

Baumann™ 24000 Little Scotty™ Bronze Control Valve

Baumann Little Scotty industrial control valves (figures 1 and 2) are intended for general utility service in pressure, flow, and temperature control applications. This control valve is positioned to take advantage of the trend toward industrial grade requirements spanning general utility to special applications. Little Scotty valves exhibit low hysteresis and deadband, good control characteristics, tight shutoff, rugged construction, high performance packing, and easy maintainability. These attributes translate into reduced maintenance costs, reduced process variability, and increased process availability, resulting in lower long-term operating costs.

Features

- Compact and light weight design reduces installed piping costs
- High quality S31600 austenitic stainless steel trim materials
- S41600 stainless steel trim available
- Dual plug and stem guiding provides increased stability during plug travel
- Multiple trim capacity reductions available to meet changing process requirements
- Epoxy powder-coated actuator with stainless steel fasteners for corrosion resistance
- Multi-spring, field-reversible actuator with reduced deadband, permits direct operation from remote signal devices
- Actuator and yoke can be removed from the valve assembly while maintaining packing integrity
- Fisher® FIELDVUE™ digital valve controller available for remote calibration and diagnostics in facilities utilizing the PlantWeb™ architecture

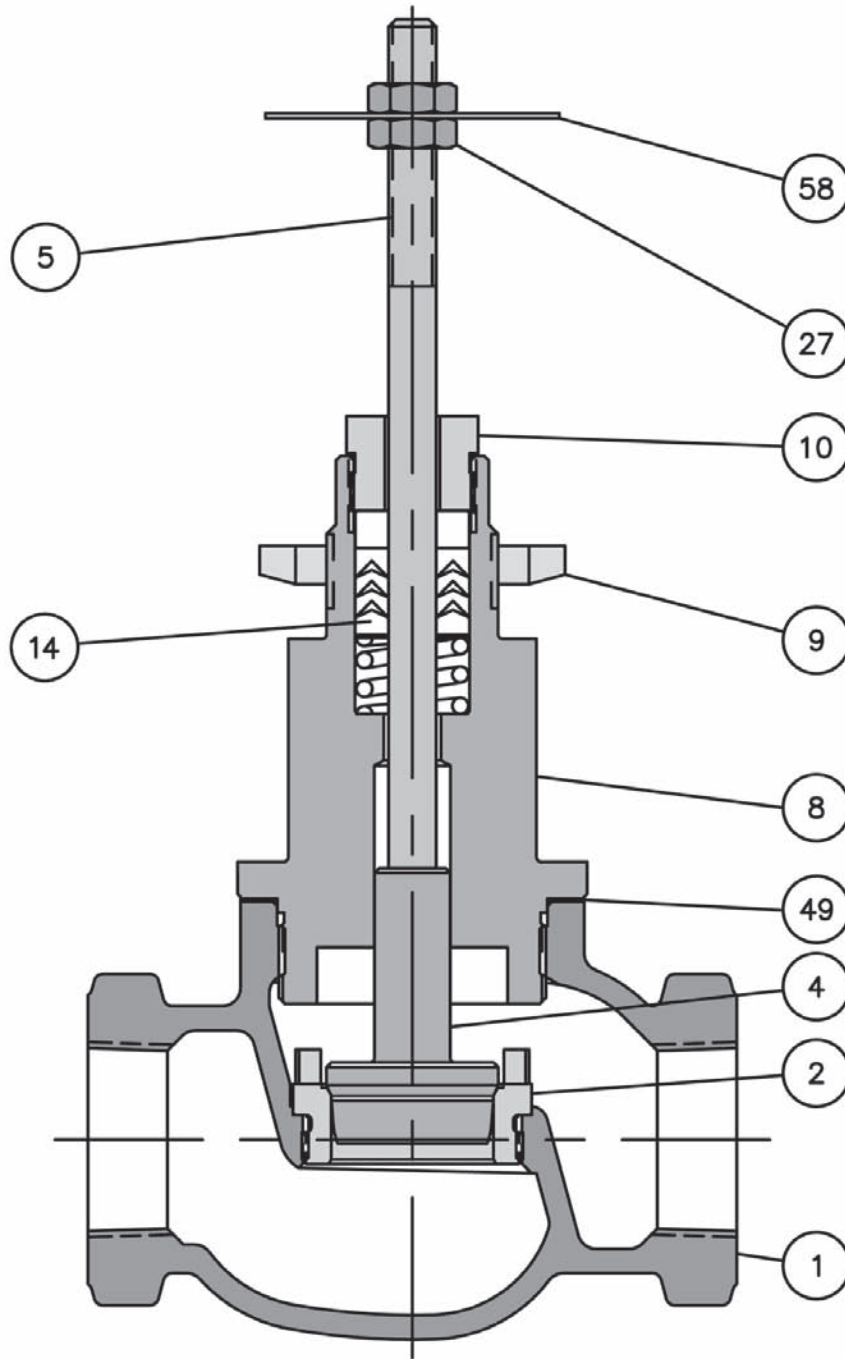


Figure 1. 24000 Little Scotty Control Valve with Baumann 32 Actuator



Figure 2. 24000 Little Scotty Control Valve with Baumann 32 Actuator and FIELDVUE DVC2000 Digital Valve Controller





