

# Model 380, 381, 382 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 DFP linear actuator.

### 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 ASME / FCI class IV to class V for the 380. 381 is capable of class III and IV shut off.



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### SPECIFICATIONS

#### Configurations

See Table 1.

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

#### Sizes and End Connection Styles

Models 380 & 381  
Size: 8"  
Rating: ASME 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 7 and 8, and Figure 8 of this bulletin.

#### Maximum Pressure Drops

Same as maximum inlet pressure unless limited by specific trim construction. For valve assembly shut off pressure drops see Table 8 and Figure 8.

#### Shutoff Classifications

See Table 1.

#### Dimensions

Valve Dimensions  
See Table 3 and Figure 2.

#### Approximate Valve Body Weights

See Table 2.

#### Valve Body to Bonnet Bolting

Standard service body to bonnet:  
B7 Studs (Standard)  
B7M Studs  
  
2H Nuts (Standard)  
2HM Nuts

#### Characteristics

- Equal Percentage (Standard)
- Modified Equal Percentage
- Linear
- Low Noise
- Anti-Cavitation

#### Flow Direction

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

#### Packing Type

The standard packing is PTFE V-Ring. Live loaded low emission, graphite and other packing arrangements are also available.

#### Flow Coefficients

See Table 6.

#### Valve Travel

See Table 6.

#### Trim Materials

See Table 7.

#### Valve Bolting Temperature Limitations

See Table 9.

#### Valve Parts List, Material and Temperature Limitations

See Table 4, 5, 7, & 9.  
See Figure 7 & 9.

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

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Table 1

### Valve Design Configurations

Valve Model	Shut Off Class Capability	Valve Plug	Guide	Seat
380	IV Standard	Balanced	Cage	Metal
	V Optional Standard For Anti-Cavitation Trim	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)

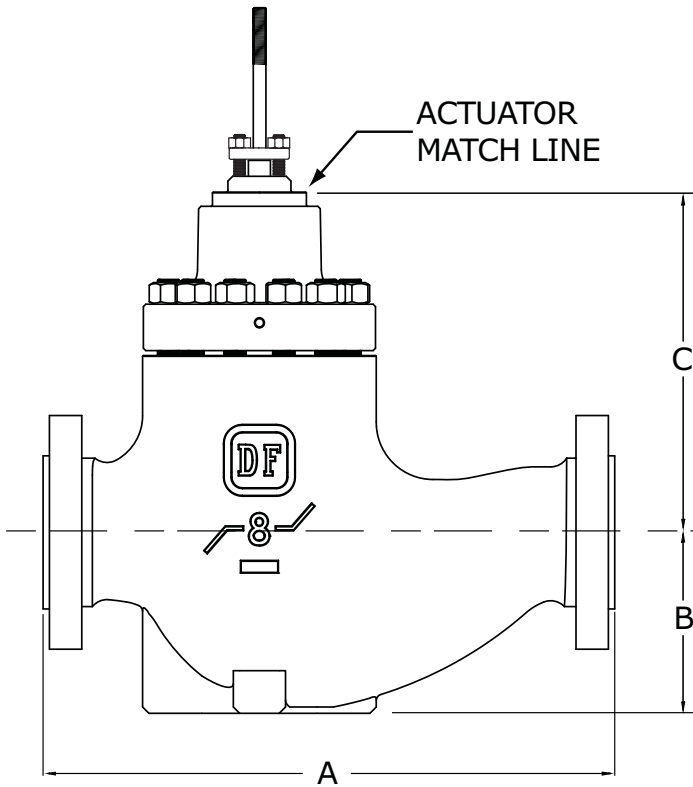
Valve Size	End Connection	Dimension		
		A	B	C
8"	RF	47.00 (1194)	14.31 (363)	26.94 (684)
	RTJ	47.38 (1203)	14.31 (363)	26.94 (684)
	BWE	47.00 (1194)	14.31 (363)	26.94 (684)

