

VG7000



VA-7152 Actuator with VG7842 Valve

VA-7150 Actuators

COMPACT SIZE – Fits in tight spaces
 90 LB. FORCE – Provides high close-off
 NON-SPRING RETURN
 DIRECT COUPLED – No linkage required
 MAGNETIC CLUTCH – Protects gearing
 CONTROLS – Hot or chilled water, steam
 FITS VG7000 VALVES – 1/2 to 1-1/4"
 FLUID TEMPERATURE – 35 to 284°F (2 to 140°C)
 MAXIMUM STEAM PRESSURE – 38 psig saturated
 VALVE PRESSURE RATING – ANSI Class 250
 VOLTAGE – 24VAC, 50/60Hz, 4.7VA MAX



VA-7202 Actuator with VG7842 Valve

VA-7200 Actuators

COMPACT SIZE
 180 LB. FORCE – Provides high close-off
 NON-SPRING RETURN
 DIRECT COUPLED – No linkage required
 MAGNETIC CLUTCH – Protects gearing
 CONTROLS – Hot or chilled water, steam
 FITS VG7000 VALVES – 1 to 2"
 FLUID TEMPERATURE – 35 to 284°F (2 to 140°C)
 MAXIMUM STEAM PRESSURE – 38 psig saturated
 VALVE PRESSURE RATING – ANSI Class 250
 COMPLETE RANGE OF CONTROL INPUTS
 OPTIONAL AUXILIARY SWITCHES
 VOLTAGE – 24VAC, 50/60Hz, 8.7VA MAX



VA-4233-AGA-2 Actuator with VG7441 Valve

VA-4233 Actuators

SPRING RETURN – Stem up
 61 LB. FORCE – Provides high close-off
 MANUAL OPENER
 CONTROLS – Hot or chilled water, steam
 VG7000 VALVES – 1/2 to 1-1/4"
 VALVE TRIM – Brass (Stainless Steel Available)
 FLUID TEMPERATURE – 35 to 250°F (2 to 121°C)
 MAXIMUM STEAM PRESSURE – 15 psig saturated
 VALVE PRESSURE RATING – ANSI Class 250
 OPTIONAL AUXILIARY SWITCHES AVAILABLE
 VOLTAGE – 20-30VAC, 50/60Hz, 12VA MAX
 AUTO STROKE CALIBRATION – Proportional models only



M9216-HGA-2 Actuator with VG7842 Valve

M9216 Actuators

SPRING RETURN – Stem up or stem down
 180 LB. FORCE – Provides high close-off
 MANUAL OPENER
 CONTROLS – Hot or chilled water, steam
 VG7000 VALVES – 1/2 to 2"
 FLUID TEMPERATURE – 35 to 284°F (2 to 140°C)
 MAXIMUM STEAM PRESSURE – 38 psig saturated
 VALVE PRESSURE RATING – ANSI Class 250
 OPTIONAL AUXILIARY SWITCHES AVAILABLE
 VOLTAGE – 20-30VAC, 50/60Hz, 12VA MAX

Valve	Size	Cv	Close-off	On-Off / Floating	On-Off / Floating with Feedback	0 to 10 VDC Proportional
				VA-7150-1001	VA-7153-1001	VA-7152-1001
2-way Hot or Chilled Water, Brass Trim						
VG7241CT	1/2"	0.73	345	VG7241CT+7150G	VG7241CT+7153G	VG7241CT+7152G
VG7241ET	1/2"	1.8	345	VG7241ET+7150G	VG7241ET+7153G	VG7241ET+7152G
VG7241GT	1/2"	4.6	216	VG7241GT+7150G	VG7241GT+7153G	VG7241GT+7152G
VG7241LT	3/4"	7.3	138	VG7241LT+7150G	VG7241LT+7153G	VG7241LT+7152G
VG7241NT	1"	11.6	86	VG7241NT+7150G	VG7241NT+7153G	VG7241NT+7152G
VG7241PT	1-1/4"	18.5	52	VG7241PT+7150G	VG7241PT+7153G	VG7241PT+7152G
3-way Mixing, Brass Trim						
VG7842CT	1/2"	0.73	345 / 345	VG7842CT+7150G	VG7842CT+7153G	VG7842CT+7152G
VG7842ET	1/2"	1.8	345 / 345	VG7842ET+7150G	VG7842ET+7153G	VG7842ET+7152G
VG7842GT	1/2"	4.6	216 / 257	VG7842GT+7150G	VG7842GT+7153G	VG7842GT+7152G
VG7842LT	3/4"	7.3	138 / 153	VG7842LT+7150G	VG7842LT+7153G	VG7842LT+7152G
VG7842NT	1"	11.6	86 / 100	VG7842NT+7150G	VG7842NT+7153G	VG7842NT+7152G
VG7842PT	1-1/4"	18.5	52 / 57	VG7842PT+7150G	VG7842PT+7153G	VG7842PT+7152G
VG7842RT	1-1/2"	28.9	34 / 36	VG7842RT+7150G	VG7842RT+7153G	VG7842RT+7152G
VG7842ST	2"	46.2	21 / 22	VG7842ST+7150G	VG7842ST+7153G	VG7842ST+7152G
2-way, Stainless Steel Trim (100 psig max steam pressure 35 to 338°F fluid temp)						
VG7243CT	1/2"	0.73	239	VG7243CT+7150G	VG7243CT+7153G	VG7243CT+7152G
VG7243ET	1/2"	1.8	239	VG7243ET+7150G	VG7243ET+7153G	VG7243ET+7152G
VG7243GT	1/2"	4.6	135	VG7243GT+7150G	VG7243GT+7153G	VG7243GT+7152G
VG7243LT	3/4"	7.3	86	VG7243LT+7150G	VG7243LT+7153G	VG7243LT+7152G
VG7243NT	1"	11.6	54	VG7243NT+7150G	VG7243NT+7153G	VG7243NT+7152G
VG7243PT	1-1/4"	18.5	33	VG7243PT+7150G	VG7243PT+7153G	VG7243PT+7152G

