8 Inch Model 380/381 Control Valves

Technical Sales Bulletin

Figure 1 *Model 380 Control Valve with DFC Actuator*

The Dyna-Flo 380 series of valves are heavy duty cage guided globe style control valves designed for high pressure applications. These valves are used in all kinds of demanding applications, including oil and gas production and chemical process.

Both Models 380 and 381 are cage guided control valves with balanced plugs. Model 380 control valves are capable of Class V shutoff at process temperatures below 450°F (232°C). Model 381 control valves are designed for high temperature / high pressure applications and are well suited for general applications that do not require tight shutoff.

A bolted bonnet is standard and a typical actuator is a Dyna-Flo Model DFC, DFO, or DFLP linear actuators.

Features

High Quality Construction
Dyna-Flo uses only materials that have been proven to provide superior, trouble free performance. All materials comply with ASME and ASTM specifications.

Versatility
A wide range of trim options including Low Noise and Anti-Cavitation make the 380 a highly versatile control valve.

Field Service Friendly
No special tools are required to change or inspect trim. Top access makes in-line service easy.

Highly Durable Design
Unique trim design features of the 380 series are well suited to applications where thermal expansion is a factor, such as temperature cycling applications. These design features also allow for superior performance in a variety of demanding applications.

High Flow Capacity
Offset flow chamber and specially designed flow cavities allow for increased capacity.

Sour Gas Service Capability
The 380 Series can be constructed out of materials that comply with the recommendations of the National Association of Corrosion Engineers (NACE) MR-0175.

Shut Off Classification
Seat leakage options range from ANSI/FCI 70.2 and IEC 60534-4 Class IV to Class V for the 380. 381 is capable of Class III and IV shut off.

SPECIFICATIONS

Configurations
Refer to Table 1.

Consult your Dyna-Flo sales office for other available configurations.

Sizes and End Connection Styles

Models	380 & 381
Size:	8″
Rating:	ASME 900 & 1500
Connections:	RF / RTJ / BWE

Maximum Inlet Temperatures and Pressures
In accordance with ASME B16.34 Class 1500 unless limited by material selection shown in Tables 4 to 6, and Figure 9 of this bulletin.

Maximum Pressure Drops
Same as maximum inlet pressure unless limited by specific trim construction. For valve assembly shut off pressure drops refer to Table 8 and Figure 9.

Shutoff Classifications
Refer to Table 1.

Dimensions
Valve Dimensions
Refer to Table 3 and Figure 2.

Approximate Valve Body Weights
Refer to Table 2.

Valve Body to Bonnet Bolting
Refer to Table 5.

Characteristics
- Equal Percentage (Standard)
- Modified Equal Percentage
- Linear
- Contact factory for Low-Noise and Anti-Cavitation options.

Flow Direction
Flow down through seat ring except when using Low-Noise trim.

Packing Type and Examples
The standard packing is PTFE V-Ring. Live loaded low emission, graphite and other packing arrangements are also available. Refer to Figure 8.

Flow Coefficients
For standard coefficients at maximum travel, refer to Table 7. For full list of coefficients refer to document P-CVSM.

Valve Travel
Refer to Table 7.

Trim Materials
Refer to Table 6.

Materials
Body and bonnet material options include:

LCC (A350-LF2 optional* bonnet material)

WCC (A350-LF2 optional* bonnet material)

CF8M (A182-F316 optional* bonnet material)

***NOTE:** Dyna-Flo reserves the right to substitute a cast material with the forged bar equivalent in the event a casting is not available.

Refer to Figure 8. Refer to Tables 4 & 5 for typical construction materials. Refer to Table 8 for trim selections.

For more information and other options contact your Dyna-Flo sales office.

8 Inch Model 380/381 Control Valves

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Table 1

Valve Design Configurations

Valve Model	Shut Off Class Capability (in accordance with ANSI / FCI 70.2)	Valve Plug	Guide	Seat
380	IV Standard	Balanced	Cage	Metal
	V Optional	Balanced	Cage	Metal
381	III Standard	Balanced	Cage	Metal
	IV Optional	Balanced	Cage	Metal

Table 2

Approximate Weights lb (kg)

Class	Body	
	Flanged (RF/RTJ)	Buttweld (BWE)
1500	3700 (1700)	3100 (1400)

