

## 599 Series Ball Valve and Actuator Assemblies Selection

<b>Description</b>	<p>This Technical Bulletin aids in the selection of a ball valve and actuator assembly.</p> <ul style="list-style-type: none"> <li>Y Table 1 and Table 2 list full-port ball valve product numbers and flow coefficients.</li> <li>Y Table 3 through Table 17 identify the product numbers for all possible combinations of ball valves and compatible actuators that can be ordered as complete valve assemblies from the factory.</li> <li>Y Figure 1 and Table 18, and Figure 2 and Table 19 provide the dimensions for the valve/actuator assembly and the required service envelope.</li> </ul> <p>It is recommended that 2-position applications use a full-port ball valve without a flow characterizer. For modulating applications, it is recommended that the ball valve include a flow characterizer.</p>
<b>Example: Selecting a 2-Way Ball Valve and Actuator for 2-Position Control</b>	<ol style="list-style-type: none"> <li>1. Job specifications require a 2-position, normally-open, spring return ball valve in a 1/2-inch (15 mm) supply line size.</li> <li>2. See Table 5 to locate a full-port valve with a 1/2 inch (15 mm) valve size that matches the 1/2-inch (15 mm) supply line size. Select valve product number 599-10307.</li> <li>3. In Table 5, locate the column for a 2-position normally-open fail safe actuator.</li> <li>4. In Table 5, locate the row corresponding to the 599-10307 a valve product number. The row/column intersection shows that the valve and actuator assembly product number is 171H-10307.</li> </ol>
<b>Example: Selecting a 2-Way Ball Valve and Actuator for Modulating Control</b>	<ol style="list-style-type: none"> <li>1. Job specifications require a 40 Cv valve with stainless steel ball and stem, and 0 to 10 Vdc, fail-in-place actuator for a 1-1/4 inch (30 mm) supply line size.</li> <li>2. In Table 9, locate the actuator column for a 0 to 10 Vdc actuator. Locate the row corresponding to the 599-10319S valve which has a 40 Cv. The row/column intersection shows that the valve and actuator assembly product number is 171C-10319S.</li> </ol>

Use Tables 1 and 2 to determine the effective Cv when using a full-port ball valve where the ball size and the line size may differ.

**Table 1. Product Numbers: 2-Way, Full-Port (No Flow Characterizer) Chrome-Plated Ball with Brass Stems or Stainless Steel Ball with Stainless Steel Stems 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.

\* S suffix = Stainless Steel


**Table 2. Product Numbers: 3-Way, Full-Port (No Flow Characterizer) Chrome-Plated Ball with Brass Stems or Stainless Steel Ball with Stainless Steel Stems 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)	599-10357 599-10357S	10.00 (8.62)	6.94 (5.93)	6.19 (5.29)	--	--	--	--	--	--	--	--
3/4 (20)	599-10360 599-10360S	--	16.00 (13.79)	13.9 (11.98)	12.4 (10.69)	--	--	--	--	--	--	--
1 (25)	599-10363 599-10363S	--	--	25.00 (21.55)	22.5 (19.40)	21.2 (18.27)	--	--	--	--	--	--
1-1/4 (32)	599-10366 599-10366S	--	--	--	40.00 (34.48)	36.9 (31.81)	33.3 (28.70)	--	--	--	--	--
1-1/2 (40)	599-10369 599-10369S	--	--	--	--	63.00 (54.31)	55.3 (47.67)	51.00 (43.96)	--	--	--	--
2 (50)	599-10372 599-10372S	--	--	--	--	--	100 (86.21)	94.3 (81.29)	86.1 (74.23)	--	--	--