Valve	Size	Cv	Close-off	On-Off / Floating	On-Off / Floating with Feedback	0 to 10 VDC Proportional
				VA-7200-1001	VA-7203-1001	VA-7202-1001
2-way Hot or Chilled Water, Brass Trim						
VG7241NT	1"	11.6	179	VG7241NT+7200G	VG7241NT+7203G	VG7241NT+7202G
VG7241PT	1-1/4"	18.5	109	VG7241PT+7200G	VG7241PT+7203G	VG7241PT+7202G
VG7241RT	1-1/2"	28.9	70	VG7241RT+7200G	VG7241RT+7203G	VG7241RT+7202G
VG7241ST	2"	46.2	45	VG7241ST+7200G	VG7241ST+7203G	VG7241ST+7202G
3-way Mixing, Brass Trim						
VG7842NT	1"	11.6	179 / 209	VG7842NT+7200G	VG7842NT+7203G	VG7842NT+7202G
VG7842PT	1-1/4"	18.5	109 / 120	VG7842PT+7200G	VG7842PT+7203G	VG7842PT+7202G
VG7842RT	1-1/2"	28.9	70 / 74	VG7842RT+7200G	VG7842RT+7203G	VG7842RT+7202G
VG7842ST	2"	46.2	45 / 46	VG7842ST+7200G	VG7842ST+7203G	VG7842ST+7202G
2-way, Stainless Steel Trim (100 psig max steam pressure 35 to 338°F fluid temp)						
VG7243CT	1/2"	0.73	308	VG7243CT+7200G	VG7243CT+7203G	VG7243CT+7202G
VG7243ET	1/2"	1.8	308	VG7243ET+7200G	VG7243ET+7203G	VG7243ET+7202G
VG7243GT	1/2"	4.6	278	VG7243GT+7200G	VG7243GT+7203G	VG7243GT+7202G
VG7243LT	3/4"	7.3	177	VG7243LT+7200G	VG7243LT+7203G	VG7243LT+7202G
VG7243NT	1"	11.6	112	VG7243NT+7200G	VG7243NT+7203G	VG7243NT+7202G
VG7243PT	1-1/4"	18.5	68	VG7243PT+7200G	VG7243PT+7203G	VG7243PT+7202G
VG7243RT	1-1/2"	28.9	44	VG7243RT+7200G	VG7243RT+7203G	VG7243RT+7202G
VG7243ST	2"	46.2	28	VG7243ST+7200G	VG7243ST+7203G	VG7243ST+7202G

Valve	Size	Cv	Close-off	Spring Return - Stem Up		
				Floating	On-Off	0 to 10 VDC Proportional
VA-4233-AGA-2						
2-way Spring Return Open, Brass Trim						
VG7241CT	1/2"	0.73	345	VG7241CT+423AGA	VG7241CT+423BGA	VG7241CT+423GGA
VG7241ET	1/2"	1.8	345	VG7241ET+423AGA	VG7241ET+423BGA	VG7241ET+423GGA
VG7241GT	1/2"	4.6	208	VG7241GT+423AGA	VG7241GT+423BGA	VG7241GT+423GGA
VG7241LT	3/4"	7.3	132	VG7241LT+423AGA	VG7241LT+423BGA	VG7241LT+423GGA
VG7241NT	1"	11.6	63	VG7241NT+423AGA	VG7241NT+423BGA	VG7241NT+423GGA
VG7241PT	1-1/4"	18.5	38	VG7241PT+423AGA	VG7241PT+423BGA	VG7241PT+423GGA
2-way Spring Return Closed, Brass Trim						
VG7441CT	1/2"	0.73	345	VG7441CT+423AGA	VG7441CT+423BGA	VG7441CT+423GGA
VG7441ET	1/2"	1.8	345	VG7441ET+423AGA	VG7441ET+423BGA	VG7441ET+423GGA
VG7441GT	1/2"	4.6	173	VG7441GT+423AGA	VG7441GT+423BGA	VG7441GT+423GGA
VG7441LT	3/4"	7.3	103	VG7441LT+423AGA	VG7441LT+423BGA	VG7441LT+423GGA
VG7441NT	1"	11.6	68	VG7441NT+423AGA	VG7441NT+423BGA	VG7441NT+423GGA
VG7441PT	1-1/4"	18.5	38	VG7441PT+423AGA	VG7441PT+423BGA	VG7441PT+423GGA
3-way Mixing, Brass Trim						
VG7842CT	1/2"	0.73	345 / 345	VG7842CT+423AGA	VG7842CT+423BGA	VG7842CT+423GGA
VG7842ET	1/2"	1.8	345 / 345	VG7842ET+423AGA	VG7842ET+423BGA	VG7842ET+423GGA
VG7842GT	1/2"	4.6	208 / 173	VG7842GT+423AGA	VG7842GT+423BGA	VG7842GT+423GGA
VG7842LT	3/4"	7.3	132 / 103	VG7842LT+423AGA	VG7842LT+423BGA	VG7842LT+423GGA
VG7842NT	1"	11.6	63 / 68	VG7842NT+423AGA	VG7842NT+423BGA	VG7842NT+423GGA
VG7842PT	1-1/4"	18.5	38 / 38	VG7842PT+423AGA	VG7842PT+423BGA	VG7842PT+423GGA

