

## 599 Series Zone Valves 2-Way, 3-Way Zone Valve Electric and Thermic Actuators



### Description

The 599 Series Zone Valves work with any SFA/P Series or SSA/P Series electric actuator, or with the STAP Series thermic actuator (See Table 5). The actuators accept one of either 24 Vac or 120 Vac power supplies signal to provide two-position, three-position or 0 to 10 Vdc control. Typical applications include hot or chilled water for zones with radiators; floor heating via manifolds; fan coil units; cooling ceilings (Zone Valves); wall-mounted boilers (zone valves); and VAV applications.

### Features

Zone valves have a direct-coupled universal bonnet. SF and SSA/P actuators are UL listed. Actuators have a direct-coupled installation; are hand-tightened without tools, provide manual override and visual position indication.

### Product Numbers

Use the product numbers in the tables to order the valve and the actuator assembled together. The product number consists of a 3-digit prefix code, a hyphen, and a 5-digit suffix code. The prefix specifies an actuator. The suffix specifies the valve body.

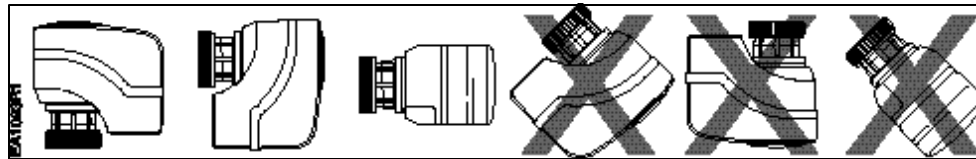
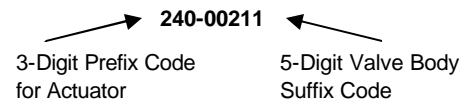


Figure 1. Preferred Mounting Position for the SFA/P Series or SSA/P Series Electric Actuator.

Table 1. Product Numbers: Electric Actuator/2-Way Zone Valve Assemblies.

Connection	Line Size		Flow Rate		Valve Body	120 Vac		24 Vac				
						Fail Safe (SR)		Fail Safe (SR)		Fail-in-Place		
	2-Position		2-Position			3-Position	0 to 10 Vdc Modulating					
	Normally Closed	Normally Open	Normally Closed	Normally Open		Normally Closed	Normally Closed	Normally Open				
	SFA11U	SFP11U	SFA71U	SFP71U		SSA81U	SSA61U	SSP61U				
Actuator Code 240	Actuator Code 241	Actuator Code 242	Actuator Code 243	Actuator Code 244	Actuator Code 245	Actuator Code 248						
Inch	Mm	Cv	Kvs									
NPT	.50	15	1.0	.85	599-00210	240-00210	241-00210	242-00210	243-00210	244-00210	245-00210	248-00210
	.50	15	2.5	2.0	599-00211	240-00211	241-00211	242-00211	243-00211	244-00211	245-00211	248-00211
	.50	15	4.0	3.4	599-00214	240-00214	241-00214	242-00214	243-00214	244-00214	245-00214	248-00214
	.75	20	4.1	3.5	599-00212	240-00212	241-00212	242-00212	243-00212	244-00212	245-00212	248-00212
	1.00	25	7.0	6.0	599-00213	240-00213	241-00213	242-00213	243-00213	244-00213	245-00213	248-00213
Sweat	.50	15	1.0	.85	599-00510	240-00510	241-00510	242-00510	243-00510	244-00510	245-00510	248-00510
	.50	15	2.5	2.0	599-00511	240-00511	241-00511	242-00511	243-00511	244-00511	245-00511	248-00511
	.50	15	4.0	3.4	599-00514	240-00514	241-00514	242-00514	243-00514	244-00514	245-00514	248-00514
	.75	20	4.1	3.5	599-00512	240-00512	241-00512	242-00512	243-00512	244-00512	245-00512	248-00512
	1.00	25	7.0	6.0	599-00513	240-00513	241-00513	242-00513	243-00513	244-00513	245-00513	248-00513

NOTE: For more information, see *Technical Instructions* (155-320P25, 155-321P25 and 155-710).

