SIEMENS

Technical Instructions
Document No. 155-703P25
VF 599-9
September 4, 2025

599 Series
2-Way Ball Valves





Description

The 599 Series 2-way Ball Valves are coupled with Siemens damper actuators to provide equal percentage flow control. The ball valves are 1/4-turn rotary control valves and are available in 1/2-inch to 2-inch line sizes.

Features

- ANSI 250 valve body rating.
- 200 psi close-off with ANSI Class IV leakage for all line sizes and actuators.
- Available with chrome-plated brass ball and brass stem or 316 stainless steel ball and stem.
- Blow-out proof stem withstands high pressure.
- Universal mounting plate.
- Actuator and plate can be rotated (90-degree increments).
- Standoffs provide a thermal barrier between the actuator and the mounting plate.
- Operating handle for manual operation.
- All ball valve actuators include integral conduit adapters.

Application

Ball valves can control hot or chilled water and up to 50% water-glycol solution in air handling units, convectors, fan coil units, unit conditioners, radiators, and reheat coils.

WARNING:	⚠	Personal injury or loss of life may occur if you do not perform a procedure as specified.
CAUTION:	⚠	Equipment damage may occur if you do not perform a procedure as specified.

Product Numbers

See Table 2 through Table 12.

Accessories/Kits

599-10078	Ball Valve Bracket Kit (includes bracket, mounting screws, shaft and handle)
599-10080	Ball Valve Weather Shield (provides NEMA 3R protection)

Specifications

Material	Body	Brass: ASTM B283, C37700
	Ball	Chrome-plated brass or 316 stainless steel
	Ball seals	Glass filled PTFE with EPDM O-rings
	Flow characterizer	Glass filled PTFE
	End connections	Internal NPT
	Stem	Brass or 316 stainless steel
	Stem seals	EPDM O-rings
	Maximum operating differential pressure	60 psi (414 kPa)
Operating	Valve body rating	ANSI 250/600 WOG
	Media temperature	0°F to 250°F (-18°C to 121°C)
	Controlled medium	Water, water-glycol solutions to 50%
	Angle of rotation	0° to 90°
	Close-off rating	200 psi (ANSI Class IV)
Miscellaneous	Canadian Registration Number	OC8213.5ADD4
	Mounting location	NEMA 1 (interior only) NEMA 3R (with weather shield)
	Dimensions, service envelope, weight	See Figure 6 and Table 14.

Ordering a Valve/Actuator Assembly

To order a complete valve plus actuator assembly from the factory, combine an actuator prefix code (see Table 1) with the suffix of the valve assembly product number.

Table 1. Actuator Prefix Codes.

Actuator Prefix Code	Siemens Damper Actuator [1)]	Control
171A	GDE131.1P	Floating, fail-in-place
171B	GLB131.1P	Floating, fail-in-place
171C	GDE161.1P	0 to 10 Vdc, fail-in-place
171D	GLB161.1P	0 to 10 Vdc, fail-in-place
171E	GMA121.1P	2-position, fail-safe, normally open
171F	GMA131.1P	Floating, fail-safe, normally open
171G	GMA161.1P	0 to 10 Vdc, fail-safe, normally open
171H	GQD121.1P	2-position, fail-safe, normally open
171J	GQD131.1P	Floating, fail-safe, normally open
171K	GQD151.1P	2 to 10 Vdc fail-safe, normally open
171L	GQD221.1U	120V, 2-position, fail-safe, normally open
171M	GMA221.1U	120V, 2-position, fail-safe, normally open
171N	GQD126.1P	2-position, fail-safe, normally open, dual auxiliary switches
171P	GMA126.1P	2-position, fail-safe, normally open, dual auxiliary switches
172E	GMA121.1P	2-position, fail-safe, normally closed
172F	GMA131.1P	Floating, fail-safe, normally closed
172G	GMA161.1P	0 to 10 Vdc, fail-safe, normally closed
172H	GQD121.1P	2-position, fail-safe, normally closed
172J	GQD131.1P	Floating, fail-safe, normally closed
172K	GQD151.1P	2 to 10 Vdc fail-safe, normally closed
172L	GQD221.1U	120V, 2-position, fail-safe, normally closed
172M	GMA221.1U	120V, 2-position, fail-safe, normally closed
172N	GQD126.1P	2-position, fail-safe, normally closed, dual auxiliary switches

Actuator Prefix Code	Siemens Damper Actuator[1)]	Control
172P	GMA126.1P	2-position, fail-safe, normally closed, dual auxiliary switches

1) When ordered as an assembly, the actuator is provided with 3-foot (.9 m) wires.

See TB253 *599 Series Ball Valve and Actuator Assemblies Selection Technical Bulletin* (155-704P25) for complete selection procedures and ordering numbers for both two-way and three-way ball valve assemblies.

Individual two-way ball valves can be ordered using the product numbers in Table 2 through Table 6 for valves with a chrome-plated ball and brass stem or Table 7 through Table 11 for valves with stainless steel ball and stem.