Valve	Size	Cv	Close-off	Spring Return Open - Stem Up		Spring Return Closed - Stem Down	
				On-Off / Floating	0 to 10 Vdc Proportional	On-Off / Floating	0 to 10 Vdc Proportional
M9216-AGA-2							
2-way Hot or Chilled Water, Brass Trim							
VG7241CT	1/2"	0.73	345	VG7241CT+926AGA	VG7241CT+926HGA	VG7241CT+946AGA	VG7241CT+946HGA
VG7241ET	1/2"	1.8	345	VG7241ET+926AGA	VG7241ET+926HGA	VG7241ET+946AGA	VG7241ET+946HGA
VG7241GT	1/2"	4.6	345	VG7241GT+926AGA	VG7241GT+926HGA	VG7241GT+946AGA	VG7241GT+946HGA
VG7241LT	3/4"	7.3	289	VG7241LT+926AGA	VG7241LT+926HGA	VG7241LT+946AGA	VG7241LT+946HGA
VG7241NT	1"	11.6	182	VG7241NT+926AGA	VG7241NT+926HGA	VG7241NT+946AGA	VG7241NT+946HGA
VG7241PT	1-1/4"	18.5	111	VG7241PT+926AGA	VG7241PT+926HGA	VG7241PT+946AGA	VG7241PT+946HGA
VG7241RT	1-1/2"	28.9	71	VG7241RT+926AGA	VG7241RT+926HGA	VG7241RT+946AGA	VG7241RT+946HGA
VG7241ST	2"	46.2	46	VG7241ST+926AGA	VG7241ST+926HGA	VG7241ST+946AGA	VG7241ST+946HGA
3-way Mixing, Brass Trim							
VG7842CT	1/2"	0.73	345 / 345	VG7842CT+926AGA	VG7842CT+926HGA	VG7842CT+946AGA	VG7842CT+946HGA
VG7842ET	1/2"	1.8	345 / 345	VG7842ET+926AGA	VG7842ET+926HGA	VG7842ET+946AGA	VG7842ET+946HGA
VG7842GT	1/2"	4.6	345 / 345	VG7842GT+926AGA	VG7842GT+926HGA	VG7842GT+946AGA	VG7842GT+946HGA
VG7842LT	3/4"	7.3	289 / 321	VG7842LT+926AGA	VG7842LT+926HGA	VG7842LT+946AGA	VG7842LT+946HGA
VG7842NT	1"	11.6	182 / 213	VG7842NT+926AGA	VG7842NT+926HGA	VG7842NT+946AGA	VG7842NT+946HGA
VG7842PT	1-1/4"	18.5	111 / 122	VG7842PT+926AGA	VG7842PT+926HGA	VG7842PT+946AGA	VG7842PT+946HGA
VG7842RT	1-1/2"	28.9	71 / 76	VG7842RT+926AGA	VG7842RT+926HGA	VG7842RT+946AGA	VG7842RT+946HGA
VG7842ST	2"	46.2	46 / 47	VG7241ST+926AGA	VG7842ST+926HGA	VG7842ST+946AGA	VG7842ST+946HGA
2-way, Stainless Steel Trim (100 psig max steam pressure 35 to 338°F fluid temp)							
VG7243CT	1/2"	0.73	308	VG7243CT+926AGA	VG7243CT+926HGA	VG7243CT+946AGA	VG7243CT+946HGA
VG7243ET	1/2"	1.8	308	VG7243ET+926AGA	VG7243ET+926HGA	VG7243ET+946AGA	VG7243ET+946HGA
VG7243GT	1/2"	4.6	283	VG7243GT+926AGA	VG7243GT+926HGA	VG7243GT+946AGA	VG7243GT+946HGA
VG7243LT	3/4"	7.3	180	VG7243LT+926AGA	VG7243LT+926HGA	VG7243LT+946AGA	VG7243LT+946HGA
VG7243NT	1"	11.6	114	VG7243NT+926AGA	VG7243NT+926HGA	VG7243NT+946AGA	VG7243NT+946HGA
VG7243PT	1-1/4"	18.5	70	VG7243PT+926AGA	VG7243PT+926HGA	VG7243PT+946AGA	VG7243PT+946HGA
VG7243RT	1-1/2"	28.9	45	VG7243RT+926AGA	VG7243RT+926HGA	VG7243RT+946AGA	VG7243RT+946HGA
VG7243ST	2"	46.2	28	VG7243ST+926AGA	VG7243ST+926HGA	VG7243ST+946AGA	VG7243ST+946HGA

Most popular models are shown. For a complete listing refer to Product/Technical Bulletin LIT-977140.

Sizing Water Valves

Two-Position Applications: The valve is normally sized to the pipe size with largest Cv available.

Modulating Applications: The valve should be sized to produce the required GPM flow at a pressure drop of 1 to 2 times the pressure drop across the coil at design flow.

Example: Coil requirements 28 GPM @ 5 psig pressure drop. The valve should be selected to provide 28 GPM with a pressure drop between 5 and 10 psig (1 to 2 times the pressure drop across the coil at required flow).

Solution: From the table below a 1", 11.6 Cv valve will provide 25.9 GPM @ 5 psig pressure drop and 36.7 GPM @ 10 psig pressure drop. This valve should be selected as the pressure drop across the valve at required flow is between 1 and 2 times the pressure drop across the coil at required flow.

