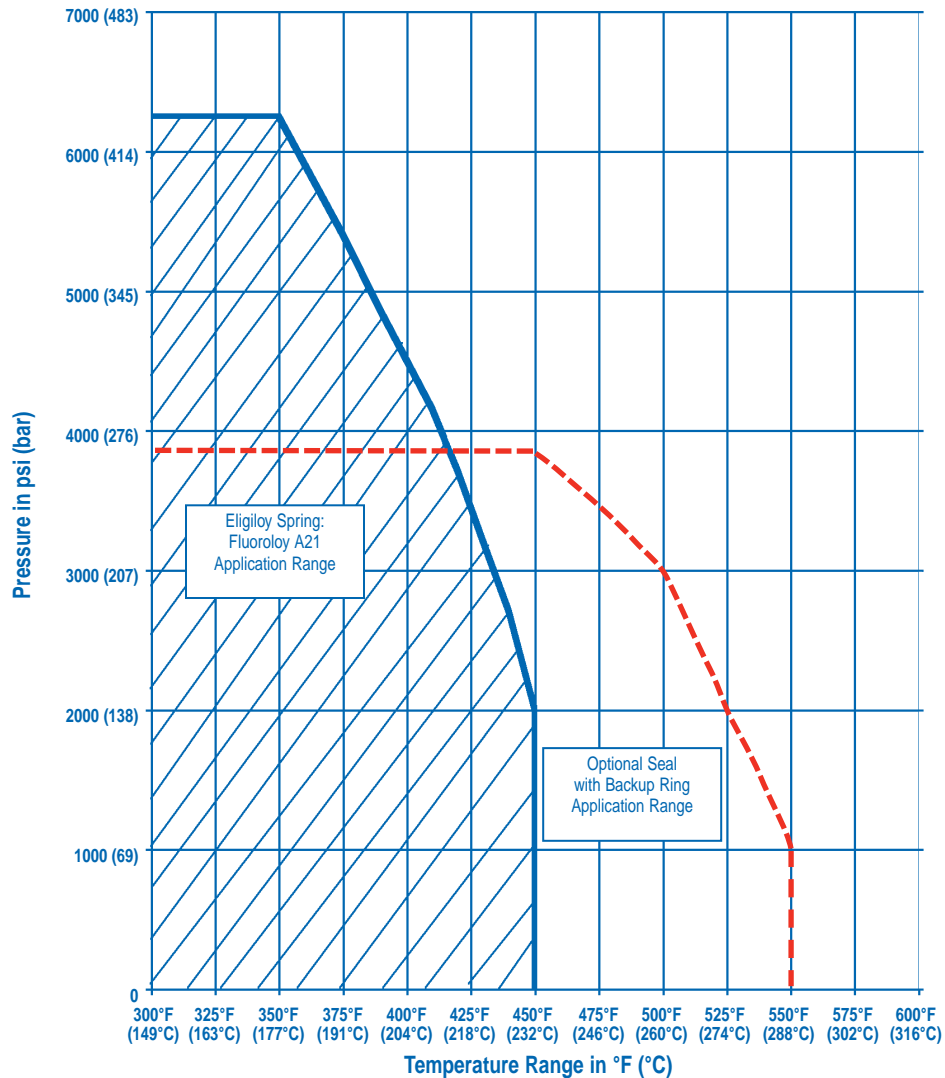
Temperature Range / Seat Leakage

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 (See Note 3)
1.5 to 8	40 to 200	Balanced	Metal Seat	-20°F (-29°C)	450°F (232°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 Masoneilan.
2. Seat leakage class ratings per IEC 534-4 and ANSI/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 & 1.5	25 & 40	<input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/>
2	50	<input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/>
3	80	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>
4	100	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>
6	150	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>
8	200	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="radio"/> <input checked="" type="radio"/> <input type="checkbox"/> <input type="checkbox"/>

- Sizes, ratings and end connections are available in both globe and angle body styles.
- Pressure classes shown represent ASME/ANSI 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	9.0	.98	.15
3	80	2.25	57.2	.62	15.7	20	.98	.25
4	100	2.88	73.2	.75	19.1	34	.98	.43
6	150	4.12	105	1.00	25.4	65	.98	.56
8	200	5.38	137	1.25	31.8	135	.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	6.0	.994	7.5	.991	.12
3	80	2.25	57.2	.62	15.7	10	.996	13	.994	16.5	.991	.20
4	100	2.88	73.2	.75	19.1	16.5	.996	22	.994	28	.991	.35
6	150	4.12	105	1.00	25.4	34	.996	45	.994	56	.991	.46
8	200	5.38	137	1.25	31.8	70	.996	90	.994	115	.991	.80

Standard Capacity – 6-Stage Design

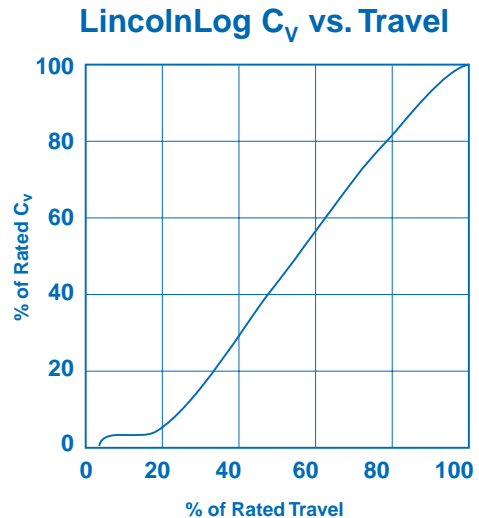
Flow Characteristic: **MODIFIED LINEAR**

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	6.0	.994	.08
3	80	2.25	57.2	.62	15.7	7.5	.998	9.5	.997	13	.994	.13
4	100	2.88	73.2	.75	19.1	12	.998	16	.997	22	.994	.22
6	150	4.12	105	1.00	25.4	25	.998	33	.997	45	.994	.30
8	200	5.38	137	1.25	31.8	50	.998	65	.997	91	.994	.65

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 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% 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.