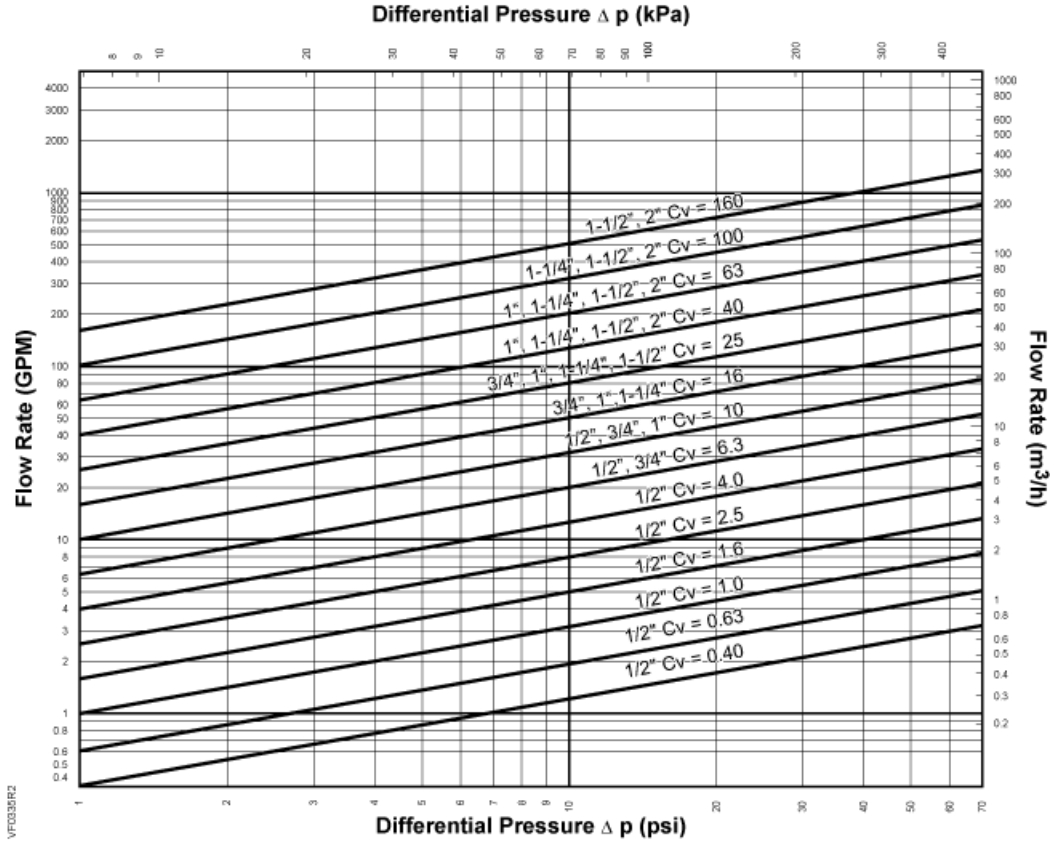


Figure 1.

Table 2. Fail-In-Place Assemblies: Chrome-Plated Ball with Brass Stem (1/2-inch and 3/4-inch).

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-Off ΔP in psi (kPa)	Fail-in-Place	
					
				Floating	0 to 10 Vdc
				GDE 131.1P	GDE 161.1P
				3-foot (.9m) Wires	
				Actuator Prefix Code	
				171A	171C
599-10300	1/2 (15)	0.4 (0.34)	200 (1379)	171A-10300	171C-10300
599-10301		0.63 (0.54)		171A-10301	171C-10301
599-10302		1.0 (0.9)		171A-10302	171C-10302
599-10303		1.6 (1.4)		171A-10303	171C-10303
599-10304		2.5 (2.2)		171A-10304	171C-10304
599-10305		4.0 (3.4)		171A-10305	171C-10305
599-10306		6.3 (5.4)		171A-10306	171C-10306
599-10307[1)]		10 (8.6)		171A-10307[1)]	171C-10307[1)]
599-10308	3/4 (20)	6.3 (5.4)		171A-10308	171C-10308
599-10309		10 (8.6)		171A-10309	171C-10309
599-10310		16 (14)		171A-10310	171C-10310
599-10311[1)]		25 (22)		171A-10311[1)]	171C-10311[1)]

1) Denotes a full-port valve without flow characterizers insert.

Table 3. Fail-In-Place Assemblies: Chrome-Plated Ball with Brass Stem (1-Inch to 2-Inch).

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-Off ΔP in psi (kPa)	Fail-in-Place			
							
				Floating		0 to 10 Vdc	
				GDE 131.1P	GLB 131.1P	GDE 161.1P	GLB 161.1P
				3-foot (.9m) Wires			
				Actuator Prefix Code			
				171A	171B	171C	171D
599-10312	1 (25)	10 (9.0)	200 (1379)	171A-10312		171C-10312	
599-10313		16 (14)		171A-10313		171C-10313	
599-10314		25 (22)		171A-10314		171C-10314	
599-10315		40 (34)		171A-10315		171C-10315	
599-10316[1)]		63 (54)		171A-10316[1)]		171C-10316[1)]	
599-10317	1 1/4 (32)	16 (14)		171A-10317		171C-10317	
599-10318		25 (22)		171A-10318		171C-10318	
599-10319		40 (34)		171A-10319		171C-10319	
599-10320		63 (54)		171A-10320		171C-10320	
599-10321[1)]		100 (90)		171A-10321[1)]		171C-10321[1)]	
599-10322	1 1/2 (40)	25 (22)			171B-10322		171D-10322
599-10323		40 (34)			171B-10323		171D-10323
599-10324[1)]		63 (54)			171B-10324[1)]		171D-10324[1)]
599-10325		100 (90)			171B-10325		171D-10325
599-10326[1)]		160 (140)			171B-10326[1)]		171D-10326[1)]
599-10327	2 (50)	40 (34)			171B-10327		171D-10327
599-10328		63 (54)			171B-10328		171D-10328
599-10329[1)]		100 (90)			171B-10329[1)]		171D-10329[1)]
599-10330		160 (140)			171B-10330		171D-10330

1) Denotes a full-port valve without flow characterizers insert.