Flow Rate in GPM (Gallons Per Minute)

Pipe Size NPT	1/2"	1/2"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Cv	.73	1.8	4.6	7.3	11.6	18.5	28.9	46.2
Pressure Drop								
1	.7	1.8	4.6	7.3	11.6	18.5	28.9	46.2
2	1.0	2.5	6.5	10.3	16.4	26.2	40.9	65.3
3	1.3	3.1	8.0	12.6	20.1	32.0	50.1	80.0
4	1.5	3.6	9.2	14.6	23.2	37.0	57.8	92.4
5	1.6	4.0	10.3	16.3	25.9	41.4	64.6	103.3
6	1.8	4.4	11.3	17.9	28.4	45.3	70.8	113.2
7	1.9	4.8	12.2	19.3	30.7	48.9	76.5	122.2
8	2.1	5.1	13.0	20.6	32.8	52.3	81.7	130.7
9	2.2	5.4	13.8	21.9	34.8	55.5	86.7	138.6
10	2.3	5.7	14.5	23.1	36.7	58.5	91.4	146.1
11	2.4	6.0	15.3	24.2	38.5	61.4	95.9	153.2
12	2.5	6.2	15.9	25.3	40.2	64.1	100.1	160.0
13	2.6	6.5	16.6	26.3	41.8	66.7	104.2	166.6
14	2.7	6.7	17.2	27.3	43.4	69.2	108.1	172.9
15	2.8	7.0	17.8	28.3	44.9	71.7	111.9	178.9
16	2.9	7.2	18.4	29.2	46.4	74.0	115.6	184.8
17	3.0	7.4	19.0	30.1	47.8	76.3	119.2	190.5
18	3.1	7.6	19.5	31.0	49.2	78.5	122.6	196.0
19	3.2	7.8	20.1	31.8	50.6	80.6	126.0	201.4
20	3.3	8.0	20.6	32.6	51.9	82.7	129.2	206.6
21	3.3	8.2	21.1	33.5	53.2	84.8	132.4	211.7
22	3.4	8.4	21.6	34.2	54.4	86.8	135.6	216.7
23	3.5	8.6	22.1	35.0	55.6	88.7	138.6	221.6
24	3.6	8.8	22.5	35.8	56.8	90.6	141.6	226.3
25	3.7	9.0	23.0	36.5	58.0	92.5	144.5	231.0
26	3.7	9.2	23.5	37.2	59.1	94.3	147.4	235.6
27	3.8	9.4	23.9	37.9	60.3	96.1	150.2	240.1
28	3.9	9.5	24.3	38.6	61.4	97.9	152.9	244.5
28	3.9	9.7	24.8	39.3	62.5	99.6	155.6	248.8
30	4.0	9.9	25.2	40.0	63.5	101.3	158.3	253.0

Sizing Steam Valves

Two-Position Applications:

The valve is normally sized to be the same as the pipe using the largest Cv available for a given pipe size.

Modulating Applications:

Select the valve to meet the BtuH requirements of the coil. The table assumes an atmospheric return.