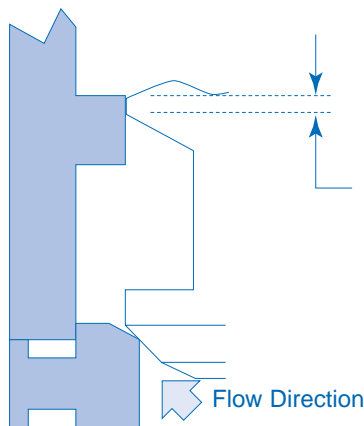
% Max. Opening	5	10	20	30	40	50	60	70	80	90	100
% Max. C_v	*	*	3	15	27	39	52	64	76	88	100

* Clearance Flow Only

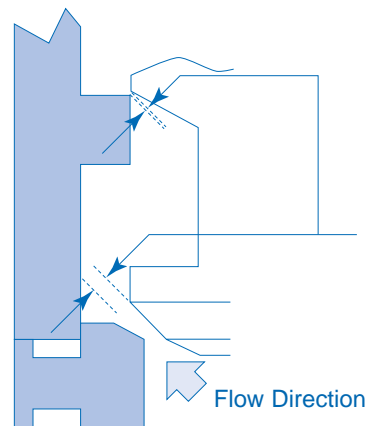
Trim Seat Protection

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% of Plug Travel
Trim overlap with the valve in the closed or low lift positions.



15 - 100% 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 the latest Masoneilan sizing and selection software program.

Noise Predictions

Valve noise calculations can be performed using the 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 (60 bar) for continuous duty cycle applications and up to 1000 psi (70 bar) ΔP per stage for intermittent service. The recommended operating throttling ΔP limits are also shown in the table below.

Engineered Solutions

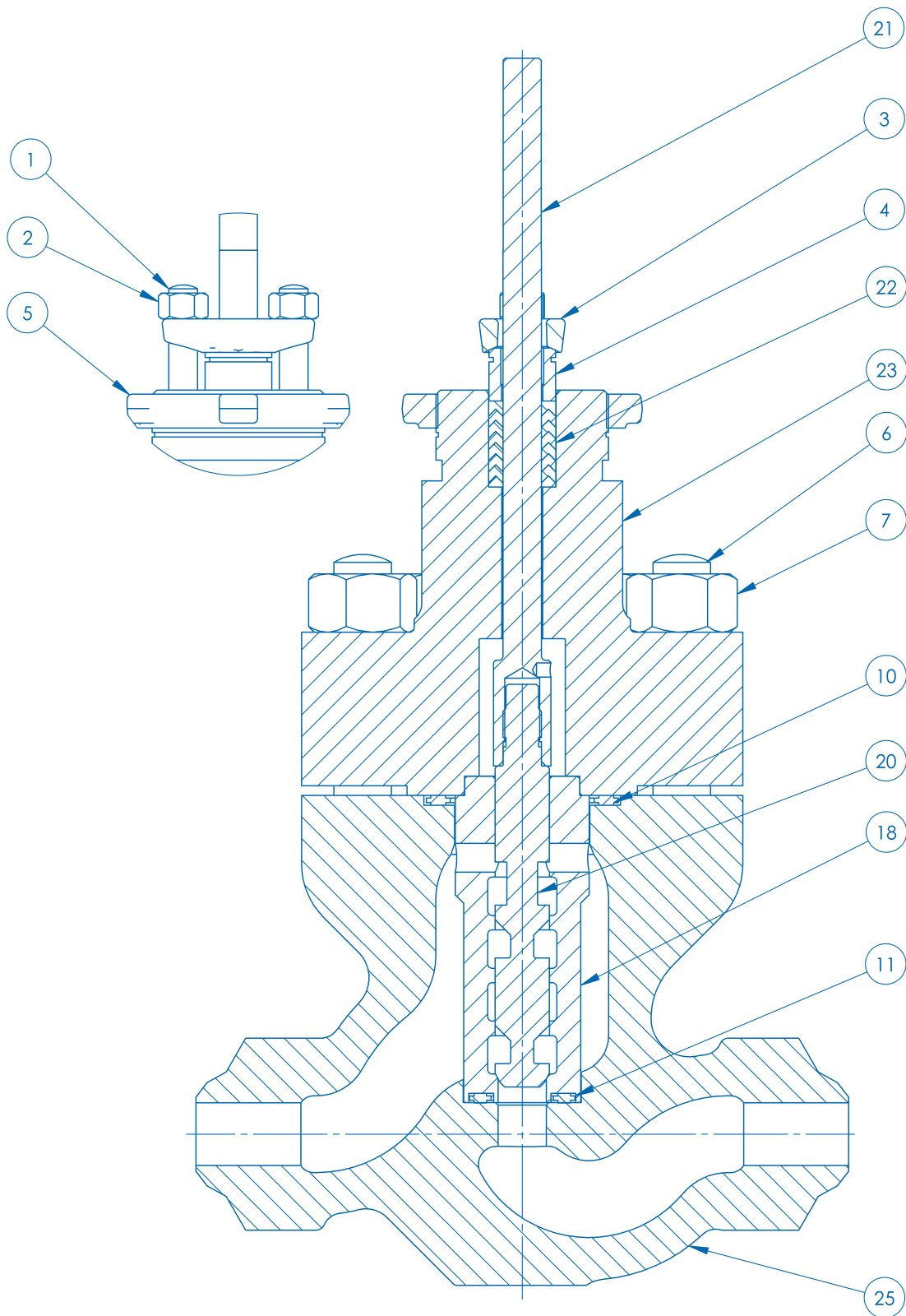
For flashing service, the expansion ratio of the fluid will determine the appropriate staging ratio to apply. Non-standard staging ratios can be supplied for compressible two-phase flow or flashing conditions not covered by the standard trim. Please consult Masoneilan for proper sizing and design of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

Staging Ratios & Pressure Drop Guidelines

Trim Type	No. of Stages	Staging Ratios ^{(1) (2)}	Pressure Drop per Stage ⁽³⁾		Maximum Recommended Throttling ΔP			
			Stages	Fraction of Total ΔP	Continuous Service		Intermittent Service	
					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	3698	255	4713	325
			6	.05				
B	6	1-1-1-1-2-3	1 to 4	.23	3480	240	4350	300
			5	.06				
			6	.025				
A	6	1-1-1-1-2-4	1 to 4	.23	3408	235	4278	295
			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 (60 bar) for continuous duty cycle applications and up to 1000 psi (70 bar) ΔP per stage for intermittent service.

