

Product Bulletin

52.1:84000
D103343X012
March 2011

84000 Valve

Baumann[™] 84000 Sanitary Control Valves



The Baumann 84000 sanitary control valves (figures 1, 2, and 3) are designed to satisfy the stringent demands of the pharmaceutical and biotechnology industries. These valves are in compliance with 3A Sanitary Standards Inc. requirements. Incorporating reliable class III diaphragm technology, the 84000 valves can handle temperatures up to 160°C (320°F). The uniquely shaped diaphragm, unlike plug style sanitary valves, results in low shear forces in the flow stream, minimizing possible damage to delicate bio-media or altering the consistency of end product.

Features

- Electropolished internal surfaces
- USP 24 Class VI PTFE, EPDM backed diaphragm
- Designed for Clean-in-Place (CIP) and Sanitize-in-Place (SIP) service
- Self-draining in preferred mounting mode
- Compact size, see figures 12 to 13 and tables 14 to 15
- FDA approved epoxy powder-coated actuator with stainless steel fasteners for maximum corrosion resistance
- Stainless steel spring case and yoke available
- Multi-spring field-reversible actuators with reduced deadband permits direct operation from remote signal devices
- Fisher® FIELDVUE™ digital valve controller available for remote calibration and diagnostics in facilities utilizing the PlantWeb™ architecture



W9838

Figure 1. 84000 Inline Sanitary Valve with Baumann 32 Actuator



W9839

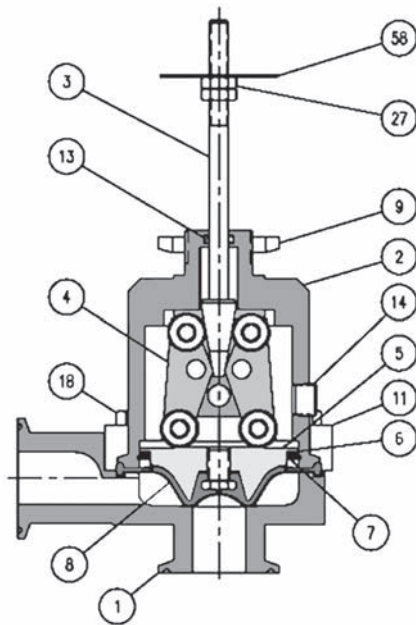
Figure 2. 84000 Angle Sanitary Valve with Baumann 32 Actuator and FIELDVUE DVC2000 Digital Valve Controller



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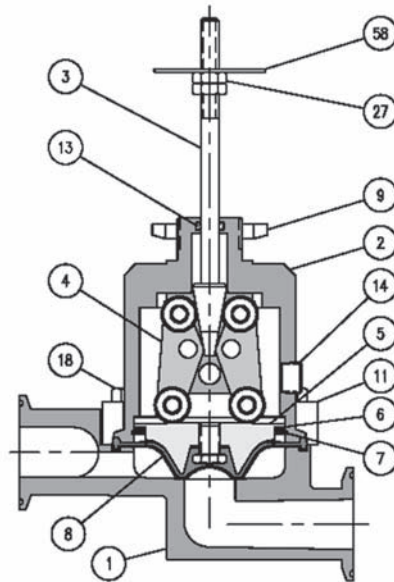
Figure 3. 84000 Angle Sanitary Valve with Baumann 54 Actuator and FIELDVUE DVC6000 Digital Valve Controller





E1314

Figure 4. Baumann 84000 NPS 1 Angle Valve Body Sub-Assembly

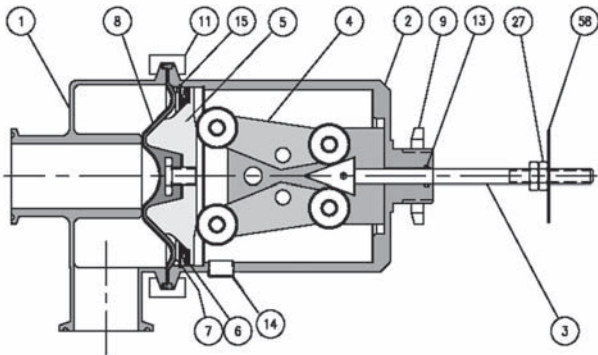


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Figure 5. Baumann 84000 NPS 1 Inline Valve Body Sub-Assembly

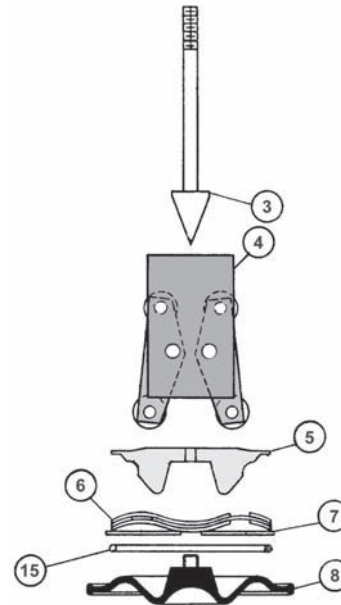
Table 1. Materials of Construction for NPS 1 Angle and Inline Valves

