

Model 5400/5450 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.

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.



Shown in "straight-through" flow configuration

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)

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)

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

NOTE: Taylor Valve reserves the right to change product designs and specifications without notice.

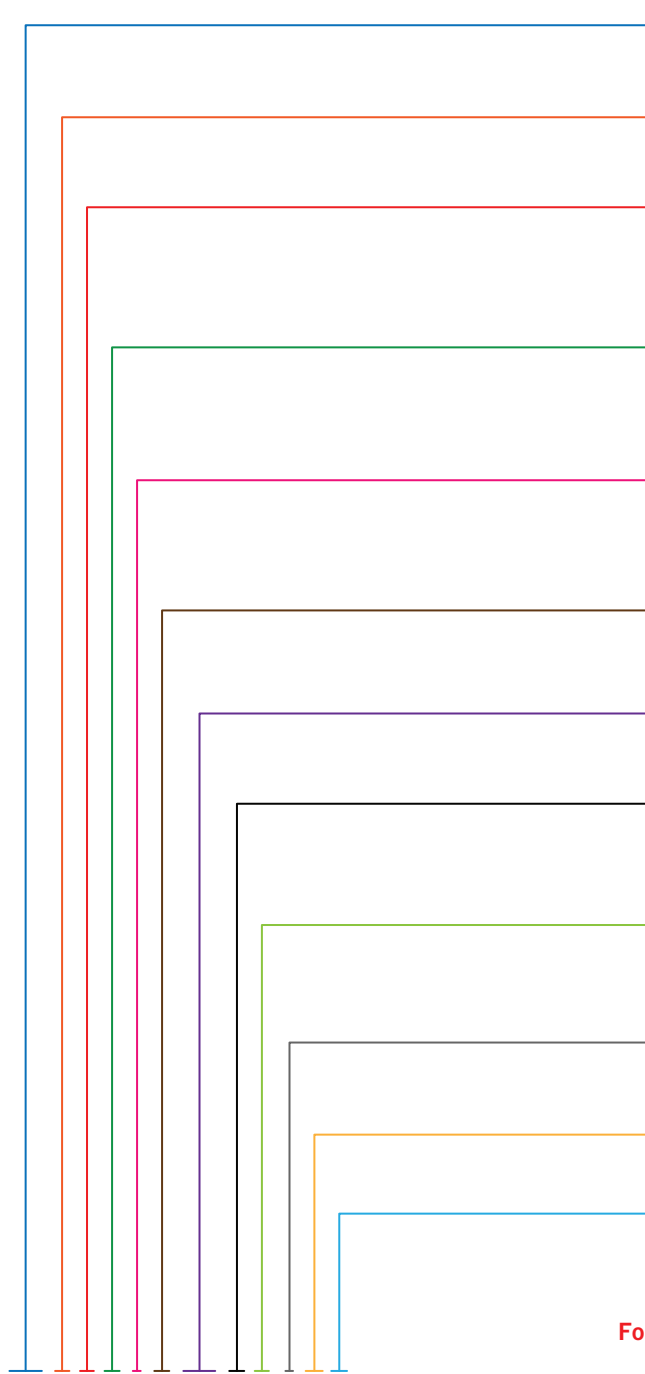
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Model 5400/5450 Open Yoke & Close-Coupled Control (Dump) Valves

Part Number Codes



Style

- 00 • Open Yoke
- 50 • Close-Coupled

Body Size

- 1 • 1"
- 2 • 2"

End Connections

- S • Female NPT
- F • RF Flange
- J • RTJ Flange

ANSI Class (Pressure Rating)

- 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)

Materials of Construction

- • Carbon Steel, Standard Service
- N • Carbon Steel, NACE MR0175
- L • Low-Temp

Body Style

- G • Globe
- T • Tee (1") or Angle (2")

Actuator Selection

- 33 • No. 35 Act. w/3-15 Spring
- 36 • No. 35 Act. w/6-30 Spring
- 73 • No. 70 Act. w/3-15 Spring
- 76 • No. 70 Act. w/6-30 Spring

Actuator Type

- R • Reverse Acting (Spring Closes / Air Opens)
- D • Direct Acting (Spring Opens / Air Closes)

Seal Material

- A • Aflas®
- B • Buna-N
- E • EPDM
- L • Low Temp Buna-N
- R • HNBR
- V • Viton®
- Y • Viton® GLT (Low Temp)

Trim Material

- 1 • 17-4PH SST
- 2 • Tungsten Carbide

Trim Size

- 2 • 1/4"
- 3 • 3/8"
- 4 • 1/2"
- 6 • 3/4"
- 8 • 1"

