

The Model 5500 is a durable and reliable control valve, well suited for throttling or on/off control of non-lubricating, viscous, or other hard-to-handle fluids. The Model 5500 is used over a broad range of pressure drops and temperatures where accurate and reliable control is required. This valve is available in a wide variety of integral end connection styles, and comes complete with a pneumatic spring return fail-open or fail-close diaphragm actuator.

Features:

- **Rugged Construction** - The heavy-duty steel body / bonnet constructions enable the Model 5500 to provide reliable service in harsh industrial environments.
- **Optimized Flow Path** - Engineered with wide flow passages for maximized flow capacities.
- **Variety of Trim Materials** - Available with 316 SST, or 17-4PH SST plug / cage / seat materials. Hardened seating surfaces (Alloy 6 for cage control or tungsten carbide for plug control) are available for erosive / abrasive services and TFE soft seating surface is available for tight shutoff requirements.
- **Variety of Trim Designs** - Available with equal percentage, linear, or quick opening flow characteristic for cage control and modified percent characteristic for plug control. Anti-cavitation or noise abatement trim sets are also available (cage control design only).
- **Balanced Trim Design** - The pressure-balanced plug reduces actuator thrust requirements, enabling cost savings on the valve actuator.
- **Excellent Shutoff Performance** - Zero leakage (ANSI Class VI) is achieved with the TFE soft seating trim option.
- **Spring-loaded Packing** - Packing is "Live Loaded" by means of a load spring so the packing does not need to be constantly adjusted.
- **Simple Maintenance** - The design of the Model 5500 allows for fast and easy inspection or replacement of the trim without removing the valve from the line. Special tools are not required.



Specifications

Available Body Sizes

2", 3", 4", or 6"

End Connections / Pressure Ratings¹

FNPT ²	3750 psig (259 bar)
150# RF	290 psig (20 bar)
300# RF	750 psig (52 bar)
600# RF	1500 psig (103 bar)
600# RTJ	1500 psig (103 bar)
900# RF	2250 psig (155 bar)
900# RTJ	2250 psig (155 bar)
1500# RF	3750 psig (259 bar)
1500# RTJ	3750 psig (259 bar)

Flow Characteristics

Equal Percent (Cage Control)
 Linear (Cage Control)
 Quick Opening (Cage Control)
 Anti-cavitation (Cage Control)
 Noise Abatement (Cage Control)
 Modified Percent (Plug Control)

Flow Coefficients

See Tables 1A and 1B

Allowable Pressure Drops

See Tables 2A through 2K

Temperature Limits

Standard Valve Configuration:

- -20 to 400° F (-29 to 204° C)

Modified Valve Configurations³:

- -50 to 750° F (-46 to 400° C)

Materials of Construction

See Tables 3A and 3B

Leakage Rates

Metal-to-Metal Seating	ANSI Leakage Class
0.25" - 0.75"	IV
1.00"	III
1.5" - 6.0"	IV
Soft Seating	ANSI Leakage Class
All Sizes	VI