Key Number	Description	Material
1	Valve Body	ASTM A479 S31603 stainless steel, annealed
2	Bonnet	ASTM A479 S30400 Annealed
3	Piston Stem Sub-assembly	Stainless Steel
4	Drive Mechanism Sub-assembly	Multiple (predominantly stainless steel)
5	Compressor	S30300 or S30400 stainless steel
6	Wave Spring	S17700 stainless steel
7	Retaining Ring	S30200 stainless steel
8	Diaphragm, Closure Member	PTFE face with Aramid fabric reinforced EPDM backing and S30400 stainless steel insert. Diaphragm assembly conforms to FDA 21CFR 177.1550 and USP24 Class VI standards.
9	Drive Nut, Actuator Yoke	S30400 stainless steel
11	Bonnet Flange	ASTM A240 S30400 stainless steel
13	O-Ring, Stem	FKM fluorocarbon
14	Tell Tale Port	S31600 stainless steel
18	Hex Head Cap Screw	Grade B8, Class 1
27	Locknuts	S30400 stainless steel
58	Travel Indicator	S30400 stainless steel



E1316

Figure 6. Baumann 84000 NPS 1-1/2 and 2 Angle Valve Body Sub-Assembly



E1317

Figure 7. Baumann 84000 Linkage Mechanism

Table 2. Materials of Construction for NPS 1-1/2 and 2 Angle Valves

Key Number	Description	Material
1	Valve Body	ASTM A479 S31603 stainless steel, annealed
2	Bonnet	ASTM A479 S30400 Annealed
3	Piston Stem Sub-assembly	Stainless Steel
4	Drive Mechanism Sub-assembly	Multiple (predominantly stainless steel)
5	Compressor	S30300 or S30400 stainless steel
6	Wave Spring	S17700 stainless steel
7	Retaining Ring	S30200 stainless steel
8	Diaphragm, Closure Member	PTFE face with Aramid fabric reinforced EPDM backing and S30400 stainless steel insert. Diaphragm assembly conforms to FDA 21CFR 177.1550 and USP24 Class VI standards.
9	Drive Nut, Actuator Yoke	S30400 stainless steel
11	Clamp	S30400 stainless steel
13	O-Ring, Stem	FKM fluorocarbon
14	Tell Tale Port	S31600 stainless steel
15	O-Ring	EPDM, conforming to FDA 21CFR 177.1550
27	Locknuts	S30400 stainless steel
58	Travel Indicator	S30400 stainless steel

Table 3. Cv Values at Percent Plug Opening

VALVE SIZE NPS	FLOW DIRECTION (1)	ACTUATOR TRAVEL Inches	Cv VERSUS PERCENT OF ACTUATOR TRAVEL OPEN									
			10	20	30	40	50	60	70	80	90	100
1 Angle & Inline	A to B or B to A	0.50	0.02	0.09	0.20	0.40	0.64	0.90	1.16	1.44	1.72	2.00
		0.50	0.03	0.16	0.36	0.90	1.20	1.75	2.30	2.90	3.50	4.00
		0.75	0.04	0.24	0.62	1.20	2.00	3.10	4.20	5.50	6.80	8.00
1-1/2 Angle	A to B	0.50	1.45	3.07	4.86	6.95	9.34	12.0	14.3	16.7	19.1	21.7
		0.75	2.18	4.86	8.00	12.0	15.5	19.1	22.9	25.9	28.2	29.6
	B to A	0.50	1.82	3.61	5.39	7.42	9.66	12.1	13.4	14.6	15.7	17.1
		0.75	2.73	5.39	8.43	12.1	14.1	15.7	17.8	20.2	22.5	24.2
2 Angle	A to B	0.50	2.60	3.0	3.90	6.94	10.4	14.2	18.4	22.4	26.1	29.4
		0.75	2.70	3.90	8.46	14.2	20.5	26.1	31.0	35.3	39.6	42.6
	B to A	0.50	0.50	0.80	1.35	2.49	5.81	11.3	14.6	17.9	21.5	23.5
		0.75	0.50	1.35	3.06	11.3	16.2	21.5	24.5	26.0	29.2	32.5

1. Flow A to B is recommended for low discharge pressure. Low discharge pressure being defined as near or below atmospheric pressure.

