

## Control Valves

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**SINCE 1958**  
WORLDWIDE

Precise.

Quality.

Reliable.



## Mallard Control Model 5100 Freezeless Control (Dump) Valve

### Features

- Compact valve size
- Stainless steel trim
- Threaded process connections
- NACE MR0175 compliance option

### Specifications

Process connections

1" MNPT x 1/2" FNPT

1" MNPT x 1" FNPT

Body Style: "Freezeless" angle

Maximum operating pressure  
2220 psig at 100 °F (38 °C)

Operating temperature range  
-20° to 200° F (-29° to 93 °C)

Actuator

Air supply connection: 1/4" FNPT

Action: Reverse (fail close)

Effective area: 35 sq. in.

Maximum supply pressure

50 psig

Trim characteristic

Quick opening (on/off)

Port diameter / Flow coefficient (C<sub>v</sub>)

0.38"/4.8 C<sub>v</sub> 0.50"/8.3 C<sub>v</sub>

The model 5100 "freezeless" dump valve is perfectly suited for fluid control in oil and gas separators and other process vessels.

The valve body design allows the plug and seat to remain submerged in the process media, thus giving the valve its "freezeless" characteristic.



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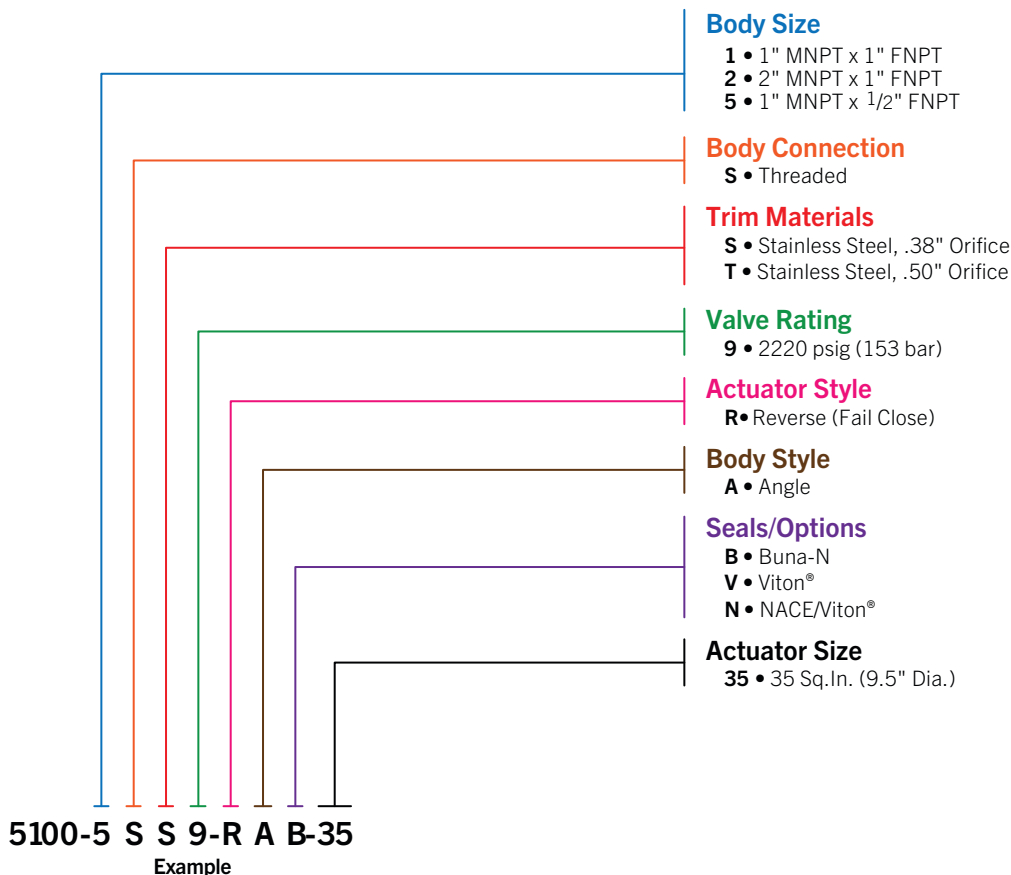
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## Mallard Control Model 5100 Freezeless Control (Dump) Valve