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


\* S suffix = Stainless Steel

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

Valve Body Product Number *	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 131.1Q	GDE 161.1P	GDE 161.1Q
				3 foot (.9m) Wires	Conduit Adapter & 6-foot (1.8m) Wires	3 foot (.9m) Wires	Conduit Adapter & 6-foot (1.8m) Wires
				Actuator Prefix Code			
171A	173A	171C	173C				
599-10300	1/2 (15)	0.4 (0.34)	200 (1379)	171A-10300	173A-10300	171C-10300	173C-10300
599-10301		0.63 (0.54)		171A-10301	173A-10301	171C-10301	173C-10301
599-10302		1.0 (0.9)		171A-10302	173A-10302	171C-10302	173C-10302
599-10303		1.6 (1.4)		171A-10303	173A-10303	171C-10303	173C-10303
599-10304		2.5 (2.2)		171A-10304	173A-10304	171C-10304	173C-10304
599-10305		4.0 (3.4)		171A-10305	173A-10305	171C-10305	173C-10305
599-10306		6.3 (5.4)		171A-10306	173A-10306	171C-10306	173C-10306
599-10307*		10 (8.6)		171A-10307*	173A-10307*	171C-10307*	173C-10307*
599-10308	3/4 (20)	6.3 (5.4)		171A-10308	173A-10308	171C-10308	173C-10308
599-10309		10 (8.6)		171A-10309	173A-10309	171C-10309	173C-10309
599-10310		16 (14)		171A-10310	173A-10310	171C-10310	173C-10310
599-10311*		25 (22)		171A-10311*	173A-10311*	171C-10311*	173C-10311*


\*Denotes a full-port valve without flow characterizers insert.

**Table 4. Fail-In-Place Assemblies: Chrome-Plated Ball with Brass Stem (1-Inch to 2-Inch)**

Valve Body Product Number *	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 131.1Q	GLB 131.1Q	GDE 161.1P	GLB 161.1P	GDE 161.1Q	GLB 161.1Q
				3 foot (.9m) Wires		Conduit Adapter & 6-foot (1.8m) Wires		3 foot (.9m) Wires		Conduit Adapter & 6-foot (1.8m) Wires	
				Actuator Prefix Code							
171A	171B	173A	173B	171C	171D	173C	173D				
599-10312	1 (25)	10 (9.0)	200 (1379)	171A-10312	173A-10312	171C-10312	173C-10312				
599-10313		16 (14)		171A-10313	173A-10313	171C-10313	173C-10313				
599-10314		25 (22)		171A-10314	173A-10314	171C-10314	173C-10314				
599-10315		40 (34)		171A-10315	173A-10315	171C-10315	173C-10315				
599-10316*		63 (54)		171A-10316*	173A-10316*	171C-10316*	173C-10316*				
599-10317	1 1/4 (32)	16 (14)		171A-10317	173A-10317	171C-10317	173C-10317				
599-10318		25 (22)		171A-10318	173A-10318	171C-10318	173C-10318				
599-10319		40 (34)		171A-10319	173A-10319	171C-10319	173C-10319				
599-10320		63 (54)		171A-10320	173A-10320	171C-10320	173C-10320				
599-10321*		100 (90)		171A-10321*	173A-10321*	171C-10321*	173C-10321*				
599-10322	1 1/2 (40)	25 (22)		171B-10322	173B-10322	171D-10322	173D-10322				
599-10323		40 (34)		171B-10323	173B-10323	171D-10323	173D-10323				
599-10324*		63 (54)		171B-10324*	173B-10324*	171D-10324*	173D-10324*				
599-10325		100 (90)		171B-10325	173B-10325	171D-10325	173D-10325				
599-10326*		160 (140)		171B-10326*	173B-10326*	171D-10326*	173D-10326*				
599-10327	2 (50)	40 (34)		171B-10327	173B-10327	171D-10327	173D-10327				
599-10328		63 (54)	171B-10328	173B-10328	171D-10328	173D-10328					
599-10329*		100 (90)	171B-10329*	173B-10329*	171D-10329*	173D-10329*					
599-10330		160 (140)	171B-10330	173B-10330	171D-10330	173D-10330					


\*Denotes a full-port valve without flow characterizers insert.

**Table 5. 2-Way Valve Fail-Safe Assemblies: Chrome-Plated Ball and Brass Stem (1/2-Inch and 3/4-Inch).**

Valve Body Product Number*	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail-Safe					
									
				2-Position GQD121.1P		Floating GQD131.1P		2 to 10 Vdc 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*	10 (8.6)	171H-10307*	172H-10307*	171J-10307*	172J-10307*	171K-10307*	172K-10307*		
599-10308	3/4 (20)	6.3 (5.4)	200 (1379)	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*		25 (22)		171H-10311*	172H-10311*	171J-10311*	172J-10311*	171K-10311*	172K-10311*



\*Denotes a full-port valve without flow characterizer insert.