Table 4. Kv Values at Percent Plug Opening

VALVE SIZE DN	FLOW DIRECTION (1)	ACTUATOR TRAVEL mm	Kv VERSUS PERCENT OF ACTUATOR TRAVEL OPEN									
			10	20	30	40	50	60	70	80	90	100
25 Angle & Inline	A to B or B to A	12.7	0.017	0.077	0.17	0.34	0.55	0.77	0.998	1.24	1.48	1.72
		12.7	0.026	0.138	0.31	0.77	1.03	1.51	1.98	2.49	3.01	3.44
		19.05	0.034	0.206	0.53	1.03	1.72	2.67	3.61	4.73	5.85	6.88
40 Angle	A to B	12.7	1.25	2.64	4.18	5.98	8.03	10.32	12.29	14.36	16.43	18.66
		19.05	1.88	4.18	6.88	10.32	13.33	16.43	19.69	22.27	24.25	25.46
	B to A	12.7	1.57	3.10	4.64	6.38	8.31	10.41	11.52	12.56	13.50	14.71
		19.05	2.35	4.64	7.25	10.41	12.13	13.50	15.31	17.37	19.35	20.81
50 Angle	A to B	12.7	2.24	3.0	3.35	5.97	8.94	12.21	15.82	19.26	22.45	25.28
		19.05	2.33	3.35	7.28	12.21	17.63	22.45	26.66	30.36	34.06	36.64
	B to A	12.7	0.43	0.69	1.16	2.14	4.98	9.72	12.56	15.39	18.49	20.21
		19.05	0.43	1.16	2.63	9.72	13.93	18.49	21.07	22.36	25.11	27.95

1. Flow A to B is recommended for low discharge pressure. Low discharge pressure being defined as near or below atmospheric pressure.

Product Bulletin

52.1:84000
March 2011

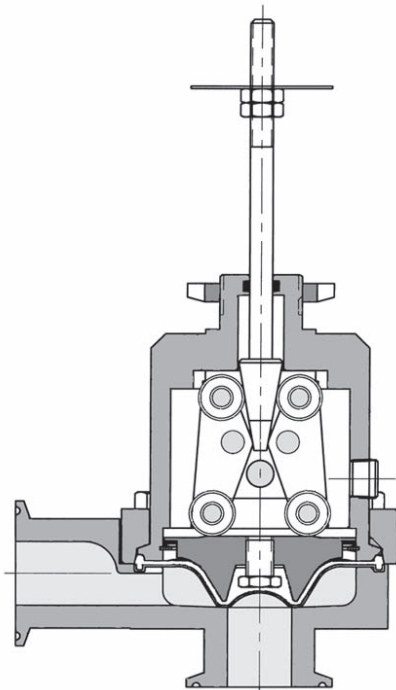
84000 Valve

Table 5. Technical Specifications

VALVE SIZE			NPS 1 Angle & Inline			NPS 1-1/2 Angle		NPS 2 Angle	
RATED	Installed with flow from Port A to B	Cv	2	4	8	22	30	29	43
		Kv	1.72	3.44	6.88	18.92	25.8	24.94	36.98
	Installed with flow from Port B to A	Cv	2	4	8	17	24	24	32
		Kv	1.72	3.44	6.88	14.62	20.64	20.64	27.52
TRAVEL	inches	0.50	0.50	0.75	0.50	0.75	0.50	0.75	
	mm	12.7	12.7	19.05	12.7	19.05	12.7	19.05	
BONNET			Bolted			Clamped			
ACTUATOR TYPE			32 or 54			54			
RANGEABILITY			100:1						
CHARACTERISTIC			Modified Equal Percentage						
SEAT LEAKAGE			ASME/FCI 70-2, Class VI						
MAXIMUM OPERATING PRESSURE			10.34 bar (150 Psi)						
MAXIMUM OPERATING TEMPERATURE			320°F (160°C)						
INTERNAL BODY FINISH (WETTED INTERIOR)			< 30 Ra Microinch / 0.76 Ra Micron (standard) < 20 Ra Microinch / 0.51 Ra Micron (optional - or as required)						
END CONNECTIONS			Sanitary (optional welded ends)						