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Figure 3. Baumann Little Scotty Valve Body Subassembly with Standard PTFE Spring-Loaded Packing

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24000 Valves

Table 1. Materials of Construction

Key No.	Description	Material
1	Valve Body	ASTM B62 Grade C83600
2	Seat Ring	Standard ASTM A276 S31600 Condition A
		Optional ASTM A582 S41600 Condition T
4	Plug (Metal Seat) Cv < 2.5	Standard ASTM A479 S21800 Annealed
		Optional ASTM A582 S41600 Condition T
	Plug (Metal Seat) Cv > 4.0	Standard ASTM A276 S31600 Condition A
		Optional ASTM A582 S41600 Condition T
Plug (Soft Seat)	ASTM A276 S31600 Condition A with PTFE (Polytetrafluoroethylene) Insert	
5	Stem	ASTM A276 S31600 Condition A
8	Bonnet	ASTM B148 Alloy C95500
9	Drive Nut (Yoke)	S30400 (ASTM A194 Grade 8M)
10	Packing Follower	ASTM A276 S31600 Condition A
14	Packing	Standard V-Ring, see figure 4
		Optional Molded Graphite, see figure 5
27	Locknuts	Stainless Steel (18-8 SST)
49	Body Gasket	Standard Annealed Soft Copper
		Optional Graphite Grade GHR with S31600 Insert
58	Travel Indicator	ASTM A240 S30400

Table 2. Cv Values at 100% Plug Opening ($K_v = 0.86 \times C_v$)

VALVE SIZE	ORIFICE DIAMETER	PLUG TRAVEL	PLUG SERIES				
			102	577	548 / 588	677	648 / 688
NPS	inch	inch	Cv	Cv	Cv	Cv	Cv
1/2 3/4 1	0.25	0.50	0.02, 0.05 0.10, 0.20	---	0.2, 0.5 1.0	---	0.5 1.0
	0.375	0.50	---	1.0, 1.5, 2.5	1.5, 2.5	0.1, 0.2, 0.5 1.0, 2.5	1.5 2.5
1/2	0.8125	0.50	---	4, 6	4, 6	5	4, 6
3/4	0.8125	0.50	---	4, 7.5	4, 8	5	4, 8
1	0.8125	0.50	---	4, 8.5	4, 9	5	4, 9
	1.0625	0.50	---	13	13	---	13
1-1/2	1.25	0.75	---	20	10, 20	20	10, 20
	1.5	0.75	---	10, 17, 28	10, 17, 28	10, 17	10, 17, 28
2	1.5	0.75	---	10, 17, 28	10, 17, 28	10, 17	10, 17, 28
	2.0	0.75	---	30	30, 50	30, 50	30, 50