**Table 2. Product Numbers: Electric Actuator/3-Way Zone Valve Assemblies.**

Connection	Line Size		Flow Rate AB→A		Valve Body	120 Vac		24 Vac					
						2-Position		2-Position		3-Position	0 to 10 Vdc Modulating		
	Inch	Mm	Cv	Kvs		Fail AB? B	Fail AB? A	Fail AB? B	Fail AB? A	Fail-In-Place	Fail-In Place		
						SFA11U	SFP11U	SFA71U	SFP71U		SSA81U	SSA61U	SSP61U
Actuator Code 240		Actuator Code 241		Actuator Code 242		Actuator Code 243		Actuator Code 244		Actuator Code 245		Actuator Code 248	
NPT	.50	15	1.0	.85	599-00230	240-00230	241-00230	242-00230	243-00230	244-00230	245-00230	248-00230	
	.50	15	2.5	2.0	599-00231	240-00231	241-00231	242-00231	243-00231	244-00231	245-00231	248-00231	
	.50	15	4.0	3.4	599-00234	240-00234	241-00234	242-00234	243-00234	244-00234	245-00234	248-00234	
	.75	20	4.1	3.5	599-00232	240-00232	241-00232	242-00232	243-00232	244-00232	245-00232	248-00232	
	1.00	25	7.0	6.0	599-00233	240-00233	241-00233	242-00233	243-00233	244-00233	245-00233	248-00233	
Sweat	.50	15	1.0	.85	599-00530	240-00530	241-00530	242-00530	243-00530	244-00530	245-00530	248-00530	
	.50	15	2.5	2.0	599-00531	240-00531	241-00531	242-00531	243-00531	244-00531	245-00531	248-00531	
	.50	15	4.0	3.4	599-00534	240-00534	241-00534	242-00534	243-00534	244-00534	245-00534	248-00534	
	.75	20	4.1	3.5	599-00532	240-00532	241-00532	242-00532	243-00532	244-00532	245-00532	248-00532	
	1.00	25	7.0	6.0	599-00533	240-00533	241-00533	242-00533	243-00533	244-00533	245-00533	248-00533	

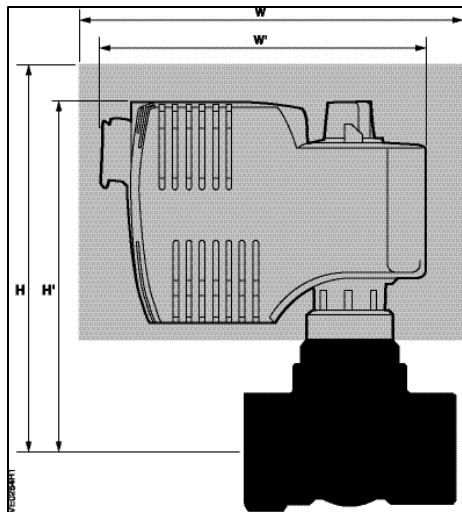
**NOTE:** For more information, see *Technical Instructions* (155-320P25, 155-321P25 and 155-710).

**Valve Specifications**

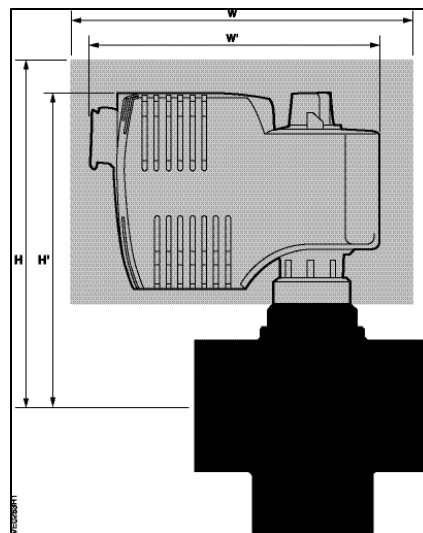
- Line size: 1/2-inch to 1-inch (15 mm to 25 mm)
- Action:
  - 2-way NO/NC determined by actuator
  - 3-way diverting (mixing, limited application)
- Valve body rating: ANSI Class 125
- Leakage rate: ANSI Class III
- Close off ratings: According to ANSI/FCI 70-2
- Medium temperature range: 34°F to 230°F (1°C to 110°C)
- Flow characteristic: Linear

**Electric Actuator SFA/P Series Specifications**

- Control Signal: Two-position
- Operating voltage: 24 Vac ±20% 120 Vac ±20%
- Power Consumption: 9.8 VA 9.8 VA
- Frequency: 50/60 Hz
- Agency certification: UL listed to UL873  
 cUL certified to Canadian Standard C22.2 No. 24-93
- Mounting location: NEMA 1 (interior only)
- Weight: 1.18 lb (0.54 kg)
- Dimensions inches (mm): 3.4 (85) H x 4.4 (111) W x 2.3 (58) D