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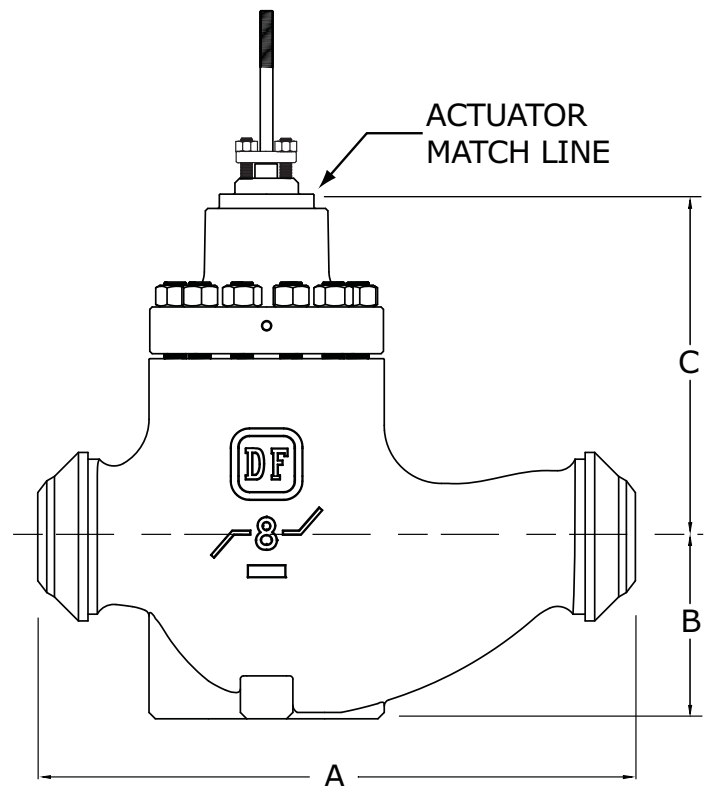
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Figure 2 Typical Valve Dimension Diagrams



## FLANGED END CONNECTIONS



## BUTTWELD (BWE) END CONNECTIONS

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Table 4

### Typical Construction Materials

Key	Part Description	Standard Construction	NACE Construction
1	BODY	LCC	LCC
2	BONNET	LCC	LCC
3	PACKING BOX RING	S31600*	S31600*
4	PACKING SPRING	S30400	-
5	LANTERN RING	-	S31600*
6	RETAINING RING	S30200	S30200
7	SPECIAL WASHER	S30400	-
8	V-RING PACKING SET	PTFE	PTFE (Double)
9	PACKING FOLLOWER	S31600*	S31600*
10	UPPER STEM WIPER	FELT	FELT
10A	LOWER STEM WIPER	TFE	TFE
11	CAGE	S17400 DH1150	S17400 DH1150
12	VALVE PLUG - STEM ASSEMBLY	S42000 HT PLUG - S20910 STEM	S31600* / ALLOY 6 SEAT & GUIDE - S20910 STEM
13	SEAT RING	S17400 H1075	S31600* / ALLOY 6
14	SEAL RING	CPTFE / R30003	CPTFE / R30003
15	BACKUP RING	S31600*	S31600*
16	PACKING FLANGE	CARBON STEEL-PLATED	CARBON STEEL-PLATED
17	PACKING NUT	2HM	2HM
18	PACKING STUD	B7M	B7M
19	BONNET STUD	B7M	B7M
20	BONNET NUT	2HM	2HM
21	SEAT RING O-RING	SEE TABLE 9	SEE TABLE 9
21A	SEAT RING GASKET	N06600 / GRAPHITE	N06600 / GRAPHITE
22	BONNET GASKET	N06600 / GRAPHITE	N06600 / GRAPHITE
22A	CAGE GASKET	N06600 / GRAPHITE	N06600 / GRAPHITE
23	SEAT RING CAP SCREW	S66286 HT	S66286 HT
24	PACKING SET	GRAPHITE LAMINATE / FILAMENT	GRAPHITE LAMINATE / FILAMENT
25	PISTON RING	GRAPHITE (MODEL 381)	GRAPHITE (MODEL 381)

\* All S31600 barstock is dual grade S31600/S31603 (316/316L).



