

The Model 5530 / 5540 is a 3-way control valve designed for throttling or on/off service in converging (blending) or diverging (flow splitting) applications. This valve is available with balanced or unbalanced cage-guided trim. Standard trim material is 316 stainless steel. The Model 5530 / 5540 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 5530 / 5540 to provide reliable service in harsh industrial environments.
- **Variety of Trim Materials** – Available with 316 SST or 17-4PH SST plug / cage / seat materials. Alloy 6 hardened seating surfaces are available for extended trim life in erosive / abrasive services.
- **Application Flexibility** – The Model 5530's bottom port is common, while the Model 5540's side port is common, providing flexibility in piping design.
- **Balanced Trim Design** – The pressure-balanced plug on the 5530 reduces actuator thrust requirements, enabling the use of smaller, lower-cost valve actuators.



## SPECIFICATIONS

### Available Body Sizes

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

### End Connections / Pressure Ratings<sup>1</sup>

FNPT <sup>2</sup>	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)

### Flow Characteristic

Linear

### Flow Coefficients

See Tables 1A and 1B

### Valve Plug Styles

Model 5530: Balanced, metal-seated

Model 5540: Unbalanced, metal-seated

### Allowable Pressure Drops

See Tables 2A, 2B, and 2C

### Temperature Limits

-20 to 400° F (-29 to 204° C)

### Materials of Construction

See Tables 3A and 3B

### Shutoff Classifications

ANSI Class IV

1. Pressure ratings @ 100°F (38°C).



**FLOW DIRECTIONS**

**Model 5530 (Common Port on Bottom)**

Plug Down – Flow in converging service is from right to bottom. Flow in diverging service is from bottom to right.

Plug Up – Flow in converging service is from left to bottom. Flow in diverging service is from bottom to left.

Intermediate Plug Positions – Flow in converging service is from both left and right to bottom, with capacities proportional to travel. Flow in diverging service is from bottom to both left and right, with capacities proportional to travel.

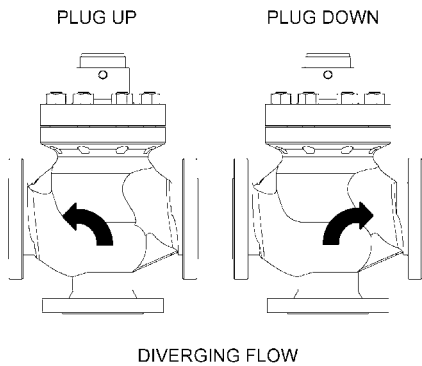
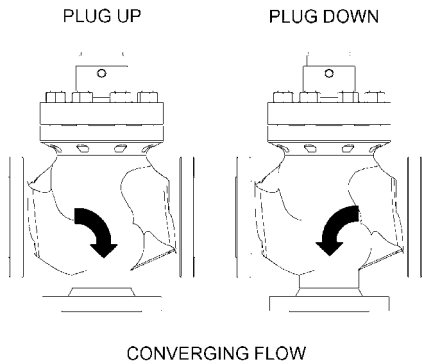


Table 1A. Flow Coefficients ( $C_v$ ) – Model 5530

Body Size	Flow Direction	$C_v$
2"	Rt-Btm (Plug Down)	41.0
	Left-Btm (Plug Up)	50.3
3"	Rt-Btm (Plug Down)	90.2
	Left-Btm (Plug Up)	108
4"	Rt-Btm (Plug Down)	148
	Left-Btm (Plug Up)	157
6"	Rt-Btm (Plug Down)	267
	Left-Btm (Plug Up)	291

**Model 5540 (Common Port on Left)**

Plug Down – Flow in converging service is from right to left. Flow in diverging service is from left to right.

Plug Up – Flow in converging service is from bottom to left. Flow in diverging service is from left to bottom.

Intermediate Plug Positions – Flow in converging service is from both bottom and right to left, with capacities proportional to travel. Model 5540 is not recommended for throttling diverging service.

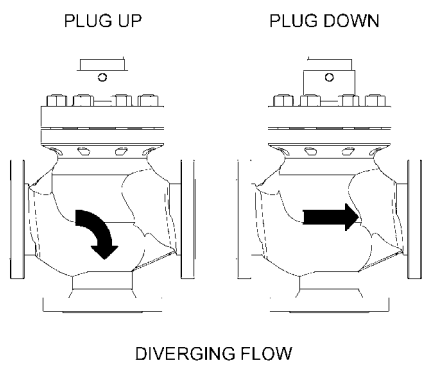
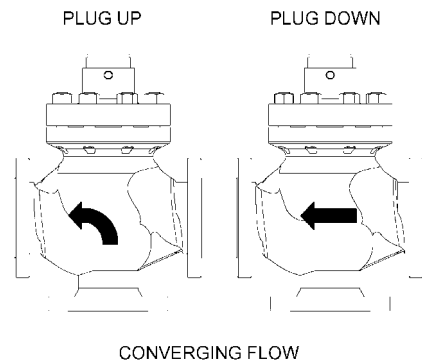