Table 4. Fail-Safe Assemblies: Chrome-Plated Ball with Brass Stem (1/2-inch and 3/4-inch).

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail-Safe					
									
				2-Position		Floating		2 to 10 Vdc	
				GQD121.1P		GQD131.1P		GQD151.1P	
				N.O.	N.C.	N.O.	N.C.	N.O.	N.C.
				Actuator Prefix Code					
				171H	172H	171J	172J	171K	172K
599-10300	1/2 (15)	0.4 (0.34)	200 (1379)	171H-10300	172H-10300	171J-10300	172J-10300	171K-10300	172K-10300
599-10301		0.63 (0.54)		171H-10301	172H-10301	171J-10301	172J-10301	171K-10301	172K-10301
599-10302		1.0 (0.9)		171H-10302	172H-10302	171J-10302	172J-10302	171K-10302	172K-10302
599-10303		1.6 (1.4)		171H-10303	172H-10303	171J-10303	172J-10303	171K-10303	172K-10303
599-10304		2.5 (2.2)		171H-10304	172H-10304	171J-10304	172J-10304	171K-10304	172K-10304
599-10305		4.0 (3.4)		171H-10305	172H-10305	171J-10305	172J-10305	171K-10305	172K-10305
599-10306		6.3 (5.4)		171H-10306	172H-10306	171J-10306	172J-10306	171K-10306	172K-10306
599-10307[1)]		10 (8.6)		171H-10307[1)]	172H-10307[1)]	171J-10307[1)]	172J-10307[1)]	171K-10307[1)]	172K-10307[1)]
599-10308	3/4 (20)	6.3 (5.4)		171H-10308	172H-10308	171J-10308	172J-10308	171K-10308	172K-10308
599-10309		10 (8.6)		171H-10309	172H-10309	171J-10309	172J-10309	171K-10309	172K-10309
599-10310		16 (14)		171H-10310	172H-10310	171J-10310	172J-10310	171K-10310	172K-10310
599-10311[1)]		25 (22)		171H-10311[1)]	172H-10311[1)]	171J-10311[1)]	172J-10311[1)]	171K-10311[1)]	172K-10311[1)]

1) Denotes a full-port valve without flow characterizer insert.

Table 5. Fail-Safe Assemblies: Chrome-Plated Ball with Brass Stem (1-inch to 2-inch).

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail-Safe					
									
				2-Position		Floating		0 to 10 Vdc	
				GMA121.1P		GMA131.1P		GMA161.1P	
				N.O.	N.C.	N.O.	N.C.	N.O.	N.C.
				Actuator Prefix Code					
				171E	172E	171F	172F	171G	172G
599-10312	1 (25)	10 (9.0)	200 (1379)	171E-10312	172E-10312	171F-10312	172F-10312	171G-10312	172G-10312
599-10313		16 (14)		171E-10313	172E-10313	171F-10313	172F-10313	171G-10313	172G-10313
599-10314		25 (22)		171E-10314	172E-10314	171F-10314	172F-10314	171G-10314	172G-10314
599-10315		40 (34)		171E-10315	172E-10315	171F-10315	172F-10315	171G-10315	172G-10315
599-10316[1)]		63 (54)		171E-10316[1)]	172E-10316[1)]	171F-10316[1)]	172F-10316[1)]	171G-10316[1)]	172G-10316[1)]
599-10317	1-1/4 (32)	16 (14)		171E-10317	172E-10317	171F-10317	172F-10317	171G-10317	172G-10317
599-10318		25 (22)		171E-10318	172E-10318	171F-10318	172F-10318	171G-10318	172G-10318
599-10319		40 (34)		171E-10319	172E-10319	171F-10319	172F-10319	171G-10319	172G-10319
599-10320		63 (54)		171E-10320	172E-10320	171F-10320	172F-10320	171G-10320	172G-10320
599-10321[1)]		100 (90)		171E-10321[1)]	172E-10321[1)]	171F-10321[1)]	172F-10321[1)]	171G-10321[1)]	172G-10321[1)]
599-10322	1-1/2 (40)	25 (22)		171E-10322	172E-10322	171F-10322	172F-10322	171G-10322	172G-10322
599-10323		40 (34)		171E-10323	172E-10323	171F-10323	172F-10323	171G-10323	172G-10323
599-10324[1)]		63 (54)		171E-10324[1)]	172E-10324[1)]	171F-10324[1)]	172F-10324[1)]	171G-10324[1)]	172G-10324[1)]
599-10325		100 (90)		171E-10325	172E-10325	171F-10325	172F-10325	171G-10325	172G-10325
599-10326[1)]		160 (140)		171E-10326[1)]	172E-10326[1)]	171F-10326[1)]	172F-10326[1)]	171G-10326[1)]	172G-10326[1)]
599-10327	2 (50)	40 (34)		171E-10327	172E-10327	171F-10327	172F-10327	171G-10327	172G-10327
599-10328		63 (54)		171E-10328	172E-10328	171F-10328	172F-10328	171G-10328	172G-10328
599-10329[1)]		100 (90)		171E-10329[1)]	172E-10329[1)]	171F-10329[1)]	172F-10329[1)]	171G-10329[1)]	172G-10329[1)]
599-10330		160 (140)		171E-10330	172E-10330	171F-10330	172F-10330	171G-10330	172G-10330

1) Denotes a full-port valve without flow characterizer insert.