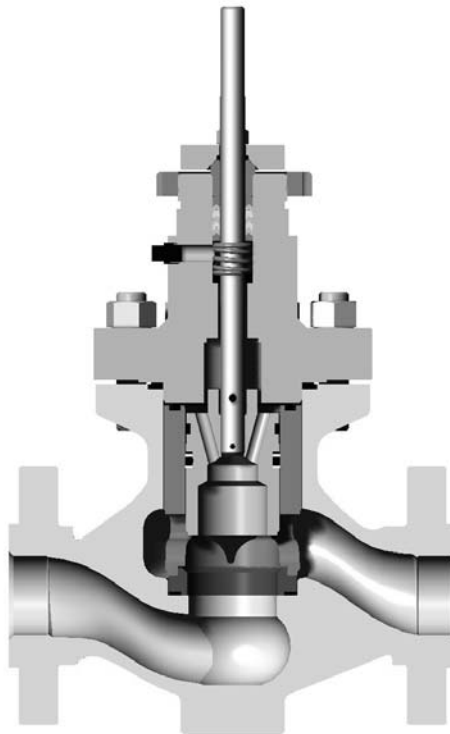


Figure 2. Sectional View

1. Pressure ratings @ 100°F (38°C).
 2. 2" valve body only.
 3. Consult Factory.

Table 1A. Flow Coefficients (C_v), Modified Percent and Quick-Opening

Body Size	Orifice Size	Valve Opening (% Travel)									
		10	20	30	40	50	60	70	80	90	100
2"	0.25"	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.43
	0.38"	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70
	0.50"	.592	1.17	1.76	2.34	2.95	3.70	4.57	5.50	5.95	6.08
	0.75"	.882	1.76	2.76	3.82	5.53	6.57	8.49	10.8	15.0	16.2
	1.00"	1.01	2.02	3.14	5.07	9.68	11.9	14.9	17.2	19.3	20.9
	1.5"	4.74	7.67	9.53	12.9	18.4	24.9	33.6	44.0	53.4	59.5
	2.0"	5.01	11.0	20.3	33.8	48.9	61.4	67.2	69.5	70.8	71.6
3"	0.25"	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.43
	0.38"	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70
	0.50"	.592	1.17	1.76	2.34	2.95	3.70	4.57	5.50	5.95	6.08
	0.75"	.882	1.76	2.76	3.82	5.53	6.57	8.49	10.8	15.0	16.2
	1.00"	1.01	2.02	3.14	5.07	9.68	11.9	14.9	17.2	19.3	20.9
	1.5"	4.74	7.67	9.53	12.9	18.4	26.2	35.6	46.2	57.0	65.1
	2.0"	5.01	9.85	16.6	30.6	47.2	62.9	77.0	88.8	96.4	101
4"	0.25"	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.43
	0.38"	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70
	0.50"	.592	1.17	1.76	2.34	2.95	3.70	4.57	5.50	5.95	6.08
	0.75"	.882	1.76	2.76	3.82	5.53	6.57	8.49	10.8	15.0	16.2
	1.00"	1.01	2.02	3.14	5.07	9.68	11.9	14.9	17.2	19.3	20.9
	1.5"	4.74	7.67	9.53	12.9	18.4	26.2	37.9	50.6	62.1	67.4
	2.0"	6.20	11.5	20.9	37.1	53.1	70.3	82.1	93.3	104	110
4"	3.0"	7.60	19.0	36.1	59.1	80.6	111	135	151	166	172
	4.0"	8.42	21.6	38.3	71.5	114	148	177	196	207	211

Table 1B. Flow Coefficients (C_v), Equal Percentage

Body Size	Orifice Size	Valve Opening (% Travel)									
		10	20	30	40	50	60	70	80	90	100
2"	1.5"	1.03	1.52	2.15	2.89	4.08	6.52	9.85	15.1	21.7	27.4
	2.0"	1.20	2.54	4.75	7.84	12.6	19.2	28.8	40.1	50.4	62.2
3"	2.0"	1.40	2.73	4.96	8.12	12.8	20.4	32.6	49.7	71.6	90.4
	3.0"	2.95	5.89	8.76	16.2	26.9	44.2	68.1	92.6	111	124
4"	3.0"	3.14	6.04	8.96	16.8	27.8	46.3	74.3	108	124	148
	4.0"	4.51	10.2	19.0	31.1	51.7	78.4	120	155	183	192
6"	4.0"	5.2	11.4	21.2	33.0	53.8	83.9	129	178	220	265
	6.0"	11.3	24.5	42.8	67.5	102	161	239	319	358	392

Table 1C. Flow Coefficients (C_v), Anti-Cavitation (linear characteristic)