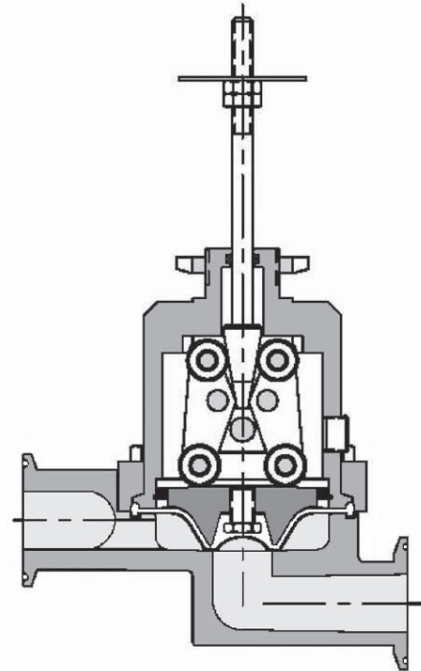
Table 6. Actuator Specifications

TYPE	32 Multi-Spring Diaphragm (Single-Acting)	54 Multi-Spring Diaphragm (Single-Acting)
NOMINAL SIZE	32 in ²	54 in ²
AIR FAILURE	Open or Closed	
TRAVEL	12.7 to 19.05 mm (0.50 or 0.75 inches)	
AMBIENT TEMPERATURE RANGE	-29 to 82°C (-20 to 180°F)	
MAXIMUM AIR PRESSURE	2.4 bar (35 psig)	
DIAPHRAGM MATERIAL	Nitrile / Polyester	
SPRING CASES	■ Steel, Powder Epoxy-Coated Appliance White per FDA 21 CFR 175.300 or ■ Stainless Steel	
FASTENERS	Stainless Steel	
YOKE	■ Ductile Iron, Powder Epoxy-Coated Appliance White per FDA 21 CFR 175.300 or ■ Cast Stainless Steel	



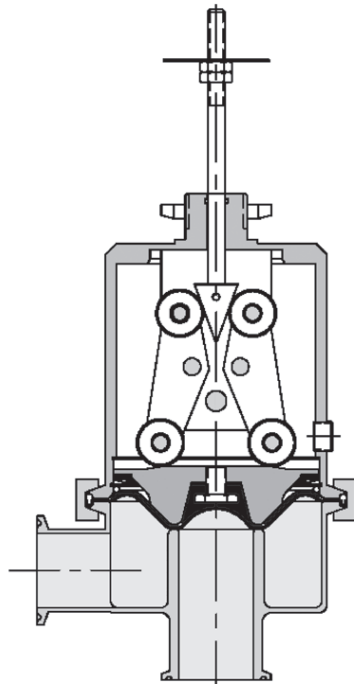
NPS 1 ANGLE VALVE BODY POSITIONED FOR FORWARD FLOW SELF DRAINING FROM PORT A TO B

E1318



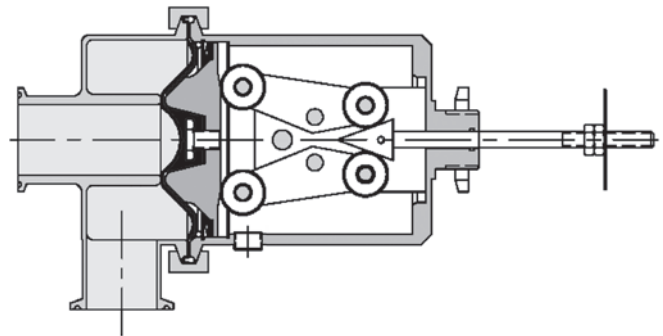
NPS 1 INLINE VALVE BODY POSITIONED FOR FORWARD FLOW SELF DRAINING FROM PORT A TO B

E1319



E1320

NPS 1-1/2 AND 2 ANGLE VALVE BODY (RECOMMENDED FOR PROCESSES WHERE ATMOSPHERIC OR SLIGHT VACUUM IS PRESENT DOWNSTREAM OF PORT B [PORTS A AND B MUST BE DRAINED SEPARATELY])



