

# Model 390/391 Control Valves

## Technical Sales Bulletin



**Figure 1** Model 390 Control Valve

The Model 390 control valve (Figure 1) is a heavy duty globe style control valve. This valve is used in all kinds of demanding applications, including oil and gas production and chemical process industries. Metal seats are used for increased seat life.

Model 390 valves are cage guided, single port valves that can be used in either snap on/off acting or throttling applications of either liquids or gases. A bolted bonnet is standard and a typical actuator is a Dyna-Flo DFC or DFO model 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 Anti-Cavitation and Low-Noise make the 390 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.

#### Industrial High Quality External Coatings

Our standard industrial high quality external coatings provide long lasting resistance to the harshest environments.

#### Pressure Drop Capabilities

The Model 390 can shut off against inlet pressures equal to ASME B16.34 rating.

#### Sour Gas Service Capability

The Model 390 can be constructed out of materials that comply with the recommendations of the National Association of Corrosion Engineers (NACE) MR0175/ISO 15156.

#### Shut Off Classification

Seat leakage options range from ASME class II to class VI.

#### Plug Design

Standard balanced plug design allows the use of smaller actuators.

#### Environmentally Friendly

Available with low emission live loaded packing.



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### SPECIFICATIONS

#### Configurations

See Table 1.

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

#### Sizes and Connection Styles

Model: 390, 391

Size: 2", 3", 4", 6", and 8"x6"

Rating: ASME 900 or 1500

Connections: RF / RTJ / BWE

#### Maximum Inlet Temperatures and Pressures

Consistent with ASME class rating as per ASME B16.34, unless limited by either material, pressure or temperature limitations.

#### Maximum Pressure Drops

Same as maximum inlet pressure unless otherwise rated by specific trim construction. For Actuator and Valve assembly shut off pressure drops see Tables 15 and 16. For trim pressure / temperature ratings refer to Figure 9.

#### Standard Seat Leakage Classifications

Refer to Table 1.

#### Dimensions

Valve and Actuator Assembly Dimensions  
Refer to Tables 3 to 8, and Figure 2.

#### Approximate Valve Body Weights

Refer to Table 2.

#### Valve Body to Bonnet Bolting

Standard service body to bonnet:  
B7 Studs / 2H Nuts

For NACE MR0175/ISO 15156  
B7M Studs / 2HM Nuts

For CF8M construction:

B8M Studs / 8M Nuts  
B7 Studs Fluorokote / 2H Nuts Fluorokote  
B7M Studs Fluorokote / 2HM Nuts Fluorokote

#### Characteristics

- Equal Percentage (Standard) - Flow Down
- Modified Equal Percentage (Same cage as Equal Percentage, different travel) - Flow Down
- Linear - Flow Down
- Low-Noise 3 - Flow Up
- Anti-Cavitation 2-Stage - Flow Down
- Anti-Cavitation 3-Stage - Flow Down

#### Flow Direction

Typically Flow Down (Low-Noise Trim Flow Up).

#### Packing Type

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

#### Valve Sizing Coefficients

For standard coefficients at maximum travel, refer to Table 17. For full list of coefficients refer to document P-CVSM.

#### Valve Travel and Yoke Boss Sizes

Refer to Table 14.

#### Trim Materials

Refer to Table 12.

#### Valve Bolting Temperature Limitations

Refer to Table 9.

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

Refer to Tables 9, 10, 11, 12, & 13.  
Refer to Figures 9 and 10.

For more information and other options contact your Dyna-Flo Sales Office.

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Table 1

### Standard Seat Leakage Classifications

Valve Model	Body	Port Size	Characteristic	Shut Off Capability
390	Globe & Angle	All	Linear, Equal Percent, Modified Equal Percent, Low-Noise	IV Standard
			Anti-Cavitation	V Standard
	Globe & Angle with PEEK Anti-Extrusion Rings	1-7/8" to 5-3/8" (47.6 mm to 136.5 mm)	All	V Standard to 600°F (316°C)
			All	IV Optional
391	All	1-7/8" (47.6 mm)	All	II
		2-7/8" to 3-5/8" (47.6 mm to 136.5 mm)	All	II - Standard III - Optional IV - Optional
		4-3/8" (and Larger)	All	III - Standard IV - Optional

Table 2

### Globe Valve Approximate Weights lb (kg)

Valve Size (Inch)	Class	Body	
		Flanged	BWE
2	900 / 1500	160 (73)	115 (52)
3	900	275 (125)	---
3	1500	286 (130)	213 (97)
4	900	510 (231)	---
4	1500	552 (250)	444 (201)
6	900	1125 (510)	---
6	1500	1228 (557)	1003 (455)
8x6	900	1325 (601)	---
8x6	1500	1428 (648)	1200 (544)

### Angle Valve Approximate Weights lb (kg)

Valve Size	Class	Body	
		Flanged	BWE
2	900 / 1500	153 (69)	110 (50)
3	1500	272 (123)	173 (78)
4	1500	399 (181)	258 (117)
6	1500	788 (357)	445 (202)

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Table 3

### Standard Globe Valve Dimensions Inches (mm)

(Refer to Figure 2)

Valve Size (Inch)	ASME Class	Actuator Size	A	B	D		E
					DFC	DFO	
2	900 / 1500 <b>RF</b>	2105	14.75 (375)	3.06 (78)	30.25 (768)	25.72 (653)	16.00 (406)
	900 / 1500 <b>RTJ</b>	2105	14.88 (378)	3.06 (78)	30.25 (768)	25.72 (653)	16.00 (406)
	900 / 1500 <b>BWE</b>	2105	14.75 (375)	3.06 (78)	30.25 (768)	25.72 (653)	16.00 (406)
3	900 <b>RF</b>	2105	17.38 (441)	4.75 (121)	30.25 (768)	25.72 (653)	16.00 (406)
	900 <b>RTJ</b>	2105	17.50 (445)	4.75 (121)	30.25 (768)	25.72 (653)	16.00 (406)
	1500 <b>RF</b>	2156	18.13 (460)	4.75 (121)	30.25 (768)	25.72 (653)	18.62 (473)
	1500 <b>RTJ</b>	2156	18.25 (464)	4.75 (121)	30.25 (768)	25.72 (653)	18.62 (473)
	1500 <b>BWE</b>	2156	18.13 (460)	4.75 (121)	30.25 (768)	25.72 (653)	18.62 (473)
3	900 <b>RF</b>	3156	17.38 (441)	4.75 (121)	30.91 (785)	28.10 (714)	18.62 (473)
	900 <b>RTJ</b>	3156	17.50 (445)	4.75 (121)	30.91 (785)	28.10 (714)	18.62 (473)
	1500 <b>RF</b>	3156	18.13 (461)	4.75 (121)	30.91 (785)	28.10 (714)	18.62 (473)
	1500 <b>RTJ</b>	3156	18.25 (464)	4.75 (121)	30.91 (785)	28.10 (714)	18.62 (473)
	1500 <b>BWE</b>	3156	18.13 (460)	4.75 (121)	30.91 (785)	28.10 (714)	18.62 (473)
4	900 <b>RF</b>	3156	20.12 (511)	6.88 (175)	30.91 (785)	28.10 (714)	18.62 (473)
	900 <b>RTJ</b>	3156	20.25 (514)	6.88 (175)	30.91 (785)	28.10 (714)	18.62 (473)
	1500 <b>RF</b>	3220	20.88 (530)	6.88 (175)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 <b>RTJ</b>	3220	21.00 (533)	6.88 (175)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 <b>BWE</b>	3220	20.88 (530)	6.88 (175)	36.48 (927)	32.69 (830)	21.12 (536)
6	900 <b>RF</b>	3220	28.12 (714)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)
	900 <b>RTJ</b>	3220	28.25 (718)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 <b>RF</b>	3220	30.25 (768)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 <b>RTJ</b>	3220	30.50 (775)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 <b>BWE</b>	3220	30.25 (768)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)
8x6	900 <b>RF</b>	3220	28.75 (730)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)
	900 <b>RTJ</b>	3220	28.88 (734)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 <b>RF</b>	3220	31.00 (787)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 <b>RTJ</b>	3220	31.38 (797)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 <b>BWE</b>	3220	30.25 (768)	9.75 (248)	36.48 (927)	32.69 (830)	21.12 (536)