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Table 5

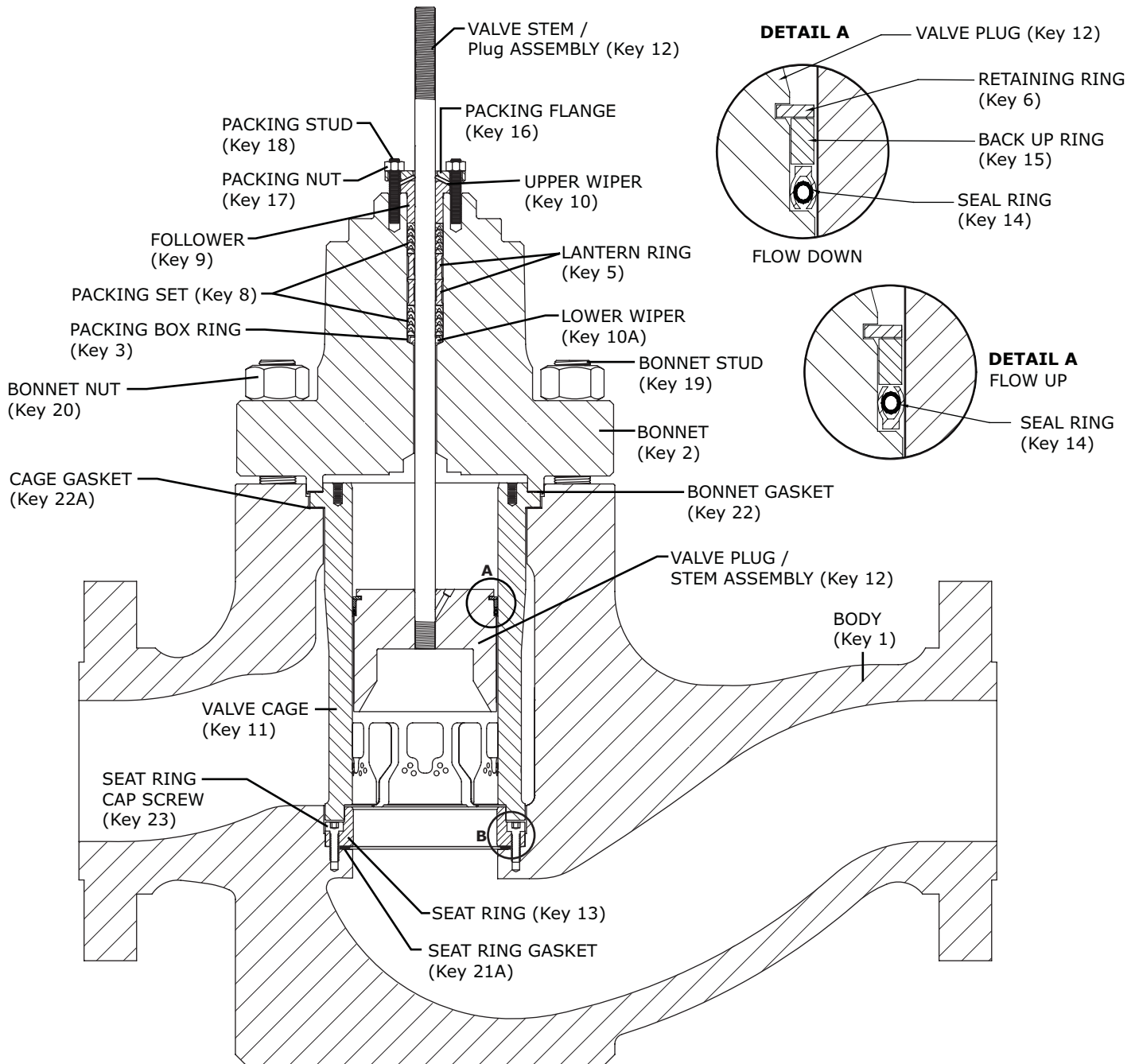
### Typical Construction Materials Continued