Materials of Construction



1" Size Unbalanced Assembly

Materials of Construction

Standard Construction

Valve Sizes 1" and 1.5" (DN 25 and 40)⁽¹⁾

Ref. No.	Temperature Range	-20°F	450°F	600°F
Ref. No.	Temperature Range	-29°C	232°C	316°C
Ref. No.	Description	Standard Materials		
1	Packing Flange Stud	304 St. St. ASTM A193 GR B8 Class 2		
2	Packing Flange Nut	304 St. St. ASTM A194 GR 8		
3	Packing Flange	Carbon Steel ASTM A668 CL B or ASTM A216 GR WCC		
4	Packing Follower	Austenitic 300 Series Stainless Steel		
5	Drive Nut	Carbon Steel SAE 1117 or ASTM A216 GR WCC		
6	Body Stud	Alloy Steel ASTM A193 GR B7		
7	Body Stud Nut	Carbon Steel ASTM A194 GR 2H		
8	Seal Retainer ⁽²⁾	316 St. St. ASTM A479 TY 316		
9	Balance Seal ⁽³⁾⁽⁴⁾	PTFE Jacket (Fluoroloy® A21) with Elgiloy® Spring		
10	Body Gasket	316L St. St. w/Flexible Graphite Filler (Spiral Wound)		
11	Seat Ring Gasket	316L St. St. w/Flexible Graphite Filler (Spiral Wound)		
12	Plug Pin (Not Shown)	Austenitic 300 Series Stainless Steel		
18	Liner with Integral Seat	17-4 PH St. St. ASTM A564 GR 630 Cond. H900		
20	Plug	410 St. St. ASTM A479		
21	Stem	17-4 PH St. St. ASTM A564 GR 630 Cond. H1075		
22	Packing	TFE V-Ring with Std. Bonnet		
		TFE V-Ring with Ext. Bonnet		
23	Valve Bonnet	Carbon Steel ASTM A216 Grade WCC		
25	Valve Body	Carbon Steel ASTM A216 Grade WCC or ASTM A105 (Forging)		

1. 1" (DN 25) valve size is only available in the unbalanced configuration.
2. The seal retainer is not required for the 1" (DN 25) size.
3. The balance seal is not required for the unbalanced construction.
4. See Page 4 for balance seal pressure and temperature limits.

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

Materials of Construction

Standard NACE⁽¹⁾ Construction

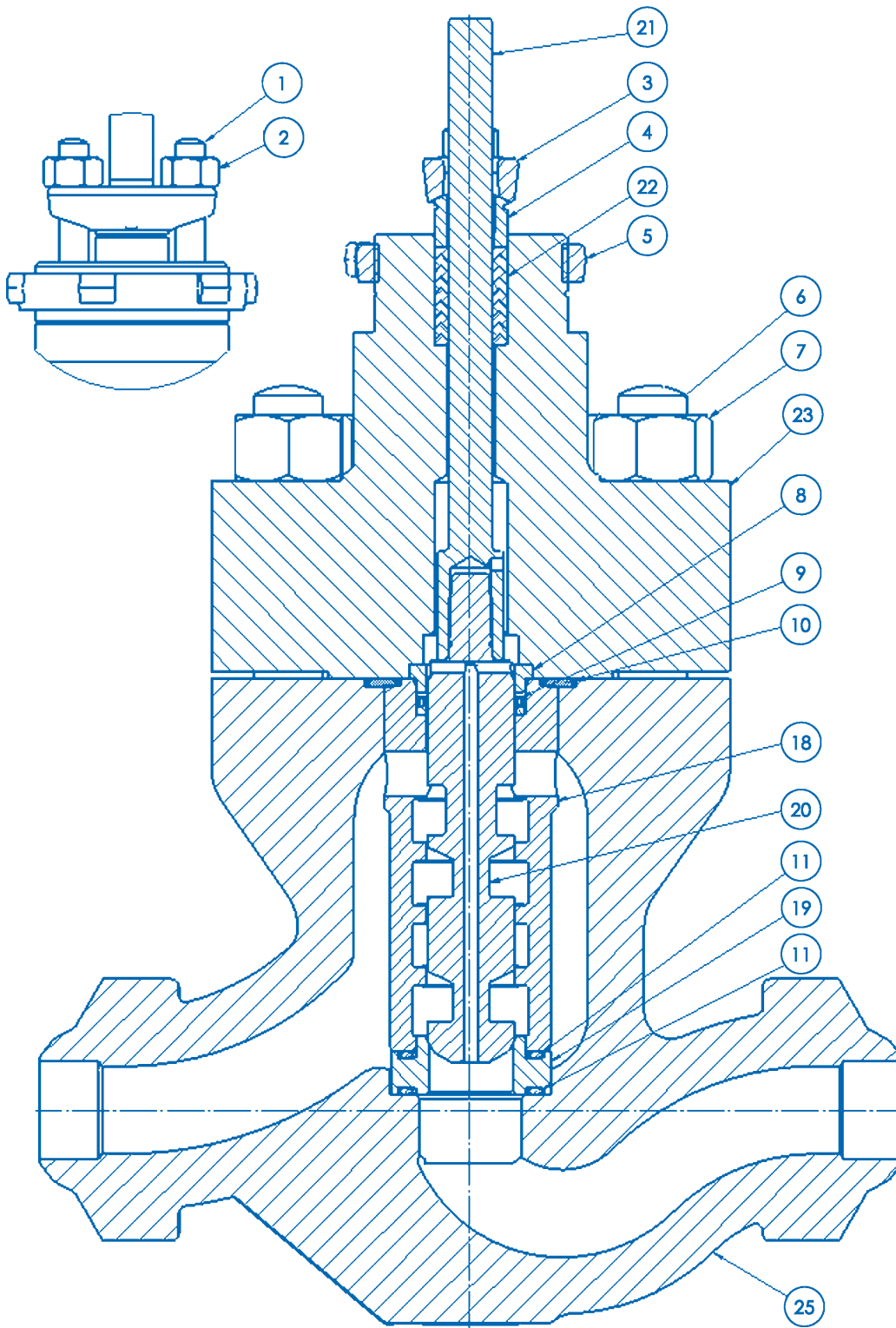
Valve Sizes 1" and 1.5" (DN 25 and 40)⁽²⁾