**Table 6. 2-Way Valve Fail Safe Assemblies: Chrome-Plated Brass Ball Brass Stem (1-Inch to 2-Inch).**

Valve Body Product Number*	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail-Safe					
									
				2-Position GMA121.1P		Floating GMA131.1P		0 to 10 Vdc 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*		63 (54)		171E-10316*	172E-10316*	171F-10316*	172F-10316*	171G-10316*	172G-10316*
599-10317	1-1/4 (32)	16 (14)	200 (1379)	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*		100 (90)		171E-10321*	172E-10321*	171F-10321*	172F-10321*	171G-10321*	172G-10321*
599-10322	1-1/2 (40)	25 (22)	200 (1379)	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*		63 (54)		171E-10324*	172E-10324*	171F-10324*	172F-10324*	171G-10324*	172G-10324*
599-10325		100 (90)		171E-10325	172E-10325	171F-10325	172F-10325	171G-10325	172G-10325
599-10326*		160 (140)		171E-10326*	172E-10326*	171F-10326*	172F-10326*	171G-10326*	172G-10326*
599-10327	2 (50)	40 (34)	200 (1379)	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*		100 (90)		171E-10329*	172E-10329*	171F-10329*	172F-10329*	171G-10329*	172G-10329*
599-10330		160 (140)		171E-10330	172E-10330	171F-10330	172F-10330	171G-10330	172G-10330


\* Denotes a full-port valve without flow characterizer insert.

**Table 7. 2-Way Valve Fail-Safe Assemblies: Full-Port, Chrome-Plated Ball and Brass Stem, 120V.**

Valve Body Product Number*	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*	1/2 (15)	10 (9)	200 (1379)	171L-10307*	172L-10307*	—	—
599-10311*	3/4 (20)	25 (22)		171L-10311*	172L-10311*	—	—
599-10316*	1 (25)	63 (54)		—	—	171M-10316*	172M-10316*
599-10321*	1-1/4 (32)	100 (90)		—	—	171M-10321*	172M-10321*
599-10326*	1-1/2 (40)	160 (140)		—	—	171M-10326*	172M-10326*
599-10330	2 (50)			—	—	171M-10330	172M-10330


\* Denotes a full-port valve without flow characterizer insert.

**Table 8. Fail-In-Place Assemblies: Stainless Steel Ball and Stem (1/2-Inch and 3/4-Inch).**

Valve Body Product Number *	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 131.1Q	GDE 161.1P	GDE 161.1Q
				3 foot (.9m) Wires	Conduit Adapter & 6-foot (1.8m) Wires	3 foot (.9m) Wires	Conduit Adapter & 6-foot (1.8m) Wires
Actuator Prefix Code							
171A	173A	171C	173C				
599-10300S	1/2 (15)	0.4 (0.34)	200 (1379)	171A-10300S	173A-10300S	171C-10300S	173C-10300S
599-10301S		0.63 (0.54)		171A-10301S	173A-10301S	171C-10301S	173C-10301S
599-10302S		1.0 (0.9)		171A-10302S	173A-10302S	171C-10302S	173C-10302S
599-10303S		1.6 (1.4)		171A-10303S	173A-10303S	171C-10303S	173C-10303S
599-10304S		2.5 (2.2)		171A-10304S	173A-10304S	171C-10304S	173C-10304S
599-10305S		4.0 (3.4)		171A-10305S	173A-10305S	171C-10305S	173C-10305S
599-10306S		6.3 (5.4)		171A-10306S	173A-10306S	171C-10306S	173C-10306S
599-10307S*		10 (8.6)		171A-10307S*	173A-10307S*	171C-10307S*	173C-10307S*
599-10308S	3/4 (20)	6.3 (5.4)		171A-10308S	173A-10308S	171C-10308S	173C-10308S
599-10309S		10 (8.6)		171A-10309S	173A-10309S	171C-10309S	173C-10309S
599-10310S		16 (14)		171A-10310S	173A-10310S	171C-10310S	173C-10310S
599-10311S*		25 (22)		171A-10311S*	173A-10311S*	171C-10311S*	173C-10311S*


\*Denotes a full-port valve without flow characterizer insert.