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Table 4

## Dimension C for Globe Valves with Standard Bonnets

Inch (mm) (Refer to Figure 2)

Valve Size (Inch)	Dimension C			
	ASME Class	2-13/16 (71) Yoke Boss Diameter	3-9/16 (90) Yoke Boss Diameter	5 (127) Yoke Boss Diameter
2	900 / 1500	10.31 (261)	10.56 (267)	13.06 (331)
2 Anti-Cavitation 2 Stage	900 / 1500	11.00 (279)	11.25 (286)	13.56 (344)
3	900 / 1500	12.69 (322)	12.25 (311)	14.56 (370)
4	900 / 1500	—	11.81 (300)	14.50 (368)
6	900 / 1500	—	14.38 (365)	15.81 (402)
8x6	900 / 1500	—	14.38 (365)	15.81 (402)

Table 5

## Dimension C for Globe Valves with Extension Style 1 Bonnets

Inch (mm) (Refer to Figure 2)

Valve Size (Inch)	Dimension C		
	2-13/16 (71) Yoke Boss Diameter	3-9/16 (90) Yoke Boss Diameter	5 (127) Yoke Boss Diameter
2	16.91 (430)	17.53 (445)	19.84 (504)
2 Anti-Cavitation 2 Stage	17.59 (447)	18.22 (463)	20.34 (517)

Table 6

## Dimension C for Angle Valves with Standard Bonnets

Inch (mm) (Refer to Figure 2)

Valve Size (Inch)	Dimension C			
	ASME Class	2-13/16 (71) Yoke Boss Diameter	3-9/16 (90) Yoke Boss Diameter	5 (127) Yoke Boss Diameter
2	900 / 1500	8.94 (277)	9.19 (233)	11.69 (297)
2 Anti-Cavitation 2 Stage	900 / 1500	9.62 (244)	9.88 (251)	12.38 (314)
3	900 / 1500	10.19 (259)	10.44 (265)	12.94 (329)
4	900 / 1500	11.38 (289)	10.94 (278)	13.25 (337)
6	900 / 1500	—	11.81 (300)	14.50 (368)

Table 7

## Dimension C for Angle Valves with Extension Bonnets

Inch (mm) (Refer to Figure 2)

Valve Size (Inch)	Dimension C			
	ASME Class	2-13/16 (71) Yoke Boss Diameter	3-9/16 (90) Yoke Boss Diameter	5 (127) Yoke Boss Diameter
2	900 / 1500	15.56 (395)	16.19 (411)	18.50 (470)
2 Anti-Cavitation 2 Stage	900 / 1500	16.25 (413)	16.88 (429)	19.19 (487)

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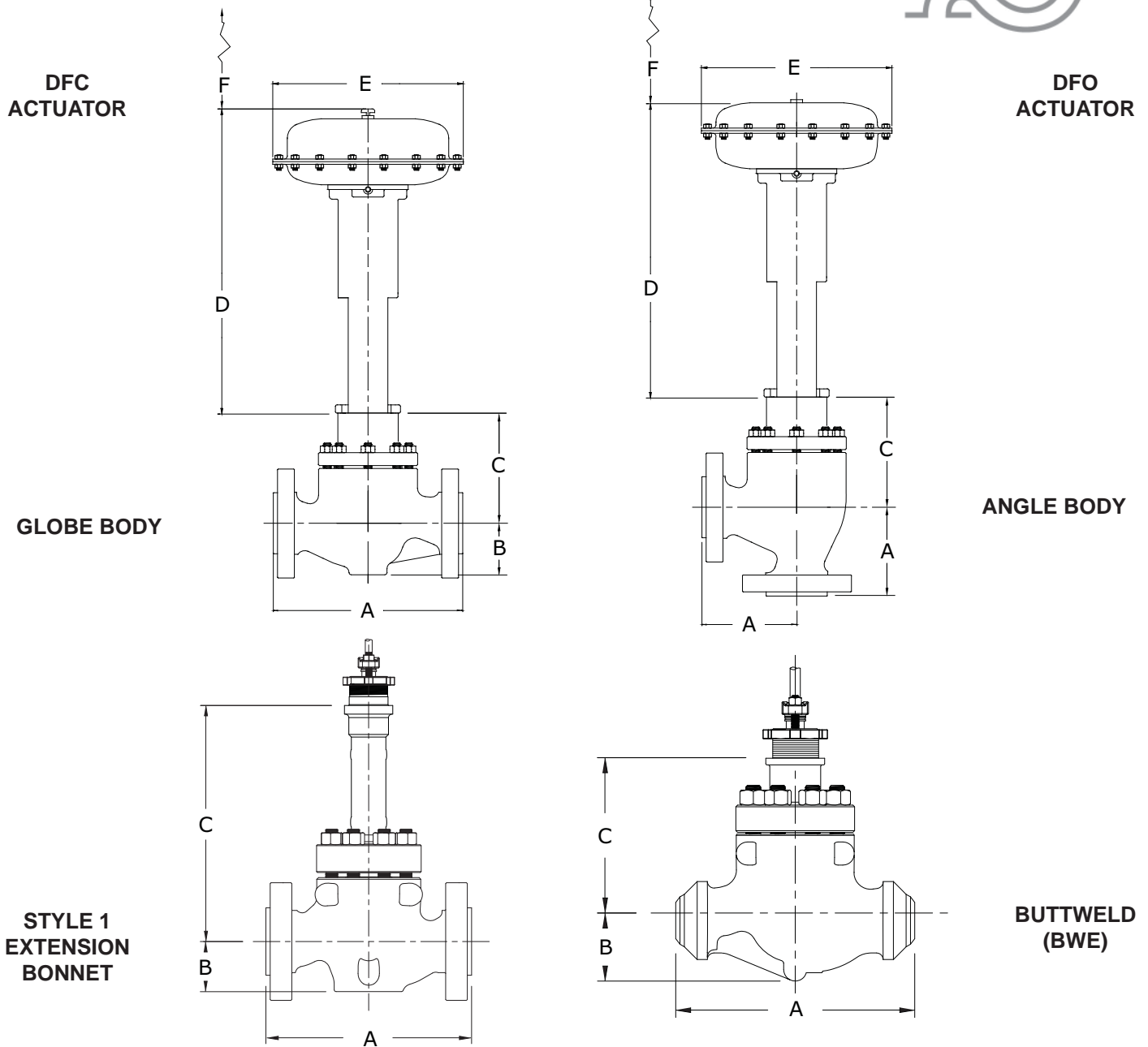
Table 8