Ref. No.	Temperature Range	-20°F	450°F	600°F
Ref. No.	Temperature Range	-29°C	232°C	316°C
Ref. No.	Description	Standard Materials		
1	Packing Flange Stud	304 St. St. ASTM A193 GR B8 Class 2		
2	Packing Flange Nut	304 St. St. ASTM A194 GR 8		
3	Packing Flange	Carbon Steel ASTM A668 CL B or ASTM A216 GR WCC		
4	Packing Follower	Austenitic 300 Series Stainless Steel		
5	Drive Nut	Carbon Steel SAE 1117 or ASTM A216 GR WCC		
6	Body Stud	Alloy Steel ASTM A193 GR B7		
7	Body Stud Nut	Carbon Steel ASTM A194 GR 2H		
8	Seal Retainer ⁽³⁾	316 St. St. ASTM A479 TY 316		
9	Balance Seal ⁽⁴⁾⁽⁵⁾	PTFE Jacket (Fluoroloy® A21) with Elgiloy® Spring		
10	Body Gasket	316L St. St. w/Flexible Graphite Filler (Spiral Wound)		
11	Seat Ring Gasket	316L St. St. w/Flexible Graphite Filler (Spiral Wound)		
12	Plug Pin (Not Shown)	Austenitic 300 Series Stainless Steel		
18	Liner with Integral Seat	Nitronic 50 ASTM A479 TY XM-19		
20	Plug	17-4 PH St. St. ASTM A564 GR 630 Cond. H1150M		
21	Stem	Nitronic 50 ASTM A479 TY XM-19		
22	Packing	TFE V-Ring with Std. Bonnet		
		TFE V-Ring with Ext. Bonnet		
23	Valve Bonnet	Carbon Steel ASTM A216 Grade WCC		
25	Valve Body	Carbon Steel ASTM A216 Grade WCC or ASTM A105 (Forging)		

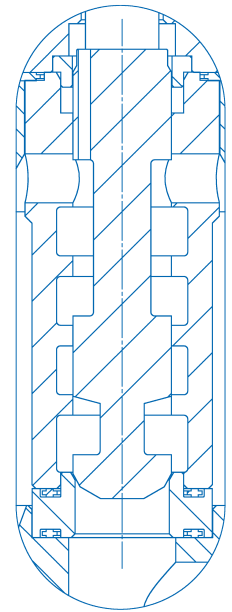
1. Standard materials and processes are in accordance with the requirements of NACE specification MR0103. Applications requiring compliance to MR0175 - 2003 or ISO 15156 would need to be reviewed by Masoneilan.
2. 1" (DN 25) valve size is only available in the unbalanced configuration.
3. The seal retainer is not required for the 1" (DN 25) size.
4. The balance seal is not required for the unbalanced construction.
5. See Page 4 for balance seal pressure and temperature limits.

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

Materials of Construction



2" Size Balanced Assembly



2" Size Unbalanced Trim Detail


Materials of Construction

Standard Construction

Valve Sizes 2" to 8" (DN 50 and 200)

Ref. No.	Temperature Range	-20°F		450°F	600°F
Description		Standard Materials			
1	Packing Flange Stud	304 St. St. ASTM A193 GR B8 Class 2			
2	Packing Flange Nut	304 St. St. ASTM A194 GR 8			
3	Packing Flange	Carbon Steel ASTM A668 CL B or ASTM A216 GR WCC			
4	Packing Follower	Austenitic 300 Series Stainless Steel			
5	Drive Nut	Carbon Steel SAE 1117 or ASTM A216 GR WCC			
6	Body Stud	Alloy Steel ASTM A193 GR B7			
7	Body Stud Nut	Carbon Steel ASTM A194 GR 2H			
8	Seal Retainer	316 St. St. ASTM A479 TY 316			
9	Balance Seal ⁽¹⁾⁽²⁾	PTFE Jacket (Fluoroloy® A21) with Elgiloy® Spring			
10	Bonnet Gasket ⁽³⁾ (2" Size)	316L St. St. w/Flexible Graphite Filler (Spiral Wound)			
	Metal Seal ⁽⁴⁾ (3" to 8" Sizes)	17-4 PH St. St. ASTM A564 GR 630 Cond. H1150M			
11	Seat Ring Gasket	316L St. St. w/Flexible Graphite Filler (Spiral Wound)			
12	Plug Pin (Not Shown)	Austenitic 300 Series Stainless Steel			
18	Liner	17-4 PH St. St. ASTM A564 GR 630 Cond. H900			
19	Seat Ring	316 St. St. ASTM A479 TY 316 with Hardfaced Seat			
20	Plug	410 St. St. ASTM 479			
21	Stem	17-4 PH St. St. ASTM A564 GR 630 Cond. H1075			
22	Packing	TFE V-Ring with Std. Bonnet			
		TFE V-Ring with Ext. Bonnet			
23	Valve Bonnet ⁽³⁾	Carbon Steel ASTM A216 Grade WCC			
24	Bonnet Flange ⁽⁴⁾ (3" to 8" Sizes)	Carbon Steel ASTM A216 Grade WCC			
25	Valve Body	Carbon Steel ASTM A216 Grade WCC or ASTM A105 (Forging)			
Ref. No.	Temperature Range	-29°C		232°C	316°C

1. The balance seal is not required for the unbalanced construction.
2. See Page 4 for balance seal pressure and temperature limits.
3. 2" size valve bonnet includes an integral flange and requires a bonnet gasket.
4. 3" to 8" size valves use separate bonnet flanges and a metal seal joint design.

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

Materials of Construction

Standard NACE⁽¹⁾ Construction

Valve Sizes 2" to 8" (DN 50 and 200)

Ref. No.	Temperature Range	-20°F		450°F 600°F		
		Description		Standard Materials		
1	Packing Flange Stud	304 St. St. ASTM A193 GR B8 Class 2				
2	Packing Flange Nut	304 St. St. ASTM A194 GR 8				
3	Packing Flange	Carbon Steel ASTM A668 CL B or ASTM A216 GR WCC				
4	Packing Follower	Austenitic 300 Series Stainless Steel				
5	Drive Nut	Carbon Steel SAE 1117 or ASTM A216 GR WCC				
6	Body Stud	Alloy Steel ASTM A193 GR B7				
7	Body Stud Nut	Carbon Steel ASTM A194 GR 2H				
8	Seal Retainer	316 St. St. ASTM A479 TY 316				
9	Balance Seal ⁽²⁾⁽³⁾	PTFE Jacket (Fluoroloy® A21) with Elgiloy® Spring				
10	Bonnet Gasket ⁽⁴⁾ (2" Size)	316L St. St. w/Flexible Graphite Filler (Spiral Wound)				
	Metal Seal ⁽⁵⁾ (3" to 8" Sizes)	17-4 PH St. St. ASTM A564 GR 630 Cond. H1150M				
11	Seat Ring Gasket	316L St. St. w/Flexible Graphite Filler (Spiral Wound)				
12	Plug Pin (Not Shown)	Austenitic 300 Series Stainless Steel				
18	Liner	Nitronic 50 ASTM A479 TY XM-19				
19	Seat Ring	316 St. St. ASTM A479 TY 316 with Hardfaced Seat				
20	Plug	17-4 PH St. St. ASTM A564 GR 630 Cond. H1150M				
21	Stem	Nitronic 50 ASTM A479 TY XM-19				
22	Packing	TFE V-Ring with Std. Bonnet				
		TFE V-Ring with Ext. Bonnet				
23	Valve Bonnet ⁽⁴⁾	Carbon Steel ASTM A216 Grade WCC				
24	Bonnet Flange ⁽⁵⁾ (3" to 8" Sizes)	Carbon Steel ASTM A216 Grade WCC				
25	Valve Body	Carbon Steel ASTM A216 Grade WCC or ASTM A105 (Forging)				
Ref. No.	Temperature Range	-29°C		232°C 316°C		