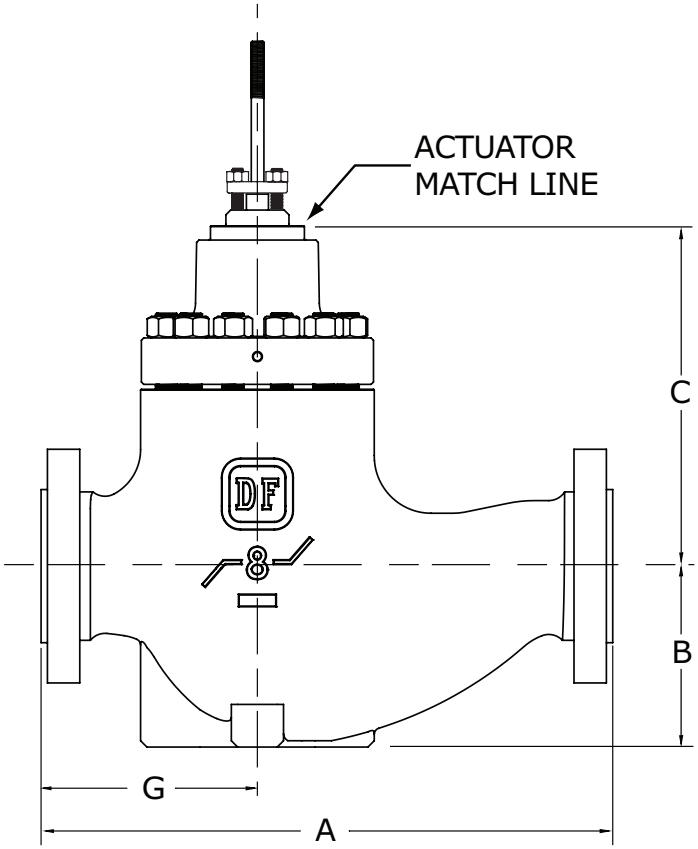
Table 3

Models 380 & 381 Standard Valve Dimensions Inches (mm) (Refer to Figure 2)

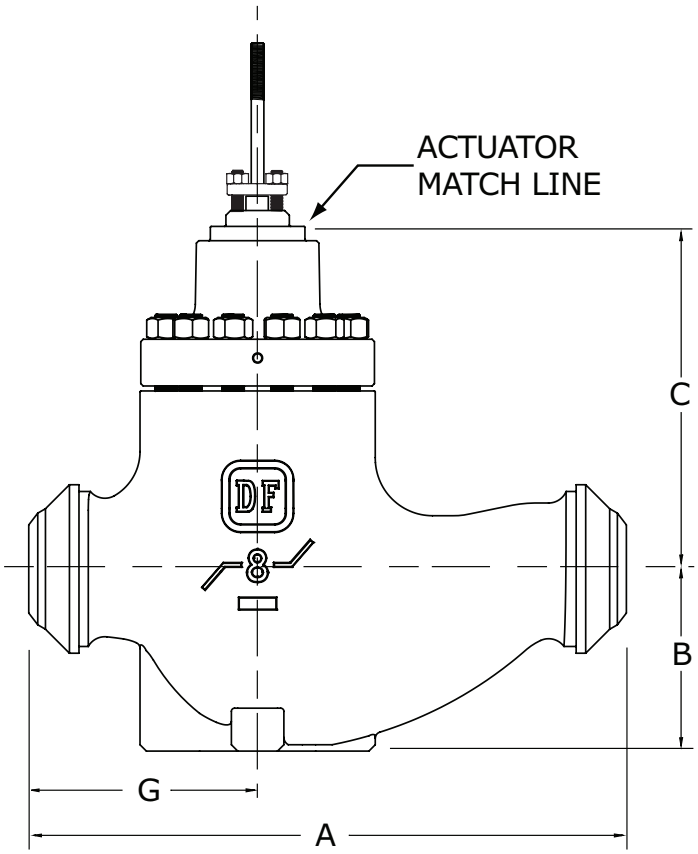
Valve Size	End Connection	Dimension			
		A	G	B	C
8"	**900 RF**	44.88 (1140)	16.88 (429)	14.31 (363)	26.94 (684)
	1500 RF	47.00 (1194)	18.00 (457)	14.31 (363)	26.94 (684)
	900 RTJ	44.88 (1140)	16.94 (430)	14.31 (363)	26.94 (684)
	1500 RTJ	47.38 (1203)	18.19 (462)	14.31 (363)	26.94 (684)
	BWE	47.00 (1194)	18.00 (457)	14.31 (363)	26.94 (684)