Body Size	Orifice Size	Valve Opening (% Travel)									
		10	20	30	40	50	60	70	80	90	100
2"	1.5"	0.47	0.58	2.03	4.82	7.46	10.2	12.5	14.6	16.6	18.0
	2.0"	0.89	1.09	3.84	9.11	14.1	19.3	23.6	27.5	31.4	34.0
3"	3.0"	1.97	2.40	8.47	20.1	31.1	42.7	52.0	60.7	69.3	75.1
4"	4.0"	3.26	21.3	40.7	59.6	76.9	94.3	109	123	135	142
6"	6.0"	6.58	8.03	28.3	67.3	104	143	174	203	232	251

Table 2A. Plug Control Allowable Pressure Drops, PSID - No. 70 Actuator, Direct Acting (Fail Open), Flow Up

Trim Size	Air to Diaphragm, psig			
	18	20	33	35
1.5"	880	1300	1560	2260
2.0"	700	1040	1260	1800
3.0"	470	830	970	1270
4.0"	280	520	680	890

Table 2B. Plug Control Allowable Pressure Drops, PSID - No. 120 Actuator, Direct Acting (Fail Open), Flow Up

Trim Size	Air to Diaphragm, psig			
	18	20	33	35
1.5"	1560	2340	2820	3750
2.0"	1250	1900	2330	3375
3.0"	870	1330	1740	2360
4.0"	640	920	1350	1550

Table 2C. Plug Control Allowable Pressure Drops, PSID - No. 70 Actuator, Reverse Acting (Fail Close), Flow Up

Trim Size	Initial Actuator Spring Setting ¹ , psig						
	3	6	9	6	9	12	15
	(3-15 spring)			(6-30 spring)			
1.5"	980	1260	1600	940	1280	1450	1850
2.0"	890	1100	1300	850	1120	1160	1560
3.0"	520	660	910	500	680	860	1290
4.0"	370	440	660	350	460	570	970

Table 2D. Plug Control Allowable Pressure Drops, PSID - No. 120 Actuator, Reverse Acting (Fail Close), Flow Up

Trim Size	Initial Actuator Spring Setting ¹ , psig						
	3	6	9	6	9	12	15
	(3-15 spring)			(6-30 spring)			
1.5"	1700	2620	3750	1550	2700	3340	3750
2.0"	1380	2120	3180	1400	2360	2680	3400
3.0"	990	1530	2280	840	1460	1990	2550
4.0"	800	1200	1780	760	990	1370	1780

1. Initial Actuator Spring Setting is the signal pressure to the diaphragm required to initially lift the plug from the valve seat, while the valve is not in service. (Sometimes referred to as "bench set".)

Table 2E. Cage Control Allowable Pressure Drops, PSID - No. 70 Actuator, Direct Acting (Fail Open), Flow Down

Trim Size	Air to Diaphragm, psig			
	18	20	33	35
1.5"	330	720	3280	3750
2.0"	280	670	3180	3550
3.0"	180	570	2950	3350
4.0"	70	370	2350	2650

Table 2F. Cage Control Allowable Pressure Drops, PSID - No. 120 Actuator, Direct Acting (Fail Open), Flow Down

Trim Size	Air to Diaphragm, psig			
	18	20	33	35
1.5"	750	1440	3750	3750
2.0"	690	1350	3750	3750
3.0"	585	1225	3750	3750
4.0"	400	900	3750	3750
6.0"	120	400	2250	2535

Table 2G. Cage Control Allowable Pressure Drops, PSID - No. 180 Actuator, Direct Acting (Fail Open), Flow Down

Trim Size	Air to Diaphragm, psig			
	18	20	33	35
4.0"	780	1550	3750	3750
6.0"	330	750	3500	3750

Table 2H. Cage Control Allowable Pressure Drops, PSID - No. 70 Actuator, Reverse Acting (Fail Close), Flow Down

Trim Size	Initial Actuator Spring Setting ¹ , psig						
	3	6	9	6	9	12	15
	(3-15 spring)			(6-30 spring)			
1.5"	320	920	1520	800	1400	2100	3350
2.0"	270	850	1440	730	1320	2000	3200
3.0"	185	750	1300	640	1190	1850	3000
4.0"	70	520	980	400	850	1420	2350