E1321

NPS 1-1/2 AND 2 ANGLE VALVE BODY POSITIONED FOR SELF DRAINING FROM PORT B TO A

Figure 8. Preferred Flow Directions for Self-Draining

Product Bulletin

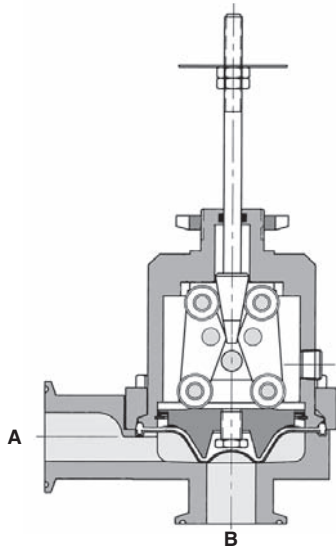
52.1:84000
March 2011

84000 Valve

Table 7. Model Numbering System

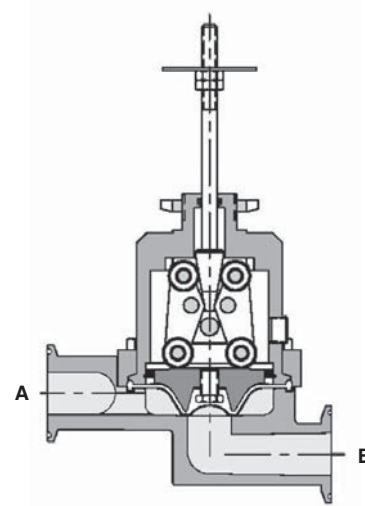
VALVE SIZE		MODEL NUMBER ^(1, 2)	TRAVEL		TYPE (Flow Direction)	RATED	
NPS	DN		Inches	mm		Cv	Kv
1 Angle	25 Angle	32-84021SAB	0.50	12.7	ANGLE (Port A to B)	2	1.72
		32-84041SAB	0.50	12.7	ANGLE (Port A to B)	4	3.44
		54-84041SAB	0.50	12.7	ANGLE (Port A to B)	4	3.44
		32-84081SAB	0.75	19.05	ANGLE (Port A to B)	8	6.88
		54-84081SAB	0.75	19.05	ANGLE (Port A to B)	8	6.88
1 Inline	25 Inline	32-84021SIB	0.50	12.7	ANGLE (Port A to B)	2	1.72
		32-84041SIB	0.50	12.7	ANGLE (Port A to B)	4	3.44
		54-84041SIB	0.50	12.7	ANGLE (Port A to B)	4	3.44
		32-84081SIB	0.75	19.05	ANGLE (Port A to B)	8	6.88
		54-84081SIB	0.75	19.05	ANGLE (Port A to B)	8	6.88
1-1/2 Angle	40 Angle	54-84161SAB	0.50	12.7	ANGLE (Port A to B)	22	18.92
		54-84351SAB	0.75	19.05	ANGLE (Port A to B)	30	25.8
		54-84161SA	0.50	12.7	ANGLE (Port B to A)	17	14.62
		54-84351SA	0.75	19.05	ANGLE (Port B to A)	24	20.64
2 Angle	50 Angle	54-84251SAB	0.50	12.7	ANGLE (Port A to B)	29	24.94
		54-84431SAB	0.75	19.05	ANGLE (Port A to B)	43	36.98
		54-84251SA	0.50	12.7	ANGLE (Port B to A)	24	20.64
		54-84431SA	0.75	19.05	ANGLE (Port B to A)	32	27.52

1. Model descriptor SA designates an angle valve body. Model descriptor SI designates an inline valve body.
 2. Tri-Clamp end connections are standard. For optional welded end connections, substitute (2) for (1) in the model number, i.e. 54-84161SA (Tri-Clamp Ends).
 54-84162SA (Welded Ends).



NPS 1 ANGLE VALVE BODY POSITIONED FOR FORWARD FLOW SELF DRAINING FROM PORT A TO B

E1318



NPS 1 INLINE VALVE BODY POSITIONED FOR FORWARD FLOW SELF DRAINING FROM PORT A TO B

E1319

Figure 9. NPS 1 Angle and Inline Valve Body Orientations

Table 8. Allowable Pressure Drops (bar): NPS 1 Angle and NPS 1 Inline Valves

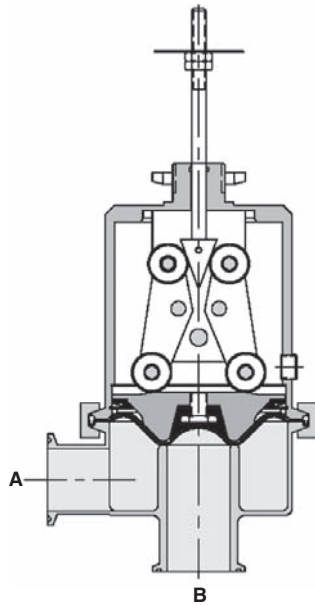
VALVE SIZE	FLOW DIRECTION	RATED Kv	TRAVEL	ACTUATOR TYPE	AIR-TO-OPEN ACTION				AIR-TO-CLOSE ACTION			
					Bench Spring Range	Signal to Actuator		With Positioner (2)	Bench Spring Range	Signal to Actuator		With Positioner (2)
						bar	0.2-1.0 bar			0.07-1.2 bar ⁽¹⁾	bar	
DN			mm		bar	0.2-1.0 bar	0.07-1.2 bar ⁽¹⁾	bar	bar	0.2-1.0 bar	0.07-1.2 bar ⁽¹⁾	bar
25	A to B	1.72	12.7	32	0.3-1.0	7.58	8.62	8.62	0.2-0.9	6.9	8.62	8.62
		3.44	12.7	32	0.3-1.0	6.9	10.34	10.34	0.2-0.9	6.9	8.62	8.62
			12.7	54	0.3-1.0	10.34	10.34	10.34	0.2-0.9	10.34	10.34	10.34
		6.88	19.05	32	0.3-1.0	3.45	8.62	8.62	0.2-0.9	3.45	8.62	8.62
19.05	54		0.5-0.9	6.9	10.34	10.34	0.2-0.7	6.9	10.34	10.34		

1. I/P transducer with 0.07 - 1.2 bar (1 - 17 psig) output signal per FCI 87.2.
2. Shutoff with positioner based on 1.4 bar (20 psi) air supply pressure.