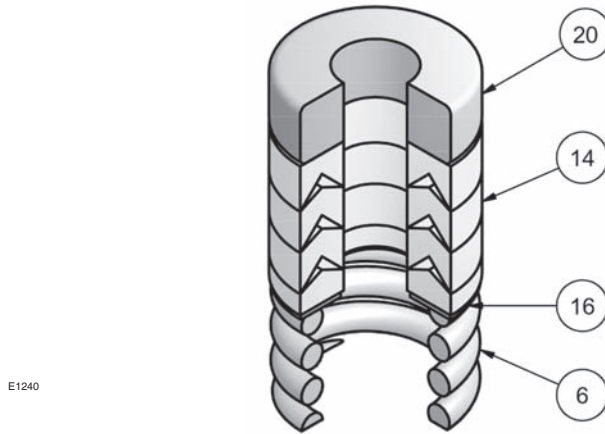


Figure 4. Spring-Loaded PTFE V-Ring Packing Kit

Table 3. Standard Spring-Loaded PTFE V-Ring Packing Kit

Key No.	Description	Material
6	Spring	ASTM A313 S30200
14	Packing Set	PTFE (Polytetrafluoroethylene) / PTFE, 25% carbon filled
16	Washer	ASTM A240 S31600
20	Spacer	J-2000 (filled PTFE)

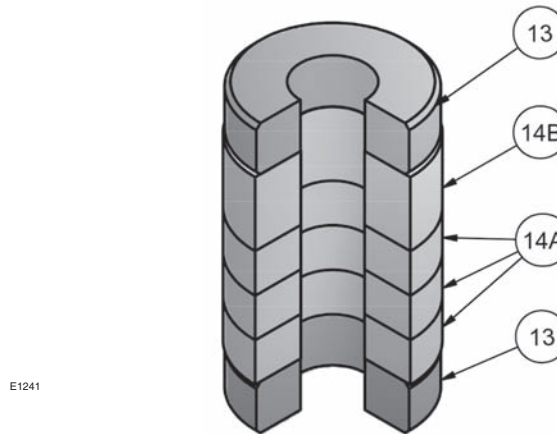


Figure 5. Molded Graphite (Flexible Graphite) Packing Kit (Optional)

Table 4. Molded Graphite (Flexible Graphite) Packing Kit (Optional)

Key No.	Description	Material
13	Bushings	Carbon – Graphite
14A	Packing Rings	Graphite
14B	Packing Ring	Graphite

Table 5. ISA Sizing Coefficients

Series	Cv Rating	FL	Fd	XT	KC
102	0.2 0.04 0.09 0.17	0.95	0.06 0.09 0.013 0.18	0.76	0.86
577	1 1.5 2.5 4 6 7.5 8.5 10 13 17 20 28 30	0.9	1.46	0.40 0.33 0.42	0.73
				0.68	
548/588	0.2 0.5 1 1.5 2.5 4 6 8 9 10 13 17 20 28 30 50	0.98	0.28	0.81	0.94
		0.9	0.4 0.33 0.46 0.46	0.68	0.73
677	0.1 0.2 0.5 1 2.5 5 10 17 30 50	0.9	0.46	0.08 0.12 0.19 0.27	0.73
				0.68	
648/688	0.5 1 1.5 2.5 4 6 8 9 10 13 20	0.9	0.46	0.4 0.33 0.42	0.73
				0.68	