- Standard materials and processes are in accordance with the requirements of NACE specification MR0103. Applications requiring compliance to MR0175 - 2003 or ISO 15156 would need to be reviewed by Masoneilan.
- The balance seal is not required for the unbalanced construction.
- See Page 4 for balance seal pressure and temperature limits.
- 2" size valve bonnet includes an integral flange and requires a bonnet gasket.
- 3" to 8" size valves use separate bonnet flanges and a metal seal joint design.



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

Materials of Construction

Cryogenic Service Configuration 18400/78400 Series Anti-Cavitation Control Valve

Valve Sizes 1" to 1.5" (DN 25 and 40)

Ref. No.	Description	Standard Materials
1	Packing Flange Stud	304 Stainless Steel ASTM A193 Gr B8 Class 2
2	Packing Flange Nut	304 Stainless Steel ASTM A194 Gr 8
3	Packing Flange	Austenitic 300 Series Stainless Steel
4	Packing Follower	Austenitic 300 Series Stainless Steel
5	Drive Nut	Carbon Steel SAE 1117 or ASTM A216 Gr WCC with ENP
6	Valve Body Stud	304 Stainless Steel ASTM A193 Gr B8 Class 2
7	Valve Body Nut	304 Stainless Steel ASTM A194 Gr 8
10	Body Gasket	316L St. St. w/ Flexible Graphite Filler (Spiral Wound)
11	Seat Ring Gasket	316L St. St. w/ Flexible Graphite Filler (Spiral Wound)
12	Plug Pin (Not Shown)	Austenitic 300 Series Stainless Steel
18	Liner with Integral Seat	316 Stainless Steel ASTM A479 TY 316 with Chrome-Plate and Hardfaced Seat
20	Plug	316 Stainless Steel ASTM A479 TY 316 with Hardfaced Guides and Seat
		Nitronic 50 with Hardfaced Seat
21	Plug Stem	316 Stainless Steel ASTM A479 TY 316
		Inconel X-750 ASTM B637 Gr 688
22	Packing	Teflon V-Ring
23	Valve Bonnet	316 Stainless Steel ASTM A351 Gr CF8M
25	Valve Body	316 Stainless Steel ASTM A351 Gr CF8M

Valve Sizes 2" to 8" (DN 50 and 400)

Ref. No.	Description	Standard Materials
1	Packing Flange Stud	304 Stainless Steel ASTM A193 Gr B8 Class 2
2	Packing Flange Nut	304 Stainless Steel ASTM A194 Gr 8
3	Packing Flange	Austenitic 300 Series Stainless Steel
4	Packing Follower	Austenitic 300 Series Stainless Steel
5	Drive Nut	Carbon Steel SAE 1117 or ASTM A216 Gr WCC with ENP
6	Valve Body Stud	304 Stainless Steel ASTM A193 Gr B8 Class 2
7	Valve Body Nut	304 Stainless Steel ASTM A194 Gr 8
10	Bonnet Gasket (2" Size)	316L St. St. w/ Flexible Graphite Filler (Spiral Wound)
	Metal Seal (3" to 8" Sizes)	A286 Super Alloy ASTM A638 Gr 660
11	Seat Ring Gasket	316L St. St. w/ Flexible Graphite Filler (Spiral Wound)
12	Plug Pin (Not Shown)	Austenitic 300 Series Stainless Steel
18	Liner	316 Stainless Steel ASTM A479 TY 316 with Chrome-Plate
19	Seat Ring	316 Stainless Steel ASTM A479 TY 316 with Hardfaced Seat
20	Plug	316 Stainless Steel ASTM A479 TY 316 with Hardfaced Guides and Seat
		Nitronic 50 with Hardfaced Seat
21	Plug Stem	316 Stainless Steel ASTM A479 TY 316
		Inconel X-750 ASTM B637 Gr 688
22	Packing	Teflon V-Ring
23	Valve Bonnet	316 Stainless Steel ASTM A351 Gr CF8M
24	Bonnet Flange (3" to 8" Sizes)	316 Stainless Steel ASTM A351 Gr CF8M
25	Valve Body	316 Stainless Steel ASTM A351 Gr CF8M

- Materials focused for cryogenic LNG applications (-196°C). Consult factory for suitability in other cryogenic applications.
- Consult factory for NACE applications.


- Trim offerings limited to unbalanced designs.
- Consult factory for proper actuator sizing to provide correct valve shut-off.
- JIS and EN equivalents available.

Materials of Construction

78400/18400 Series Optional Materials

Ref. No.	Temperature Range ⁽¹⁾	-20°F	450°F 600°F
	Description	Optional Materials	
19	Soft Seat S/A (2" to 8" Sizes)	See Below	
19A	Seat Ring	Standard - 17-4 PH St. St. ASTM A564 GR 630 Cond. H1075	
		NACE - 17-4 PH St. St. ASTM A564 GR 630 Cond. H1150M	
19B	Soft Seat Insert	Glass Reinforced PTFE (Fluorogold®)	
19C	Sliding Collar	Standard - 17-4 PH St. St. ASTM A564 GR 630 Cond. H1075	
		NACE - 17-4 PH St. St. ASTM A564 GR 630 Cond. H1150M	
20	Plug ⁽²⁾	440B or 440C St. St. ASTM A276	
22	Packing ⁽³⁾	LE® Packing ⁽⁴⁾	
		PTFE with Carbon Fiber	
		Flexible Graphite	
23	Valve Bonnet ⁽⁵⁾	316 St. St. ASTM A351 GR CF8M	
		Chrome-Moly Steel ASTM A217 GR WC9	
25	Valve Body ⁽⁵⁾	316 St. St. ASTM A351 GR CF8M or ASTM A182 GR F316 (Forging)	
		Chrome-Moly Steel ASTM A217 GR WC9 or ASTM A182 GR F22 (Forging)	
Ref. No.	Temperature Range	-29°C	232°C 316°C

1. Consult Masoneilan 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. LE 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.