**Table 9. Fail-In-Place Assemblies: Stainless Steel Ball and Stem (1-Inch to 2-Inch).**

Valve Body Product Number *	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 131.1Q	GLB 131.1Q	GDE 161.1P	GLB 161.1P	GDE 161.1Q	GLB 161.1Q
				3 foot (.9m) Wires		Conduit Adapter & 6-foot (1.8m) Wires		3 foot (.9m) Wires		Conduit Adapter & 6-foot (1.8m) Wires	
				Actuator Prefix Code							
171A	171B	173A	173B	171C	171D	173C	173D				
599-10312S	1 (25)	10 (9.0)	200 (1379)	171A-10312S	173A-10312S	171C-10312S	173C-10312S				
599-10313S		16 (14)		171A-10313S	173A-10313S	171C-10313S	173C-10313S				
599-10314S		25 (22)		171A-10314S	173A-10314S	171C-10314S	173C-10314S				
599-10315S		40 (34)		171A-10315S	173A-10315S	171C-10315S	173C-10315S				
599-10316S*		63 (54)		171A-10316S*	173A-10316S*	171C-10316S*	173C-10316S*				
599-10317S	1-1/4 (32)	16 (14)		171A-10317S	173A-10317S	171C-10317S	173C-10317S				
599-10318S		25 (22)		171A-10318S	173A-10318S	171C-10318S	173C-10318S				
599-10319S		40 (34)		171A-10319S	173A-10319S	171C-10319S	173C-10319S				
599-10320S		63 (54)		171A-10320S	173A-10320S	171C-10320S	173C-10320S				
599-10321S*		100 (90)		171A-10321S*	173A-10321S*	171C-10321S*	173C-10321S*				
599-10322S	1-1/2 (40)	25 (22)		171B-10322S	173B-10322S	171D-10322S	173D-10322S				
599-10323S		40 (34)		171B-10323S	173B-10323S	171D-10323S	173D-10323S				
599-10324S*		63 (54)		171B-10324S*	173B-10324S*	171D-10324S*	173D-10324S*				
599-10325S		100 (90)		171B-10325S	173B-10325S	171D-10325S	173D-10325S				
599-10326S*		160 (140)		171B-10326S*	173B-10326S*	171D-10326S*	173D-10326S*				
599-10327S	2 (50)	40 (34)		171B-10327S	173B-10327S	171D-10327S	173D-10327S				
599-10328S		63 (54)		171B-10328S	173B-10328S	171D-10328S	173D-10328S				
599-10329S*		100 (90)		171B-10329S*	173B-10329S*	171D-10329S*	173D-10329S*				
599-10330S		160 (140)		171B-10330S	173B-10330S	171D-10330S	173D-10330S				


\*Denotes a full-port valve without flow characterizer insert.

**Table 10. 2-Way Valve Fail-Safe Assemblies: Stainless Steel Ball and Stem (1/2-Inch and 3/4-Inch).**

Valve Body Product Number*	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				
599-10300S	1/2 (15)	0.4 (0.34)	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*		10 (8.6)		171H-10307S*	172H-10307S*	171J-10307S*	172J-10307S*	171K-10307S*	172K-10307S*
599-10308S	3/4 (20)	6.3 (5.4)		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*		25 (22)		171H-10311S*	172H-10311S*	171J-10311S*	172J-10311S*	171K-10311S*	172K-10311S*



\*Denotes a full-port valve without flow characterizer insert.

**Table 11. 2-Way Valve Fail-Safe Assemblies: Stainless Steel Ball and Stem (1-Inch to 2-Inch).**

Valve Body Product Number *	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*		63 (54)		171E-10316S*	172E-10316S*	171F-10316S*	172F-10316S*	171G-10316S*	172G-10316S*
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*		100 (90)		171E-10321S*	172E-10321S*	171F-10321S*	172F-10321S*	171G-10321S*	172G-10321S*
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*		63 (54)		171E-10324S*	172E-10324S*	171F-10324S*	172F-10324S*	171G-10324S*	172G-10324S*
599-10325S		100 (90)		171E-10325S	172E-10325S	171F-10325S	172F-10325S	171G-10325S	172G-10325S
599-10326S*		160 (140)		171E-10326S*	172E-10326S*	171F-10326S*	172F-10326S*	171G-10326S*	172G-10326S*
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*		100 (90)		171E-10329S*	172E-10329S*	171F-10329S*	172F-10329S*	171G-10329S*	172G-10329S*
599-10330S		160 (140)		171E-10330S	172E-10330S	171F-10330S	172F-10330S	171G-10330S	172G-10330S



\* Denotes a full-port valve without flow characterizer insert.