Table 1B. Flow Coefficients ( $C_v$ ) – Model 5540

Body Size	Flow Direction	$C_v$
2"	Rt-Left (Plug Down)	44.0
	Btm-Left (Plug Up)	53.3
3"	Rt-Left (Plug Down)	96.6
	Btm-Left (Plug Up)	116
4"	Rt-Left (Plug Down)	145
	Btm-Left (Plug Up)	174
6"	Rt-Left (Plug Down)	255
	Btm-Left (Plug Up)	316

Table 2A. Allowable Pressure Drops (PSID) – Model 5530

Valve Size	Actuator Size					
	70		120		180	
	Air to Diaphragm, psig					
	3-15	6-30	3-15	6-30	3-15	6-30
2"	750	1500	900	1500	--	--
3"	290	800	790	1500	--	--
4"	--	--	580	1440	--	--
6"	--	--	320	620	800	1500

Table 2B. Allowable Pressure Drops (PSID) – Model 5540 (Converging Service)

Valve Size	Actuator Size					
	70		120		180	
	Air to Diaphragm, psig					
	3-15	6-30	3-15	6-30	3-15	6-30
2"	60	180	120	255	--	--
3"	--	--	70	190	--	--
4"	--	--	20	60	55	125
6"	--	--	--	20	25	85

Table 2C. Allowable Pressure Drops (PSID) – Model 5540 (Diverging Service)

Valve Size	Actuator Size					
	70		120		180	
	Air to Diaphragm, psig					
	3-15	6-30	3-15	6-30	3-15	6-30
2"	260	590	170	360	--	--
3"	40	195	145	320	--	--
4"	--	--	65	140	100	220
6"	--	--	40	100	70	150

Table 3A. Materials of Construction

Part	Material	Temperature Limits	
		°F	°C
Body	WCC Steel	-20 to 1000	-29 to 538
	316 SST Steel	-50 to 1000	-45 to 538
Bonnet	A105 Forged Carbon Steel	-20 to 1000	-29 to 538
	CF8M Forged Stainless 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
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	Plug	Seat	Seal Ring Bushing
1	17-4PH SST (H1150M)	17-4PH SST (H1150M)	17-4PH SST (H1150M)	Reinforced TFE
3 <sup>1</sup>	316 SST	316 SST	316 SST	Reinforced TFE
6	17-4PH SST (H1150M)	316 SST with Alloy 6 hard-faced seating surface	316 SST with Alloy 6 hard-faced seating surface	Reinforced TFE

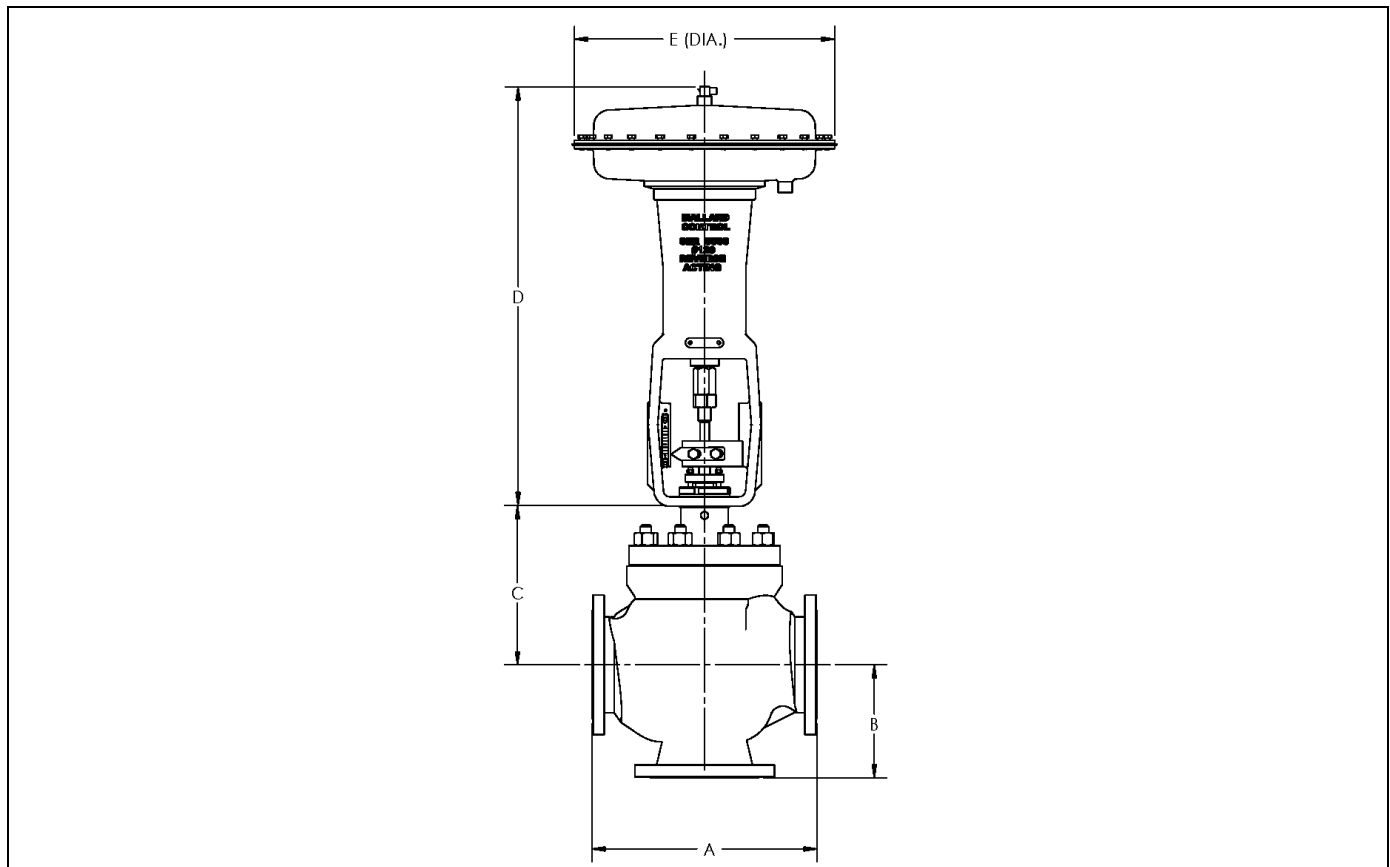
1. Standard material combination.