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

Other Optional Materials⁽¹⁾

Ref. No.	Temperature Range	-20°F	600°F
	Description	Optional Materials	
18	Liner ⁽²⁾ or Liner with Integral Seat	Ferralium® 255 ASTM A479 Duplex St. Steel	
19	Seat Ring ⁽³⁾	Ferralium® 255 ASTM A479 Duplex St. Steel	
20	Plug ⁽⁴⁾	Inconel 718 ASTM B637 GR 7178	
21	Stem	Nitronic 50 ASTM A479 TY XM-19	
Ref. No.	Temperature Range	-29°C	316°C

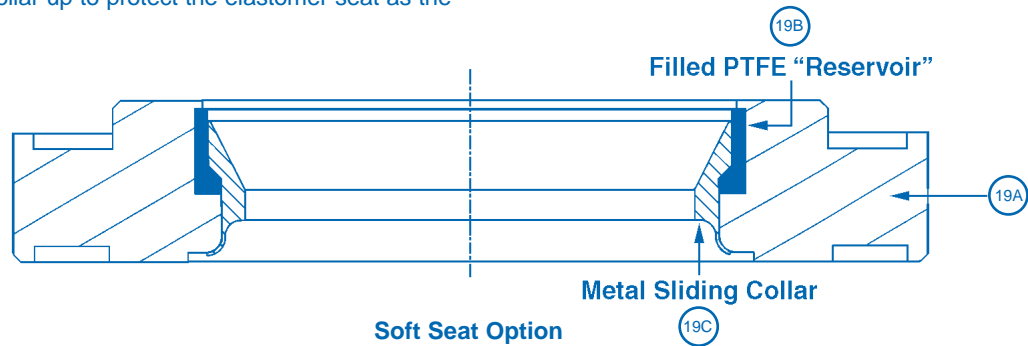
1. Listed are typical optional materials for refining applications, including sour water letdown, cold high-pressure liquid letdown, and amine service.
2. Material noted is recommended for the separate liner (2" to 8" sizes) or the liner with integral seat ring (1" and 1.5" sizes).
3. The standard 316 St. St. hard-faced seat ring can be applied in most of the refining applications noted except for amine service. Ferralium 255 is recommended for the separate seat ring in amine service.
4. Some material combinations may require electroless nickel or hard chrome plating to prevent galling. Consult factory for specific requirements.

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.

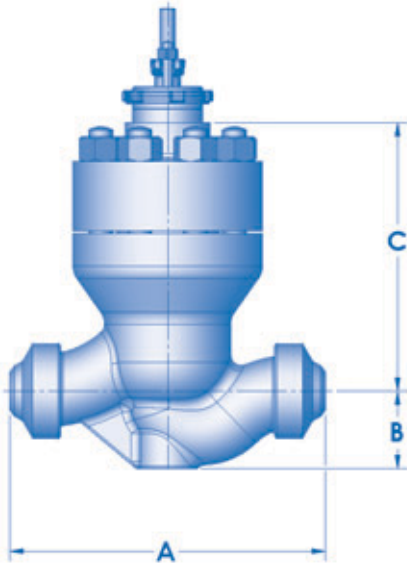
The metal collar holds the PTFE soft seat element in place and prevents it from extruding out during operation. Fluid pressure acts to push the collar up to protect the elastomer seat as the

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.

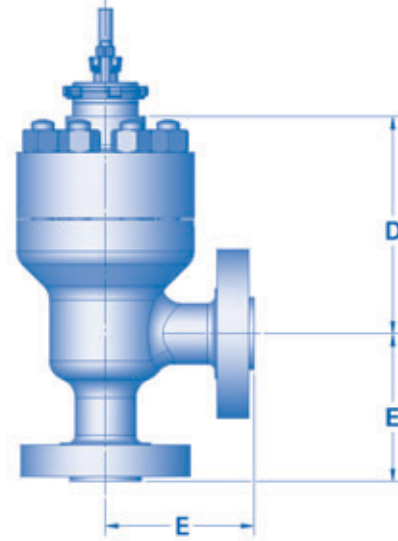


Dimensions (inches)

Cast Globe Style



Cast Angle Style



18400/78400 Series Cast Body Dimensions (inches)

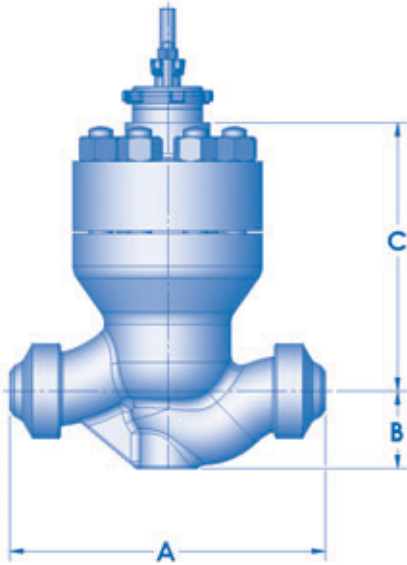
ANSI Class 600 through 2500 and equivalent PN

Valve Size (inches)	A													
	ANSI Class 600-900		ANSI Class 1500		ANSI Class 2500		ANSI Class 600		ANSI Class 900		ANSI Class 1500		ANSI Class 2500	
	BW	SW & THD	BW	SW & THD	BW	SW & 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

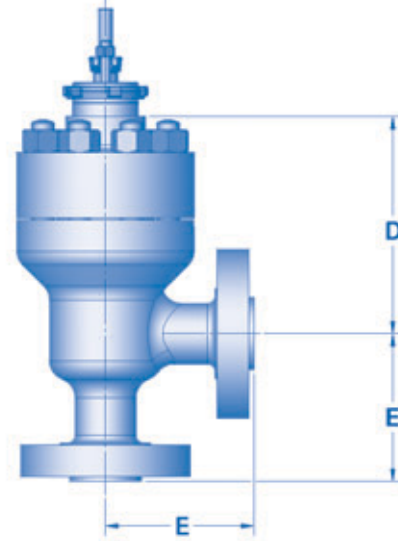
Valve Size (inches)	B							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & RTJ
1	1.97	1.97	1.97	1.97	2.44	2.94	2.94	3.13
1.5	2.62	2.62	2.62	2.62	3.06	3.50	3.50	4.00
2	3.64	3.64	3.64	3.64	3.25	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)