Table 6. Technical Specifications

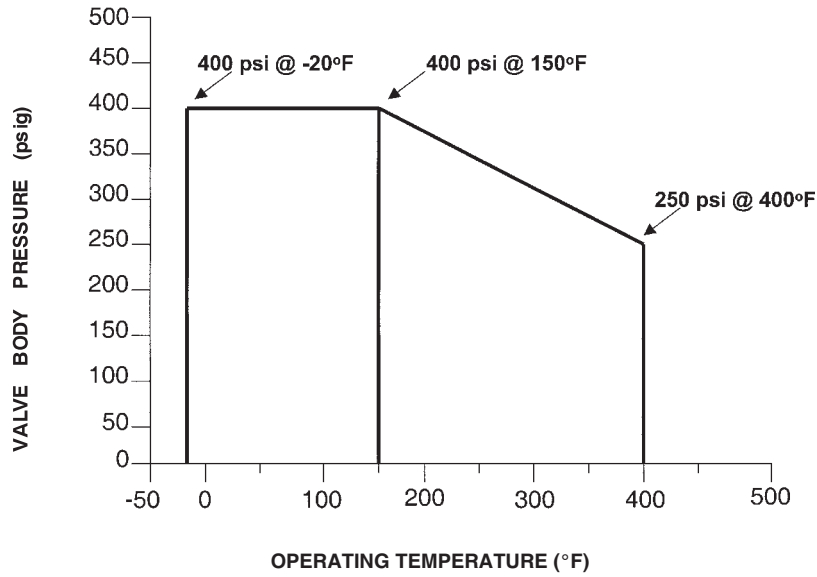
VALVE TYPE	EN	ASME
NOMINAL SIZE	DN 15, 20, 25, 40, & 50	NPS 1/2, 3/4, 1, 1-1/2, & 2
END CONNECTIONS	Screwed NPT	
PRESSURE RATING	400 psi @ 150°F / 250 psi @ 400°F (ASME B16.15 CL250)	
SEAT PLUG SEALING	Metal to metal or PTFE soft seat	
CHARACTERISTIC	Equal Percentage or Linear	
TEMPERATURE LIMITS	-29 to 204°C	-20 to 400°F

Table 7. Actuator Specifications

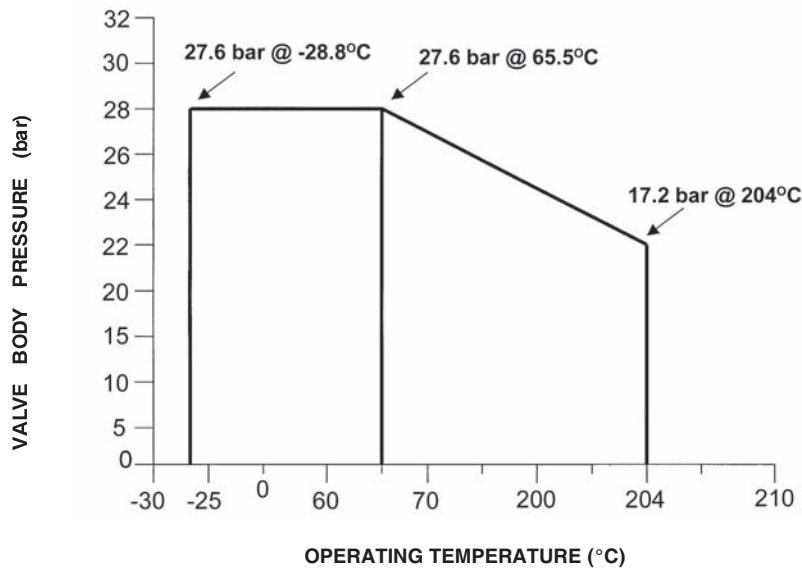
TYPE	32, 54, 70 Multi-Spring Diaphragm (Single Acting)
DIAPHRAGM AREA	210, 350, 450 cm ² / 32, 54, 70 in ²
AIR FAILURE	32 and 54 Fails Open or Closed (Field Reversible) / 70 Fails Closed ONLY
TRAVEL ⁽¹⁾	12.7 or 19.1 mm / 0.50 or 0.75 inches
AMBIENT TEMPERATURE RANGE	-29°C to 71°C / -20°F to 160°F
MAXIMUM AIR PRESSURE	2.4 barg / 35 psig
DIAPHRAGM MATERIAL ⁽²⁾	NBR (Nitrile) / TPES (Polyester Thermoplastic)
SPRING CASES	Steel, Powder Epoxy-Coated with Stainless Steel Fasteners
YOKE	Ductile Iron, Powder Epoxy-Coated