Pipe Size NPT	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	1"	1"	1-1/4"	1-1/4"	1-1/2"	1-1/2"	2"	2"
Cv	0.73	0.73	1.8	1.8	4.6	4.6	7.3	7.3	11.6	11.6	18.5	18.5	28.9	28.9	46.2	46.2
Saturated Steam	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH
Steam Supply Pressure																
1	6,500	8,300	16,100	20,400	41,100	52,000	65,300	82,600	103,800	131,200	165,500	209,300	258,500	327,000	413,200	522,700
2	9,500	12,000	23,400	29,700	59,900	75,800	95,100	120,300	151,100	191,100	240,900	304,700	376,400	476,100	601,700	761,000
3	11,900	15,100	29,500	37,300	75,300	95,200	119,500	151,200	189,900	240,200	302,800	383,100	473,100	598,400	756,300	956,600
4	14,200	17,900	34,900	44,200	89,300	113,000	141,700	179,300	225,200	284,800	359,100	454,300	561,000	709,600	896,900	1,134,400
5	16,200	20,500	40,000	50,600	102,200	129,300	162,200	205,200	257,800	326,100	411,100	520,000	642,200	812,400	1,026,700	1,298,700
6	18,200	23,000	44,900	56,800	114,700	145,100	182,100	230,300	289,300	365,900	461,400	583,600	720,800	911,700	1,152,200	1,457,500
7	20,100	25,400	49,500	62,700	126,600	160,100	200,900	254,100	319,200	403,800	509,100	644,000	795,300	1,006,000	1,271,400	1,608,200
8	21,900	27,800	54,100	68,400	138,300	174,900	219,400	277,600	348,700	441,100	556,100	703,400	868,700	1,098,800	1,388,700	1,756,600
9	23,700	30,000	58,500	74,000	149,600	189,200	237,400	300,300	377,200	477,200	601,600	761,000	939,900	1,188,900	1,502,500	1,900,500
10	25,500	32,300	62,900	79,600	160,800	203,400	255,200	322,900	405,600	513,000	646,800	818,200	1,010,500	1,278,200	1,615,400	2,043,300
11	27,300	34,500	67,200	85,000	171,800	217,300	272,700	344,900	433,300	548,100	691,000	874,100	1,079,500	1,365,400	1,725,600	2,182,800
12	29,000	36,700	71,500	90,400	182,600	231,000	289,800	366,600	460,500	582,500	734,400	929,000	1,147,300	1,451,300	1,834,100	2,320,000
15	34,100	43,100	84,100	106,300	214,800	271,700	340,900	431,200	541,700	685,200	863,900	1,092,800	1,349,600	1,707,100	2,157,400	2,729,000
20	42,400	53,000	104,600	130,800	267,400	334,200	424,400	530,300	674,400	842,700	1,075,500	1,344,000	1,680,200	2,099,500	2,685,900	3,356,300
25	50,400	60,300	124,300	148,600	317,700	379,800	504,100	602,700	801,100	957,700	1,277,600	1,527,300	1,995,800	2,385,900	3,190,500	3,814,200
30	58,400	67,600	143,900	166,700	367,800	425,900	583,700	675,900	927,500	1,074,000	1,479,100	1,712,800	2,310,600	2,675,700	3,693,800	4,277,500
35	66,200	74,800	163,200	184,500	417,000	471,500	661,800	748,200	1,051,700	1,188,900	1,677,200	1,896,100	2,620,100	2,962,000	4,188,600	4,735,100
40	69,800	77,400	172,100	190,900	439,800	487,900	698,000	774,400	1,109,100	1,230,500	1,768,900	1,962,400	2,763,300	3,065,600	4,417,500	4,900,700
45	81,900	89,500	201,900	220,600	516,000	563,900	818,900	894,800	1,301,300	1,421,900	2,075,400	2,267,700	3,242,000	3,542,600	5,182,800	5,663,200
50	89,700	96,800	221,100	238,600	565,000	609,700	896,600	967,600	1,424,800	1,537,600	2,272,200	2,452,100	3,549,600	3,830,600	5,674,500	6,123,700
55	97,400	104,000	240,100	256,500	613,700	655,400	973,900	1,040,100	1,547,600	1,652,800	2,468,100	2,635,900	3,855,600	4,117,700	6,163,600	6,582,500
60	105,100	111,200	259,100	274,300	662,200	701,000	1,050,900	1,112,400	1,669,900	1,767,700	2,663,200	2,819,100	4,160,400	4,403,900	6,650,900	7,040,200
65	112,800	118,500	278,100	292,200	710,700	746,600	1,127,900	1,184,800	1,792,300	1,882,800	2,858,300	3,002,700	4,465,200	4,690,700	7,138,100	7,498,600
70	120,500	125,700	297,100	310,000	759,300	792,300	1,204,900	1,257,400	1,914,700	1,998,100	3,053,600	3,186,600	4,770,200	4,977,900	7,625,700	7,957,800
75	128,100	132,900	315,900	327,700	807,200	837,500	1,281,000	1,329,000	2,035,500	2,111,900	3,246,300	3,368,000	5,071,300	5,261,400	8,107,000	8,411,000
80	135,800	140,200	334,800	345,600	855,700	883,200	1,357,900	1,401,600	2,157,800	2,227,200	3,441,300	3,552,000	5,375,900	5,548,800	8,594,000	8,870,400
85	143,400	147,300	353,500	363,200	903,300	928,100	1,433,600	1,472,900	2,278,000	2,340,500	3,633,000	3,732,700	5,675,400	5,831,200	9,072,800	9,321,800
90	151,000	154,500	372,400	381,000	951,700	973,800	1,510,200	1,545,300	2,339,800	2,455,600	3,827,300	3,916,200	5,978,900	6,117,800	9,558,000	9,780,000
95	158,600	161,600	390,900	398,500	999,100	1,018,500	1,585,500	1,616,300	2,519,400	2,568,400	4,018,100	4,096,200	6,276,900	6,398,900	10,034,300	10,229,400
100	166,200	168,900	409,800	416,400	1,047,400	1,064,200	1,662,200	1,688,800	2,641,300	2,683,600	4,212,300	4,279,800	6,580,400	6,685,800	10,519,500	10,688,000

Notes:

- 1.) Must use stainless steel trim for steam pressures greater than 38 psig (262 kPa).
- 2.) Minimum coil BtuH calculated assuming a pressure drop across the valve of 50% of supply pressure.
- 3.) Maximum coil BtuH calculated assuming a pressure drop across the valve of 80% of supply pressure or 45% of absolute pressure, whichever is lower.

Replacement Parts

Valve Reconditioning Kits include a bonnet, bonnet nut, packing, stem, plug, and disk. Reconditioning kits for stainless steel trim valves also include a replacement seat, since the seat can only be replaced on stainless steel trim models.

Packing Kits include enough materials to repack one valve.

Lower Body Kits for two-way valves include a bottom cap only; lower body kits for three-way valves include a lower body with seat.

Valve Size	Cv	Trim	Packing Kit	Reconditioning Kits			
				Standard Threaded stem (All assemblies except V-3801, VA-8x2x, V-500, and MP84 actuated models)			
				Equal Percentage Flow Characteristic			Linear Flow Characteristic

M150 Series Actuators

VG2000



M150 Series Actuators with VG2000 Series Valves.

VALVE

- Provides control of chilled water, hot water, or steam
- May be used with 50% glycol solution
- ANSI 125 flange – per ANSI B16.1
- ANSI III close-off
- 175 psig static pressure rating – water temperatures 35 to 150°F; decreasing to 125 psig at 281°F
- Fluid temperature rating – 35 to 281°F (2 to 138°C)
- Steam pressure rating 35 psig
- Packing – EPT ring packs, field replaceable
- Cast iron body
- Bronze trim – field replaceable
- Stainless steel stem

ACTUATOR

- Factory or field mounted
- 270 pounds closing/opening force
- Long-life, oil-immersed gear train
- Buffer spring protects actuator and linkage
- 24 VAC, 50/60 Hz, 20 VA
- Ambient temperature rating -40 to 125°F (-40 to 52°C)

				Non-Spring Return	
				Floating Without Switches	0 to 10 VDC Proportional
				M150AGA Actuator Y20EBD-3 Linkage	M150GGA Actuator Y20EBD-3 Linkage
				2-way Push-Down-To-Close	
VG2231TM	2-1/2"	51	46	VG2231TM+5UAGA	VG2231TM+5UGGA
VG2231UM	3"	83	32	VG2231UM+5UAGA	VG2231UM+5UGGA
VG2231VM	4"	150	18	VG2231VM+5UAGA	VG2231VM+5UGGA
				3-way Mixing	
VG2831TM	2-1/2"	54	28	VG2831TM+5UAGA	VG2831TM+5UGGA
VG2831UM	3"	80	19	VG2831UM+5UAGA	VG2831UM+5UGGA
VG2831VM	4"	157	11	VG2831VM+5UAGA	VG2831VM+5UGGA

VA-3100 Series Actuators



VA-3100 Series Actuators with VG2000 Series Valves.