Figure 2 Typical *Valve Dimension Diagrams*

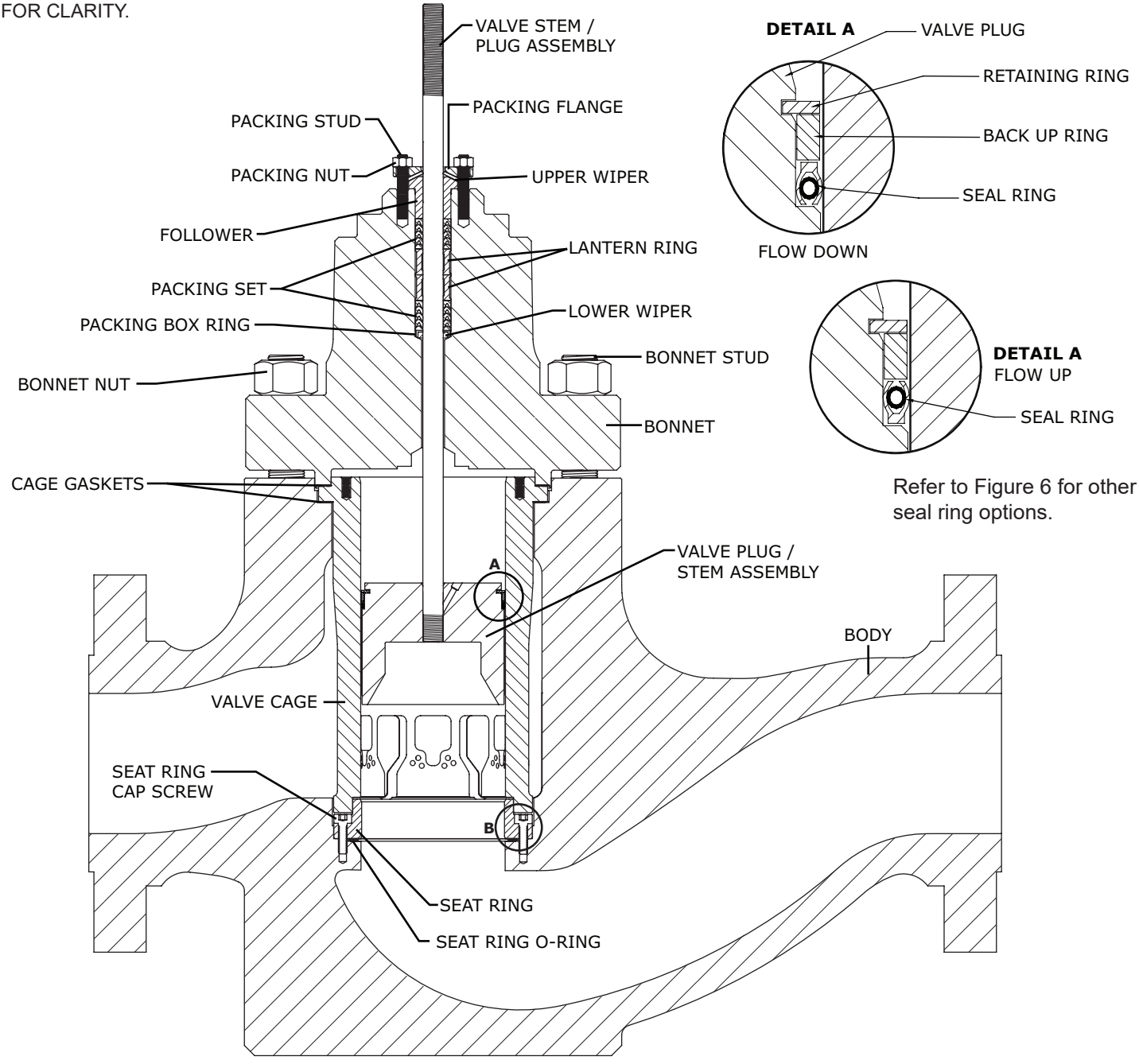
FLANGED END CONNECTIONS



BUTTWELD (BWE) END CONNECTIONS



NOTE: BONNET ROTATED 90º FOR CLARITY.



Refer to Figure 6 for other seal ring options.