### Part Number Codes



### Materials of Construction

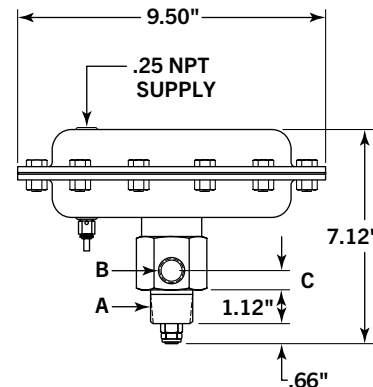
Description	Material
Liquid Chamber	Carbon Steel (Std.)
Cover	Carbon Steel
Body	Carbon Steel
Plug	302 Stainless Steel
Seat	304 Stainless Steel
Valve Stem	303 Stainless Steel,
Seals	Buna-N, Viton® (Optional)
Actuator Housing	Steel

### Approximate Weight (lbs., kg)

Process Connection	Weight	
	(lbs.)	(kg)
1.00 MNPT x 0.50 FNPT	13.5	6.1
1.00 MNPT x 1.00 FNPT	14.5	6.6
2.00 MNPT x 1.00 FNPT	14.5	6.6

### Dimensional Data (in., mm)

Body Size Code	Dimension (in.)			Dimension (mm)		
	A (MNPT)	B (FNPT)	C	A (MNPT)	B (FNPT)	C
1	1.00	1.00	0.75	25.4	25.4	19.1
2	2.00	1.00	0.75	50.8	25.4	19.1
5	1.00	0.50	0.63	25.4	12.7	16.0



## Mallard Control Model 5126/5127 "Freezeless" Control(Dump) Valve

### Features

- > Simple maintenance: Valve trim or the complete actuator assembly can be quickly changed by simply removing the hammer nut and lifting the actuator assembly off the valve body. Disassembly of the actuator or removal of the valve from the line is not required. No special tools are required.
- > Simple installation: Compact, lightweight design enables quick, easy installation with minimal labor requirements.
- > Variety of valve trims: Available in stainless steel (standard) or tungsten carbide (optional) trim material, size 1/4", 3/8" or 1/2".
- > Bonnet safety pressure relief: Special design of hammer nut provides warning indication if an attempt is made to remove the actuator while the valve body is still under pressure.
- > Variety of actuators: The spring-opposed diaphragm actuator is available in adjustable and non-adjustable configurations for either reverse (fail close) or direct (fail open) acting applications.
- > Materials of construction that comply with NACE MR0175 specifications are available upon request.

The model 5126/5127 "freezeless" dump valve is designed for fluid control in oil and gas separators and other process vessels.

The valve body design allows the plug and seat to remain submerged in the process media, thus giving the valve its "freezeless" characteristic.



### Specifications

Body style: Angle  
 Process connections: 2" MNPT x 1" FNPT  
 Pressure rating: 1500 psig at 100 °F (38 °C)  
 Maximum differential pressure: 1500 psig  
 Assembled valve temperature range  
 - 20 to 200° F (-29° to 93 °C)  
 ANSI leakage rating: Class IV