VALVE

- Provides control of chilled water, hot water, or steam
- May be used with 50% glycol solution
- ANSI 125 flange – per ANSI B16.1
- ANSI III close-off
- 175 psig static pressure rating – water temperatures 35 to 150°F; decreasing to 125 psig at 281°F
- Fluid temperature rating – 35 to 281°F (2 to 138°C)
- Steam pressure rating 35 psig
- Packing – EPT ring packs, field replaceable
- Cast iron body
- Bronze trim – field replaceable
- Stainless steel stem

ACTUATOR

- Direct coupled – factory or field mounted
- 675 pounds closing/opening force provides high close-off
- Force limit switches ensure tight close-off in all applications
- 24 VAC, 60 Hz, 18 VA maximum
- NEMA 3/3R rated enclosure – IP 54
- Manual hand crank
- Ambient temperature rating 14 to 122°F (-10 to 50°C)

				Non-Spring Return		
				Floating Without Switches	Floating with Feedback 2 Switches	0 to 10 VDC Proportional 2 Switches
Valve	Size	Cv	Close-off	VA-3100-AGA	VA-3100-AGC	VA-3100-HGC
				2-way Push-Down-To-Close		
VG2231TM	2-1/2"	51	115	VG2231TM+300AGA	VG2231TM+300AGC	VG2231TM+300HGC
VG2231UM	3"	83	79	VG2231UM+301AGA	VG2231UM+301AGC	VG2231UM+301HGC
VG2231VM	4"	150	45	VG2231VM+301AGA	VG2231VM+301AGC	VG2231VM+301HGC
VG2231WN	5"	240	29	VG2231WN+302AGA	VG2231WN+302AGC	VG2231WN+302HGC
VG2231YN	6"	350	20	VG2231YN+302AGA	VG2231YN+302AGC	VG2231YN+302HGC
				3-way Mixing		
VG2831TM	2-1/2"	54	69	VG2831TM+300AGA	VG2831TM+300AGC	VG2831TM+300HGC
VG2831UM	3"	80	48	VG2831UM+301AGA	VG2831UM+301AGC	VG2831UM+301HGC
VG2831VM	4"	157	27	VG2831VM+301AGA	VG2831VM+301AGC	VG2831VM+301HGC
VG2831WN	5"	238	17	VG2831WN+302AGA	VG2831WN+302AGC	VG2831WN+302HGC
VG2831YN	6"	347	12	VG2831YN+302AGA	VG2831YN+302AGC	VG2831YN+302HGC

Ordering Guide

VA-6100 Series Actuators



VA-6100 Series Actuators with VG2000 Series Valves.

VALVE

- Provides control of chilled water, hot water, or steam
- May be used with 50% glycol solution
- ANSI 125 flange – per ANSI B16.1
- ANSI III close-off
- 175 psig static pressure rating – water temperatures 35 to 150°F; decreasing to 125 psig at 281°F
- Fluid temperature rating – 35 to 281°F (2 to 138°C)
- Steam pressure rating 35 psig
- Packing – EPT ring packs, field replaceable
- Cast iron body
- Bronze trim – field replaceable
- Stainless steel stem

ACTUATOR

- Direct coupled – factory or field mounted
- 1,350 pounds closing/opening force provides high close-off
- Force limit switches ensure tight close-off in all applications
- 24 VAC, 60 Hz, 42 VA maximum
- NEMA 4 rated enclosure – IP 65
- Manual hand wheel
- Ambient temperature rating -4 to 140°F (-20 to 60°C)

				Non-Spring Return	
				Floating with Feedback 2 Switches	0 to 10 VDC Proportional 2 Switches
Valve	Size	Cv	Close-off	VA-6100-AGC (4, 5, & 6")	VA-6100-HGC (4, 5, & 6")
				2-way Push-Down-To-Close	
VG2231VN	4"	150	89	VG2231VN+602AGC	VG2231VN+602HGC
VG2231WN	5"	240	57	VG2231WN+602AGC	VG2231WN+602HGC
VG2231YN	6"	350	40	VG2231YN+602AGC	VG2231YN+602HGC
				3-way Mixing	
VG2831VN	4"	157	54	VG2831VN+602AGC	VG2831VN+602HGC
VG2831WN	5"	238	34	VG2831WN+602AGC	VG2831WN+602HGC
VG2831YN	6"	347	24	VG2831YN+602AGC	VG2831YN+602HGC

Most popular models are shown. For a complete listing refer to Product/Technical Bulletin LIT-977133.

Sizing Water Valves

Two-Position Applications: The valve is normally sized to the pipe size.

Modulating Applications: A water valve will not gain control over a coil or heat exchanger until the pressure drop across the valve is at least equal to the pressure drop across the coil. For good valve authority in modulating control applications, it is normally best to size the valve to provide the required flow with a pressure drop of one to two times the pressure drop across the coil at the required flow.

Example: A coil requires 600 GPM to produce rated cooling output. At 600 GPM, the coil produces a pressure drop of 5 psig.

Solution: We need a valve that will flow 600 GPM with a pressure drop between 5 and 10 psig (one to two times the pressure drop across the coil). From the table below we find that a 5", 240 Cv valve will flow 600 GPM with a pressure drop between 6 and 7 psig. This valve should be selected for the application as the valve will provide the required flow with a pressure drop of one to two times the pressure drop across the coil.