Key	Part Description	Standard CF8M Construction
1	BODY	CF8M
2	BONNET	CF8M
3	PACKING BOX RING	S31600*
4	PACKING SPRING	-
5	LANTERN RING	S31600*
6	RETAINING RING	S30200
7	SPECIAL WASHER	-
8	PACKING SET	PTFE (Double)
9	PACKING FOLLOWER	S31600*
10	UPPER STEM WIPER	FELT
10A	LOWER STEM WIPER	TFE
11	CAGE	S31600* / ENC
12	VALVE PLUG - STEM ASSEMBLY	S31600* / ALLOY 6 SEAT & GUIDE - S20910 STEM
13	SEAT RING	S31600* / ALLOY 6
14	SEAL RING	CPTFE / R30003
15	BACKUP RING	S31600*
16	PACKING FLANGE	CARBON STEEL-PLATED
17	PACKING NUT	2HM
18	PACKING STUD	B7M
19	BONNET STUD	B7M
20	BONNET NUT	2HM
21	SEAT RING O-RING	SEE TABLE 9
21A	SEAT RING GASKET	N06600 / GRAPHITE
22	BONNET GASKET	N06600 / GRAPHITE
22A	CAGE GASKET	N06600 / GRAPHITE
23	SEAT RING CAP SCREW	S66286 HT
24	PACKING SET	GRAPHITE LAMINATE / FILAMENT
25	PISTON RING	GRAPHITE (MODEL 381)

\* All S31600 barstock is dual grade S31600/S31603 (316/316L).

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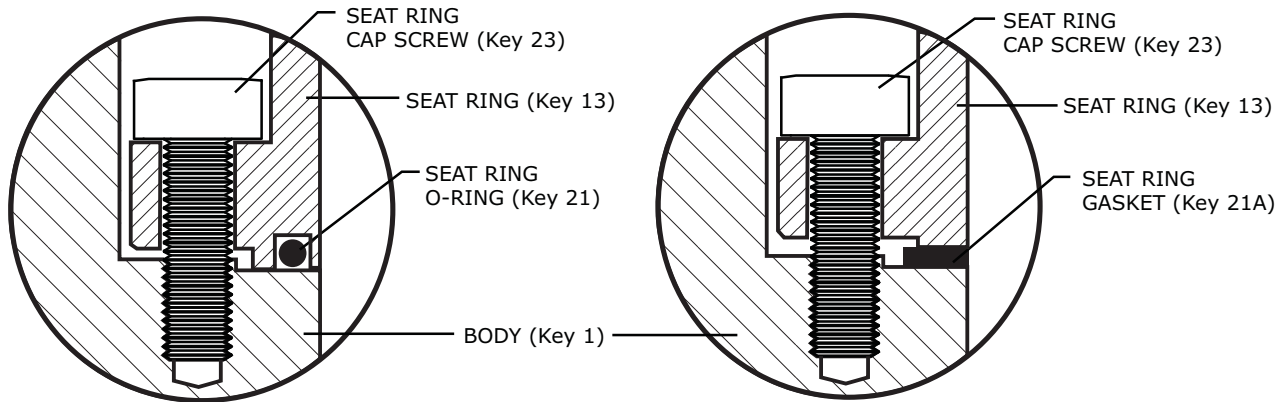
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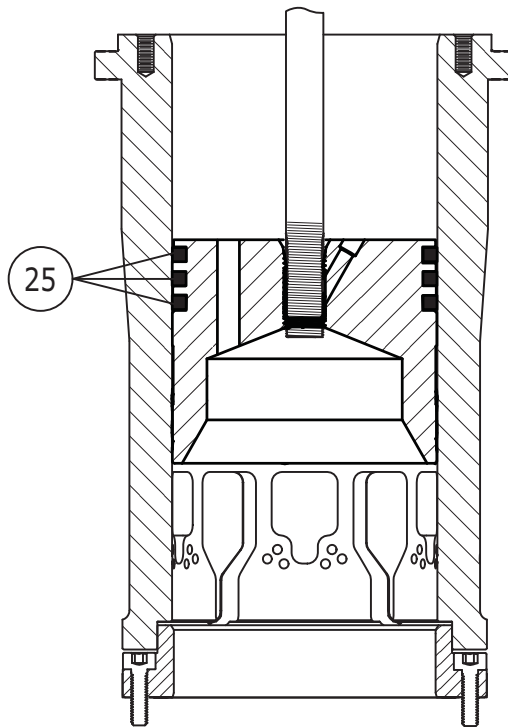
**Figure 3** Cross-section of 380 Control Valve with 1" Stem