### Model 5126 Flow Coefficients (C<sub>v</sub>)

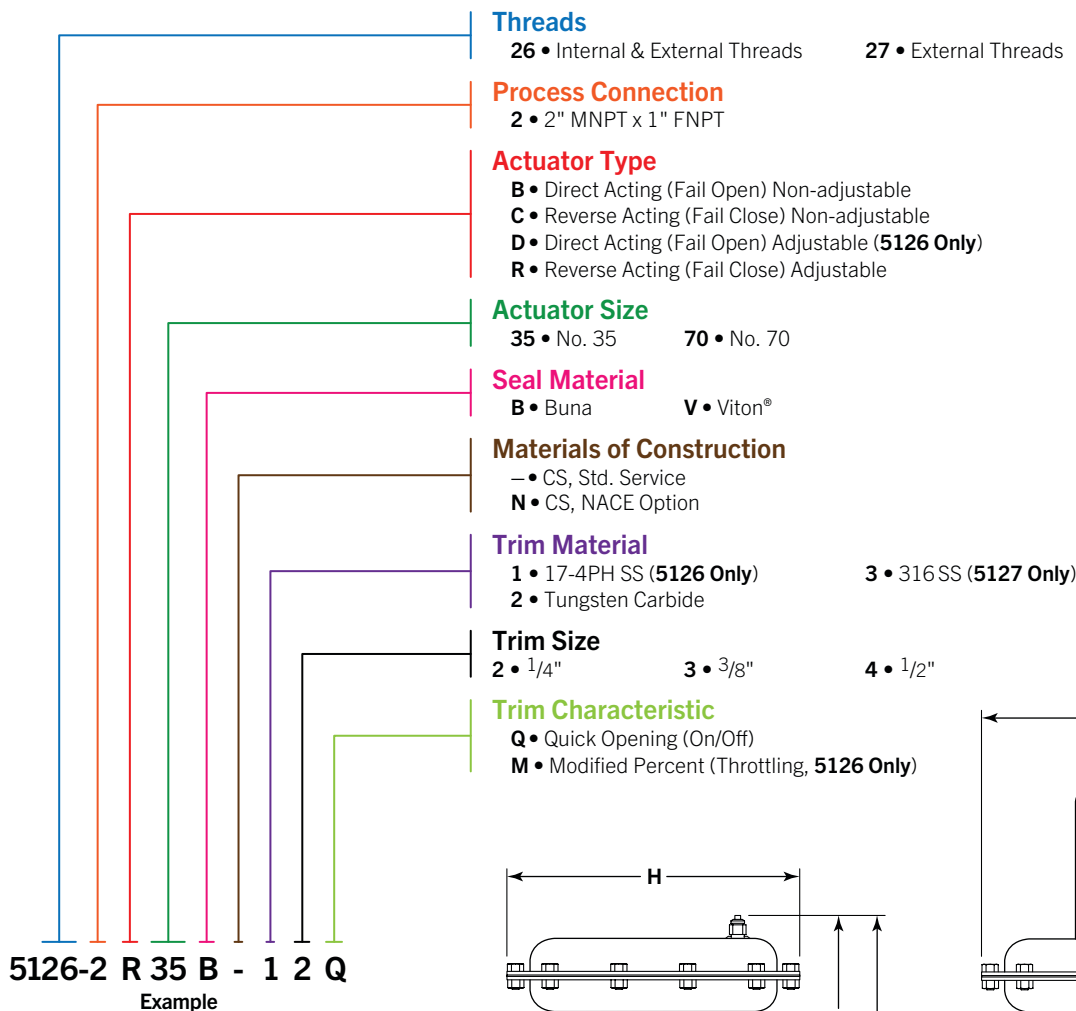
Trim Size (in.)	Trim Characteristic	
	Quick Opening	Mod. Percent
1/4	1.4	1.3
3/8	2.0	1.9
1/2	2.3	2.2

### Approx. Weight w/ Actuator (lbs., kg)

Actuator Size	Weight	
	(lbs.)	(kg)
No. 35	25	11.3
No. 70	35	15.8

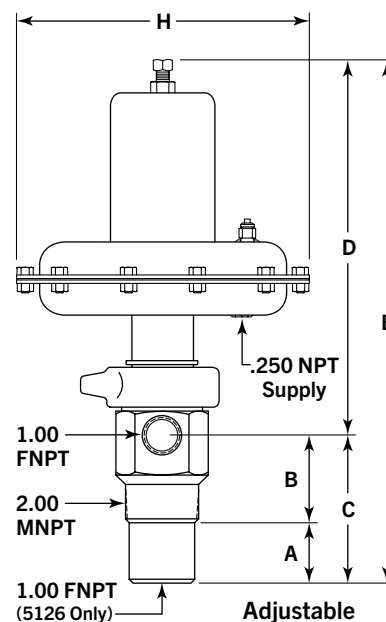
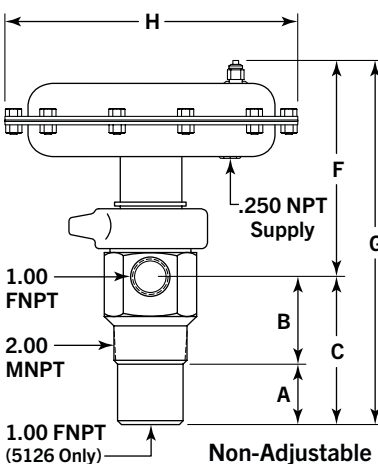
## Mallard Control Model 5126/5127 “Freezeless” Control(Dump) Valve