**Figure 2. SFA/P Electric Actuator with 2-Way Valve: Assembly Service Envelope.**



**Figure 3. SFA/P Electric Actuator with 3-Way Valve: Assembly Service Envelope.**

**Table 3. SFA/P Electric Actuator/Valve Assembly Dimensions and Recommended Service Envelope in Inches (mm).**

2-Position Actuator	Actuator Prefix Codes	Valve Line Size	Valve Centerline to Top of Actuator H1		Service Height H		Width or Diameter of Actuator W1		Assembly Service Width W	
			2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way
Fail-Up/ Fail-Down	240	.50 (15)	4.38 (112)	4.38 (112)	12.38 (315)	12.38 (315)	4.38 (112)	4.38 (112)	12.38 (315)	12.38 (315)
	241	.75 (20)	4.38 (112)	4.38 (112)	12.38 (315)	12.38 (315)	4.38 (112)	4.38 (112)	12.38 (315)	12.38 (315)
	242	.75 (20)	4.38 (112)	4.38 (112)	12.38 (315)	12.38 (315)	4.38 (112)	4.38 (112)	12.38 (315)	12.38 (315)
	243	1.00 (25)	4.38 (112)	4.38 (112)	12.38 (315)	12.38 (315)	4.38 (112)	4.38 (112)	12.38 (315)	12.38 (315)

**Electric Actuator SSA/P Series Specifications**

Control Signal: SSA81U 3-Position      SSA/P61U 0 to 10 Vdc  
 Operating voltage: 24 Vac ±20%      24 Vac ±20%  
 Power Consumption: 0.8 VA      2.5 VA

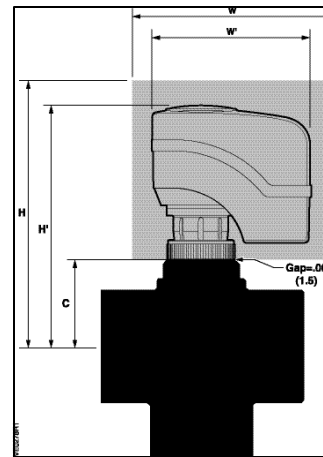
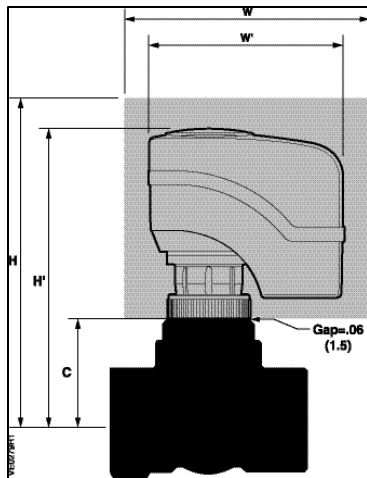
Agency Certification: UL873 Conforms to CE requirements, cUL conforms to Canadian Standard 22.2 No. 24-93

Mounting location: NEMA 1 (interior only)

Weight: 9 oz (0.25 kg)

Dimensions inches (mm):  
 3.26 H x 3.26 W x 1.9 D (82x83x48)

Frequency: 50/60 Hz



**Figure 4. Electric Actuator SSA/P Series with 2-Way Valve: Assembly Service Envelope.**

**Figure 5. Electric Actuator SSA/P Series with 3-Way Valve: Assembly Service Envelope.**

**Table 4. SSA/P Electric Actuator/Valve Assembly Dimensions and Recommended Service Envelope in Inches (mm).**

Actuator	Actuator Prefix Codes	Valve Line Size	Valve Centerline to Top of Actuator H1		Service Height H		Valve Centerline to Actuator Coupling C		Width or Diameter of Actuator W1		Service Width W	
			2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way
Fail-In-Place	244 245 248	.50 (15)	4.26 (108)	4.26 (108)	12.26 (311)	12.26 (311)	1.00 (25)	1.00 (25)	3.26 (83)	3.26 (83)	11.26 (286)	11.26 (286)
		.75 (20)	4.26 (108)	4.26 (108)	12.26 (311)	12.26 (311)	1.00 (25)	1.00 (25)	3.26 (83)	3.26 (83)	11.26 (286)	11.26 (286)
		1.00 (25)	4.26 (108)	4.26 (108)	12.26 (311)	12.26 (311)	1.00 (25)	1.00 (25)	3.26 (83)	3.26 (83)	11.26 (286)	11.26 (286)

## Thermic Actuators: STA/P71 Specifications

Control Signal: Two-Position  
 Operating voltage: 24 Vac or 24 Vdc  $\pm$ 20%  
 Power Consumption:  
     Normal Operation: 2.5W  
     Power on: 6 VA  
 Frequency: 50/60 Hz  
 Agency certification: Conforms to CE requirements  
 Mounting: NEMA 1 (interior only)  
 Weight: 0.33 lb (0.15 kg)  
 Dimensions Inches (mm): 2.44 H x 1.71 W (62 x 43.5)



### WARNING:

Thermic actuators must be installed from an upright to a horizontal position only (the range marked in black on the diagram, see Figure 6).