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**Figure 4** *Detail B - Seat Ring Gasket Options*



**Figure 5** *Model 381 Cage Design*



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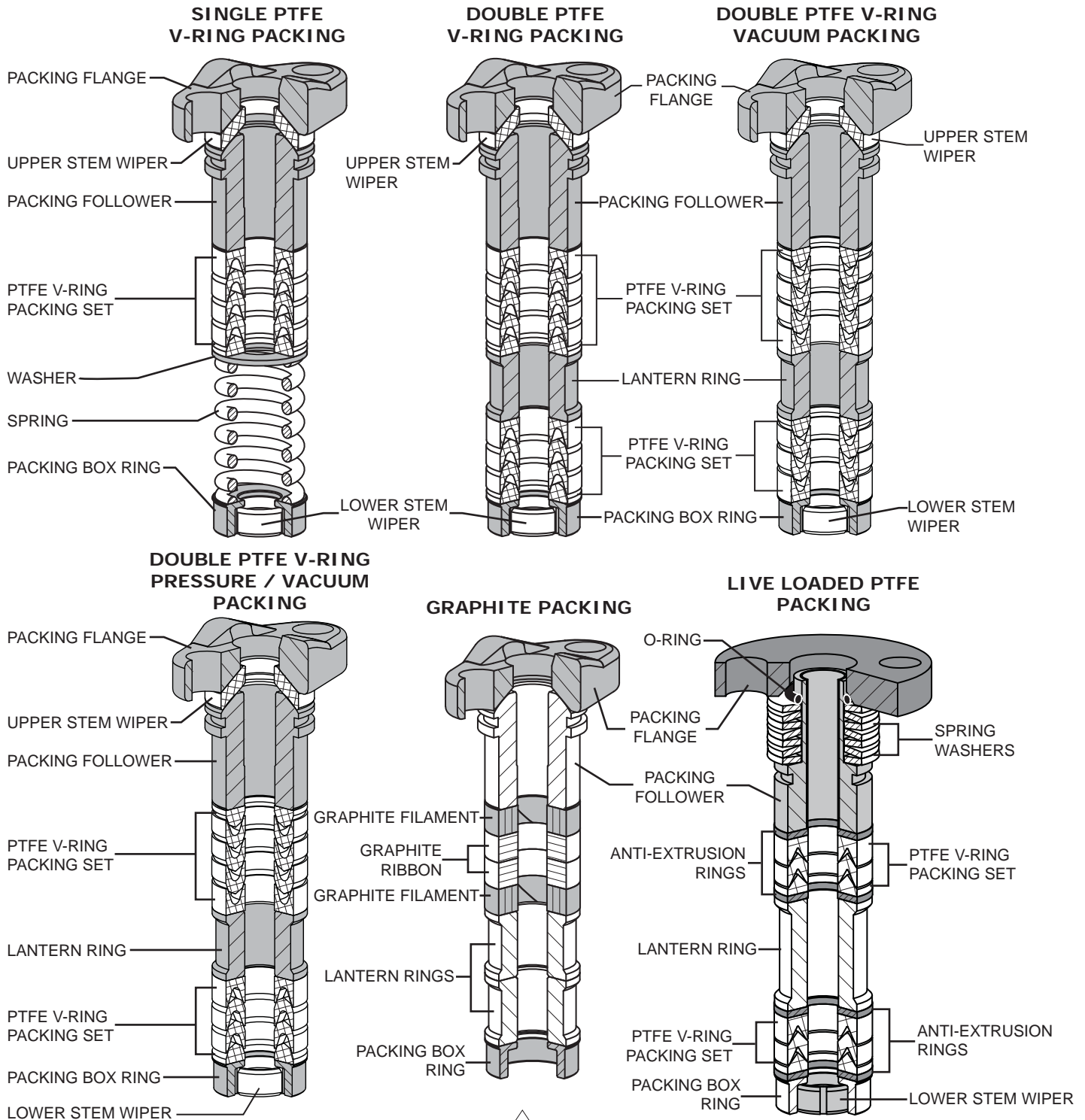