Table 6. Fail-Safe Assemblies: Full-Port, Chrome-Plated Ball and Brass Stem, 120V.

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail-Safe, 120V			
							
				2-Position			
				GQD221.1U		GMA221.1U	
				N.O.	N.C.	N.O.	N.C.
				Actuator Prefix Code			
				171L	172L	171M	172M
599-10307[1)]	1/2 (15)	10 (9)	200 (1379)	171L-10307[1)]	172L-10307[1)]	—	—
599-10311[1)]	3/4 (20)	25 (22)		171L-10311[1)]	172L-10311[1)]	—	—
599-10316[1)]	1 (25)	63 (54)		—	—	171M-10316[1)]	172M-10316[1)]
599-10321[1)]	1-1/4 (32)	100 (90)		—	—	171M-10321[1)]	172M-10321[1)]
599-10326[1)]	1-1/2 (40)	160 (140)		—	—	171M-10326[1)]	172M-10326[1)]
599-10330	2 (50)			—	—	171M-10330	172M-10330

1) Denotes a full-port valve without flow characterizers insert.

Table 7. Fail-In-Place Assemblies: Stainless Steel Ball and Stem (1/2-Inch and 3/4-Inch).

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-Off ΔP in psi (kPa)	Fail-in-Place	
					
				Floating	0 to 10 Vdc
				GDE 131.1P	GDE 161.1P
				3-foot (.9m) Wires	3-foot (.9m) Wires
				Actuator Prefix Code	
				171A	171C
599-10300S	1/2 (15)	0.4 (0.34)	200 (1379)	171A-10300S	171C-10300S
599-10301S		0.63 (0.54)		171A-10301S	171C-10301S
599-10302S		1.0 (0.9)		171A-10302S	171C-10302S
599-10303S		1.6 (1.4)		171A-10303S	171C-10303S
599-10304S		2.5 (2.2)		171A-10304S	171C-10304S
599-10305S		4.0 (3.4)		171A-10305S	171C-10305S
599-10306S		6.3 (5.4)		171A-10306S	171C-10306S
599-10307S[1)]		10 (8.6)		171A-10307S[1)]	171C-10307S[1)]
599-10308S	3/4 (20)	6.3 (5.4)		171A-10308S	171C-10308S
599-10309S		10 (8.6)		171A-10309S	171C-10309S
599-10310S		16 (14)		171A-10310S	171C-10310S
599-10311S[1)]		25 (22)		171A-10311S[1)]	171C-10311S[1)]

1) Denotes a full-port valve without flow characterizer insert.

Table 8. Fail-In-Place Assemblies: Stainless Steel Ball and Stem (1-inch to 2-inch).

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-Off ΔP in psi (kPa)	Fail-in-Place			
							
				Floating		0 to 10 Vdc	
				GDE 131.1P	GLB 131.1P	GDE 161.1P	GLB 161.1P
				3-foot (.9m) Wires		3-foot (.9m) Wires	
				Actuator Prefix Code			
				171A	171B	171C	171D
599-10312S	1 (25)	10 (9.0)	200 (1379)	171A-10312S		171C-10312S	
599-10313S		16 (14)		171A-10313S		171C-10313S	
599-10314S		25 (22)		171A-10314S		171C-10314S	
599-10315S		40 (34)		171A-10315S		171C-10315S	
599-10316S[1)]		63 (54)		171A-10316S[1)]		171C-10316S[1)]	
599-10317S	1-1/4 (32)	16 (14)		171A-10317S		171C-10317S	
599-10318S		25 (22)		171A-10318S		171C-10318S	
599-10319S		40 (34)		171A-10319S		171C-10319S	
599-10320S		63 (54)		171A-10320S		171C-10320S	
599-10321S[1)]		100 (90)		171A-10321S[1)]		171C-10321S[1)]	
599-10322S	1-1/2 (40)	25 (22)			171B-10322S		171D-10322S
599-10323S		40 (34)			171B-10323S		171D-10323S
599-10324S[1)]		63 (54)			171B-10324S[1)]		171D-10324S[1)]
599-10325S		100 (90)			171B-10325S		171D-10325S
599-10326S[1)]		160 (140)			171B-10326S[1)]		171D-10326S[1)]
599-10327S	2 (50)	40 (34)			171B-10327S		171D-10327S
599-10328S		63 (54)			171B-10328S		171D-10328S
599-10329S[1)]		100 (90)			171B-10329S[1)]		171D-10329S[1)]
599-10330S		160 (140)			171B-10330S		171D-10330S

1) Denotes a full-port valve without flow characterizer insert.

Table 9. Fail-Safe Assemblies: Stainless Steel Ball and Stem (1/2-inch and 3/4-inch).