**Standard Angle Valve Dimensions** Inches (mm)  
(Refer to Figure 2)

Valve Size (Inch)	ASME Class	Actuator Size	A	D		E
				DFC	DFO	
2	900 RF	2105	7.00 (178)	30.25 (768)	25.72 (653)	16.00 (406)
	900 RTJ	2105	7.06 (179)	30.25 (768)	25.72 (653)	16.00 (406)
	1500 RF	2105	7.00 (178)	30.25 (768)	25.72 (653)	16.00 (406)
	1500 RTJ	2105	7.06 (179)	30.25 (768)	25.72 (653)	16.00 (406)
	1500 BWE	2105	7.00 (178)	30.25 (768)	25.72 (653)	16.00 (406)
3	900 RF	2105	8.88 (226)	30.25 (768)	25.72 (653)	16.00 (406)
	900 RTJ	2105	8.94 (227)	30.25 (768)	25.72 (653)	16.00 (406)
	1500 RF	2156	9.25 (235)	30.25 (768)	25.72 (653)	18.62 (473)
	1500 RTJ	2156	9.31 (236)	30.25 (768)	25.72 (653)	18.62 (473)
	1500 BWE	2156	9.25 (235)	30.25 (768)	25.72 (653)	18.62 (473)
3	900 RF	3156	8.88 (226)	30.91 (785)	28.10 (714)	18.62 (473)
	900 RTJ	3156	8.94 (227)	30.91 (785)	28.10 (714)	18.62 (473)
	1500 RF	3156	9.25 (235)	30.91 (785)	28.10 (714)	18.62 (473)
	1500 RTJ	3156	9.31 (236)	30.91 (785)	28.10 (714)	18.62 (473)
	1500 BWE	3156	9.25 (235)	30.91 (785)	28.10 (714)	18.62 (473)
4	900 RF	3156	10.75 (273)	30.91 (785)	28.10 (714)	18.62 (473)
	900 RTJ	3156	10.81 (275)	30.91 (785)	28.10 (714)	18.62 (473)
	1500 RF	3220	10.75 (273)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 RTJ	3220	10.81 (275)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 BWE	3220	10.75 (273)	36.48 (927)	32.69 (830)	21.12 (536)
6	900 RF	3220	12.81 (325)	36.48 (927)	32.69 (830)	21.12 (536)
	900 RTJ	3220	12.88 (327)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 RF	3220	13.88 (353)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 RTJ	3220	14.00 (356)	36.48 (927)	32.69 (830)	21.12 (536)
	1500 BWE	3220	13.88 (353)	36.48 (927)	32.69 (830)	21.12 (536)

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F Dimension	
2" Valve - 6.88" (175 mm)	4" Valve - 9.12" (232 mm)
3" Valve - 6.88" (175 mm)	6" Valve - 9.12" (232 mm)
3" Valve - 9.12" (232 mm) For DFC/DFO 3156	8"x6" Valve - 9.12" (232 mm)

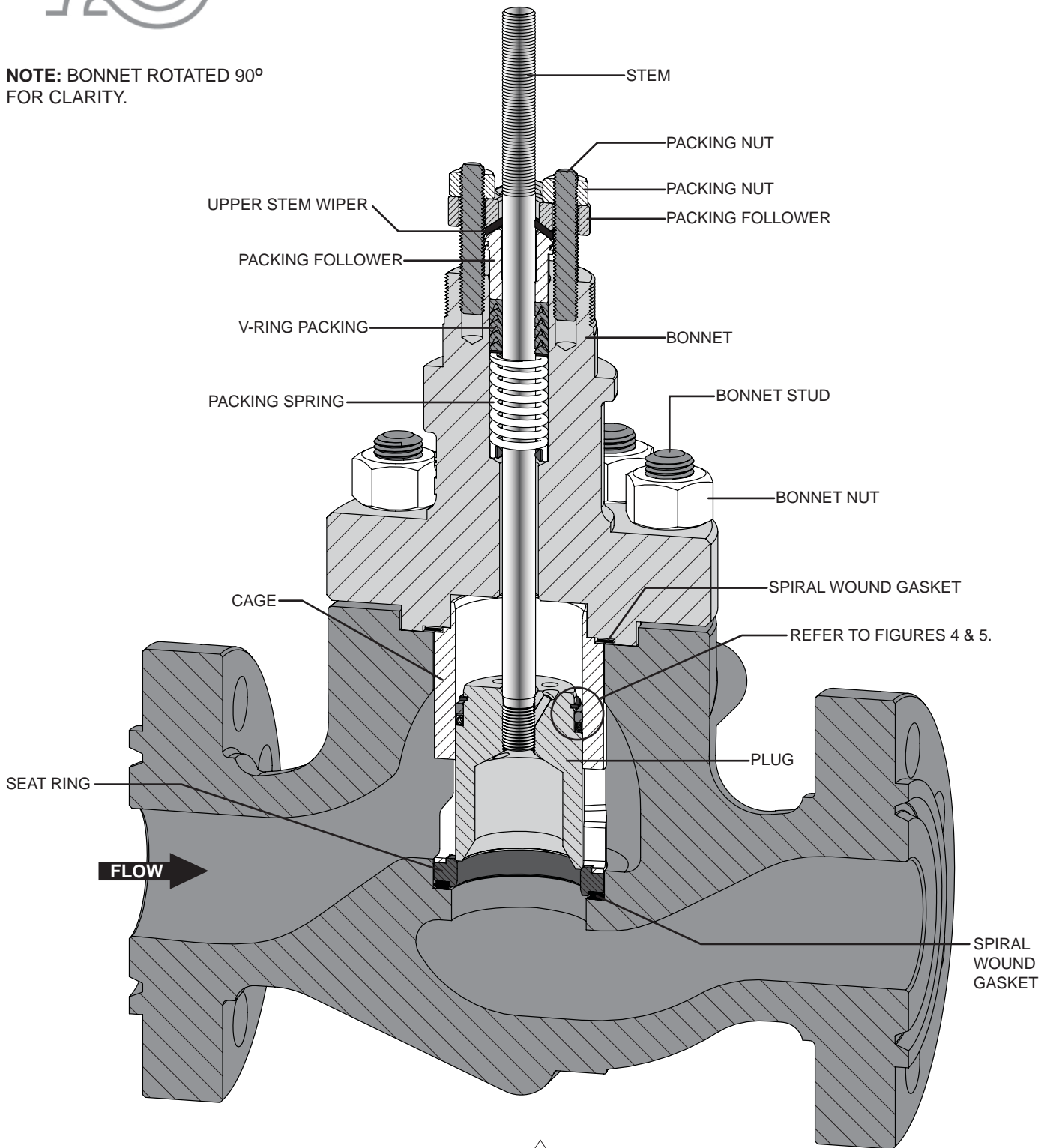
Figure 2 Typical Valve Assembly Diagrams

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**NOTE:** BONNET ROTATED 90° FOR CLARITY.