### Part Number Codes



### Materials of Construction

Description	Material
Valve Body	Carbon Steel
Bonnet	Carbon Steel
Hammer Nut	Carbon Steel
Trim	17-4PH Stainless Steel, Tungsten Carbide (Opt.)
Valve Stem	303 Stainless Steel, 316 Stainless Steel (Opt.)
Packing	PTFE V-Ring
Seals	Buna, Viton® (Opt.)
Diaphragm Housings	Steel
Diaphragm	Buna Reinforced with Nylon Fabric
Actuator Spring	Steel



### Dimensional Data (in., mm)

Model	Dimension (in.)							
	A	B	C	D Max.	E Max.	F Max.	G Max.	H
5126	3.00	2.88	5.88	13.5	19.38	9.25	15.13	9.5
5127	1.75	2.88	4.62	14.0	18.62	9.25	13.87	9.5
Model	Dimension (mm)							
	A	B	C	D Max.	E Max.	F Max.	G Max.	H
5126	76.20	731.15	149.35	342.9	492.25	234.95	384.3	241.3
5127	44.45	731.15	117.35	356.0	472.95	234.95	352.3	241.3

## Mallard Control Open Yoke & Close-Coupled Control (Dump) Valves

### Features

- > Simple maintenance: Valve trim or the complete actuator assembly can be quickly changed by simply removing the hammer nut and lifting the actuator assembly off the valve body. Disassembly of the actuator or removing the valve from the line is not required. No special tools are required.
- > Compact, lightweight design enables quick, easy installation with minimum labor requirements.
- > Bonnet safety pressure relief: Special design of hammer nut provides warning indication if an attempt is made to remove the actuator while the valve body is still under pressure.
- > Hardened trim: Control valve trim is available in stainless steel (standard) or tungsten carbide (standard) to handle the most difficult applications.
- > Bi-directional flow: Valve can be installed for either "flow up" or "flow down" operation, whichever best suits the application.

### Specifications

- Available configurations
- Open yoke (model 5400)
  - Fail-open or fail-close
  - Close-coupled (model 5450)
  - Fail-open or fail-close
- Flow characteristic
- Modified percent (throttling)
  - Quick opening (on/off)
- Body styles
- Globe (1" & 2"), angle (2" only) & tee (1" only)

Models 5400 open yoke and 5450 close-coupled control (dump) valves are designed to meet the high pressure and erosive applications common to the oil and gas industry. These valves are ideally suited for pressure, level, temperature, and flow control applications on

separators, scrubbers, wellheads and other oilfield equipment. The ease of maintenance, rugged steel construction, flexibility to meet a wide variety of applications, and safety features make models 5400/5450 control valves the preferred choice of production operators worldwide.



Model 5450  
w/tee body

Shown in "straight-through" flow configuration

- End connections
- FNPT, flanged, socket weld & butt weld
- Pressure ratings
- 4000 psig from -40 to 200°F (-40 to 93°C)
  - 3540 psig at 500°F (260°C)
- Assembled valve temperature range
- Model 5400/5450: -40 to 500°F (-40 to 260°C)
- Available trim sizes: 1/4", 3/8", 1/2", 3/4" & 1"
- Shutoff classification: ANSI class IV  
(Stainless steel or tungsten carbide trim)



Model 5400

- Flow direction
- Either direction, to suit the application
  - Flow up (under the seat) recommended for throttling applications
- Air pressure to actuator
- 3-15 spring
  - 0 to 20 psig control signal recommended
  - 6-30 spring
  - 0 to 35 psig control signal recommended



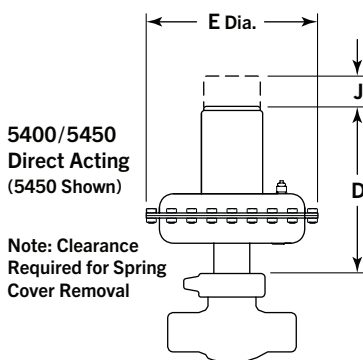
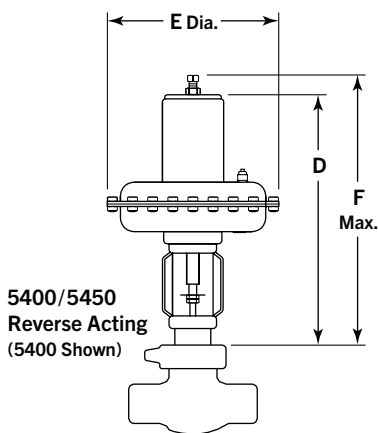
## Model 5400/5450 Open Yoke & Close-Coupled Control (Dump) Valves