Figure 3 *Cross-section of 380 Control Valve with 1" Stem*

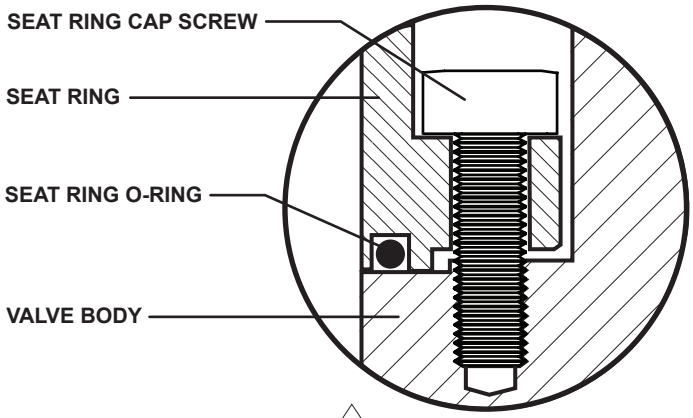


Figure 4 *Detail B - Seat Ring O-Ring*

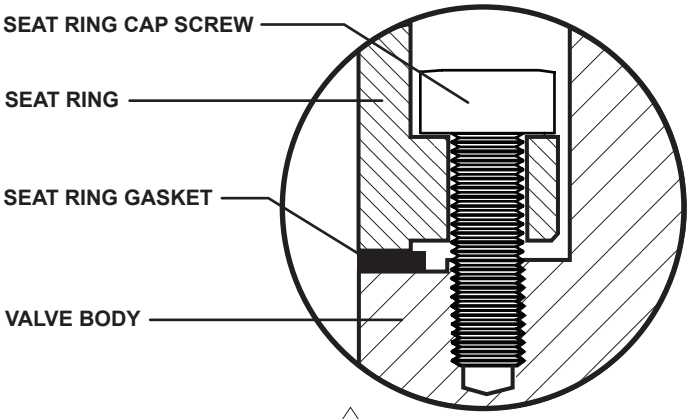


Figure 5 *Detail B - Seat Ring Gasket*

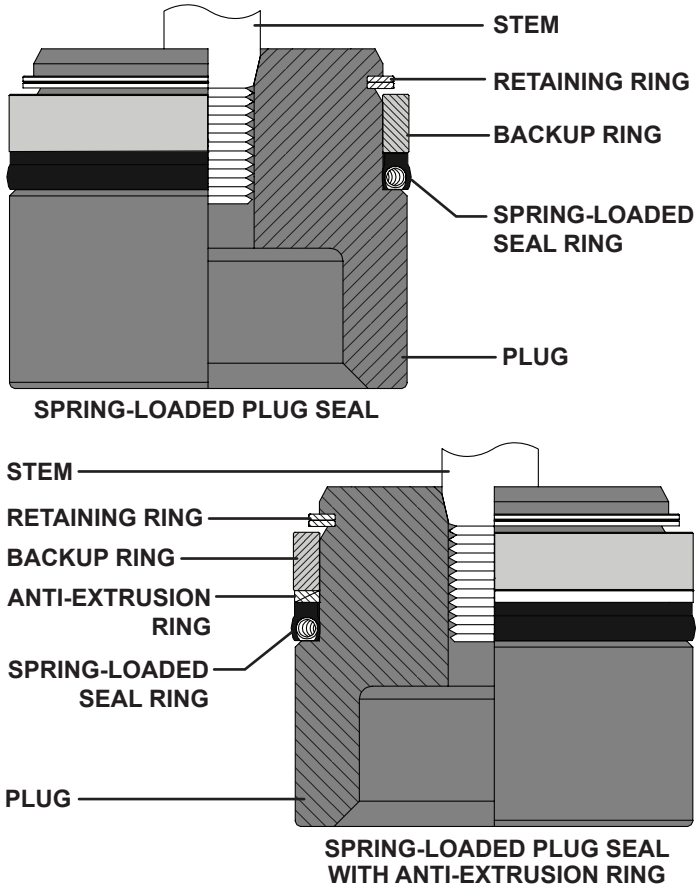


Figure 6 *Detail A - Model 380 Plug Seal Options*

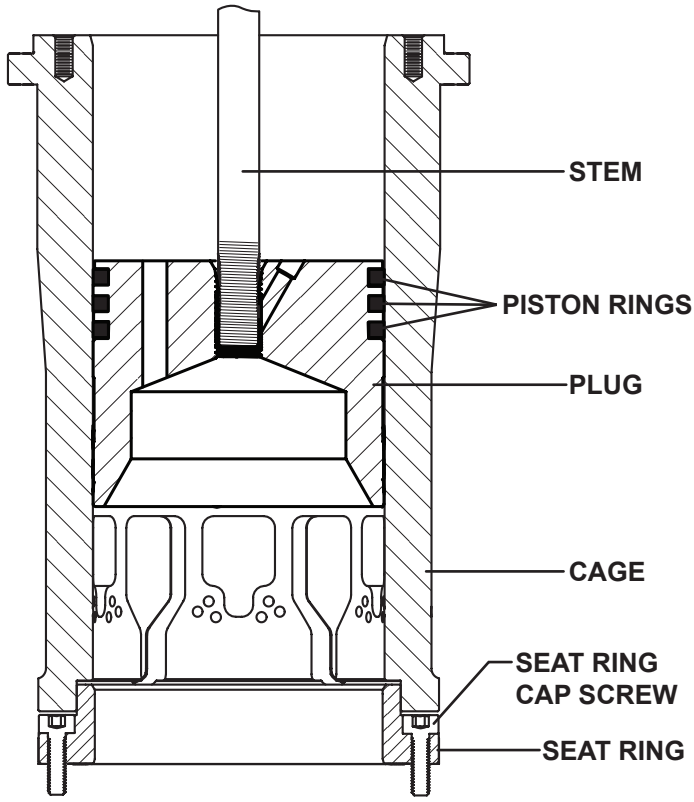


Figure 7 *Model 381 Plug and Cage Design*

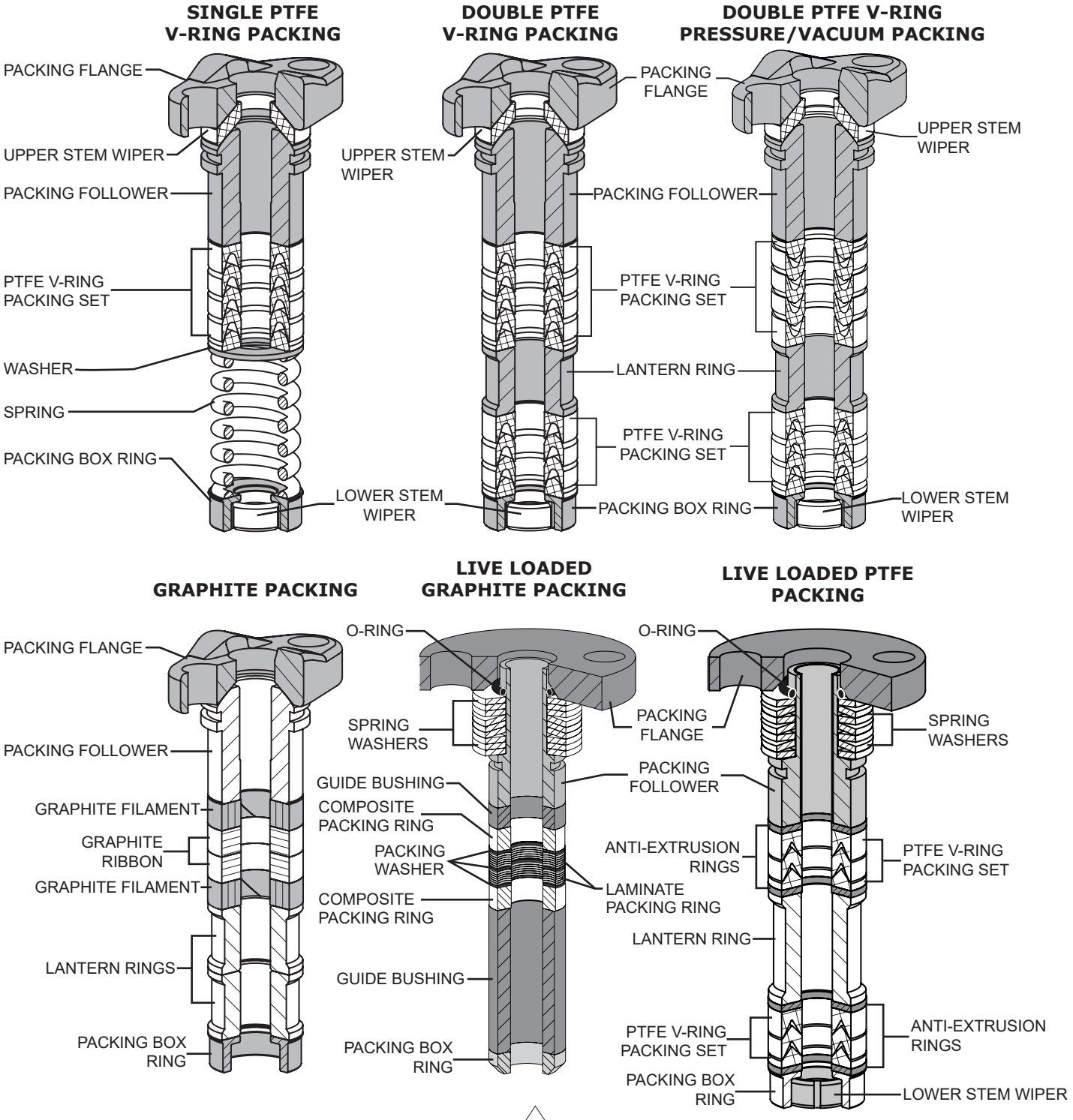


Figure 8 *Typical Packing Arrangements*

Table 4

Common Valve Parts Typical Construction Materials and Temperature Limitations

Part		Material	Temperature Limitations			
			Min. ºF	Max. ºF	Min. ºC	Max. ºC
Valve Stem		S20910	NLF(1)	NLF(1)	NLF(1)	NLF(1)
Cage Gasket		N04400	NLF(1)	NLF(1)	NLF(1)	NLF(1)
Spring-Loaded (Three-Piece) Valve Plug Seal (Model 380 Only)	Backup Ring	S31600/S31603 Dual Grade	NLF(1)	NLF(1)	NLF(1)	NLF(1)