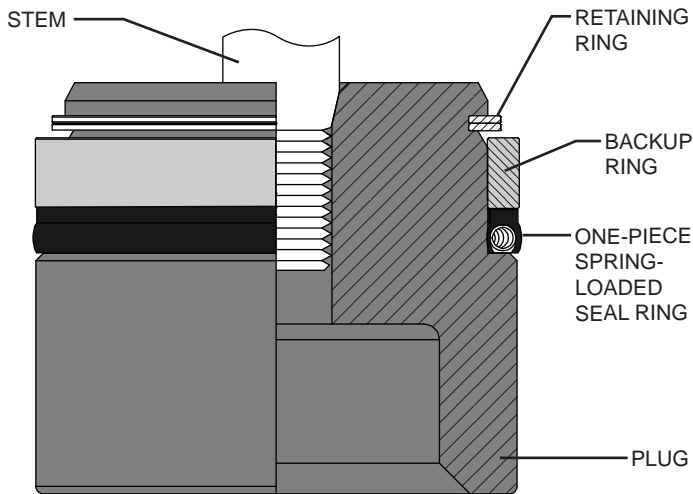


**Figure 3** Cross-section of 390 Series Control Valve

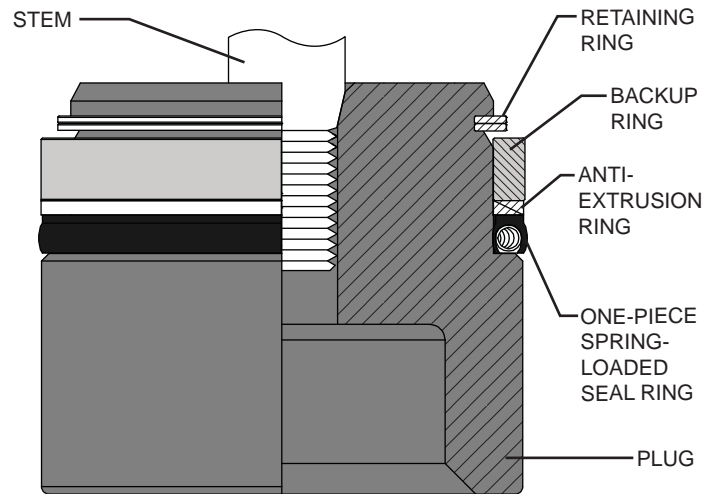


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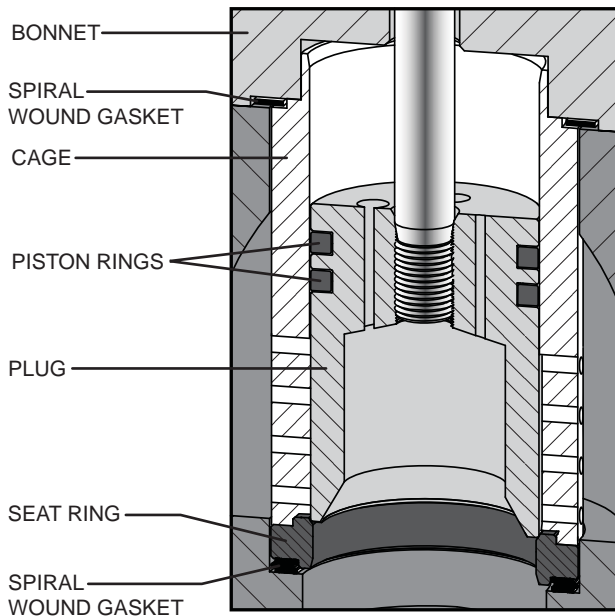
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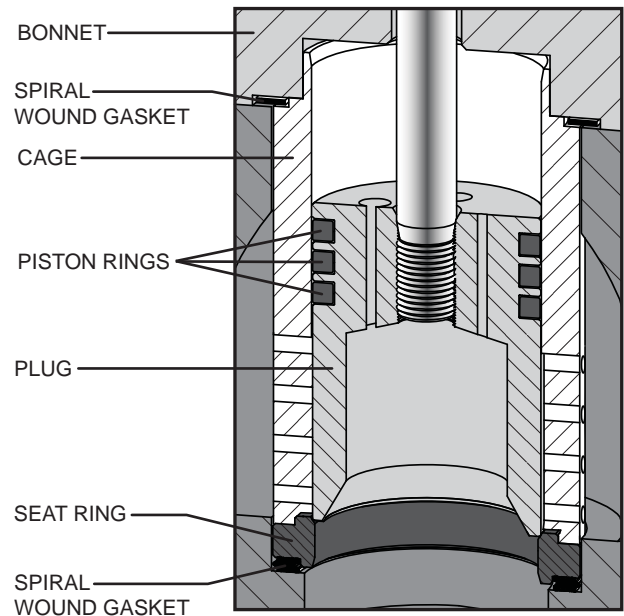
**Figure 4** Spring-Loaded Plug Seal Arrangement



**Figure 5** Spring-Loaded Plug Seal with Anti-Extrusion Ring



**Figure 6** Model 391 Standard Assembly Detail



**Figure 7** Model 391 Triple Piston Ring Detail (Class IV)

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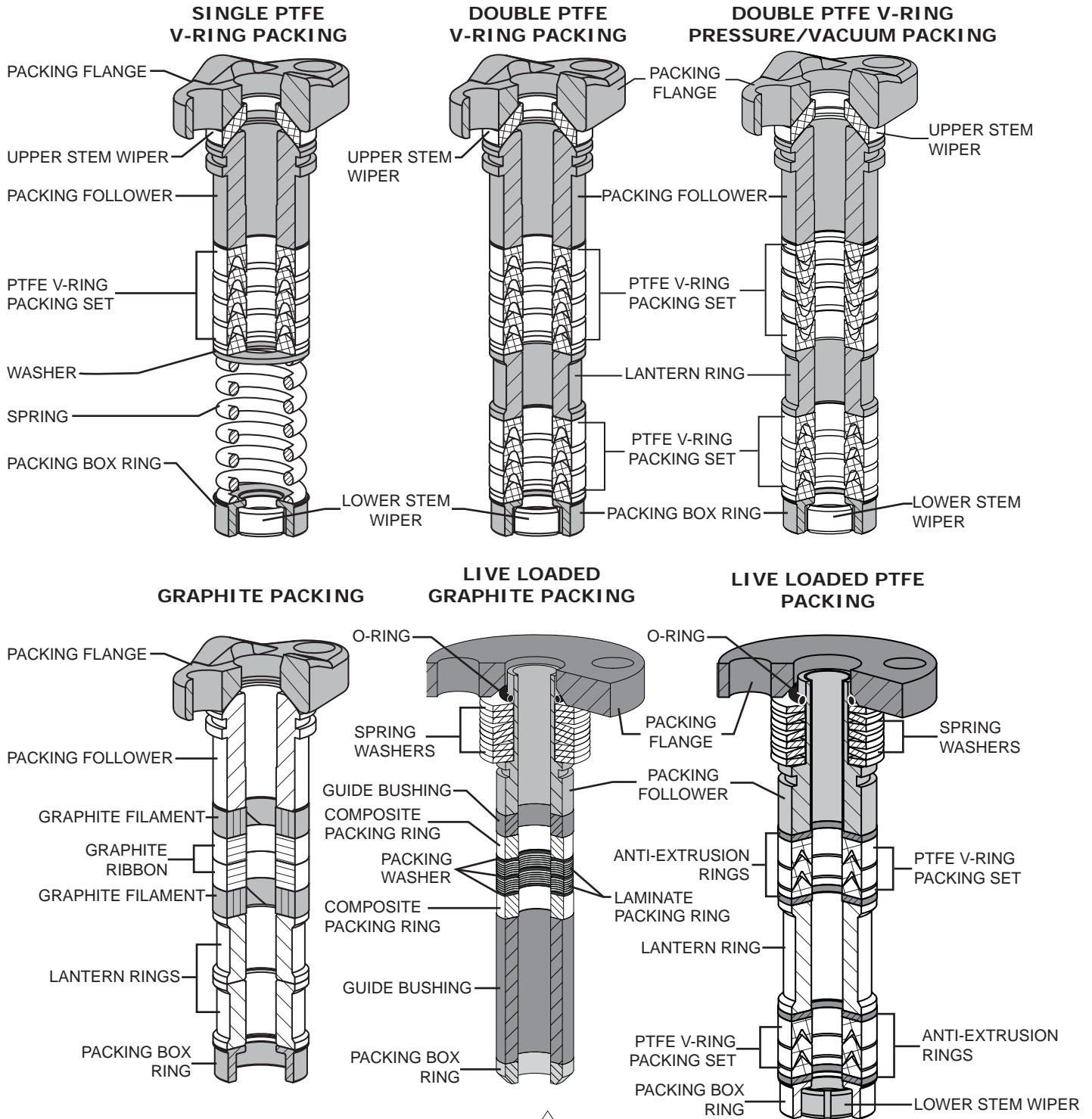


Figure 8 Typical Packing Arrangements

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Table 9

## Body to Bonnet Bolting Temperature Limitations

Body Material	Asme Class	NACE Compliance	Bolt/Nut Material	Temperature Limitations			
				Min. °F	Max. °F	Min. °C	Max. °C
LCC	150/300/600	Non-Exposed <sup>(1)</sup>	B7/2H	-50	650	-46	343
		Exposed <sup>(2)</sup>	B7M/2HM	-50	650	-46	343
WCC/WC9	150/300/600	Non-Exposed <sup>(1)</sup>	B7/2H	-20	NLF <sup>(3)</sup>	-29	NLF <sup>(3)</sup>
		Exposed <sup>(2)</sup>	B7M/2HM	-20	NLF <sup>(4)</sup>	-29	NLF <sup>(4)</sup>
CF8M	150/300/600	Non-Exposed <sup>(1)</sup>	B7 Fluorokote #1 / 2H Fluorokote #1	-20	500	-29	260
			B8M/8M	-20	1000	-29	538
		Exposed <sup>(2)</sup>	B7M Fluorokote #1/ 2HM Fluorokote #1	-20	500	-29	260

**NOTES:**

- 1 - NACE MR0175/ISO15156 Non-Exposed Bolting.
- 2 - NACE MR0175/ISO15156 Exposed Bolting.
- 3 - NLF - This Material is Not A Limiting Factor. For the temperature limitation refer to the valve body material temperature limit.