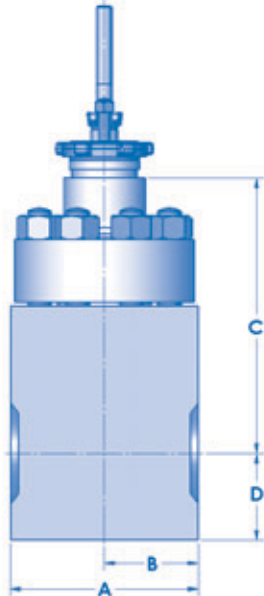
ANSI Class 600 through 2500 and equivalent PN

Valve Size (inches)	C				D			
	Standard Bonnet		Extension Bonnet		Standard Bonnet		Extension Bonnet	
	ANSI Class 600-2500		ANSI Class 600-2500		ANSI Class 600-2500		ANSI Class 600-2500	
	3 & 4 Stage	6 Stage	3 & 4 Stage	6 Stage	3 & 4 Stage	6 Stage	3 & 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

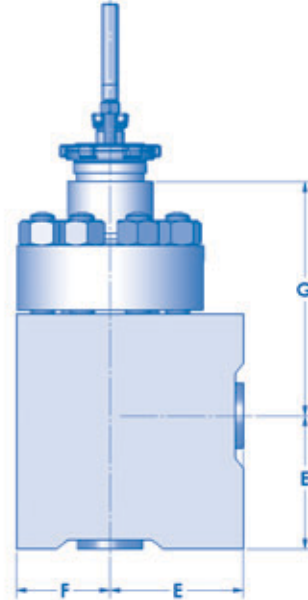
Valve Size (inches)	E													
	ANSI Class 600-900		ANSI Class 1500		ANSI Class 2500		ANSI Class 600		ANSI Class 900		ANSI Class 1500		ANSI Class 2500	
	BW	SW & THD	BW	SW & THD	BW	SW & THD	RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ
1	3.87	3.87	3.87	3.87	4.25	4.25	5.75	5.75	5.75	5.75	5.75	5.75	6.06	6.06
1.5	4.63	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)

ANSI Class 600 through 2500 and equivalent PN

Valve Size (inches)	A		B		C				D	
	ANSI Class 600-2500		ANSI Class 600-2500		Standard Bonnet		Extension Bonnet		ANSI Class 600-2500	
	RF, RTJ & BW	SW & THD	RF, RTJ & BW	SW & THD	ANSI Class 600-2500		ANSI Class 600-2500		RF, RTJ & BW	SW & THD
					3 & 4 STAGE	6 STAGE	3 & 4 STAGE	6 STAGE		
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	

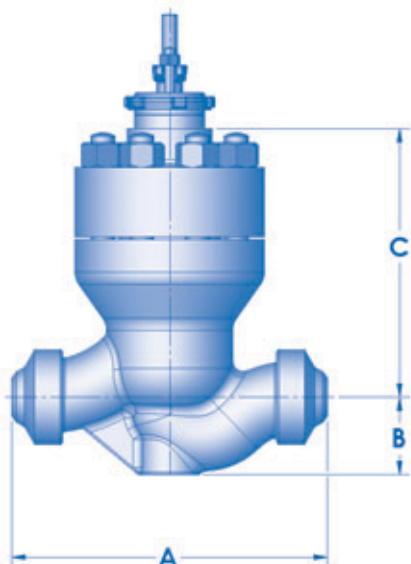
78400F Series Forged Angle Style Body Dimensions (inches)

ANSI Class 600 through 2500 and equivalent PN

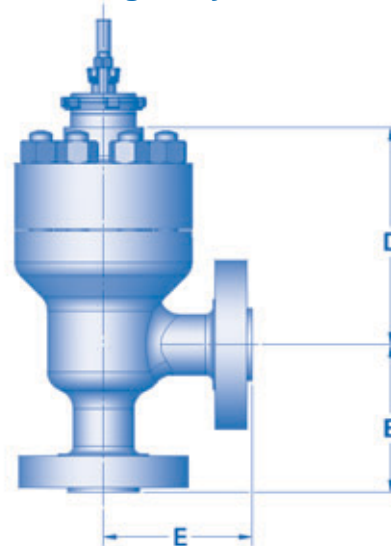
Valve Size (inches)	E		F		G			
	ANSI Class 600-2500		ANSI Class 600-2500		Standard Bonnet		Extension Bonnet	
	RF, RTJ & BW	SW & THD	RF, RTJ & BW	SW & THD	ANSI Class 600-2500		ANSI Class 600-2500	
					3 & 4 STAGE	6 STAGE	3 & 4 STAGE	6 STAGE
1	4.12	4.12	2.89	2.89	7.24	8.62	11.26	12.63
1.5	4.94	4.94	3.56	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		5.50		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)

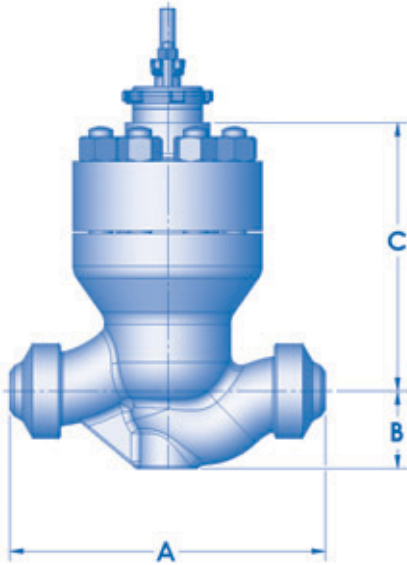
ANSI Class 600 through 2500 and equivalent PN

Valve Size (inches)	A													
	ANSI Class 600-900		ANSI Class 1500		ANSI Class 2500		ANSI Class 600		ANSI Class 900		ANSI Class 1500		ANSI Class 2500	
	BW	SW & THD	BW	SW & THD	BW	SW & 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	445	441	445	460	463	498	502
4	511		530		575		511	514	511	514	530	533	737	746
6	768		768		819		768	771	768	771	768	778	819	832
8	832		832		1022		914	917	914	917	972	981	1022	1038

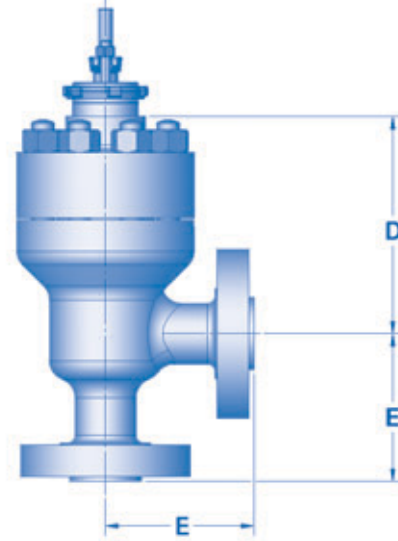
Valve Size (inches)	B							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & RTJ
1	50	50	50	50	62	75	75	80
1.5	67	67	67	67	78	89	89	102
2	92	92	92	92	83	108	108	118
3	135		136		105	121	133	152
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)