### Part Number Codes

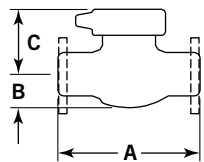
	<b>Style</b>	
	00 • Open Yoke	
	50 • Close-Coupled	
	<b>Body Size</b>	
	1 • 1"	
	2 • 2"	
	<b>End Connections</b>	
	S • Female NPT	
	F • RF Flange	
	J • RTJ Flange	
	<b>ANSI Class (Pressure Rating)</b>	
	1 • ANSI 150	
	3 • ANSI 300	
	6 • ANSI 600	
	9 • ANSI 900	
	5 • ANSI 1500 (FNPT Rated at 4000 psig at 200°F/93°C)	
	<b>Materials of Construction</b>	
	— • Carbon Steel, Standard Service	
	N • Carbon Steel, NACE MR0175	
	L • Low-Temp	
	<b>Body Style</b>	
	G • Globe	
	T • Tee (1") or Angle (2")	
	<b>Actuator Selection</b>	
	33 • No. 35 Act. w/3-15 Spring	73 • No. 70 Act. w/3-15 Spring
	36 • No. 35 Act. w/6-30 Spring	76 • No. 70 Act. w/6-30 Spring
	<b>Actuator Type</b>	
	R • Reverse Acting (Spring Closes / Air Opens)	
	D • Direct Acting (Spring Opens / Air Closes)	
	<b>Seal Material</b>	
	A • Aflas®	L • Low Temp Buna-N
	B • Buna-N	R • HNBR
	E • EPDM	V • Viton®
		Y • Viton® GLT (Low Temp)
	<b>Trim Material</b>	
	1 • 17-4PH SST	
	2 • Tungsten Carbide	
	<b>Trim Size</b>	
	2 • 1/4"	4 • 1/2"      8 • 1"
	3 • 3/8"	6 • 3/4"
	<b>Trim Characteristic</b>	
	M • Modified Percent (Throttling)	Q • Quick Opening (On/Off)

**5450-2 S 5 - G 73 R B-1 4 Q**  
Example

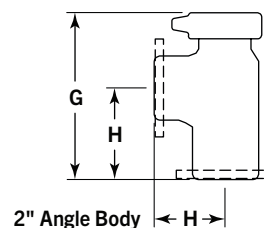
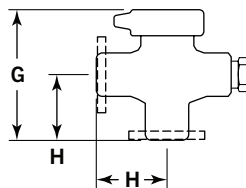
## Model 5400/5450 Open Yoke & Close-Coupled Control (Dump) Valves



1" & 2" Globe Body



1" Tee Body



Valve & Actuator Dimensional Data (in., mm)

End Connection	Dimension (in.)									
	1" Globe Body			2" Globe Body			1" Tee Body		2" Angle Body	
	A	B	C	A	B	C	G	H	G	H
NPT	6.25	1.56	3.69	7.50	1.69	3.69	6.82	3.13	7.44	3.75
150RF	7.25	1.56	3.69	10.00	1.69	3.69	7.32	3.63	8.69	5.00
300RF	7.75	1.56	3.69	10.50	1.69	3.69	7.57	3.88	8.94	5.25
600RF	8.25	1.56	3.69	11.25	1.69	3.69	7.82	4.13	9.31	5.63
600RTJ	8.25	1.56	3.69	11.38	1.69	3.69	7.82	4.13	9.38	5.69
900/1500RF	9.38	1.56	3.69	12.88	1.69	3.69	8.38	4.69	10.13	6.44
900/1500 RTJ	9.38	1.56	3.69	13.00	1.69	3.69	8.38	4.69	10.19	6.50
Dimension (mm)										
NPT	158.8	39.6	93.7	190.5	42.9	93.7	173.2	79.5	189.0	95.3
150RF	184.2	39.6	93.7	254.0	42.9	93.7	185.9	92.2	220.7	127.0
300RF	196.9	39.6	93.7	266.7	42.9	93.7	192.3	98.6	227.1	133.4
600RF	209.6	39.6	93.7	285.8	42.9	93.7	198.6	104.9	236.5	143.0
600RTJ	209.6	39.6	93.7	289.1	42.9	93.7	198.6	104.9	238.3	144.5
900/1500RF	238.3	39.6	93.7	327.2	42.9	93.7	212.9	119.1	257.3	163.6
900/1500 RTJ	238.3	39.6	93.7	330.2	42.9	93.7	212.9	119.1	258.8	165.1