	Seal Ring	PTFE / Elgiloy	-100	450	-73	232
	Retaining Ring	S31600	NLF(1)	NLF(1)	NLF(1)	NLF(1)
Spring-Loaded (Three-Piece) Valve Plug Seal with Anti-Extrusion Rings (Model 380 Only)	Anti-Extrusion Ring	PolyEtherEtherKetone (PEEK)	NLF(1)	NLF(1)	NLF(1)	NLF(1)
	Backup Ring	S31600/S31603 Dual Grade	NLF(1)	NLF(1)	NLF(1)	NLF(1)
	Seal Ring	PTFE / Elgiloy	-100	600	-73	319
	Retaining Ring	S31600	NLF(1)	NLF(1)	NLF(1)	NLF(1)
Piston Ring (Model 381 Only)		Graphite	NLF(1)	1100(4)	NLF(1)	593(4)
Seat Ring O-Ring		Viton(2)	-10	400	-23	204
		Nitrile (NACE)	-20	225	-29	107
		Ethylene-Propylene (EPDM) (Anti-Cavitation, NACE)	-40	450	-40	232
Seat Ring Gasket		N06600 / Graphite	NLF(1)	NLF(1)	NLF(1)	NLF(1)
Packing		PTFE V-Ring	-40	450	-40	232
		Graphite (Ribbon/Filament)	-425	1000(3)	-254	538(3)