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Table 10

### Common Valve Parts Typical Construction Materials and Temperature Limitations

Part	Material	Temperature Limitations				
		Min. °F	Max. °F	Min. °C	Max. °C	
Valve Stem	S20910	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	
Spring-Loaded (Three-Piece) Valve Plug Seal <sup>(1)</sup> (390 Only)	Backup Ring	S31600/S31603 Dual Grade	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>
	Seal Ring	PTFE / Elgiloy	NLF <sup>(3)</sup>	450	NLF <sup>(3)</sup>	232
	Retaining Ring	S31600	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>
Spring-Loaded (Three-Piece) Valve Plug Seal with Anti-Extrusion Rings <sup>(2)</sup> (390 Only)	Anti-Extrusion Ring	PolyEtherEtherKetone (PEEK)	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>
	Backup Ring	S31600/S31603 Dual Grade	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>
	Seal Ring	PTFE / Elgiloy	NLF <sup>(3)</sup>	600	NLF <sup>(3)</sup>	316
	Retaining Ring	S31600	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>
Piston Ring (391 Only)	Graphite	-50	1,100	-46	593	
Spiral Wound Gaskets	S30400 / Graphite	NLF <sup>(3)</sup>	NLF <sup>(3)</sup>	NLF	NLF <sup>(3)</sup>	

**NOTES:**

- 1 - Standard for 2 to 6 inch 390 valves.
- 2 - Optional for 390 valves to allow for a maximum temperature limitation of 600°F (316°C).
- 3 - NLF - This Material is Not A Limiting Factor. For the temperature limitation refer to the valve body material temperature limit.

Table 11

Bonnet and Packing Selection <sup>(1)</sup>		
Bonnet Style	Packing Material	In-Body Process Temperature Limitations
<b>Standard Bonnet:</b> Standard for all valve sizes 2 through 6.	PTFE V-Ring	0°F to 450°F (-18°C to 232°C)
	Graphite (Ribbon/Filament)	0°F to 600°F (-18°C to 316°C) <sup>2</sup>
<b>Extension Bonnet Style 1:</b> Optional for valves 2 through 6 inch.	PTFE V-Ring	-50°F to 600°F (-46°C to 316°C) <sup>2</sup>
	Graphite (Ribbon/Filament)	

1 The above temperatures assume the presence of an ambient temperature outside the valve body of 70°F (21°C) with no bonnet insulation. An extension bonnet may be required when operating valves in low temperatures to prevent damage that could occur from the formation of valve stem frost. Other limiting factors, such as trim material components, will have to be considered.

2 Consult Dyna-Flo for temperatures above 450°F (232°C).

**NOTE:** For temperatures above or below these standard temperatures consult Dyna-Flo.

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Table 12

### Trim Options (Refer to Figure 9 for pressure / Temperature Limits)

Trim Spec	Valve Plug	Stem	Cage	Seat Ring	Service
S	S41600 HT	S20910	S17400 H900	S41600 HT	Standard / Non-corrosive / High Temp
N	S31600 <sup>(1)</sup> / ALLOY 6 Seat and Guide	S20910	S17400 DH1150	S31600 <sup>(1)</sup> / ALLOY 6	Corrosive / NACE High Temperature
C	S31600 <sup>(1)</sup> / ALLOY 6 Seat and Guide	S20910	S31600 <sup>(1)</sup> / ENC <sup>(2)</sup>	S31600 <sup>(1)</sup> / ALLOY 6	General / Mild Corrosive
A	S44004 HT	S20910	S17400 H900	S44004 HT	Standard / Non-corrosive / Tight Shut off

**NOTE:**

- 1 - All S31600 barstock is dual grade S31600/S31603 (316/316L).
- 2 - ENC = Electroless Nickel Coating.

Table 13

### Valve Body/Trim Option Temperature Limitations (Refer to Figure 9 for pressure/temperature limits)

Refer to Tables 9, 10, & 11 of other limiting factors.

Body Material	Trim Designation	Temperature Limitations			
		Min. °F	Max. °F	Min. °C	Max. °C
LCC	S, A	-20	650	-29	343
	N	-50	650	-46	343
CF8M	A	-20	450	-29	232
	C	-50	800	-46	427
WCC	S	-20	650 <sup>(1)</sup>	-29	343 <sup>(1)</sup>
	N	-20	800	-29	427
	A	-20	450	-29	232
WC9	S	-20	650 <sup>(1)</sup>	-29	343 <sup>(1)</sup>
	N	-20	800	-29	427
	A	-20	450	-29	232

**NOTES:**

- 1 - Trim temperature limitations can be extended to 800°F (427°C) when used in 1 and 2 inch size valve bodies