**Table 12. 2-Way Valve Fail-Safe Assemblies: Full-Port, Stainless Steel Ball and Stem, 120V.**

Valve Body Product Number*	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*	1/2 (15)	10 (9)	200 (1379)	171L-10307S*	172L-10307S*	—	—
599-10311S*	3/4 (20)	25 (22)		171L-10311S*	172L-10311S*	—	—
599-10316S*	1 (25)	63 (54)		—	—	171M-10316S*	172M-10316S*
599-10321S*	1-1/4 (32)	100 (90)		—	—	171M-10321S*	172M-10321S*
599-10326S*	1-1/2 (40)	160 (140)		—	—	171M-10326S*	172M-10326S*
599-10330S	2 (50)			—	—	171M-10330S	172M-10330S


\* Denotes a full-port valve without flow characterizer insert.

**Table 13. 2-Way Valve Fail-Safe Assemblies: Full-Port, Stainless Steel Ball and Stem, Dual Auxiliary Switches.**

Valve Body Product Number*	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*	1/2 (15)	10 (9)	200 (1379)	171N-10307S*	172N-10307S*	—	—
599-10311S*	3/4 (20)	25 (22)		171N-10311S*	172N-10311S*	—	—
599-10316S*	1 (25)	63 (54)		—	—	171P-10316S*	172P-10316S*
599-10321S*	1-1/4 (32)	100 (90)		—	—	171P-10321S*	172P-10321S*
599-10326S*	1-1/2 (40)	160 (140)		—	—	171P-10326S*	172P-10326S*
599-10330S	2 (50)			—	—	171P-10330S	172P-10330S


\* Denotes a full-port valve without flow characterizer insert.

**Table 14. 3-Way Valve Fail-in-Place Assemblies: Chrome-Plated Ball and Brass Stem.**

Product Number *	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail- In-Place							
											
				Floating Control				0 to 10 Vdc			
				3-foot (0.9 m) Wires		Conduit Adapter and 6-foot (1.8 m) Wires		3-foot (0.9 m) Wires		Conduit Adapter and 6-foot (1.8 m) Wires	
				Actuator Prefix Code							
GDE131.1P 171A	GLB131.1P 171B	GDE131.1Q 173A	GLB131.1Q 173B	GDE161.1P 171C	GLB161.1P 171D	GDE161.1Q 173C	GLB161.1Q 173D				
599-10350	1/2 (15)	0.4 (0.34)	200 (1379)	171A-10350	173A-10350	171C-10350	173C-10350				
599-10351		0.63 (0.54)		171A-10351	173A-10351	171C-10351	173C-10351				
599-10352		1.0 (0.9)		171A-10352	173A-10352	171C-10352	173C-10352				
599-10353		1.6 (1.4)		171A-10353	173A-10353	171C-10353	173C-10353				
599-10354		2.5 (2.2)		171A-10354	173A-10354	171C-10354	173C-10354				
599-10355		4.0 (3.4)		171A-10355	173A-10355	171C-10355	173C-10355				
599-10356		6.3 (5.5)		171A-10356	173A-10356	171C-10356	173C-10356				
599-10357*		10 (8.6)		171A-10357*	173A-10357*	171C-10357*	173C-10357*				
599-10358	3/4 (20)	6.3 (5.5)		171A-10358	173A-10358	171C-10358	173C-10358				
599-10359		10 (8.6)		171A-10359	173A-10359	171C-10359	173C-10359				
599-10360*		16 (14)		171A-10360*	173A-10360*	171C-10360*	173C-10360*				
599-10361	1 (25)	10 (8.6)		171A-10361	173A-10361	171C-10361	173C-10361				
599-10362		16 (14)		171A-10362	173A-10362	171C-10362	173C-10362				
599-10363*		25 (22)		171A-10363*	173A-10363*	171C-10363*	173C-10363*				
599-10364	1-1/4 (32)	16 (14)		171A-10364	173A-10364	171C-10364	173C-10364				
599-10365		25 (22)		171A-10365	173A-10365	171C-10365	173C-10365				
599-10366*		40 (35)		171A-10366*	173A-10366*	171C-10366*	173C-10366*				
599-10367	1-1/2 (40)	25 (22)		171B-10367	173B-10367	171D-10367	173D-10367				
599-10368		40 (35)		171B-10368	173B-10368	171D-10368	173D-10368				
599-10369*		63 (54)		171B-10369*	173B-10369*	171D-10369*	173D-10369*				
599-10370		40 (35)		171B-10370	173B-10370	171D-10370	173D-10370				
599-10371	2 (50)	63 (54)		171B-10371	173B-10371	171D-10371	173D-10371				
599-10372*		100 (86)		171B-10372*	173B-10372*	171D-10372*	173D-10372*				

\*Denotes a full-port valve without flow characterizer insert.