NOTES:

1 - NLF - This Material is Not A Limiting Factor. For the temperature limitation refer to the valve body material temperature limit.

2 - Standard option, not for water or steam service. Fluoroelastomer is limited to 300ºF (149ºC) when used for NACE.

3 - Oxidizing service limited to 700ºF (371ºC).

4 - Oxidizing service limited to 1000ºF (538ºC).

Table 5

Body to Bonnet Bolting Temperature Limitations

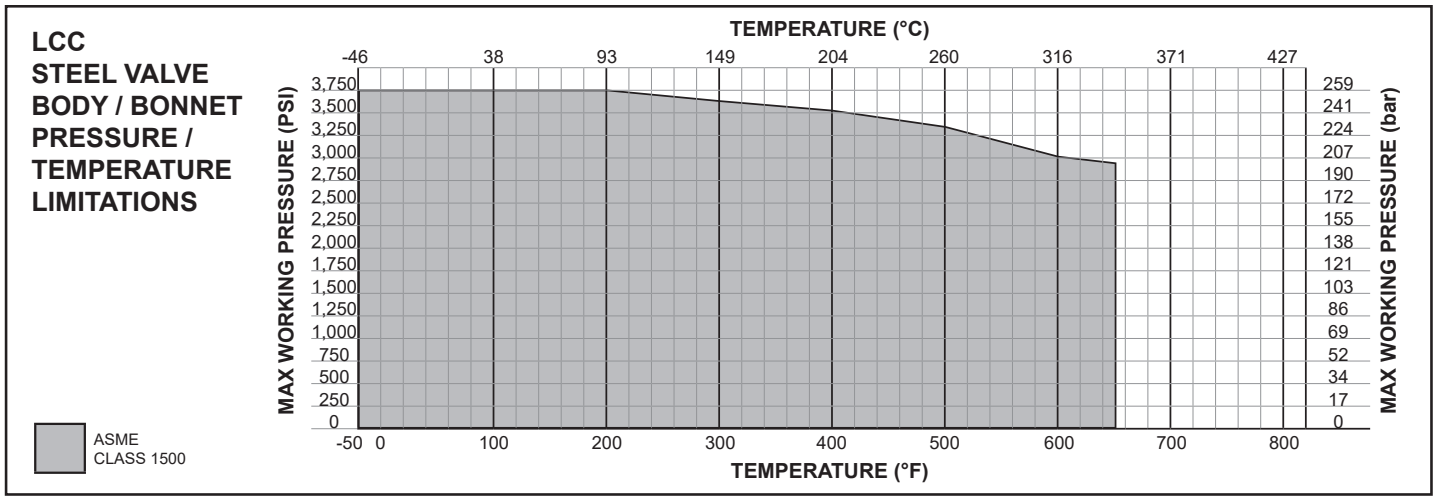
Body Material	ASME Class	Bolt/Nut Material	Temperature Limitations			
			Min. ºF	Max. ºF	Min. ºC	Max. ºC
LCC	150/300/600	B7/2H(1)(2)	-50	650	-46	343
		B7M/2HM(3)	-50	650	-46	343
WCC	150/300/600	B7/2H(1)(2)	-20	800	-29	427
		B7M/2HM(3)	-20	800	-29	427
CF8M	150/300/600	B7 Fluorokote #1 / 2H Fluorokote #1 (Standard)(2)	-50	500	-46	260
		B8M/8M(2)	-325	800	-198	427
		B7M Fluorokote #1/ 2HM Fluorokote #1(3)	-20	500	-29	260