Table 2J. Cage Control Allowable Pressure Drops, PSID - No. 120 Actuator, Reverse Acting (Fail Close), Flow Down

Trim Size	Initial Actuator Spring Setting ¹ , psig						
	3	6	9	6	9	12	15
	(3-15 spring)			(6-30 spring)			
1.5"	750	1780	2800	1600	2600	3750	3750
2.0"	690	1700	2700	1530	2520	3650	3750
3.0"	580	1540	2500	1400	2330	3450	3750
4.0"	400	1175	1950	1000	1700	2750	3100
6.0"	120	550	975	400	800	1400	2100

Table 2K. Cage Control Allowable Pressure Drops, PSID - No. 180 Actuator, Reverse Acting (Fail Close), Flow Down

Trim Size	Initial Actuator Spring Setting ¹ , psig						
	3	6	9	6	9	12	15
	(3-15 spring)			(6-30 spring)			
4.0"	780	1950	3120	1740	3320	3750	3750
6.0"	340	970	1600	780	1400	2250	3000

1. Initial Actuator Spring Setting is the signal pressure to the diaphragm required to initially lift the plug from the valve seat, while the valve is not in service. (Sometimes referred to as "bench set".)

Table 3A. Materials of Construction

Part	Material	Temperature Limits	
		°F	°C
Body	WCC Steel	-20 to 1000	-29 to 538
	316 SST	-50 to 1000	-45 to 538
Bonnet	A105 Forged Carbon Steel	-20 to 1000	-29 to 538
	CF8M Forged Carbon Steel	-50 to 1000	-45 to 538
Yoke	Ductile Iron	-20 to 1000	-29 to 538
Valve Stem	316 Stainless Steel	-50 to 1000	-45 to 538
Packing	PTFE V-Ring	-50 to 400	-45 to 204
	Graphoil	-50 to 750	-45 to 400
Actuator Housing	Steel	-20 to 1000	-29 to 538
Actuator Spring	Steel	-20 to 1000	-29 to 538
Diaphragm	Nylon-Reinforced Buna-N	-20 to 200	-29 to 93

Table 3B. Materials of Construction - Trim Options

Trim Code	Cage	Guide	Plug	Seat	Seal Ring ⁽⁷⁾
1 ^(1,2)	17-4PH SST (H1150M)	---	17-4PH SST (H1150M)	17-4PH SST (H1150M)	TFE
2 ⁽⁵⁾	316 SST	316 SST	316 SST with tungsten carbide insert	316 SST with tungsten carbide seating surface	TFE
3 ⁽³⁾	316 SST	316 SST	316 SST	316 SST	TFE
6 ⁽⁴⁾	17-4PH SST (H1150M)	---	316 SST with Alloy 6 hard-faced seating surface	316 SST with Alloy 6 hard-faced seating surface	TFE
8 ⁽⁶⁾	316 SST	316 SST	316 SST with TFE insert	316 SST with TFE insert	TFE

- Standard material combination for Cage Control trim design.
- Standard material combination for Plug Control trim design, sizes 1" and smaller.
- Standard material combination for Plug Control trim design, sizes greater than 1".
- Available for Cage Control trim only.
- Available for Plug Control trim only.
- For Cage Control trim, TFE insert is part of the seat. For Plug Control trim, TFE insert is part of the plug.
- Consult Factory for temperature requirements above 400°F.

HOW TO ORDER

If Valve Specifics are Known:

- Specify Valve Size with Model 5500.
(Example: 3" 5500)
- Locate the product model code on the back page of this bulletin and select the proper code corresponding to the specifications required.
- Call Mallard Control or your local representative with the valve size, model, and model code for pricing and delivery.