Table 9. Allowable Pressure Drops (psi): NPS 1 Angle and NPS 1 Inline Valves

VALVE SIZE	FLOW DIRECTION	RATED Cv	TRAVEL	ACTUATOR TYPE	AIR-TO-OPEN ACTION				AIR-TO-CLOSE ACTION			
					Bench Spring Range	Signal to Actuator		With Positioner (2)	Bench Spring Range	Signal to Actuator		With Positioner (2)
						psig	3-15 psig			1-2 psig ⁽¹⁾	psig	
NPS			Inches		psig	3-15 psig	1-2 psig ⁽¹⁾	psig	psig	3-15 psig	1-2 psig ⁽¹⁾	psig
1	A to B	2.00	0.50	32	5-15	110	125	125	3-13	100	125	125
		4.00	0.50	32	5-15	100	150	150	3-13	100	125	125
			0.50	54	5-15	150	150	150	3-13	150	150	150
		8.00	0.75	32	5-15	50	125	125	3-13	50	125	125
0.75	54		7-13	100	150	150	3-10	100	150	150		

1. I/P transducer with 0.07 - 1.2 bar (1 - 17 psig) output signal per FCI 87.2.
2. Shutoff with positioner based on 1.4 bar (20 psi) air supply pressure.



RECOMMENDED FOR PROCESSES WHERE
ATMOSPHERIC OR SLIGHT VACUUM IS PRESENT
DOWNSTREAM OF PORT B. (PORTS A AND B MUST BE
DRAINED SEPARATELY)

E1320

Figure 10. NPS 1-1/2 and 2 Angle Valve Body

Table 10. Allowable Pressure Drops (bar): Flow Direction A to B: NPS 1-1/2 and 2 Angle Valves

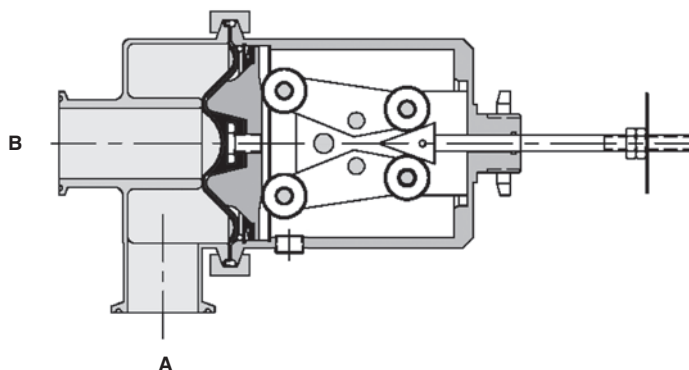
VALVE SIZE	FLOW DIRECTION	RATED Kv	TRAVEL	ACTUATOR TYPE	AIR-TO-OPEN ACTION				AIR-TO-CLOSE ACTION			
					Bench Spring Range	Signal to Actuator		With Positioner (2)	Bench Spring Range	Signal to Actuator		With Positioner (2)
						bar	0.2-1.0 bar			0.07-1.2 bar(1)	bar	
DN			mm		bar	0.2-1.0 bar	0.07-1.2 bar(1)	bar	bar	0.2-1.0 bar	0.07-1.2 bar(1)	bar
40	A to B	18.92	12.7	54	0.3-1.0	1.99	3.99	3.99	0.2-0.9	1.99	3.99	6.96
		18.92	12.7	54	0.6-1.0	4.96	6.96	6.96	0.2-0.7	4.96	6.96	9.99
		25.8	19.05	54	0.3-1.0	1.99	3.99	3.99	0.2-0.9	1.99	3.99	6.96
		25.8	19.05	54	0.5-0.9	3.99	5.99	5.99	0.2-0.7	4.92	6.96	9.99
50	A to B	24.94	12.7	54	0.3-1.0	2.34	4.68	4.68	0.2-0.9	2.34	4.68	8.20
		24.94	12.7	54	0.6-1.0	5.86	8.20	8.20	0.2-0.7	5.79	8.20	11.72
		36.98	19.05	54	0.3-1.0	2.34	4.68	4.68	0.2-0.9	2.34	4.68	8.20
		36.98	19.05	54	0.5-0.9	4.68	7.03	7.03	0.2-0.7	5.86	8.20	11.72

1. I/P transducer with 0.07 - 1.2 bar (1 - 17 psig) output signal per FCI 87.2.
2. Shutoff with positioner based on 1.4 bar (20 psi) air supply pressure.

Table 11. Allowable Pressure Drops (psi): Flow Direction A to B: NPS 1-1/2 and 2 Angle Valves

VALVE SIZE	FLOW DIRECTION	RATED Cv	TRAVEL	ACTUATOR TYPE	AIR-TO-OPEN ACTION				AIR-TO-CLOSE ACTION			
					Bench Spring Range	Signal to Actuator		With Positioner (2)	Bench Spring Range	Signal to Actuator		With Positioner (2)
						psig	3-15 psig			1-2 psig(1)	psig	
NPS			Inches		psig	3-15 psig	1-2 psig(1)	psig	psig	3-15 psig	1-2 psig(1)	psig
1-1/2	A to B	22	0.50	54	5-15	29	58	58	3-13	29	58	101
		22	0.50	54	8-15	72	101	101	3-10	72	101	145
		30	0.75	54	5-15	29	58	58	3-13	29	58	101
		30	0.75	54	7-13	58	87	87	3-10	72	101	145
2	A to B	29	0.50	54	5-15	34	68	68	3-13	34	68	119
		29	0.50	54	8-15	85	119	119	3-10	84	119	170
		43	0.75	54	5-15	34	68	68	3-13	34	68	119
		43	0.75	54	7-13	68	102	102	3-10	85	119	170

1. I/P transducer with 0.07 - 1.2 bar (1 - 17 psig) output signal per FCI 87.2.
2. Shutoff with positioner based on 1.4 bar (20 psi) air supply pressure.