**Valve Body Dimensions, inches (mm)**

Body End Connection Style	2"			3"			4"			6"					
	A	B	C	A	B	C	A	B	C	A	B	C			
FNPT	11.25 (286)	5.63 (143)	9.00 (228)												
BWE	11.25 (286)	5.63 (143)													
SWE	11.25 (286)	5.63 (143)													
150# RF	10.00 (254)	5.00 (127)			11.75 (298)	5.88 (149)	9.25 (235)	13.88 (352)	6.94 (176)	10.12 (257)	17.75 (451)	8.88 (225)	12.63 (321)		
300# RF	10.50 (266)	5.25 (133)			12.50 (317)	6.25 (159)			14.50 (368)		7.25 (184)			18.62 (473)	9.31 (236)
600# RF	11.25 (286)	5.63 (143)			13.25 (336)	6.63 (168)			15.50 (393)		7.75 (197)			20.00 (508)	10.00 (254)
600# RTJ	11.38 (289)	5.69 (145)			13.38 (339)	6.69 (169)			15.62 (397)		7.81 (198)			20.12 (511)	10.06 (255)

**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: 5530 - 3 F 3 - G 73 R S - 3 A L**

<b>STYLE</b>		<b>CODE</b>
Balanced Trim (5530)		30
Unbalanced Trim (5540)		40
<b>BODY SIZE</b>		<b>CODE</b>
2"		2
3"		3
4"		4
6"		6
<b>END CONNECTIONS</b>		<b>CODE</b>
Female NPT		S
Raised Face (RF) Flange		F
Ring Type Joint (RTJ) Flange		J
<b>ANSI CLASS (PRESSURE RATING)</b>		<b>CODE</b>
150 ( 275 psig)		1
300 ( 740 psig)		3
600 (1480 psig)		6
<b>MATERIALS OF CONSTRUCTION</b>		<b>CODE</b>
Carbon Steel - Standard Service		-
Carbon Steel - NACE MR-01-75		N
Stainless Steel		S
<b>BODY STYLE</b>		<b>CODE</b>
Globe (3-Way)		G
<b>ACTUATOR SELECTION</b>		<b>CODE</b>
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
<b>ACTUATOR TYPE</b>		<b>CODE</b>
Reverse Acting (spring closes/air opens)		R
Direct Acting (spring opens/air closes)		D
<b>GASKET MATERIAL</b>		<b>CODE</b>
304/Grf - Standard		S
INC/Grf - NACE MR-01-75		N
<b>TRIM MATERIAL</b>		<b>CODE</b>
17-4PH SST Cage, Plug, and Seat Ring		1
316 SST Cage, Plug, and Seat Ring (standard)		3
17-4PH SST Cage / 316 SST Plug and Seat Ring with Alloy 6 Hard-faced Seating Surfaces		6
<b>TRIM SIZE</b>		<b>CODE</b>
Full Port		A
<b>TRIM CHARACTERISTIC</b>		<b>CODE</b>
Linear		L

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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