Figure 7 Sample Packing Arrangements

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Table 6

### Models 380 & 381 Valve Sizing Coefficients

#### Linear - Flow Down

Valve Size	Port Inches (mm)	Travel Inches (mm)	Coefficient	Percentage of Valve Travel									
				10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
8"	7 (177.8)	3 (76)	$C_v$	104	212	332	458	578	689	788	878	954	1022
			$X_T$	0.591	0.676	0.661	0.653	0.633	0.620	0.624	0.622	0.614	0.592
			$F_L$	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82

#### Equal Percent - Flow Down

Valve Size	Port Inches (mm)	Travel Inches (mm)	Coefficient	Percentage of Valve Travel									
				10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
8"	7 (177.8)	3 (76)	$C_v$	32.5	59.6	85.3	114	159	229	334	468	619	755
			$X_T$	0.969	0.939	0.842	0.944	0.840	0.731	0.641	0.633	0.639	0.639
			$F_L$	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

#### Modified Equal Percentage - Flow Down (3 inch Travel)

Valve Size	Port Inches (mm)	Travel Inches (mm)	Coefficient	Percentage of Valve Travel									
				10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
8"	7 (177.8)	3 (76)	$C_v$	34.8	87.4	140	192.6	245.3	344.9	470.9	603.8	752.8	912.2
			$X_T$	0.946	0.891	0.910	0.835	0.744	0.669	0.669	0.664	0.668	0.667
			$F_L$	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

#### Modified Equal Percentage - Flow Down (3.5 inch Travel)

Valve Size	Port Inches (mm)	Travel Inches (mm)	Coefficient	Percentage of Valve Travel									
				10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
8"	7 (177.8)	3.5 (88.9)	$C_v$	38.3	70.2	103	145	216	324	495	684	844	912
			$X_T$	0.946	0.891	0.91	0.835	0.744	0.669	0.669	0.664	0.665	0.667
			$F_L$	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

For Anti-Cavitation and Low Noise valve characteristics please contact Dyna-Flo

Relationships of Note:  $C_1 = 39.76\sqrt{X_T}$        $C_g = C_v C_1$        $K_M = F_L^2$

**NOTE:** Modified Equal Percent is a factor of travel and requires no special trim options above Equal Percent.

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Table 7

### Common Trim Options and Temperature Ratings

Trim Spec <sup>3</sup>	Valve Plug	Stem	Cage	Seat Ring	Minimum <sup>2</sup> Temperature	Maximum Temperature
					°F (°C)	°F (°C)
S	S42000 HT	S20910	S17400 DH1150	S17400 H1075	-20 (-29)	800 (427)
N	S31600 <sup>4</sup> / Alloy 6 Seat and Guide	S20910	S17400 DH1150	S31600 <sup>4</sup> / Alloy 6	-40 (-40)	300 (149) <sup>1</sup>
C	S31600 <sup>4</sup> / Alloy 6 Seat and Guide	S20910	S31600 <sup>4</sup> ENC	S31600 <sup>4</sup> / Alloy 6	-20 (-29) <sup>2</sup>	450 (232) <sup>2</sup>
O	S42000 HT	S20910	S17400 DH1150	S44004 HT	-32 (0)	800 (427)

- 1 Only available with o-ring seat ring gasket design, o-ring material will change temperature limitation (See Table 8).
- 2 Temperatures need to be considered when specifying trim materials for elevated temperatures in corrosive environments, consult factory for further information.
- 3 Trim Spec relates to Model Numbering System on Page 14.
- 4 All S31600 barstock is dual grade S31600/S31603 (316/316L).