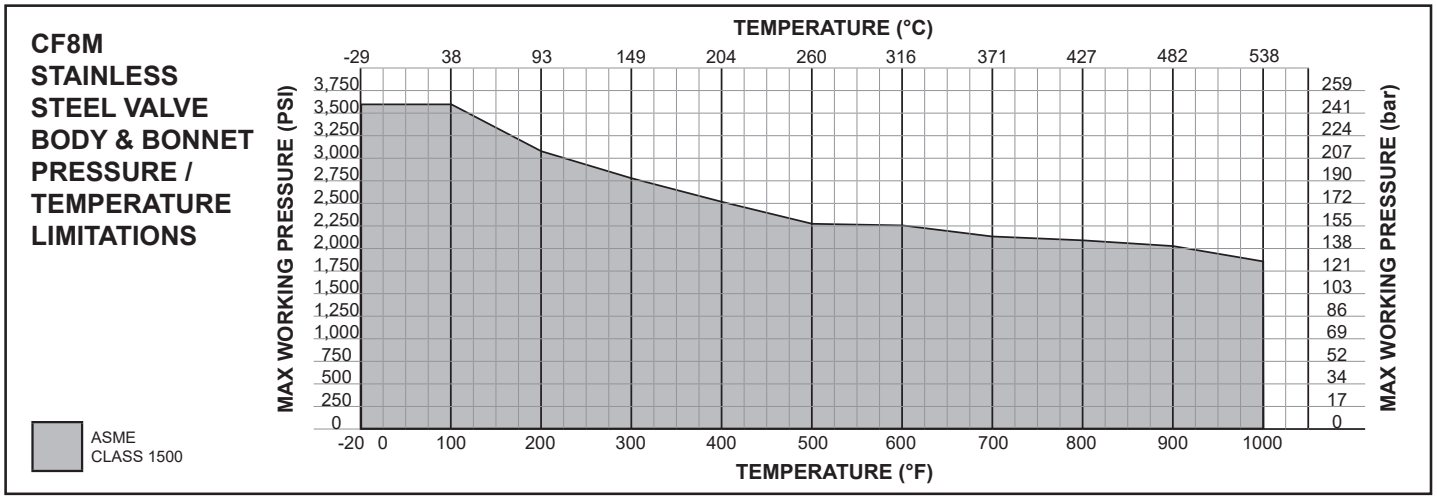
NOTES:

1 - Standard non-NACE option.

2 - NACE MR0175/ISO15156 Non-Exposed Bolting option (Bolting that is not directly exposed to sour environments and is not to be buried, insulated, equipped with flange protectors, or otherwise denied direct atmospheric exposure).

3 - NACE MR0175/ISO15156 Exposed Bolting option (Bolting that will be exposed directly to the sour environment or that will be buried, insulated, equipped with flange protectors, or otherwise denied direct atmospheric exposure).





Maximum Inlet Temperature and Pressures - Valves consistent with ASME Class rating as per ASME B16.34, unless limited by either material, pressure or temperature limitations.

Figure 9 *Pressure / Temperature Charts as per ASME B16.34 (Continued on Page 10)*

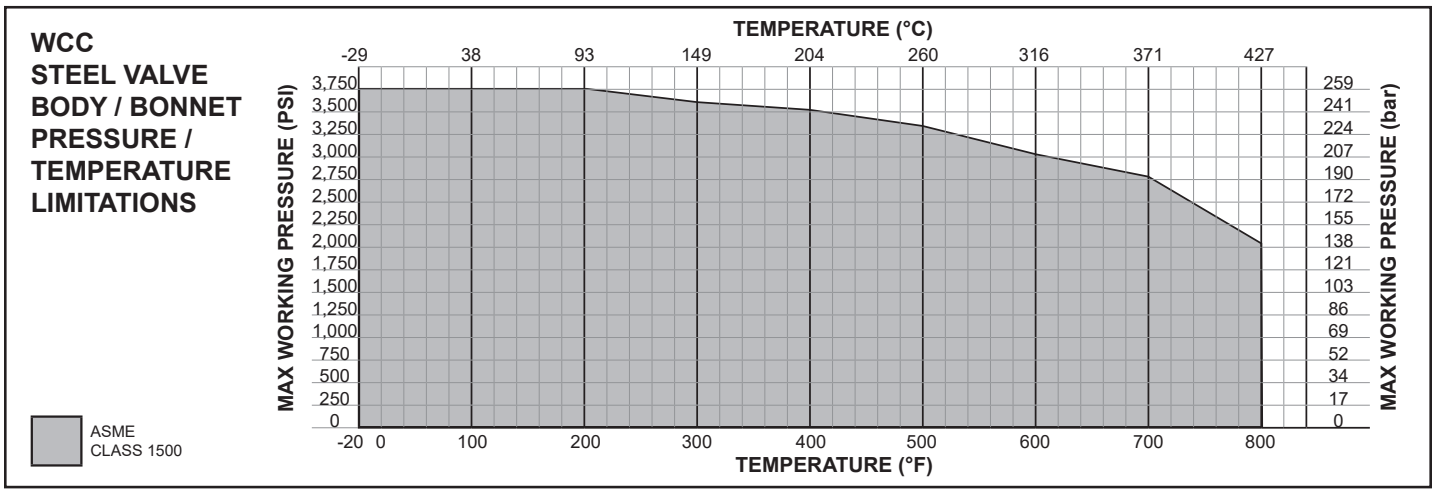


Figure 9 *Pressure / Temperature Charts as per ASME B16.34 (Continued from Page 9)*