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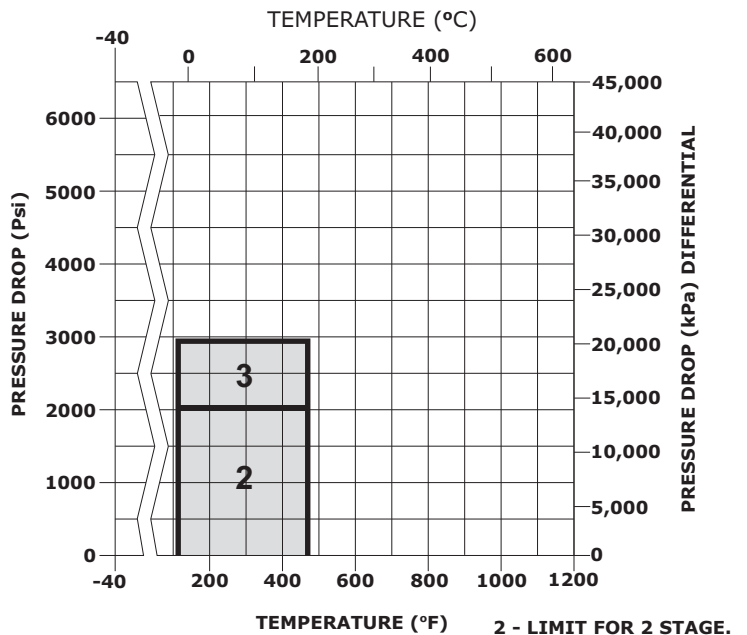
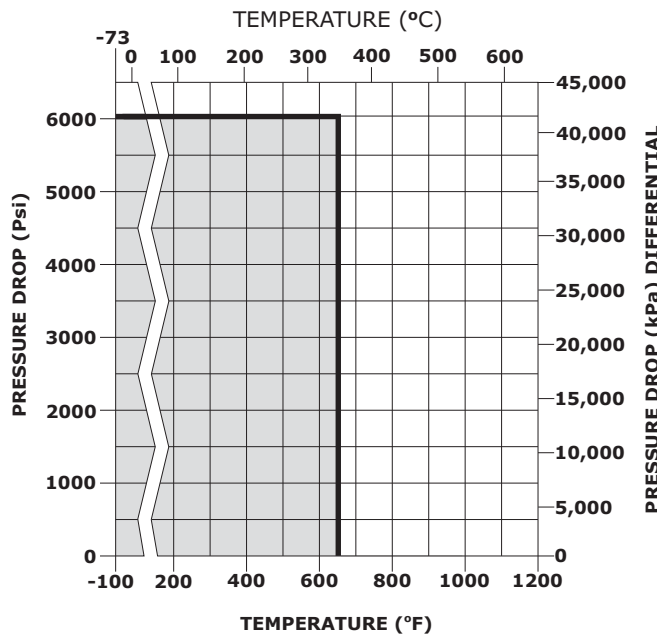
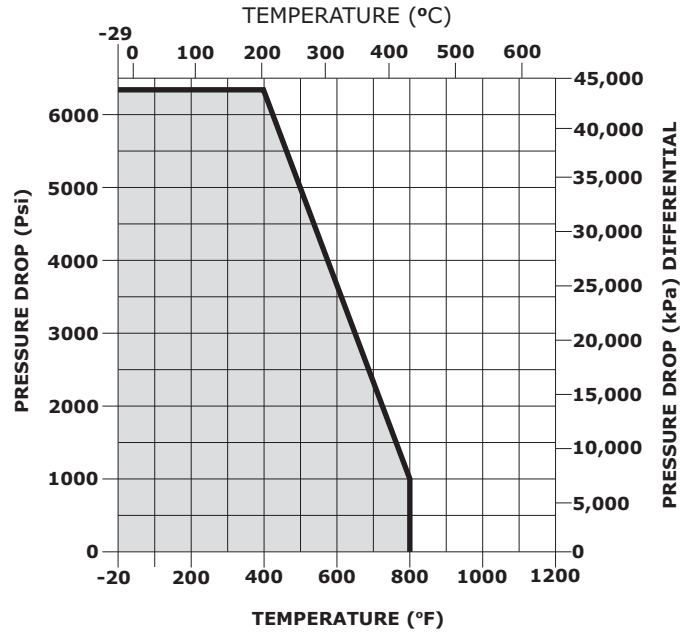
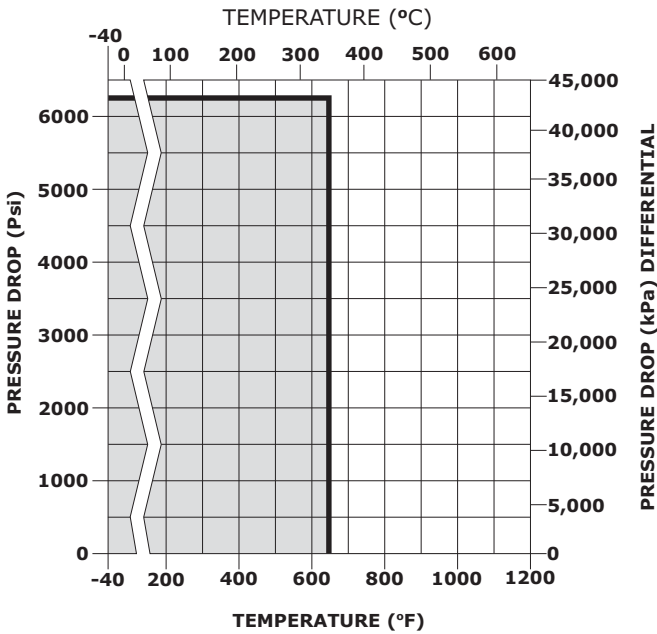
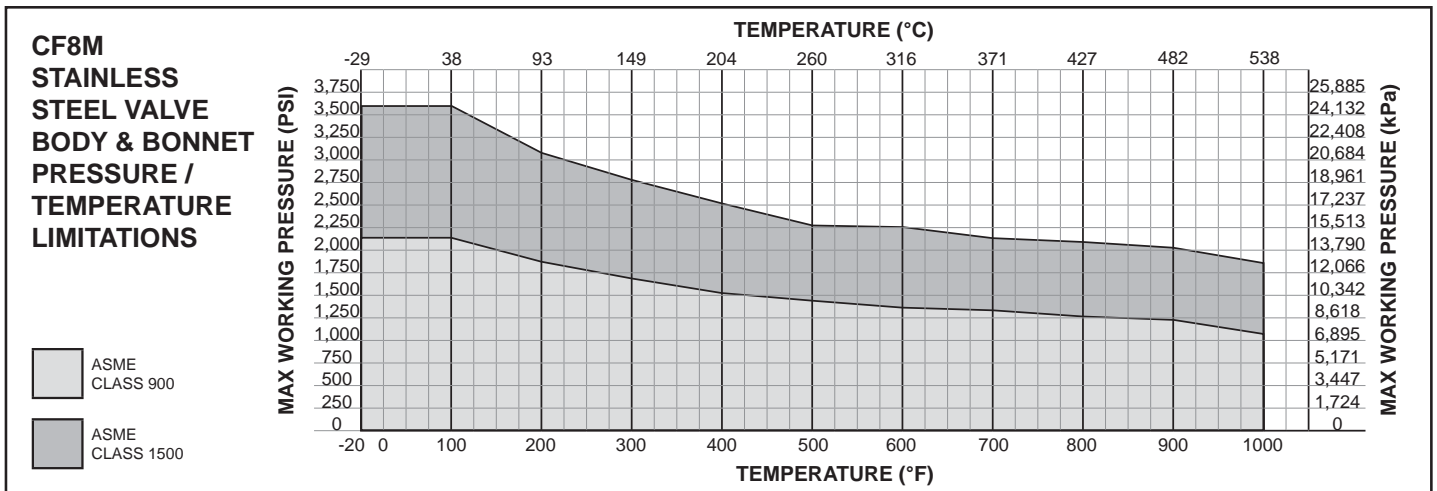
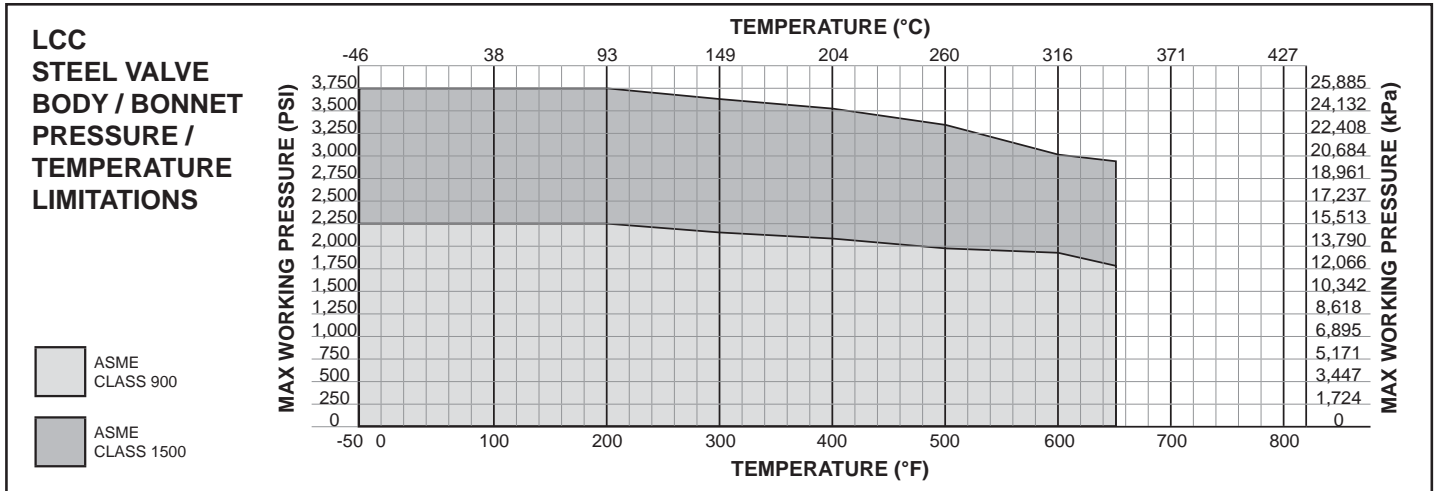


Figure 9 Trim Material Pressure / Temperature Limitations

# Model 390/391 Control Valves

## Technical Sales Bulletin



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.