**NOTE:** Bonnet Bolting refer to Table 9.

Table 8

### Model 380 and 381 Flowing Pressure Drop Limits

Service	Valve Stem Connection Size	Maximum Flowing Pressure Drop	
		Flow Down	Flow Up with Diverter Cone
All (except boiler feedwater)	2 inch (50.8 mm)	2000 Psid (137.90 Bar)	3750 Psid (258.55 Bar)
Boiler feedwater	2 inch (50.8 mm)	1000 Psid (68.95 Bar)	3750 Psid (258.55 Bar)

**NOTE** - Pressure drop limits do not include valves with Anti-Cavitation or Low-Noise Trim.

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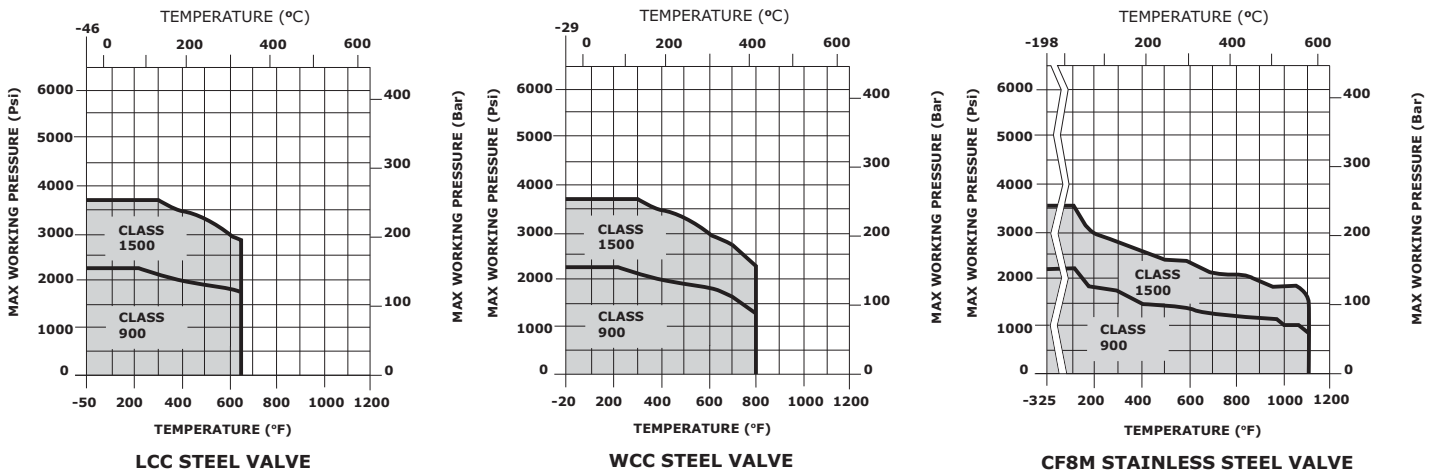