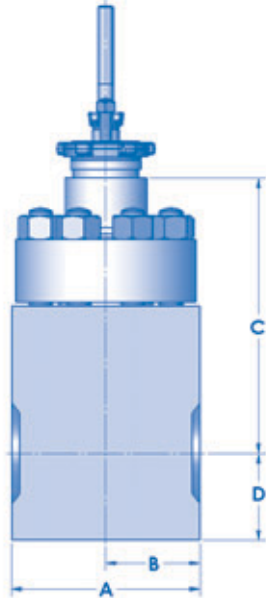
ANSI Class 600 through 2500 and equivalent PN

Valve Size (inches)	C				D			
	Standard Bonnet		Extension Bonnet		Standard Bonnet		Extension Bonnet	
	ANSI Class 600-2500		ANSI Class 600-2500		ANSI Class 600-2500		ANSI Class 600-2500	
	3 & 4 Stage	6 Stage	3 & 4 Stage	6 Stage	3 & 4 Stage	6 Stage	3 & 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

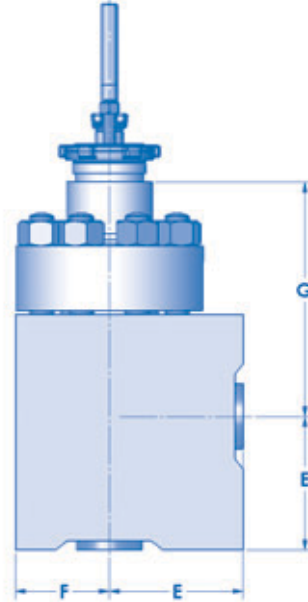
Valve Size (inches)	E													
	ANSI Class 600-900		ANSI Class 1500		ANSI Class 2500		ANSI Class 600		ANSI Class 900		ANSI Class 1500		ANSI Class 2500	
	BW	SW & THD	BW	SW & THD	BW	SW & THD	RF	RTJ	RF	RTJ	RF	RTJ	RF	RTJ
1	98	98	98	98	108	108	146	146	146	146	146	146	154	154
1.5	118	118	118	118	130	130	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)

ANSI Class 600 through 2500 and equivalent PN

Valve Size (inches)	A		B		C				D	
	ANSI Class 600-2500		ANSI Class 600-2500		Standard Bonnet		Extension Bonnet		ANSI Class 600-2500	
	RF, RTJ & BW	SW & THD	RF, RTJ & BW	SW & THD	ANSI Class 600-2500		ANSI Class 600-2500		RF, RTJ & BW	SW & THD
					3 & 4 STAGE	6 STAGE	3 & 4 STAGE	6 STAGE		
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)

ANSI Class 600 through 2500 and equivalent PN

Valve Size (inches)	E		F		G			
	ANSI Class 600-2500		ANSI Class 600-2500		Standard Bonnet		Extension Bonnet	
	RF, RTJ & BW	SW & THD	RF, RTJ & BW	SW & THD	ANSI Class 600-2500		ANSI Class 600-2500	
					3 & 4 STAGE	6 STAGE	3 & 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 S/A with Standard Bonnet (lbs)

Valve Size (inches)	3 & 4 Stage Design							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & RTJ
1	44	45	46	46	53	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							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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 S/A with Extension Bonnet (lbs)

Valve Size (inches)	3 & 4 Stage Design							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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 S/A with Standard Bonnet (lbs)

Valve Size (inches)	3 & 4 Stage Design							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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		475		462	481	516	750
6	1029		1114		1140	1187	1256	1691
8	2070		2423		2271	2370	2530	3354

Valve Size (inches)	6 Stage Design							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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 S/A with Extension Bonnet (lbs)

Valve Size (inches)	3 & 4 Stage Design							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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 S/A with Standard Bonnet (kg)

Valve Size (inches)	3 & 4 Stage Design							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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 S/A with Extension Bonnet (kg)

Valve Size (inches)	3 & 4 Stage Design							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & RTJ
1	23	23	24	24	27	30	30	34
1.5	24	25	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							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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	152	163	214
4	238		297		257	266	281	405
6	599		703		650	671	703	940
8	1173		1490		1264	1309	1378	1823

Weights (kg)

78400 Series Cast Angle Body S/A with Standard Bonnet (kg)

Valve Size (inches)	3 & 4 Stage Design							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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 S/A with Extension Bonnet (kg)

Valve Size (inches)	3 & 4 Stage Design							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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							
	ANSI Class 600-1500		ANSI Class 2500		ANSI Class 600	ANSI Class 900	ANSI Class 1500	ANSI Class 2500
	BW	SW & THD	BW	SW & THD	RF & RTJ	RF & RTJ	RF & RTJ	RF & 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 & kg)

18400F Series Forged Globe Body S/A

Valve Size (inches)	Weight (lbs)				Weight (kg)			
	Standard Bonnet		Extension Bonnet		Standard Bonnet		Extension Bonnet	
	ANSI Class 600-2500		ANSI Class 600-2500		ANSI Class 600-2500		ANSI Class 600-2500	
	3 & 4 Stage	6 Stage	3 & 4 Stage	6 Stage	3 & 4 Stage	6 Stage	3 & 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 S/A

Valve Size (inches)	Weight (lbs)				Weight (kg)			
	Standard Bonnet		Extension Bonnet		Standard Bonnet		Extension Bonnet	
	ANSI Class 600-2500		ANSI Class 600-2500		ANSI Class 600-2500		ANSI Class 600-2500	
	3 & 4 Stage	6 Stage	3 & 4 Stage	6 Stage	3 & 4 Stage	6 Stage	3 & 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

Options

Extension Bonnets
Environmental Capabilities (LE Packing)
Lubricator & Isolation Valve
Other Flange Facings
Limit Stops
Body Drain Plug
Reducer and Nipple Connections
NACE Compliance
Custom Trim Materials
U.O.P. Trim Materials
High Temperature Materials
Cryogenic Service Materials
Other Materials
Non-Destructive Examination
Oxygen Cleaning
Electric Actuators

For additional Accessories and Options, consult Masoneilan.

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CP78400 SD - 02/07
78400/18400 Series Control Valves