Flow Rate in GPM (Gallons per Minute)

Pipe Size NPT	2-way					3-way Mixing				
	2-1/2"	3"	4"	5"	6"	2-1/2"	3"	4"	5"	6"
Cv	51	83	150	240	350	54	80	157	238	347
Pressure Drop										
1	51.0	83.0	150.0	240.0	350.0	54.0	80.0	157.0	238.0	347.0
2	72.1	117.4	212.1	339.4	495.0	76.4	113.1	222.0	336.6	490.7
3	88.3	143.8	259.8	415.7	606.2	93.5	138.6	271.9	412.2	601.0
4	102.0	166.0	300.0	480.0	700.0	108.0	160.0	314.0	476.0	694.0
5	114.0	185.6	335.4	536.7	782.6	120.7	178.9	351.1	532.2	775.9
6	124.9	203.3	367.4	587.9	857.3	132.3	196.0	384.6	583.0	850.0
7	134.9	219.6	396.9	635.0	926.0	142.9	211.7	415.4	629.7	918.1
8	144.2	234.8	424.3	678.8	989.9	152.7	226.3	444.1	673.2	981.5
9	153.0	249.0	450.0	720.0	1,050.0	162.0	240.0	471.0	714.0	1,041.0
10	161.3	262.5	474.3	758.9	1,106.8	170.8	253.0	496.5	752.6	1,097.3
11	169.1	275.3	497.5	796.0	1,160.8	179.1	265.3	520.7	789.4	1,150.9
12	176.7	287.5	519.6	831.4	1,212.4	187.1	277.1	543.9	824.5	1,202.0
13	183.9	299.3	540.8	865.3	1,261.9	194.7	288.4	566.1	858.1	1,251.1
14	190.8	310.6	561.2	898.0	1,309.6	202.0	299.3	587.4	890.5	1,298.4
15	197.5	321.5	580.9	929.5	1,355.5	209.1	309.8	608.1	921.8	1,343.9
16	204.0	332.0	600.0	960.0	1,400.0	216.0	320.0	628.0	952.0	1,388.0
17	210.3	342.2	618.5	989.5	1,443.1	222.6	329.8	647.3	981.3	1,430.7
18	216.4	352.1	636.4	1,018.2	1,484.9	229.1	339.4	666.1	1,009.7	1,472.2
19	222.3	361.8	653.8	1,046.1	1,525.6	235.4	348.7	684.3	1,037.4	1,512.5
20	228.1	371.2	670.8	1,073.3	1,565.2	241.5	357.8	702.1	1,064.4	1,551.8
21	233.7	380.4	687.4	1,099.8	1,603.9	247.5	366.6	719.5	1,090.7	1,590.2
22	239.2	389.3	703.6	1,125.7	1,641.6	253.3	375.2	736.4	1,116.3	1,627.6
23	244.6	398.1	719.4	1,151.0	1,678.5	259.0	383.7	752.9	1,141.4	1,664.2
24	249.8	406.6	734.8	1,175.8	1,714.6	264.5	391.9	769.1	1,166.0	1,699.9
25	255.0	415.0	750.0	1,200.0	1,750.0	270.0	400.0	785.0	1,190.0	1,735.0
26	260.0	423.2	764.9	1,223.8	1,784.7	275.3	407.9	800.5	1,213.6	1,769.4
27	265.0	431.3	779.4	1,247.1	1,818.7	280.6	415.7	815.8	1,236.7	1,803.1
28	269.9	439.2	793.7	1,270.0	1,852.0	285.7	423.3	830.8	1,259.4	1,836.2
29	274.6	447.0	807.8	1,292.4	1,884.8	290.8	430.8	845.5	1,281.7	1,868.7
30	279.3	454.6	821.6	1,314.5	1,917.0	295.8	438.2	859.9	1,303.6	1,900.6

Sizing Steam Valves

Two-Position Applications: The valve is normally sized to the pipe size.

Modulating Applications: Select the valve to meet the BtuH requirements of the coil for a given supply pressure. The table assumes an atmospheric return.

Example: A steam coil is rated to produce 3,000,000 BtuH. The steam supply pressure is 10 psig.

Solution: From the table below, a 3", 83 Cv valve will provide between 2,900,000 and 3,600,000 BtuH with an inlet pressure of 10 psig. This valve should be selected, as the requirements of the coil fall within the capabilities of the valve. If an exact match is not available, it is often possible to adjust the steam supply pressure by adjusting the pressure control on the boiler or adding a steam pressure regulator to reduce the pressure.

Notes: 1.) Minimum coil BtuH calculated assuming a pressure drop across the valve of 50% of supply pressure.
2.) Maximum coil BtuH calculated assuming a pressure drop across the valve of 80% of supply pressure.