1. Dual travel stops are available on Baumann 32 and 54 actuators. These are not field reversible.

2. Optional reinforced VMQ (Silicone) diaphragm with FKM (Fluorocarbon) O-ring actuator stem seal for high temperature conditions (-29°C to 121°C / -20°F to 250°F) is available with Baumann 32 and 54 actuators ONLY.



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Figure 6. Baumann 24000 Pressure–Temperature Ratings

Table 8. Allowable Pressure Drops (bar)

ORIFICE DIA. (mm)	PLUG TRAVEL (mm)	ACT TYPE	AIR-TO-OPEN ACTION						AIR-TO-CLOSE ACTION				
			BENCH RANGE (barg)	0.2-1.0 barg SIGNAL TO ACTUATOR		WITH POSITIONER 1.38 barg AIR SUPPLY		BENCH RANGE (barg)	0.2-1.0 barg SIGNAL TO ACTUATOR		WITH POSITIONER 1.38 barg AIR SUPPLY		
				Max CL IV Shutoff Press.	Max CL VI Shutoff Press.	Max CL IV Shutoff Press.	Max CL VI Shutoff Press.		Max CL IV Shutoff Press.	Max CL VI Shutoff Press.	Max CL IV Shutoff Press.	Max CL VI Shutoff Press.	
6.3	12.7	32	0.3-1.0	27.58	27.58	---	---	0.2-0.9	27.58	---	27.58 ⁽¹⁾	---	
9.5	12.7	32	0.3-1.0	27.58	19.17	---	27.58	0.2-0.9	27.58	19.17	27.58 ⁽¹⁾	27.58 ⁽¹⁾	
20.6	12.7	32	0.3-1.0	7.79	---	15.58	9.10	0.2-0.9	7.7	---	21.09	20.75	
		32	0.5-1.0	15.58	9.10	23.37	16.89	0.2-0.7	19.51	12.96	27.58	27.58	
		54	0.3-1.0	5.92	---	17.71	11.16	0.2-0.9	11.79	5.30	27.58 ⁽¹⁾	27.58	
		54	0.5-1.0	23.64	17.09	27.58	27.58	0.2-0.7	27.58	23.02	27.58 ⁽¹⁾	27.58 ⁽¹⁾	
		54	0.6-1.0	27.58	27.58	27.58 ⁽¹⁾	27.58 ⁽¹⁾	---	---	---	---	---	
27.0	12.7	32	0.3-1.0	4.68	---	9.44	4.27	0.2-0.9	4.68	---	16.47	11.37	
		32	0.5-1.0	9.44	4.27	14.13	8.96	0.2-0.7	11.79	6.61	23.58	18.40	
		54	0.3-1.0	3.58	---	10.68	5.58	0.2-0.9	7.17	1.99	25.02	19.85	
		54	0.5-1.0	14.27	9.10	21.44	16.27	0.2-0.7	17.85	12.68	27.58 ⁽¹⁾	27.58	
		54	0.6-1.0	21.44	16.27	27.58	23.44	---	---	---	---	---	
31.8	19.1	32	0.3-1.0	3.44	---	6.96	2.48	0.2-0.9	3.44	---	12.13	7.65	
		32	---	---	---	---	---	0.2-0.7	8.68	4.20	17.30	12.89	
		54	0.3-1.0	5.24	---	10.48	6.06	0.2-0.9	5.24	---	18.34	13.92	
		54	0.5-1.0	10.48	6.06	15.72	11.60	0.2-0.7	13.10	8.68	26.26	21.78	
		54	0.7-1.0	18.34	16.92	23.64	19.17	---	---	---	---	---	
		70	0.7-1.0	24.95	20.47	27.58	27.58	---	---	---	---	---	
38.1	19.1	32	0.3-1.0	2.41	---	4.89	---	0.2-0.9	2.41	---	8.54	4.75	
		32	---	---	---	---	---	0.2-0.7	6.13	2.34	12.20	8.48	
		54	0.3-1.0	3.72	---	7.37	3.65	0.2-0.9	3.72	---	12.96	9.17	
		54	0.5-0.9	7.37	3.65	11.10	7.30	0.2-0.7	9.23	5.51	18.54	14.75	
		54	0.7-1.0	12.96	9.17	16.68	12.89	---	---	---	---	---	
		70	0.7-1.0	17.65	13.85	22.68	18.89	---	---	---	---	---	
		70	0.8-1.2	---	---	27.58	23.92	---	---	---	---	---	
50.8	19.1	32	0.3-1.0	1.37	---	2.82	---	0.2-0.9	1.37	---	4.89	1.99	
		32	---	---	---	---	---	0.2-0.7	3.51	---	7.03	4.13	
		54	0.3-1.0	2.13	---	4.27	1.37	0.2-0.9	2.13	---	7.44	4.55	
		54	0.5-0.9	4.27	1.37	6.34	3.51	0.2-0.7	5.30	2.41	10.61	7.72	
		54	0.7-1.0	7.44	4.55	9.58	6.68	---	---	---	---	---	
		70	0.7-1.0	10.13	7.23	13.03	10.13	---	---	---	---	---	
		70	0.8-1.2	---	---	15.85	13.03	---	---	---	---	---	