### Diaphragm Effective Area & Housing Max. Pressure

Actuator Size	Diaphragm Effective Area	Housing Max. Pressure
No. 35	35 in. <sup>2</sup>	50 psig
No. 70	70 in. <sup>2</sup>	35 psig

Actuator Size	Dimension (in.)											
	5400 Direct			5400 Reverse			5450 Direct			5450 Reverse		
	D	E	J <sup>1</sup>	D	E	F	D	E	J <sup>1</sup>	D	E	F
No. 35	17.06	9.50	5.50	14.31	9.50	16.31	11.44	9.50	5.50	8.69	9.50	10.69
No. 70	18.56	12.50	7.00	15.44	12.50	17.44	12.94	12.50	7.00	9.81	12.50	11.81
Dimension (mm)												
No. 35	433.3	241.3	139.7	363.5	241.3	414.3	290.6	241.3	139.7	220.7	241.3	271.5
No. 70	471.4	317.5	177.8	392.2	317.5	443.0	328.7	317.5	177.8	249.2	317.5	300.0

<sup>1</sup>Clearance required for spring removal.

### Approximate Weights (lbs., kg)

End Connection	Model 5400 / Weights (lbs., kg)															
	No. 35 Actuator								No. 70 Actuator							
	1" Globe lbs.	1" Globe kg	1" Tee lbs.	1" Tee kg	2" Globe lbs.	2" Globe kg	2" Angle lbs.	2" Angle kg	1" Globe lbs.	1" Globe kg	1" Tee lbs.	1" Tee kg	2" Globe lbs.	2" Globe kg	2" Angle lbs.	2" Angle kg
NPT	29	13.2	32	14.5	36	16.3	36	16.3	44	20.0	47	21.3	51	23.1	51	23.1
ANSI 150	34	15.4	38	17.2	46	20.9	46	20.9	49	22.2	53	24.0	61	27.7	61	27.7
ANSI 300	37	16.8	41	18.6	50	22.7	50	22.7	52	23.6	56	25.4	65	29.5	65	29.5
ANSI 600	39	17.7	43	19.5	52	23.6	52	23.6	54	24.5	58	26.3	67	30.4	67	30.4
ANSI 900/1500	46	20.9	51	23.1	80	36.3	80	36.3	61	27.7	66	29.9	95	43.1	95	43.1
Model 5450 / Weights (lbs., kg)																
NPT	25	11.3	28	12.7	32	14.5	32	14.5	40	18.1	43	19.6	47	21.3	47	21.3
ANSI 150	30	13.6	34	15.4	42	19.1	42	19.1	45	20.4	49	22.2	57	25.9	57	25.9
ANSI 300	33	15.0	37	16.8	46	20.9	46	20.9	48	21.8	52	23.6	61	27.7	61	27.7
ANSI 600	35	15.9	39	17.7	48	21.8	48	21.8	50	22.7	54	24.5	63	28.6	63	28.6
ANSI 900/1500	42	19.1	47	21.3	76	34.5	76	34.5	57	25.9	62	28.1	91	41.3	91	41.3