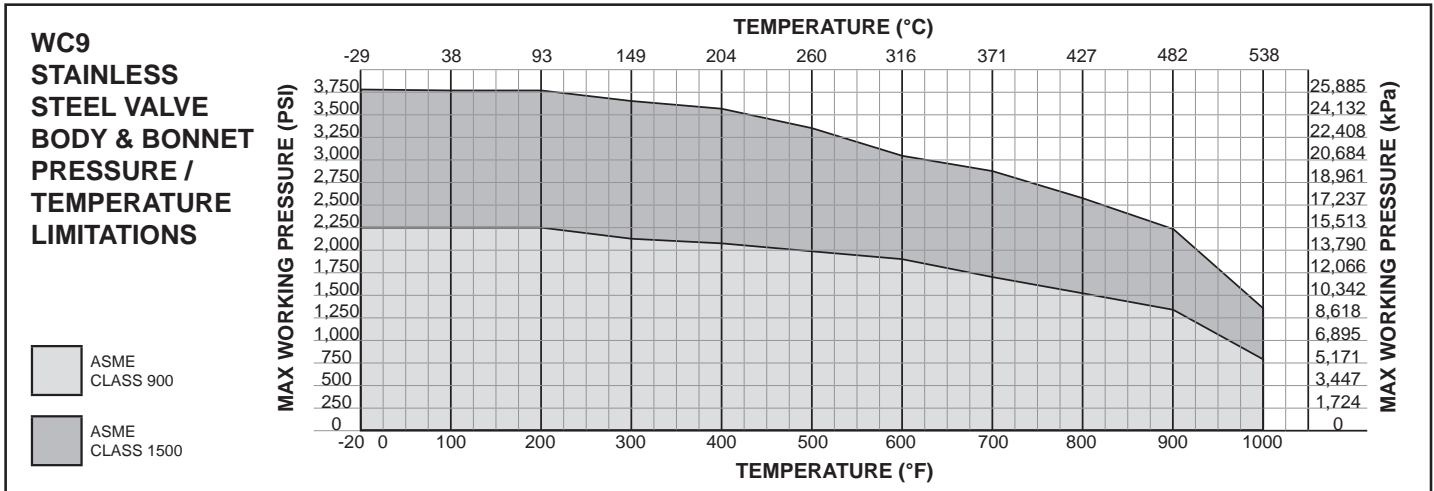
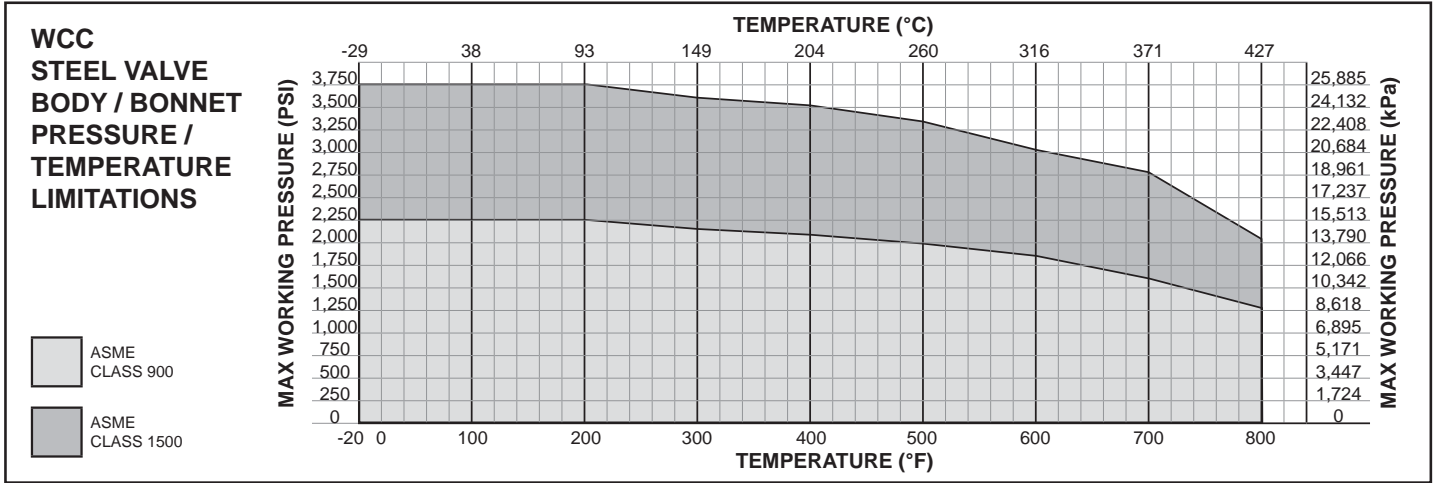


Figure 10 Pressure / Temperature Charts as per ASME B16.34 (Continued on Page 16)



# Model 390/391 Control Valves

## Technical Sales Bulletin



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



Figure 10 Pressure / Temperature Charts as per ASME B16.34 (Continued from Page 15)



# Model 390/391 Control Valves

## Technical Sales Bulletin



Table 14

### Port Diameters, Valve Plug Travel and Yoke Boss Diameter

Valve Size	Port Diameter Inch (mm)	Max Valve Travel Inch (mm)	Yoke Boss Diameter Inch (mm)	
			Stem	Valve
2" Linear, Mod. Equal Percent & Low-Noise	1 7/8 (47.6)	1-1/2 (38.1)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)	3-9/16 (90.5)
2" Equal Percent	1-7/8 (47.6)	1-1/8 (28.6)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)	3-9/16 (90.5)
2" Anti-Cavitation Stage 2	1-3/4 (44.5)	2 (50.8)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)	3-9/16 (90.5)
2" Anti-Cavitation Stage 3	1 (25.4)	2 (50.8)	3/4 (19.1)	3-9/16 (90.5)
3" Linear, Mod. Equal Percent & Low-Noise	2-7/8 (73)	2 (50.8)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
3" Equal Percent	2-7/8 (73)	1-1/2 (38.1)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
3" Anti-Cavitation Stage 2	2-1/2 (63.5)	2-1/2 (63.5)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
3" Anti-Cavitation Stage 3	1-7/8 (47.6)	2-1/2 (63.5)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
4" Linear, Mod. Equal Percent & Low-Noise	3-5/8 (98)	2 (50.8)	3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
4" Equal Percent	3-5/8 (92.1)	1-1/2 (38.1)	3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
4" Anti-Cavitation Stage 2	3-7/16 (87.3)	3 (76.2)	3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
4" Anti-Cavitation Stage 3	2-7/8 (73)	3 (76.2)	3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
6" & 8"x6" Linear, Mod. Equal Percent & Low-Noise	5-3/8 (136.5)	3 (76.2)	3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
			1-1/4 (31.8)	5 (127)
6" & 8"x6" Equal Percent	5-3/8 (136.5)	2-1/2 (63.5)	3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
			1-1/4 (31.8)	5 (127)
6" & 8"x6" Anti-Cavitation Stage 2	5-1/4 (133.4)	4 (101.6)	3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
			1-1/4 (31.8)	5 (127)
6" & 8"x6" Anti-Cavitation Stage 3	4-9/16 (115.9)	4 (101.6)	3/4 (19.1)	3-9/16 (90.5)
			1 (25.4)	5 (127)
			1-1/4 (31.8)	5 (127)



# Model 390/391 Control Valves

## Technical Sales Bulletin

Table 15

**Shut Off Capabilities for Model 390 with Fail Open Actuator  
Metal Seat, Class IV Control Valve  
35 psig supply pressure**