1. The maximum shutoff pressure when using Flexible Graphite packing is defined by: $\Delta P = \text{Table Value} - [5337(\text{Port Diameter})^2]$. These table values should not be modified by this formula and the maximum ΔP of 27.6 bar should be used for Flexible Graphite packing.

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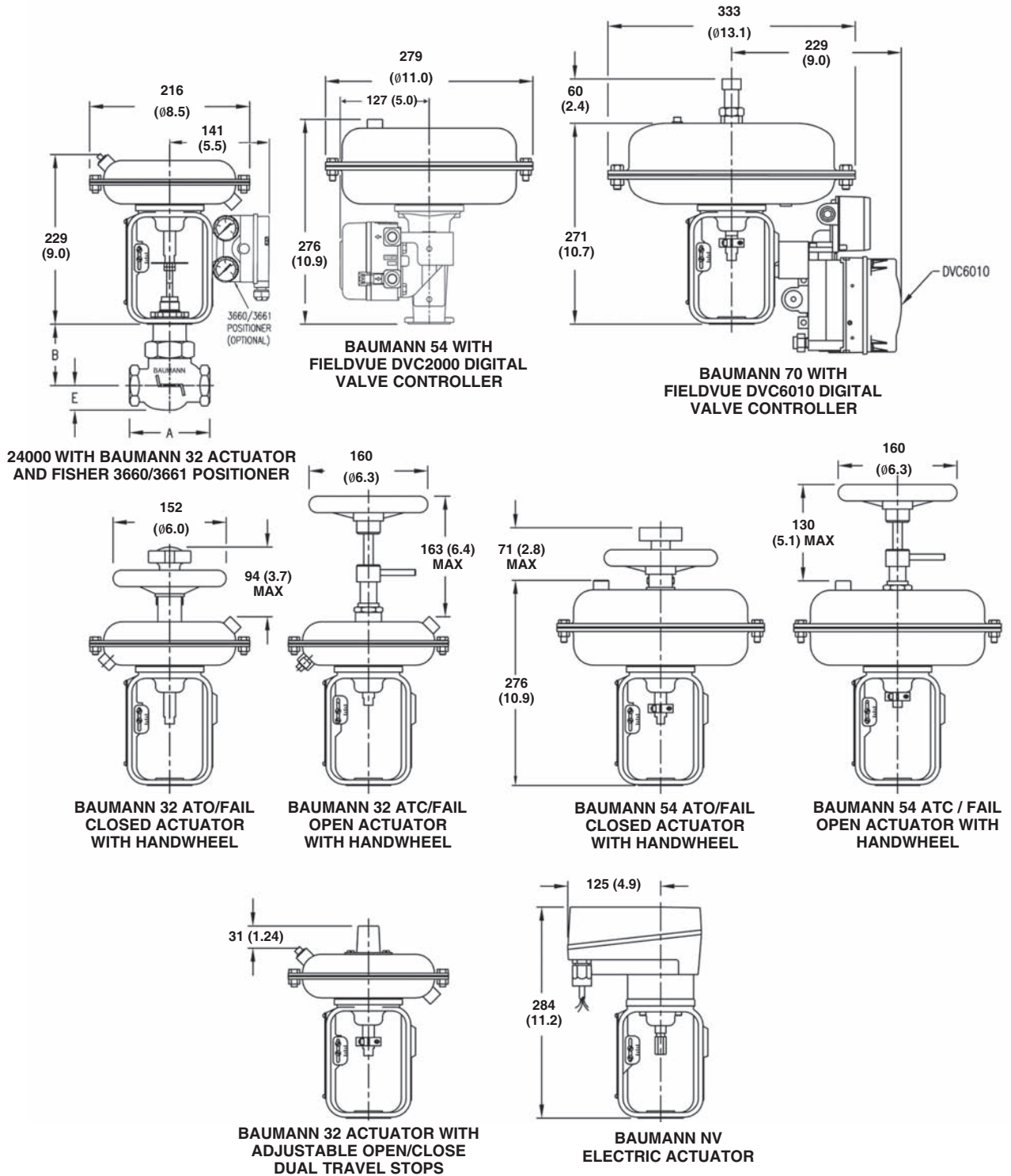
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24000 Valves

Table 9. Allowable Pressure Drops (psi)

ORIFICE DIA. (in)	PLUG TRAVEL (in)	ACT TYPE	AIR-TO-OPEN ACTION					AIR-TO-CLOSE ACTION				
			BENCH RANGE (psig)	3-15 psig SIGNAL TO ACTUATOR		WITH POSITIONER 20 psig AIR SUPPLY		BENCH RANGE (psig)	3-15 psig SIGNAL TO ACTUATOR		WITH POSITIONER 20 psig AIR SUPPLY	
				Max CL IV Shutoff Press.	Max CL VI Shutoff Press.	Max CL IV Shutoff Press.	Max CL VI Shutoff Press.		Max CL IV Shutoff Press.	Max CL VI Shutoff Press.	Max CL IV Shutoff Press.	Max CL VI Shutoff Press.
0.25	0.50	32	5-15	400	---	400	---	3-13	400	---	400 ⁽¹⁾	---
0.375	0.50	32	5-15	400	278	---	400	3-13	400	278	400 ⁽¹⁾	400 ⁽¹⁾
0.8125	0.50	32	5-15	113	---	226	132	3-13	113	---	306	301
		32	7-15	226	132	339	245	3-10	283	188	400	400
		54	4-15	86	---	257	162	3-13	171	77	400 ⁽¹⁾	400