E1321

Figure 11. NPS 1-1/2 and 2 Angle Valve Body Positioned for Self Draining from Port B to A

Table 12. Allowable Pressure Drops (bar): Flow Direction B to A: NPS 1-1/2 and 2 Angle Valves

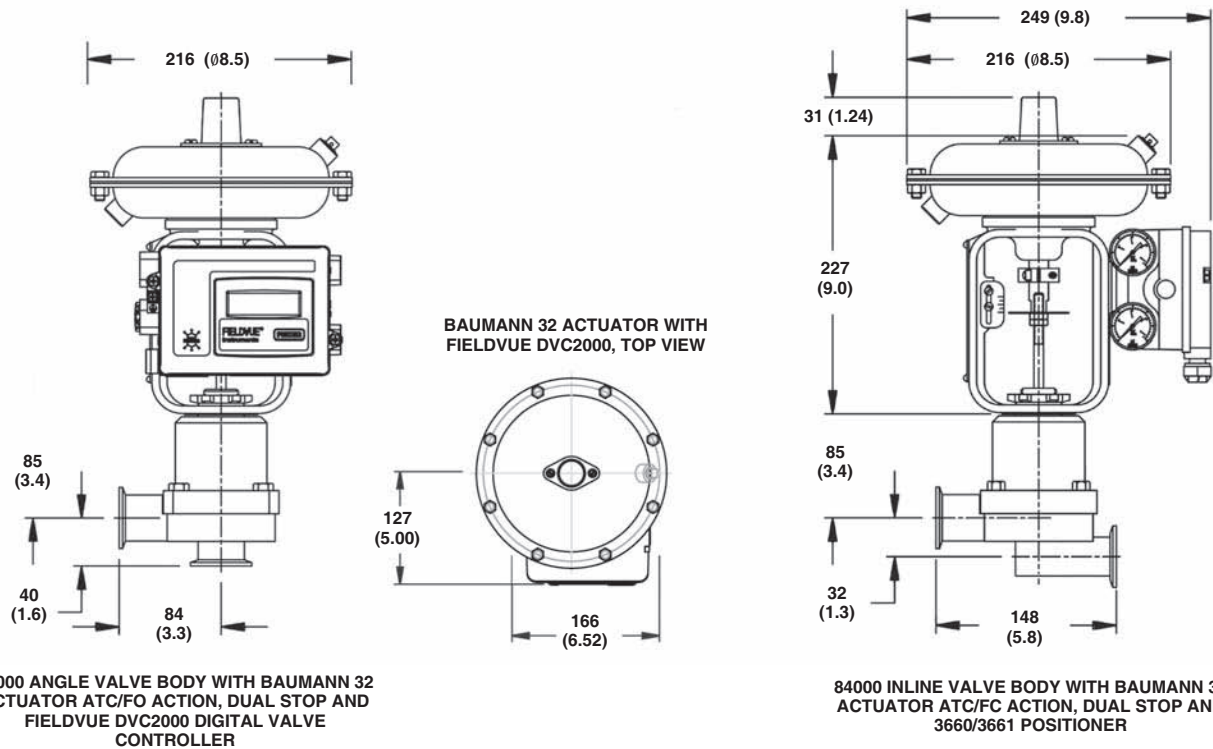
VALVE SIZE	FLOW DIRECTION	RATED Kv	TRAVEL	ACTUATOR TYPE	AIR-TO-OPEN ACTION				AIR-TO-CLOSE ACTION			
					Bench Spring Range	Signal to Actuator		With Positioner (2)	Bench Spring Range	Signal to Actuator		With Positioner (2)
						bar	0.2-1.0 bar			0.07-1.2 bar ⁽¹⁾	bar	
DN			mm									
40	B to A	14.62	12.7	54	0.3-1.0	5.10	10.20	10.20	0.2-0.9	5.10	10.20	17.86
		14.62	12.7	54	0.6-1.0	12.76	17.86	17.86	0.2-0.7	12.76	17.86	25.58
		20.64	19.05	54	0.3-1.0	5.10	10.20	10.20	0.2-0.9	5.10	10.20	17.86
		20.64	19.05	54	0.5-0.9	10.20	15.31	15.31	0.2-0.7	12.76	17.86	25.58
50	B to A	20.64	12.7	54	0.3-1.0	2.90	5.79	5.79	0.2-0.9	2.90	5.79	10.14
		20.64	12.7	54	0.6-1.0	7.24	10.14	10.14	0.2-0.7	7.24	10.14	14.48
		27.52	19.05	54	0.3-1.0	2.90	5.79	5.79	0.2-0.9	2.90	5.79	10.14
		27.52	19.05	54	0.5-0.9	5.79	8.69	8.69	0.2-0.7	7.24	10.14	14.48

1. I/P transducer with 0.07 - 1.2 bar (1 - 17 psig) output signal per FCI 87.2.
2. Shutoff with positioner based on 1.4 bar (20 psi) air supply pressure.