Table 6

Common Trim Options and Temperature Ratings

Trim Spec[2]	Valve Plug	Stem	Cage	Seat Ring	Minimum[1] Temperature °F (°C)	Maximum[1] Temperature °F (°C)
S	S41600 HT	S20910	S17400 H900	S41600 HT	-20 (-29)	800 (427)
N	S31600[3] / Alloy 6 Seat and Guide	S20910	S17400 DH1150	S31600[3] / Alloy 6	-50 (-46)	450 (232)
C	S31600[3] / Alloy 6 Seat and Guide	S20910	S31600[3] ENC	S31600[3] / Alloy 6	-325 (-46)	650 (343)

1 - Temperatures need to be considered when specifying trim materials for elevated temperatures in corrosive environments, consult factory for further information.

2 - Trim Specification relates to Model Numbering System on Page 12.

3 - All S31600 barstock is dual grade S31600/S31603 (316/316L).

Table 7

Maximum Sizing Coefficients
Full Port
Globe Body Valve
Flow Down

Characteristic	Port Inches (mm)	Travel Inches (mm)	Coefficient	Percentage of Valve Travel 100%
Equal Percent	7 (177.8)	3 (76.2)	C_V	755
Linear	7 (177.8)	3 (76.2)	C_V	1022
Modified Equal Percent	7 (177.8)	3-1/2 (88.9)	C_V	912

NOTE: For the complete list of sizing coefficients refer to catalogue P-CVSM.

8 Inch Model 380/381 Control Valves

MODEL NUMBERING SYSTEM

SAMPLE PART NUMBER: 380-8BFL-SVP5-CES4

					VALVE MODEL	**380**
380	380	**381**	381			
					VALVE SIZE	**8**
8	8 INCH					
					ASME RATING	**B**
A	900	**B**	1500			
					END CONNECTION	**F**
F	RF	**J**	RTJ	**B**	BUTTWELD (SCHEDULE 80)	
U	BUTTWELD (SCHEDULE 120)			**P**	BUTTWELD (SCHEDULE 160)	
					BODY MATERIAL	**L**
L	LCC	**M**	CF8M	**W**	WCC	
					BOLTING	**-**
-	B7 / 2H (STANDARD)			**A**	B7M / 2HM	
B	B8M / 8M			**K**	B7 FLUOROKOTE #1 / 2H FLUOROKOTE #1	
L	B7M FLUOROKOTE #1 / 2HM FLUOROKOTE #1					
					TRIM	**S**
S	TRIM SPEC S			**C**	TRIM SPEC C	
N	TRIM SPEC N					
					SEAT RING GASKET / O-RING	**V**
G	GASKET (N06600 / GRAPHITE)			**E**	O-RING (EPDM)	
N	O-RING (NITRILE)			**V**	O-RING (VITON) STANDARD	
					PACKING STYLE	**P**
P	SINGLE PTFE V-RING (PRESSURE)			**J**	DOUBLE PTFE V-RING (PRESSURE)	
G	SINGLE GRAPHITE (PRESSURE)			**V**	DOUBLE PTFE V-RING (VACUUM)	
R	DOUBLE PTFE V-RING (VACUUM / PRESSURE)			**L**	LIVE LOADED PTFE V-RING (PRESSURE)	
T	LIVE LOADED GRAPHITE (PRESSURE)			**D**	LIVE LOADED DUPLEX (PRESSURE)	
K	LIVE LOADED KALREZ®					
					YOKE BOSS SIZE / VALVE STEM DIAMETER	**5**
5	5” (127 mm) / 1” (25.4 mm)			**H**	5H - 5” (127 mm) / 1-1/4” (31.8 mm)	
					PAINT	**-**
-	DFPS-01 (STANDARD)			**2**	DFPS-02 (SEVERE SERVICE)	
3	DFPS-03 (HIGH TEMPERATURE)					
					BACKUP RING / PISTON RING	**C**
C	S31600 / PTFE-ELGILOY			**R**	S31600 / PTFE-ELGILOY WITH PEEK AE RINGS	
P	PISTON RING - GRAPHITE (MODEL 381 ONLY)					
					CHARACTERISTIC	**E**
E	EQUAL PERCENT	**L**	LINEAR	**M**	MODIFIED EQUAL PERCENT	
					BONNET STYLE	**S**
S	STANDARD			**T**	STANDARD TAPPED	
					SHUTOFF CLASS	**4**
4	IV	5	V			

NOTE: Modified Equal Percent is a factor of travel and requires no special parts or trim options that differ from Equal Percent.