		54	7-15	343	248	400	400	3-10	400	334	400 ⁽¹⁾	400 ⁽¹⁾
		54	9-15	400	400	400 ⁽¹⁾	400 ⁽¹⁾	---	---	---	---	---
1.0625	0.50	32	5-15	68	---	137	62	3-13	68	---	239	165
		32	7-15	137	62	205	130	3-10	171	96	342	267
		54	4-15	52	---	155	81	3-13	104	29	363	288
		54	7-15	207	132	311	236	3-10	259	184	400 ⁽¹⁾	400
		54	9-15	311	236	400	340	---	---	---	---	---
1.25	0.75	32	5-15	50	---	101	36	3-13	50	---	176	111
		32	---	---	---	---	---	3-10	126	61	251	187
		54	5-15	76	---	152	88	3-13	76	---	266	202
		54	7-13	152	88	228	164	3-10	190	126	381	316
		54	10-14	266	202	343	278	---	---	---	---	---
		70	10-15	362	297	400	400	---	---	---	---	---
1.5	0.75	32	5-15	35	---	71	---	3-13	35	---	124	69
		32	---	---	---	---	---	3-10	89	34	177	123
		54	5-15	54	---	107	53	3-13	54	---	188	133
		54	7-13	107	53	161	106	3-10	134	80	269	214
		54	10-14	188	133	242	187	---	---	---	---	---
		70	10-15	256	201	329	274	---	---	---	---	---
		70	12-18	---	---	400	347	---	---	---	---	---
2.0	0.75	32	5-15	20	---	41	---	3-13	20	---	71	29
		32	---	---	---	---	---	3-10	51	---	102	60
		54	5-15	31	---	62	20	3-13	31	---	108	66
		54	7-13	62	20	92	51	3-10	77	35	154	112
		54	10-14	108	66	139	97	---	---	---	---	---
		70	10-15	147	105	189	147	---	---	---	---	---
		70	12-18	---	---	230	189	---	---	---	---	---