Trim Characteristic

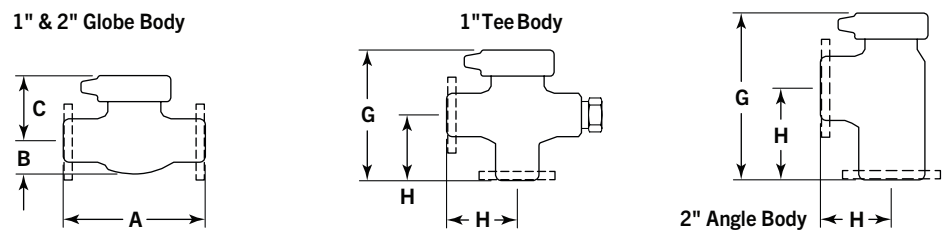
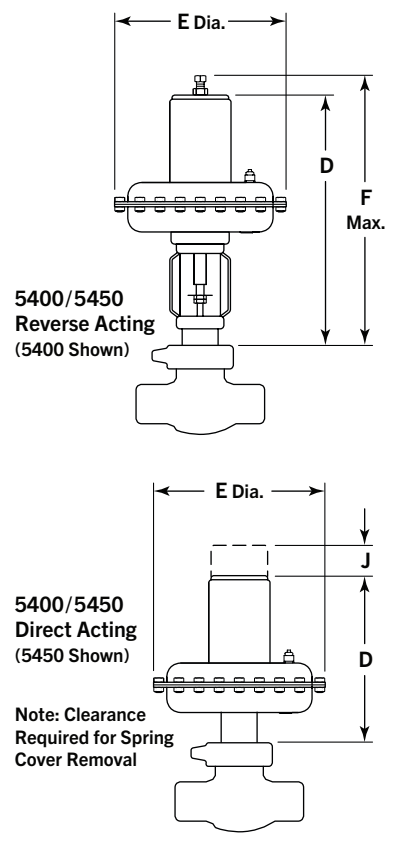
- M • Modified Percent (Throttling)
- Q • Quick Opening (On/Off)

For options not listed, please consult factory.

5450-2 S 5 - G 73 RB-1 4 Q
 Example

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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
900/1500RTJ	9.38	1.56	3.69	13.00	1.69	3.69	8.38	4.69	10.19	6.50

End Connection	Dimension (mm)									
	A	B	C	A	B	C	G	H	G	H
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
900/1500RTJ	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. ²	50 psig
No. 70	70 in. ²	35 psig

Actuator Size	Dimension (in.)											
	5400 Direct			5400 Reverse			5450 Direct			5450 Reverse		
	D	E	J	D	E	F	D	E	J	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

Actuator Size	Dimension (mm)											
	D	E	J	D	E	F	D	E	J	D	E	F
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

¹Clearance required for spring removal.

Approximate Weights (lbs., kg)

End Connection	Model 5400 / Weights (lbs., kg)															
	No. 35 Actuator								No. 70 Actuator							
	1" Globe		1" Tee		2" Globe		2" Angle		1" Globe		1" Tee		2" Globe		2" Angle	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	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

End Connection	Model 5450 / Weights (lbs., kg)															
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	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

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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 ¹		Signal to No. 70 Act ¹		Flow Direction	Signal to No. 35 Act ¹		Signal to No. 70 Act ¹	
		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
.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

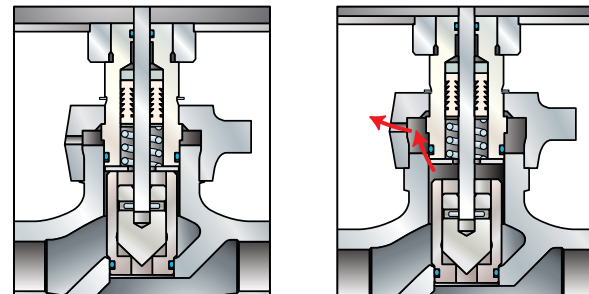
¹ Actual signal pressure to actuator includes an additional 5 psig (0.3 bar) of supply pressure to the controller.

Flow Coefficients (C_v), Modified Percent & Quick Opening

Body Size (in.)	Orifice Size (in.)	Body Style / Valve Opening (% Travel)												
		Modified Percent										Quick Opening		
		10	20	30	40	50	60	70	80	90	100	Angle 100	Globe 100	Angle 100
1	.25	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.40	1.64	1.68	1.92
	.38	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70	4.23	3.82	4.34
	.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
	.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	.25	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.40	1.66	1.68	1.98
	.38	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70	4.35	3.82	4.47
	.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
	.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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