Do not mount the actuator below horizontal.

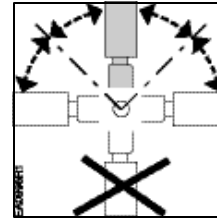


Figure 6. Acceptable Mounting Positions.

Table 5. Product Numbers: STA/P71 Thermic Actuator/2-way Valve Assembly

Valve Body	Connection	Line Size		Flow Rate		Valve Body	24 Vac			
							2-Position			
		Inch	Mm	Cv	Kvs		Normally Closed	Normally Open	Fail AB? B	Fail AB? A
							STA71	STP71	STA71	STP71
				Actuator Code 246	Actuator Code 247	Actuator Code 246	Actuator Code 247			
2-way	NPT	.50	15	1.0	.85	599-00210	246-00210	247-00211	—	—
		.50	15	2.5	2.0	599-00211	246-00211	247-00211	—	—
		.50	15	4.0	3.4	599-00214	246-00214	247-00214	—	—
		.75	20	4.1	3.5	599-00212	246-00212	247-00212	—	—
		1.00	25	7.0	6.0	599-00213	246-00213	247-00213	—	—
	Sweat	.50	15	1.0	.85	599-00510	246-00510	247-00510	—	—
		.50	15	2.5	2.0	599-00511	246-00511	247-00511	—	—
		.50	15	4.0	3.4	599-00514	246-00514	247-00514	—	—
		.75	20	4.1	3.5	599-00512	246-00512	247-00512	—	—
		1.00	25	7.0	6.0	599-00513	246-00513	247-00513	—	—
3-Way	NPT	.50	15	1.0	.85	599-00230	—	—	246-00230	247-00230
		.50	15	2.5	2.0	599-00231	—	—	246-00231	247-00231
		.50	15	4.0	3.4	599-00234	—	—	246-00234	247-00234
		.75	20	4.1	3.5	599-00232	—	—	246-00232	247-00232
		1.00	25	7.0	6.0	599-00233	—	—	246-00233	247-00233
	Sweat	.50	25	1.0	.85	599-00530	—	—	246-00530	247-00530
		.50	15	2.5	2.0	599-00531	—	—	246-00531	247-00531
		.50	15	4.0	3.4	599-00534	—	—	246-00534	247-00534
		.75	20	4.1	3.5	599-00532	—	—	246-00532	247-00532
		1.00	25	7.0	6.0	599-00533	—	—	246-00533	247-00533

## Dimensions

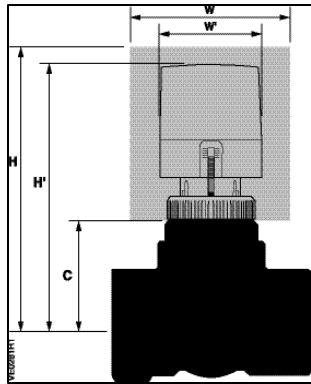


Figure 7. Thermic Actuator: 2-Way Valve Assembly Service Envelope.

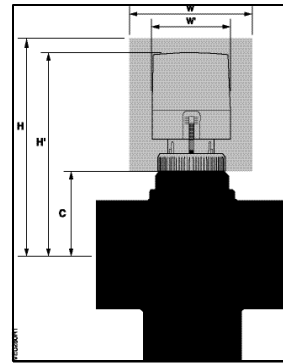


Figure 8. Thermic Actuator: 3-Way Valve Assembly Service Envelope.

**Table 6.**  
**Thermic Actuator STA/P Series Dimensions and Recommended Service Envelope in Inches (mm).**

Valve Line Size Inches (mm)	Valve Centerline to Top of Actuator H <sup>1</sup>		Service Height H		Valve Centerline to Actuator Coupling C		Width or Diameter of Actuator W <sup>1</sup>		Service Width W	
	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way
.50 (15)	3.44 (87)	3.44 (87)	7.44 (189)	7.44 (189)	1.00 (25)	1.00 (25)	1.71 (43.5)	1.71 (43.5)	9.86 (251)	9.86 (251)
.75 (20)	3.44 (87)	3.44 (87)	7.44 (189)	7.44 (189)	1.00 (25)	1.00 (25)	1.71 (43.5)	1.71 (43.5)	9.86 (251)	9.86 (251)
1.00 (25)	3.44 (87)	3.44 (87)	7.44 (189)	7.44 (189)	1.00 (25)	1.00 (25)	1.71 (43.5)	1.71 (43.5)	9.86 (251)	9.86 (251)

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