Valve Body Product Number[1)]	Flow Rate Cv (Kvs)	Valve Size Inches (mm)	Close-off ΔP in psi (kPa)	Fail-Safe					
									
				2-Position		Floating		2 to 10 Vdc	
				GQD121.1P		GQD131.1P		GQD151.1P	
				N.O.	N.C.	N.O.	N.C.	N.O.	N.C.
				Actuator Prefix Code					
				171H	172H	171J	172J	171K	172K
599-10300S	0.4 (0.34)	1/2 (15)	200 (1379)	171H-10300S	172H-10300S	171J-10300S	172J-10300S	171K-10300S	172K-10300S
599-10301S	0.63 (0.54)			171H-10301S	172H-10301S	171J-10301S	172J-10301S	171K-10301S	172K-10301S
599-10302S	1.0 (0.9)			171H-10302S	172H-10302S	171J-10302S	172J-10302S	171K-10302S	172K-10302S
599-10303S	1.6 (1.4)			171H-10303S	172H-10303S	171J-10303S	172J-10303S	171K-10303S	172K-10303S
599-10304S	2.5 (2.2)			171H-10304S	172H-10304S	171J-10304S	172J-10304S	171K-10304S	172K-10304S
599-10305S	4.0 (3.4)			171H-10305S	172H-10305S	171J-10305S	172J-10305S	171K-10305S	172K-10305S
599-10306S	6.3 (5.4)			171H-10306S	172H-10306S	171J-10306S	172J-10306S	171K-10306S	172K-10306S
599-10307S[1)]	10 (8.6)			171H-10307S[1)]	172H-10307S[1)]	171J-10307S[1)]	172J-10307S[1)]	171K-10307S[1)]	172K-10307S[1)]
599-10308S	6.3 (5.4)	3/4 (20)		171H-10308S	172H-10308S	171J-10308S	172J-10308S	171K-10308S	172K-10308S
599-10309S	10 (8.6)			171H-10309S	172H-10309S	171J-10309S	172J-10309S	171K-10309S	172K-10309S
599-10310S	16 (14)			171H-10310S	172H-10310S	171J-10310S	172J-10310S	171K-10310S	172K-10310S
599-10311S[1)]	25 (22)			171H-10311S[1)]	172H-10311S[1)]	171J-10311S[1)]	172J-10311S[1)]	171K-10311S[1)]	172K-10311S[1)]

1) Denotes a full-port valve without flow characterizer insert.

Table 10. Fail-Safe Assemblies: Stainless Steel Ball and Stem (1-inch to 2-inch).

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail-Safe					
									
				2-Position		Floating		0 to 10 Vdc	
				GMA121.1P		GMA131.1P		GMA161.1P	
				N.O.	N.C.	N.O.	N.C.	N.O.	N.C.
				Actuator Prefix Code					
				171E	172E	171F	172F	171G	172G
599-10312S	1 (25)	10 (9.0)	200 (1379)	171E-10312S	172E-10312S	171F-10312S	172F-10312S	171G-10312S	172G-10312S
599-10313S		16 (14)		171E-10313S	172E-10313S	171F-10313S	172F-10313S	171G-10313S	172G-10313S
599-10314S		25 (22)		171E-10314S	172E-10314S	171F-10314S	172F-10314S	171G-10314S	172G-10314S
599-10315S		40 (34)		171E-10315S	172E-10315S	171F-10315S	172F-10315S	171G-10315S	172G-10315S
599-10316S[1)]		63 (54)		171E-10316S[1)]	172E-10316S[1)]	171F-10316S[1)]	172F-10316S[1)]	171G-10316S[1)]	172G-10316S[1)]
599-10317S	1-1/4 (32)	16 (14)		171E-10317S	172E-10317S	171F-10317S	172F-10317S	171G-10317S	172G-10317S
599-10318S		25 (22)		171E-10318S	172E-10318S	171F-10318S	172F-10318S	171G-10318S	172G-10318S
599-10319S		40 (34)		171E-10319S	172E-10319S	171F-10319S	172F-10319S	171G-10319S	172G-10319S
599-10320S		63 (54)		171E-10320S	172E-10320S	171F-10320S	172F-10320S	171G-10320S	172G-10320S
599-10321S[1)]		100 (90)		171E-10321S[1)]	172E-10321S[1)]	171F-10321S[1)]	172F-10321S[1)]	171G-10321S[1)]	172G-10321S[1)]
599-10322S	1-1/2 (40)	25 (22)		171E-10322S	172E-10322S	171F-10322S	172F-10322S	171G-10322S	172G-10322S
599-10323S		40 (34)		171E-10323S	172E-10323S	171F-10323S	172F-10323S	171G-10323S	172G-10323S
599-10324S[1)]		63 (54)		171E-10324S[1)]	172E-10324S[1)]	171F-10324S[1)]	172F-10324S[1)]	171G-10324S[1)]	172G-10324S[1)]
599-10325S		100 (90)		171E-10325S	172E-10325S	171F-10325S	172F-10325S	171G-10325S	172G-10325S
599-10326S[1)]		160 (140)		171E-10326S[1)]	172E-10326S[1)]	171F-10326S[1)]	172F-10326S[1)]	171G-10326S[1)]	172G-10326S[1)]
599-10327S	2 (50)	40 (34)		171E-10327S	172E-10327S	171F-10327S	172F-10327S	171G-10327S	172G-10327S
599-10328S		63 (54)		171E-10328S	172E-10328S	171F-10328S	172F-10328S	171G-10328S	172G-10328S
599-10329S[1)]		100 (90)		171E-10329S[1)]	172E-10329S[1)]	171F-10329S[1)]	172F-10329S[1)]	171G-10329S[1)]	172G-10329S[1)]
599-10330S		160 (140)		171E-10330S	172E-10330S	171F-10330S	172F-10330S	171G-10330S	172G-10330S

1) Denotes a full-port valve without flow characterizer insert.