Valve Size (inch)	Actuator Size				
	Pressure Drop Psig (kPag)				
	DFO - 2105	DFO - 2156	DFO - 3105	DFO - 3156	DFO - 3220
2	3,750 (25,855) <sup>1</sup>	3,750 (25,855) <sup>1</sup>	—	—	—
3	3,750 (25,855) <sup>2</sup>	37,50 (25,855) <sup>1</sup>	3,750 (25,855) <sup>2</sup>	3,750 (25,855) <sup>1</sup>	—
4	—	—	—	3,750 (25,855) <sup>3</sup>	3,750 (25,855) <sup>1</sup>
6	—	—	—	—	2,280 (15,720) <sup>4</sup>
8x6	—	—	—	—	2,280 (15,720) <sup>4</sup>

**Note**

- 1 - 6 to 26 Psig (41 to 179 kPag) bench range
- 2 - 6 to 24 Psig (41 to 165 kPag) bench range
- 3 - 6 to 22 Psig (41 to 152 kPag) bench range
- 4 - 6 to 17 Psig (41 to 117 kPag) bench range

Table 16

**Shut Off Capabilities for Model 390 with Fail Closed Actuator  
Metal Seat, Class IV Control Valve  
35 psig supply pressure**

Valve Size (inch)	Actuator Size				
	Pressure Drop Psig (kPag)				
	DFC - 2105	DFC - 2156	DFC - 3105	DFC - 3156	DFC - 3220
2	3,750 (25,855) <sup>1</sup>	3,750 (25,855) <sup>1</sup>	—	—	—
3	3,750 (25,855) <sup>2</sup>	3,750 (25,855) <sup>1</sup>	3,750 (25,855) <sup>2</sup>	3,750 (25,855) <sup>1</sup>	—
4	—	—	—	2,280 (15,720) <sup>2</sup>	3,750 (25,855) <sup>3</sup>
6	—	—	—	—	2,280 (15,720) <sup>4</sup>
8x6	—	—	—	—	2,280 (15,720) <sup>4</sup>

**Note**

- 1 - 6 to 30 psig (41 to 207 kPag) Bench Range
- 2 - 9 to 30 psig (62 to 207 kPag) Bench Range
- 3 - 15 to 30 psig (103 to 207 kPag) Bench Range
- 4 - 18 to 30 Psig (124 to 207 kPag) Bench Range with a DFC4-3220 Actuator

# Model 390/391 Control Valves

## Technical Sales Bulletin



Table 17

**Maximum Sizing Coefficients  
Equal Percentage Characteristic  
Globe Body Valve  
Flow Down**

Valve Size Inches	Port Inches (mm)	Travel Inches (mm)	Coefficient	Percentage of Valve Travel
				100%
2	1-7/8 (47.6)	1-1/8 (28.6)	C <sub>v</sub>	41.0
3	2-7/8 (73)	1-1/2 (38.1)	C <sub>v</sub>	92.5
4	3-5/8 (92.1)	1-1/2 (38.1)	C <sub>v</sub>	164
6	5-3/8 (136.5)	2-1/2 (63.5)	C <sub>v</sub>	319
8x6	5-3/8 (136.5)	2-1/2 (63.5)	C <sub>v</sub>	319

**NOTE:** For full list of sizing coefficients refer to document P-CVSM.

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

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# Model 390/391 Control Valves

## MODEL NUMBERING SYSTEM

**SAMPLE PART NUMBER: 390-3AFL-SFP2-CES4**

					<b>MODEL</b>		<b>390</b>
<b>390</b>	MODEL 390			<b>391</b>	MODEL 391		
<b>BODY STYLE</b>							<b>-</b>
-	GLOBE	<b>A</b>	ANGLE				
<b>VALVE SIZE</b>							<b>3</b>
<b>2</b>	2 INCH	<b>3</b>	3 INCH	<b>4</b>	4 INCH	<b>6</b>	6 INCH
<b>8</b>	8 x 6 INCH						
<b>ASME RATING</b>							<b>A</b>
<b>A</b>	900	<b>B</b>	1500	<b>C</b>	900 / 1500		
<b>END CONNECTION</b>							<b>F</b>
<b>F</b>	RF	<b>J</b>	RTJ	<b>L</b>	BWE SCH 80	<b>U</b>	BWE SCH 120
<b>P</b>	BWE SCH 160						
<b>BODY MATERIAL</b>							<b>L</b>
<b>L</b>	LCC	<b>W</b>	WCC	<b>M</b>	CF8M	<b>9</b>	WC9
<b>BOLTING</b>							<b>-</b>
-	B7 / 2H	<b>A</b>	B7M / 2HM	<b>B</b>	B8M / 8M		
<b>K</b>	B7 / 2H FLUOROKOTE #1			<b>L</b>	B7M / 2HM FLUOROKOTE #1		
<b>TRIM</b>							<b>S</b>
<b>S</b>	TRIM SPEC S	<b>C</b>	TRIM SPEC C	<b>N</b>	TRIM SPEC N	<b>A</b>	TRIM SPEC A
<b>PORT SIZE</b>							<b>F</b>
<b>F</b>	FULL PORT						
<b>PACKING STYLE</b>							<b>P</b>
<b>P</b>	SINGLE PTFE V-RING (PRESSURE)			<b>J</b>	DOUBLE PTFE V-RING (PRESSURE)		
<b>L</b>	LIVE LOADED PTFE (PRESSURE)			<b>V</b>	DOUBLE PTFE V-RING (VACUUM)		
<b>R</b>	DOUBLE PTFE V-RING (VACUUM / PRESSURE)			<b>T</b>	LIVE LOADED GRAPHITE (PRESSURE)		
<b>G</b>	SINGLE GRAPHITE (PRESSURE)						
<b>YOKE BOSS SIZE</b>							<b>2</b>
<b>2</b>	2-13/16" (1/2" STEM)	<b>3</b>	3-9/16" (3/4" STEM)	<b>5</b>	5" (1" STEM)	<b>H</b>	5H (1-1/4" STEM)
<b>PAINT</b>							<b>-</b>
-	DFPS-01 (STANDARD)			<b>2</b>	DFPS-02 (SEVERE SERVICE)		
<b>3</b>	DFPS-03 (HIGH TEMPERATURE)						
<b>BACKUP RING / SEAL RING / PISTON RING</b>							<b>C</b>
<b>C</b>	S31600 / PTFE - ELGILOY			<b>K</b>	S31600 / KEL-F - ELGILOY		
<b>R</b>	S31600 / PTFE - ELGILOY W/ PEEK AE RINGS			<b>G</b>	DOUBLE GRAPHITE PISTON RINGS (391 ONLY)		
<b>H</b>	TRIPLE GRAPHITE PISTON RINGS** (391 ONLY)						
<b>CHARACTERISTIC</b>							<b>E</b>
<b>E</b>	EQUAL PERCENT	<b>L</b>	LINEAR	<b>M</b>	MODIFIED EQ. PERCENT		
<b>2</b>	ANTI-CAVITATION 2 STAGE			<b>3</b>	ANTI-CAVITATION 3 STAGE		
<b>H</b>	LOW-NOISE III A1	<b>B</b>	LOW-NOISE III B1	<b>P</b>	LOW-NOISE III B3	<b>I</b>	LOW-NOISE III C3
<b>D</b>	LOW-NOISE III D3		<b>Q</b>	QUICK OPENING			
<b>BONNET STYLE</b>							<b>S</b>
<b>S</b>	STANDARD	<b>T</b>	STANDARD TAPPED	<b>E</b>	EXTENSION STYLE 1		
<b>SHUT-OFF CLASS</b>							<b>4</b>
<b>2</b>	CLASS II (391 ONLY)	<b>3</b>	CLASS III (391 ONLY)	<b>4</b>	CLASS IV	<b>5</b>	CLASS V
<b>NOTE:</b> Modified Equal Percent is a factor of travel and requires no special parts or trim options that differ from Equal Percent.							
** - Triple Piston Rings are only available for valve sizes 3" to 6", for Class IV shutoff requirements for 2" valve sizes refer to Model 392 valves.							