1. The maximum shutoff pressure when using Flexible Graphite packing is defined by: $\Delta P = \text{Table Value} - [120(\text{Port Diameter})^2]$. These table values should not be modified by this formula and the maximum ΔP of 400 psi should be used for Flexible Graphite packing.



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mm
(inch)

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

Figure 7. Dimensional Drawings

Table 10. Dimensions

VALVE SIZE		A VALVE BODY		B BONNET		E	
DN	NPS	mm	inch	mm	inch	mm	inch
15	1/2	89	3.5	78	3.1	27	1.06
20	3/4	89	3.5	78	3.1	27	1.06
25	1	109	4.3	83	3.3	33	1.3
40	1-1/2	137	5.4	99	3.9	46	1.8
50	2	168	6.6	104	4.1	58	2.3

Table 11. Valve Assembly Weights

VALVE SIZE		WEIGHT	
DN	NPS	kg	lb
15	1/2	1.6	3.5
20	3/4	1.6	3.5
25	1	2.3	5.0
40	1-1/2	4.9	10.9
50	2	8.9	19.7

Table 13. Pneumatic Actuators

Actuator Type
32
54
70

Table 12. Actuator Weights

ACTUATOR TYPE	WEIGHTS	
	kg	lb
32	4.5	10
54	11.3	25
70	15.4	34
MV1020	10	22
VA1020	14	30
NV24-MFT (non spring return)	1.5	3.3
NVF24-MFT or NVF24-MFT-E (spring return)	1.8	4

Table 14. Electric Actuators⁽¹⁾

Actuator Type	Travel
MV1020	32
VA1020	54
NV ⁽²⁾	70
NVF ⁽³⁾	54
NVFE ⁽⁴⁾	70

1. Refer to bulletin 52.1:NVACT, D103326X012 for details.
2. NV24-MFT = Non Spring Return
3. NVF24-MFT = Spring return - fail open.
4. NVFE24-MFT-E = Spring return - fail closed.

Table 15. Model Numbering System

Actuator Type ⁽¹⁾	24			
	Valve Body Series	Plug Series	Characteristic	Seat Leakage
		102	Linear / Metal Seat	IV
		548	Equal % / Metal Seat (S41600)	IV
		577	Equal % / PTFE Seat	VI
		588	Equal % / Metal Seat (S31600)	IV
		677	Linear / PTFE Seat	VI
		648	Linear / Metal Seat (S41600)	IV
		688	Linear / Metal Seat	IV

1. Choose from tables 13 and 14.

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