Table 11. Fail-Safe Assemblies: Full-Port, Stainless Steel Ball and Stem, 120V.

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail-Safe, 120V			
							
				2-Position			
				GQD221.1U		GMA221.1U	
				N.O.	N.C.	N.O.	N.C.
				Actuator Prefix Code			
				171L	172L	171M	172M
599-10307S[1)]	1/2 (15)	10 (9)	200 (1379)	171L-10307S[1)]	172L-10307S[1)]	—	—
599-10311S[1)]	3/4 (20)	25 (22)		171L-10311S[1)]	172L-10311S[1)]	—	—
599-10316S[1)]	1 (25)	63 (54)		—	—	171M-10316S[1)]	172M-10316S[1)]
599-10321S[1)]	1-1/4 (32)	100 (90)		—	—	171M-10321S[1)]	172M-10321S[1)]
599-10326S[1)]	1-1/2 (40)	160 (140)		—	—	171M-10326S[1)]	172M-10326S[1)]
599-10330S	2 (50)			—	—	171M-10330S	172M-10330S

1) Denotes a full-port valve without flow characterizers insert.

Table 12. Fail-Safe Assemblies: Full-Port, Stainless Steel Ball and Stem, 24V with Dual Auxiliary Switches.

Valve Body Product Number[1)]	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail-Safe, 24V			
							
				2-Position			
				GQD126.1P		GMA126.1P	
				N.O.	N.C.	N.O.	N.C.
				Actuator Prefix Code			
				171N	172N	171P	172P
599-10307S[1)]	1/2 (15)	10 (9)	200 (1379)	171N-10307S[1)]	172N-10307S[1)]	—	—
599-10311S[1)]	3/4 (20)	25 (22)		171N-10311S[1)]	172N-10311S[1)]	—	—
599-10316S[1)]	1 (25)	63 (54)		—	—	171P-10316S[1)]	172P-10316S[1)]
599-10321S[1)]	1-1/4 (32)	100 (90)		—	—	171P-10321S[1)]	172P-10321S[1)]
599-10326S[1)]	1-1/2 (40)	160 (140)		—	—	171P-10326S[1)]	172P-10326S[1)]
599-10330S	2 (50)			—	—	171P-10330S	172P-10330S

[1)] Denotes a full-port valve without flow characterizer insert.

NOTE: Use Table 13 to determine the effective Cv when using a full-port ball valve where the ball size and the line sizes differ.

Table 13. Full-Port (No Flow Characterizer) Ball Valve Product Numbers and Flow Coefficients.

Valve Line Size in Inches (mm)	Valve Product Number	Effective (Installed) Cv (Kvs)										
		Supply Line Size in Inches (mm)										
		1/2 (13)	3/4 (20)	1 (25)	1-1/4 (32)	1-1/2 (38)	2 (51)	2-1/2 (63)	3 (76)	4 (102)	5 (127)	6 (152)
1/2 (15)	599-10307 599-10307S	**10.00 (8.62)**	**6.94 (5.93)**	**6.19 (5.29)**	—	—	—	—	—	—	—	—
3/4 (20)	599-10311 599-10311S	—	**25.00 (21.55)**	**18.66 (15.95)**	**15.35 (13.12)**	—	—	—	—	—	—	—
1 (25)	599-10316 599-10316S	—	—	**63.00 (54.31)**	**39.78 (34.00)**	**33.56 (28.69)**	—	—	—	—	—	—
1-1/4 (32)	599-10321 599-10321S	—	—	—	**100.00 (86.21)**	**69.19 (59.13)**	**51.45 (43.98)**	—	—	—	—	—
1-1/2 (40)	599-10324 599-10324S	—	—	—	—	**63.00 (54.31)**	**55.34 (47.30)**	**51.00 (43.59)**	—	—	—	—
	599-10326 599-10326S	—	—	—	—	**160.00 (137.93)**	**93.80 (80.17)**	**76.34 (65.25)**	—	—	—	—
2 (50)	599-10329 599-10329S	—	—	—	—	—	**100.00 (86.21)**	**94.30 (80.60)**	**86.12 (73.61)**	—	—	—

= Valve may be oversized. = Optimal valve size. = Valve may be undersized.

Operation

The parabolic shape of the flow characterizer orifice (Figure 2) provides a slowly opening valve. Equal movements of the valve stem, at any point of the flow range, change the existing flow an equal percentage regardless of the existing flow. The ball valve equal percentage flow characteristic (Figure 3) mirrors the flow characteristic of a coil, resulting in linear heat transfer.

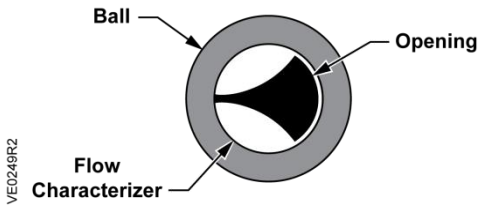


Figure 2. Ball Valve Flow Characterizer.