Pipe Size NPT	2-1/2"	2-1/2"	3"	3"	4"	4"	5"	5"	6"	6"
Cv	51	51	83	83	150	150	240	240	350	350
Saturated Steam	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH	Minimum Coil BtuH	Maximum Coil BtuH
Steam Supply Pressure										
1	456,200	557,000	742,400	939,100	1,341,700	1,697,100	2,146,700	2,715,400	3,130,600	3,959,900
2	664,200	840,100	1,080,900	1,367,300	1,953,400	2,470,900	3,125,500	3,953,500	4,558,000	5,765,500
3	834,800	1,056,000	1,358,700	1,718,600	2,455,400	3,105,900	3,928,700	4,969,400	5,729,300	7,247,100
4	990,000	1,252,300	1,611,200	2,038,100	2,911,900	3,683,300	4,659,000	5,893,200	6,794,400	8,594,300
5	1,133,400	1,433,600	1,844,500	2,333,100	3,333,400	4,216,500	5,333,500	6,746,300	7,778,000	9,838,400
6	1,271,900	1,608,900	2,070,000	2,618,400	3,741,000	4,732,000	5,985,600	7,571,200	8,729,000	11,041,400
7	1,403,400	1,775,200	2,284,000	2,889,100	4,127,800	5,221,300	6,604,500	8,354,000	9,631,500	12,183,000
8	1,533,000	1,939,100	2,494,400	3,155,800	4,508,900	5,703,300	7,214,200	9,125,300	10,520,700	13,307,800
9	1,658,600	2,098,000	2,699,300	3,414,300	4,878,200	6,170,500	7,805,100	9,872,800	11,382,500	14,397,900
10	1,783,200	2,255,600	2,902,000	3,670,800	5,244,700	6,634,000	8,391,400	10,614,400	12,237,500	15,479,400
11	1,904,900	2,409,600	3,100,200	3,921,500	5,602,700	7,087,000	8,964,400	11,339,100	13,073,000	16,536,200
12	2,024,700	2,561,000	3,295,100	4,168,000	5,954,900	7,532,400	9,527,900	12,051,900	13,894,800	17,575,700
15	2,381,600	3,012,500	3,875,900	4,902,700	7,004,600	8,860,200	11,207,400	14,176,400	16,344,200	20,673,900
20	2,956,400	3,739,600	4,811,400	6,086,000	8,695,400	10,998,800	13,912,600	17,598,200	20,289,200	25,664,000
25	3,521,900	4,454,900	5,731,800	7,250,200	10,358,600	13,102,800	16,573,800	20,964,400	24,170,200	30,573,100
30	4,077,600	5,157,800	6,636,100	8,394,000	11,992,900	15,170,000	19,188,600	24,271,900	27,983,400	35,396,600
35	4,623,800	5,848,600	7,524,900	9,518,400	13,599,300	17,201,900	21,758,900	27,523,000	31,731,700	40,137,800

Field-Added Accessories and Replacement Parts

Accessories (M150 Series Actuators Only)

Code Number

- Auxiliary Switch Kit – One SPDT Switch S91DJ-1
- Auxiliary Switch Kit – Two SPDT Switches S91EJ-1
- Auxiliary Potentiometer – 1000 Ohm, 1/3 Watt S91PT-1
- Weather Resistant Cover CVR83A-600R
- Cover Mounted Transformer – 120 VAC, 40 VA Y68AA-1
- Cover Mounted Transformer – 240 VAC, 40 VA Y68DA-1
- Cover Mounted Transformer – 24 VAC, 40 VA (used when an isolation transformer is needed) Y68HA-1

Notes: 1.) VG2431 and VG2831 valves require 2 gaskets per valve.

2.) Reconditioning Kits include all parts needed to completely rebuild a valve with exception of the valve body.

			Replacement Parts			
Code Number	Size	Stem Diameter / Actuator	Stem Packing Kits	Packing Nut Kits	Gasket Kits (Multiple Gaskets per Kit)	Reconditioning Kits
2-way Push-Down-To-Close						
VG2231TM	2-1/2"	3/8", VA-3100 Actuators	V-9999-613	V-4510-6019	V-9999-6050	V-5252-6001
VG2231UM	3"	3/8", VA-3100 Actuators	V-9999-613	V-4510-6019	V-9999-6051	V-5252-6003
VG2231VM	4"	3/8", VA-3100 Actuators	V-9999-613	V-4510-6019	V-9999-6052	V-5252-6005
VG2231VN	4"	1/2", VA-6100 Actuators	V-5252-668	V-5252-609	V-9999-6052	V-5252-6006
VG2231WN	5"	1/2", VA-6100 Actuators	V-5252-668	V-5252-609	V-9999-6053	V-5252-6007
VG2231YN	6"	1/2", VA-6100 Actuators	V-5252-668	V-5252-609	V-9999-6054	V-5252-6008
2-way Push-Down-To-Open						
VG2431TM	2-1/2"	3/8", VA-3100 Actuators	V-9999-613	V-4510-6019	V-9999-6050	V-5462-6001
VG2431UM	3"	3/8", VA-3100 Actuators	V-9999-613	V-4510-6019	V-9999-6051	V-5462-6002
VG2431VM	4"	3/8", VA-3100 Actuators	V-9999-613	V-4510-6019	V-9999-6052	V-5462-6004
VG2431VN	4"	1/2", VA-6100 Actuators	V-5252-668	V-5252-609	V-9999-6052	V-5462-6005
VG2431WN	5"	1/2", VA-6100 Actuators	V-5252-668	V-5252-609	V-9999-6053	V-5462-6006
VG2431YN	6"	1/2", VA-6100 Actuators	V-5252-668	V-5252-609	V-9999-6054	V-5462-6007
3-way Mixing						
VG2831TM	2-1/2"	3/8", VA-3100 Actuators	V-9999-613	V-4510-6019	V-9999-6050	V-5842-6001
VG8431UM	3"	3/8", VA-3100 Actuators	V-9999-613	V-4510-6019	V-9999-6051	V-5842-6002
VG2831VM	4"	3/8", VA-3100 Actuators	V-9999-613	V-4510-6019	V-9999-6052	V-5842-6004
VG2831VN	4"	1/2", VA-6100 Actuators	V-5252-668	V-5252-609	V-9999-6052	V-5842-6005
VG2831WN	5"	1/2", VA-6100 Actuators	V-5252-668	V-5252-609	V-9999-6053	V-5842-6006
VG2431YN	6"	1/2", VA-6100 Actuators	V-5252-668	V-5252-609	V-9999-6054	V-5842-6007