## Model 5400/5450 Open Yoke & Close-Coupled Control (Dump) Valves

### Actuator Maximum Allowable Shutoff Pressure Drops, Reverse Acting (Fail Close)

Trim Size (in.)	Flow Direction	Signal to No. 35 Actuator				Signal to No. 70 Actuator			
		3 - 15 Spring		6 - 30 Spring		3 - 15 Spring		6 - 30 Spring	
		3 - 15 psig	0 - 20 psig	6 - 30 psig	0 - 35 psig	3 - 15 psig	0 - 20 psig	6 - 30 psig	0 - 35 psig
.25	Up	3800	4000	4000	4000	4000	4000	4000	4000
.38		2050	3280	3410	4000	3210	4000	4000	4000
.50		1100	1680	1830	2300	1650	3190	4000	4000
.75		320	560	690	950	530	940	2020	2800
1		110	220	320	490	230	420	960	1460
.25	Down	4000	4000	4000	4000	4000	4000	4000	4000
.38		4000	4000	4000	4000	4000	4000	4000	4000
.50		3350	4000	4000	4000	4000	4000	4000	4000
.75		1580	2300	2530	3270	2080	2800	3780	4000
1		770	1100	1240	1680	970	1460	2510	2950

### Actuator Maximum Allowable Shutoff Pressure Drops, Direct Acting (Fail Open)

Trim Size (in.)	Flow Direction	Signal to No. 35 Act <sup>1</sup>		Signal to No. 70 Act <sup>1</sup>		Flow Direction	Signal to No. 35 Act <sup>1</sup>		Signal to No. 70 Act <sup>1</sup>	
		3 - 15 Spring	6 - 30 Spring	3 - 15 Spring	6 - 30 Spring		3 - 15 Spring	6 - 30 Spring	3 - 15 Spring	6 - 30 Spring
.25	Up	4000	4000	4000	4000	Down	4000	4000	4000	4000
.38		2700	4000	4000	4000		4000	4000	4000	4000
.50		1370	2880	2540	4000		3800	4000	4000	4000
.75		410	1080	730	2020		1750	1940	4000	4000
1		140	520	230	960		860	940	1840	2790

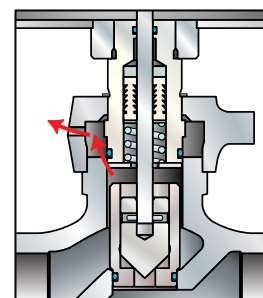
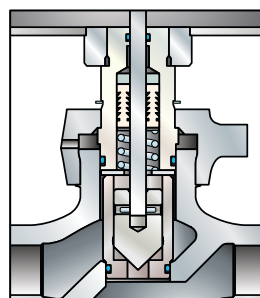
<sup>1</sup> Actual signal pressure to actuator includes an additional 5 psig (0.3 bar) of supply pressure to the controller.

### Flow Coefficients (C<sub>v</sub>), Modified Percent & Quick Opening

Body Size (in.)	Orifice Size (in.)	Body Style / Valve Opening (% Travel)												
		Modified Percent											Quick Opening	
		Globe											Angle	Globe
		10	20	30	40	50	60	70	80	90	100	100	100	100
1	0.25	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.40	1.64	1.68	1.92
	0.38	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70	4.23	3.82	4.34
	0.50	.502	1.05	1.59	2.09	2.61	3.14	3.72	4.27	4.96	5.62	6.61	5.70	6.72
	0.75	.882	1.76	2.76	3.82	4.93	6.17	7.49	8.85	10.0	11.0	15.1	11.6	15.2
	1.00	1.01	2.02	3.44	5.07	6.78	8.42	10.3	12.4	14.3	15.4	20.8	15.5	20.9
2	0.25	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.40	1.66	1.68	1.98
	0.38	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70	4.35	3.82	4.47
	0.50	.592	1.17	1.76	2.34	2.95	3.70	4.57	5.50	5.95	6.08	6.90	6.19	7.00
	0.75	.882	1.81	2.98	4.11	5.74	7.03	8.49	10.1	11.5	12.9	15.2	13.0	15.8
	1.00	1.08	2.12	3.58	5.43	7.46	9.27	11.4	13.7	15.8	17.1	21.1	18.0	22.0

### Bonnet Safety Pressure Relief

The valve on the left shows the hammer nut in the “locked” position during normal operation. The valve on the right illustrates “Bonnet Safety Pressure Relief”. The O-Ring clears the packing plug while the hammer nut is still engaged (threaded) onto the valve body. At this point, if the valve assembly is under pressure, process fluid will escape through the weep hole to indicate a warning to the service person that the valve is still under pressure, thereby prompting release of line pressure before proceeding, thus preventing the actuator assembly from blowing out.





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