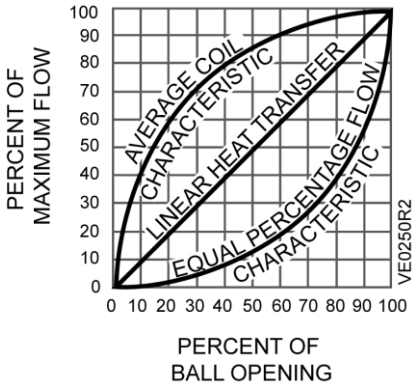


Figure 3. Ball Valve Equal Percentage Flow Control.

Mounting and Installation

Install the valve so that the flow follows the direction of the arrow cast on the valve body.

For added flexibility, the actuator mounting plate can be installed in any of the four (4) rotation angles relative to the valve body.

For best performance, install the valve assembly with the actuator above the valve body.

The valve and actuator assembly can be installed in a horizontal pipe in any position between vertical and 90°.

The ball valve also can be installed vertically.

CAUTION:

Do not install the valve assembly so that the actuator is below horizontal or upside-down.

See *Ball Valve Bracket Kit Installation Instructions* 129-496 for complete and proper installation and mounting instructions.

Allow sufficient space for servicing the valve and actuator. See Figure 6 and Table 14 for valve body dimensions and service envelope.

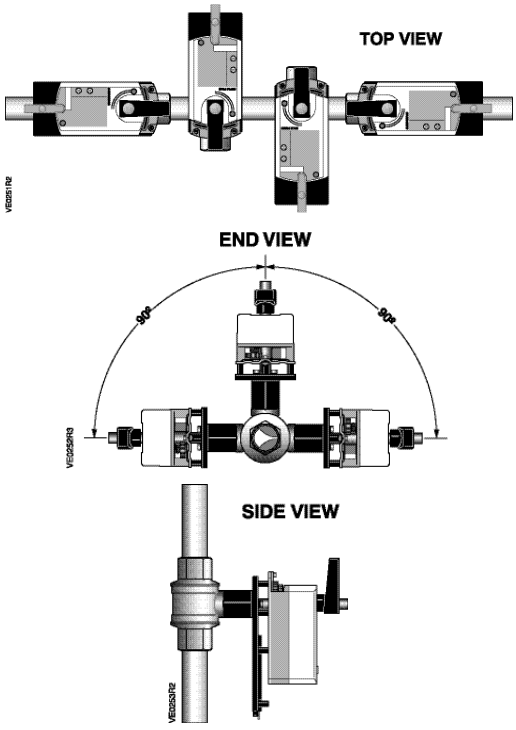


Figure 4. Mounting Positions.

Service

Replace the valve or actuator if inoperable.

Dimensions

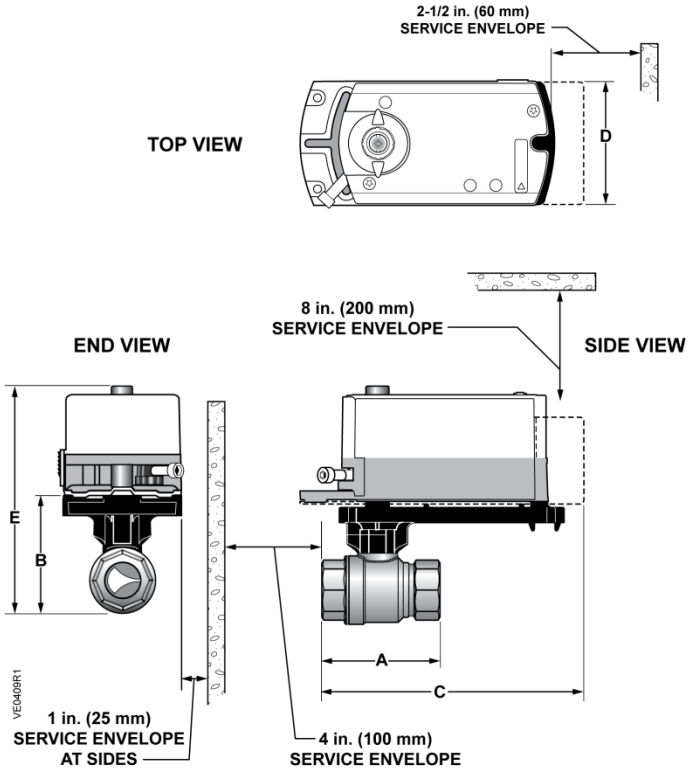


Figure 5. Two-Way Ball Valve and Low-Profile Bracket with Actuator Dimensions in Inches (Millimeters).

Line Size Inches (mm)	Cv Range	A Length	B Height	C Length Actuator Codes		D Width	E Height	Valve and Bracket Weight lbs (kg)
				GDE	GQD			
				171A-D	171H, J, K, L, N			
1/2 (15)	0.4 to 10	2-7/16 (61)	2-1/4 (57)	5-1/4 (133)	5-1/4 (133)	2-3/4 (70)	4-13/16 (123)	1 (0.45)
3/4 (20)	6.3 to 25	2-3/4 (70)	2-5/8 67)	5-3/8 (136)	5-3/8 (136)		5-1/4 (133)	1.3 (0.60)