Figure 8 Pressure / Temperature Charts as per ASME B16.34

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Table 9

## Materials and Temperature Limits For Parts other than Valve Body and Trim

Part	Material	Minimum Temperature	Maximum Temperature
Backup Ring	S31600*	-325°F (-198°C)	1100°F (593°C)
Retaining Ring	S30200	-425°F (-254°C)	1100°F (593°C)
Seal Ring	PTFE with R30003 Spring	-100°F (-73°C)	450°F (232°C)
Piston Ring	Graphite	-425°F (-254°C)	800°F (427°C)
Gaskets	N06600 / Graphite	-400°F (-240°C)	800°F (427°C)
Seat Ring O-Ring	Ethylene-propylene (Anti-Cavitation, NACE)	-40°F (-40°C)	450°F (232°C)
	Nitrile (Standard, NACE)	-20°F (-29°C)	225°F (107°C)
	Fluorocarbon (not for water or steam service) (NACE)	-10°F (-23°C)	400°F (204°C)
Packing	PTFE V-Ring	-40°F (-40°C)	450°F (232°C)
	Graphite Ribbon / Filament	-425°F (-254°C)	1000°F (537°C)
Body to Bonnet Studs	B7M (with LCC Body)	-50°F (-46°C)	700°F (371°C)
	B7M (with WCC Body)	-20°F (-29°C)	800°F (427°C)
	B7M (with CF8M Body)	-50°F (-46°C)	450°F (232°C)
	B7 (with LCC Body)	-50°F (-46°C)	650°F (343°C)
	B7 (with WCC Body)	-20°F (-29°C)	800°F (427°C)
	B7 (with CF8M Body)	-55°F (-48°C)	450°F (232°C)
Body to Bonnet Nuts	2HM (with LCC Body)	-50°F (-46°C)	700°F (371°C)
	2HM (with WCC Body)	-20°F (-29°C)	800°F (427°C)
	2HM (with CF8M Body)	-50°F (-46°C)	450°F (232°C)
	2H (with LCC Body)	-50°F (-46°C)	650°F (343°C)
	2H (with WCC Body)	-20°F (-29°C)	800°F (427°C)
	2H (with CF8M Body)	-55°F (-48°C)	450°F (232°C)

\* All S31600 barstock is dual grade S31600/S31603 (316/316L).

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## ***Our Commitment to Quality***

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## MODEL NUMBERING SYSTEM

**SAMPLE PART NUMBER: 380-8BJ-L5F2S-EP-X**

<b>VALVE MODEL</b>				<b>380</b>
<b>380</b>	380	<b>381</b>	381	
<b>VALVE SIZE</b>				<b>8</b>
<b>8</b>	8 INCH			
<b>ASME RATING</b>				<b>B</b>
<b>B</b>	1500			
<b>END CONNECTION</b>				<b>J</b>
<b>F</b>	RF	<b>J</b>	RTJ	<b>B</b> BUTTWELD (SCH. 80)
<b>BOLTING</b>				<b>-</b>
<b>-</b>	B7 / 2H (STANDARD)		<b>A</b>	B7M / 2HM
<b>BODY MATERIAL</b>				<b>L</b>
<b>L</b>	LCC	<b>M</b>	CF8M	
<b>YOKE BOSS SIZE / VALVE STEM DIAMETER</b>				<b>5</b>
<b>5</b>	5" (127 mm) / 1" (25.4 mm)		<b>6</b>	5H - 5" (127 mm) / 1-1/4" (31.8 mm)
<b>PORT SIZE</b>				<b>F</b>
<b>F</b>	FULL PORT			
<b>SEAT RING STYLE</b>				<b>2</b>
<b>2</b>	O-RING STYLE	<b>3</b>	GASKET STYLE	
<b>TRIM</b>				<b>S</b>
<b>S</b>	STANDARD		<b>C</b>	ERROSIVE / CORROSIVE
<b>N</b>	NACE / LOW TEMPERATURE		<b>O</b>	HIGHLY CORROSIVE
<b>PAINT</b>				<b>-</b>
<b>-</b>	DFPS-01 (STANDARD)		<b>2</b>	DFPS-02 (SEVERE SERVICE)
<b>3</b>	DFPS-03 (HIGH TEMPERATURE)			
<b>CHARACTERISTIC</b>				<b>E</b>
<b>E</b>	EQUAL PERCENT	<b>L</b>	LINEAR	<b>M</b> MODIFIED EQ. PERCENT
<b>PACKING STYLE</b>				<b>P</b>
<b>P</b>	SINGLE PTFE V-RING (PRESSURE)		<b>J</b>	DOUBLE PTFE V-RING (PRESSURE)
<b>G</b>	SINGLE GRAPHITE (PRESSURE)		<b>V</b>	DOUBLE PTFE V-RING (VACUUM)
<b>R</b>	DOUBLE PTFE V-RING (VACUUM / PRESSURE)		<b>L</b>	LIVE LOADED PTFE V-RING (PRESSURE)
<b>T</b>	LIVE LOADED GRAPHITE (PRESSURE)		<b>D</b>	LIVE LOADED DUPLEX (PRESSURE)
<b>SPECIAL</b>				<b>X</b>
<b>X</b>	SPECIAL			

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