If Valve Specifics are Unknown:

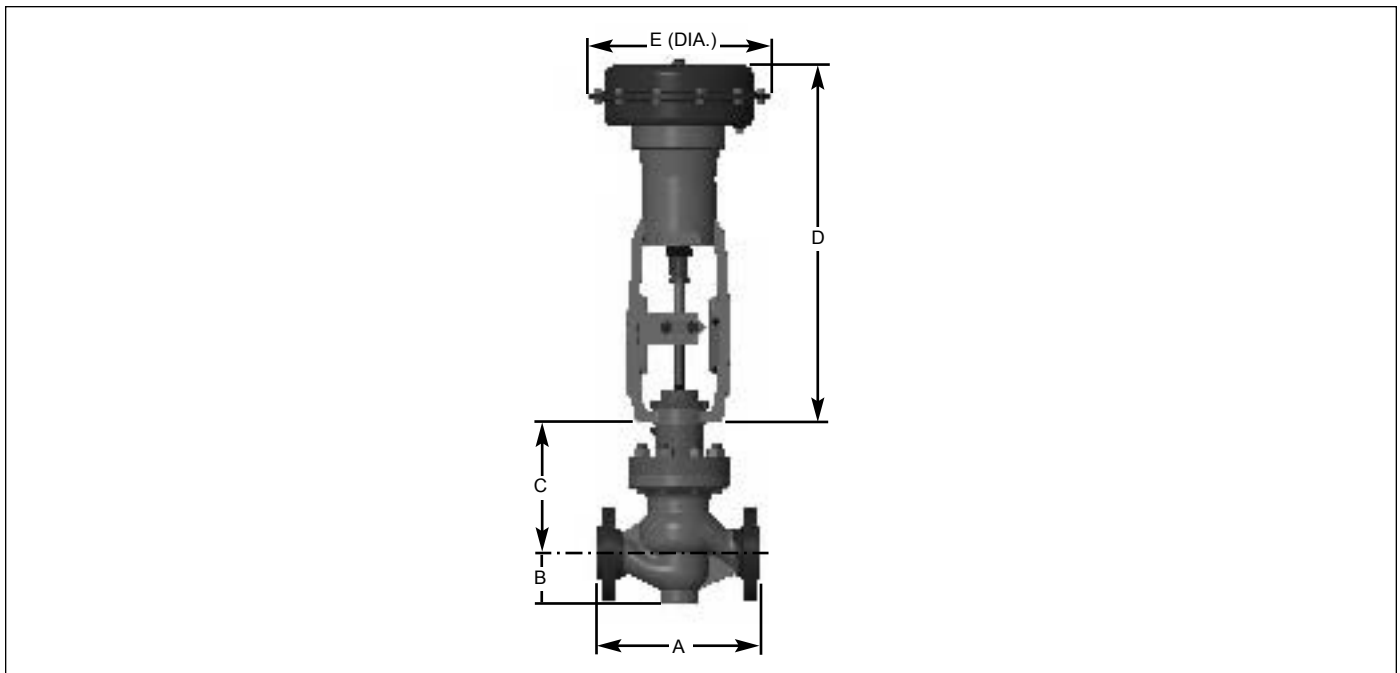
- Collect as much information about the application as possible per the following guidelines:
 - Valve application (i.e. suction, back pressure, pressure reducing, dumping, recycle, etc.)
 - Media being controlled (i.e. water, oil, natural gas, carbon dioxide, steam, etc.)
 - Specific gravity
 - Operating temperature
 - Shut-off pressure(s)
 - Inlet pressure(s)
 - Outlet pressure(s) or pressure drop(s)
 - Flow rate(s)
 - Actuator action, fail open or close
 - Accessories (if any)
- Call Mallard Control or your local representative with the information for assistance in valve sizing, model code development, pricing, and delivery.