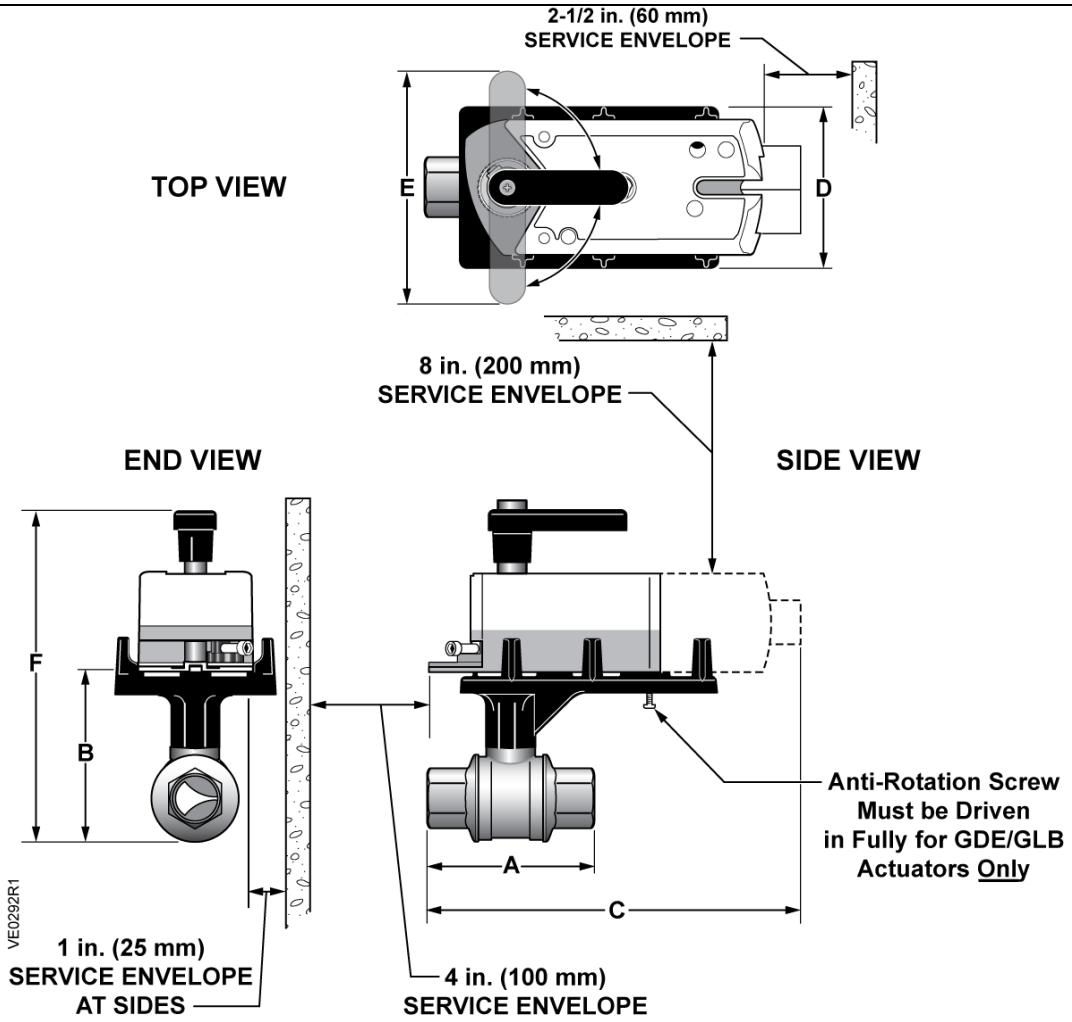


Figure 6. Dimensions with Actuator Mounted on Bracket.

NOTES:

- All dimensions are in inches (mm) and weights are in pounds (kg).
- Dimension D, Depth, is 3.7 inches (94.5 mm).
- Dimension E, Handle, is 5.3 inches (135.9 mm).

Dimensions, Continued

Table 14. Dimensions in Inches (Millimeters) and Weights in Pounds (Kg).

Line Size Inch (mm)	Cv Range	A Length	C Length[1] Actuator Codes 171A-D, GDE/GLB	C Length[1] Actuator Codes 171H,J,K,L, N GQD	C Length[1] Actuator Codes 171E,F,G,M,P 172E,F,G,M,P Fail-Safe GMA	F Height	Valve and Bracket Weight lbs (kg)
1 (25)	10	3 (77)	6-11/16 (170)	–	8 (203)	8 (203)	1.6 (0.73)
	16, 40, 63	3-1/4 (82)		–	8-3/8 (213)	8-5/16 (212)	1.8 (0.82)
	25	3-7/8 (98)	7 (178)	–	8-11/16 (221)	8-13/16 (223)	
1-1/4 (32)	16	3-3/8(86)	6-11/16 (170)	–	8-7/16 (214)	8-3/8 (213)	2.0 (0.91)
	25 to 100	3-11/16 (94)	6-15/16 (176)	–	8-11/16 (221)	8-13/16 (223)	2.5 (1.1)
1-1/2 (40)	25, 63	3-5/8 (92)		–	8-7/16 (214)	8-13/16 (223)	1.8 (0.82)
	40, 100, 160	3-15/16 (100)	7-1/16 (180)	–	8-3/4 (223)	9-1/4 (235)	3.3 (1.50)
2 (50)	40, 100	4 (102)		–		9-3/8 (238)	3.1 (1.41)
	63	4-5/8 (118)	7-1/2 (190)	–	9-1/8 (223)	10-1/16 (255)	5.25 (2.38)
	160			–			5.3 (2.40)

[1] Dimension “C” is maximum length, measured from the actuator, end fitting, or mounting plate, whichever extends the furthest.

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