Table 13. Allowable Pressure Drops (psi): Flow Direction B to A: NPS 1-1/2 and 2 Angle Valves

VALVE SIZE	FLOW DIRECTION	RATED Cv	TRAVEL	ACTUATOR TYPE	AIR-TO-OPEN ACTION				AIR-TO-CLOSE ACTION			
					Bench Spring Range	Signal to Actuator		With Positioner (2)	Bench Spring Range	Signal to Actuator		With Positioner (2)
						psig	3-15 psig			1-2 psig ⁽¹⁾	psig	
NPS			Inches									
1-1/2	B to A	17	0.50	54	5-15	74	148	148	3-13	74	148	259
		17	0.50	54	8-15	185	259	259	3-10	185	259	371
		24	0.75	54	5-15	74	148	148	3-13	74	148	259
		24	0.75	54	7-13	148	222	222	3-10	185	259	371
2	B to A	24	0.50	54	5-15	42	84	84	3-13	42	84	147
		24	0.50	54	8-15	105	147	147	3-10	105	147	210
		32	0.75	54	5-15	42	84	84	3-13	42	84	147
		32	0.75	54	7-13	84	126	126	3-10	105	147	210

1. I/P transducer with 0.07 - 1.2 bar (1 - 17 psig) output signal per FCI 87.2.
2. Shutoff with positioner based on 1.4 bar (20 psi) air supply pressure.



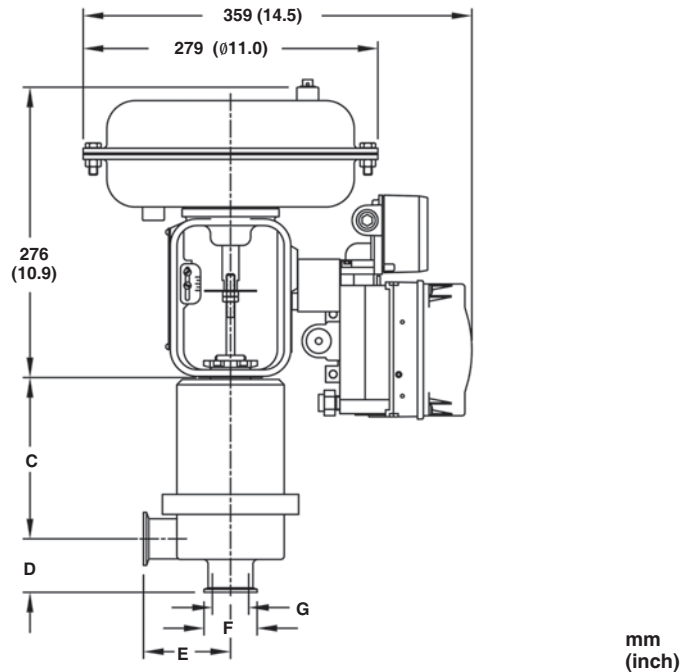
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mm
(inch)

Figure 12. Dimensional Drawings for Baumann 84000 NPS 1 Angle and Inline Valves

Table 14. Valve Assembly and Actuator Weights

VALVE SIZE		84000 ANGLE ASSEMBLY		84000 IN-LINE ASSEMBLY		ACTUATOR WEIGHTS		
DN	NPS	kgs	lbs	kgs	lbs	TYPE	kgs	lbs
25	1	4.06	9.0	4.31	9.5	32	4.5	10
40	1-1/2	5.22	11.5	N/A		54	11.3	25
50	2	5.22	11.5	N/A				



NOTE: ACTUATOR REMOVAL REQUIRES 115mm (4.5 INCHES) VERTICAL CLEARANCE.

E1323

Figure 13. Dimensional Drawing for Baumann 84000 NPS 1–1/2 and 2 Angle Valve with FIELDVUE DVC6010 Digital Valve Controller

Table 15. Valve Assembly and Actuator Weights

VALVE SIZE		C		D		E		F		G	
DN	NPS	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
40	1–1/2	152.4	6.0	50.8	2.00	82.55	3.25	50.39	1.984	34.44	1.356
50	2	160	6.3	50.8	2.00	88.9	3.50	63.9	2.516	47.63	1.875

Note

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