Valve Body Dimensions, inches (mm)

Body End Connection Style	2"			3"			4"			6"								
	A	B Max.	C	A	B Max.	C	A	B Max.	C	A	B Max.	C						
FNPT	11.25 (286)	5.38 (136)	9.00 (228)															
BWE	11.25 (286)																	
SWE	11.25 (286)																	
150# RF	10.00 (254)					11.75 (298)	6.75 (171)	9.25 (235)	13.88 (352)	7.75 (197)	10.12 (257)	17.75 (451)	10.50 (267)	12.63 (321)				
300# RF	10.50 (266)					12.50 (317)									14.50 (368)			18.62 (473)
600# RF	11.25 (286)					13.25 (336)									15.50 (393)			20.00 (508)
600# RTJ	11.38 (289)					13.38 (339)									15.62 (397)			20.12 (511)
900# RF	14.75 (374)					15.50 (393)							17.00 (431)					
900# RTJ	14.88 (378)					15.62 (397)							17.12 (435)					
1500# RF	14.75 (374)					18.12 (460)							20.88 (530)					
1500# RTJ	14.88 (378)			18.25 (463)					21.00 (533)									

Actuator Dimensions, inches (mm)

Actuator Size	D		E	Boss Size	
	Direct	Reverse			
No. 70	24.12 (612)	23.88 (606)	12.50 (317)	2.81 (71)	
No. 120	29.50 (749)	31.38 (796)	16.75 (425)	2.81 (71)	
No. 180	30.12 (765)	32.12 (816)	20.50 (521)	2.81 (71)	3.50 (89)



Model Number Information

Sample Model Number: 5500 - **2 F 6 - G 73 R S - 3 A E**

BODY SIZE	CODE
2"	2
3"	3
4"	4
6"	6

END CONNECTIONS	CODE
Female NPT	S
Raised Face (RF) Flange	F
Ring Type Joint (RTJ) Flange	J

ANSI CLASS (PRESSURE RATING)	CODE
150 (275 psig)	1
300 (740 psig)	3
600 (1480 psig)	6
900 (2220 psig)	9
1500 (3750 psig)	5

MATERIALS OF CONSTRUCTION	CODE
Carbon Steel - Standard Service	-
Carbon Steel - High Temperature Service	H
Carbon Steel - NACE MR-01-75	N

BODY STYLE	CODE
Globe	G
Globe with Drain	D
Globe with Pressure Connection Ports	P

ACTUATOR SELECTION	CODE
No. 70 Actuator with 3-15 Spring	73
No. 70 Actuator with 6-30 Spring	76
No. 120 Actuator with 3-15 Spring	23
No. 120 Actuator with 6-30 Spring	26
No. 180 Actuator with 3-15 Spring	83
No. 180 Actuator with 6-30 Spring	86

ACTUATOR TYPE	CODE
Reverse Acting (spring closes/air opens)	R
Direct Acting (spring opens/air closes)	D

GASKET MATERIAL	CODE
304/Grafoil - Standard	S
Inconel/Grafoil - NACE MR-01-75	N

TRIM MATERIAL	CODE
17-4PH SST Cage, Plug and Seat Ring	1
316 SST Cage, Plug, and Seat Ring with Tungsten Carbide Seating Surfaces	2
316 SST Cage, Plug, and Seat Ring	3
17-4PH SST Cage / 316 SST Plug and Seat Ring with Alloy 6 Hard-faced Seating Surfaces	6
316 SST Cage, Plug, and Seat Ring with TFE Soft-Seat Insert	8

TRIM SIZE	CODE
Full Port	A
Reduced Port, one size down (6" body X 4" trim, 3" body X 2" trim, 2" body X 1.5" trim)	B
Reduced Port, two sizes down (4" body X 2" trim, 3" body X 1.5" trim)	C
Reduced Port, three sizes down (4" body X 1.5" trim)	D
1/4"	2
3/8"	3
1/2"	4
3/4"	6
1"	8

TRIM CHARACTERISTIC	CODE
Equal Percentage	E
Linear	L
Quick Opening (on/off)	Q
Anti-cavitation	C
Noise Abatement	D
Modified Percent	M

While this information is presented in good faith and believed to be accurate, Mallard Control Company does not guarantee results based upon such information. Mallard Control Company reserves the right to change the design or specifications of these products without notice.

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