**Table 15. 3-Way Valve Fail-in-Place Assemblies: Stainless Steel Ball and Stem.**

Product Number *	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP in psi (kPa)	Fail- In-Place							
											
				Floating Control				0 to 10 Vdc			
				3-foot (0.9 m) Wires		Conduit Adapter and 6-foot (1.8 m) Wires		3-foot (0.9 m) Wires		Conduit Adapter and 6-foot (1.8 m) Wires	
				Actuator Prefix Code							
GDE131.1P 171A	GLB131.1P 171B	GDE131.1Q 173A	GLB131.1Q 173B	GDE161.1P 171C	GLB161.1P 171D	GDE161.1Q 173C	GLB161.1Q 173D				
599-10350S	1/2 (15)	0.4 (0.34)	200 (1379)	171A-10350S	173A-10350S	171C-10350S	173C-10350S				
599-10351S		0.63 (0.54)		171A-10351S	173A-10351S	171C-10351S	173C-10351S				
599-10352S		1.0 (0.9)		171A-10352S	173A-10352S	171C-10352S	173C-10352S				
599-10353S		1.6 (1.4)		171A-10353S	173A-10353S	171C-10353S	173C-10353S				
599-10354S		2.5 (2.2)		171A-10354S	173A-10354S	171C-10354S	173C-10354S				
599-10355S		4.0 (3.4)		171A-10355S	173A-10355S	171C-10355S	173C-10355S				
599-10356S		6.3 (5.5)		171A-10356S	173A-10356S	171C-10356S	173C-10356S				
599-10357S*		10 (8.6)		171A-10357S*	173A-10357S*	171C-10357S*	173C-10357S*				
599-10358S	3/4 (20)	6.3 (5.5)		171A-10358S	173A-10358S	171C-10358S	173C-10358S				
599-10359S		10 (8.6)		171A-10359S	173A-10359S	171C-10359S	173C-10359S				
599-10360S*		16 (14)		171A-10360S*	173A-10360S*	171C-10360S*	173C-10360S*				
599-10361S	1 (25)	10 (8.6)		171A-10361S	173A-10361S	171C-10361S	173C-10361S				
599-10362S		16 (14)		171A-10362S	173A-10362S	171C-10362S	173C-10362S				
599-10363S*		25 (22)		171A-10363S*	173A-10363S*	171C-10363S*	173C-10363S*				
599-10364S	1-1/4 (32)	16 (14)		171A-10364S	173A-10364S	171C-10364S	173C-10364S				
599-10365S		25 (22)		171A-10365S	173A-10365S	171C-10365S	173C-10365S				
599-10366S*		40 (35)		171A-10366S*	173A-10366S*	171C-10366S*	173C-10366S*				
599-10367S	1-1/2 (40)	25 (22)		171B-10367S	173B-10367S	171D-10367S	173D-10367S				
599-10368S		40 (35)		171B-10368S	173B-10368S	171D-10368S	173D-10368S				
599-10369S*		63 (54)		171B-10369S*	173B-10369S*	171D-10369S*	173D-10369S*				
599-10370S	2 (50)	40 (35)	171B-10370S	173B-10370S	171D-10370S	173D-10370S					
599-10371S		63 (54)	171B-10371S	173B-10371S	171D-10371S	173D-10371S					
599-10372S*		100 (86)	171B-10372S*	173B-10372S*	171D-10372S*	173D-10372S*					

\*Denotes a full-port valve without flow characterizer insert.

**NOTE:** Maximum operating differential pressure = 60 psi for 1/2" to 1-1/2"; 35 psi for 2" valves.

**Table 16. 3-Way Valve Fail-Safe Assemblies: Chrome-Plated Ball and Brass Stem.**


Product Number *	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off ΔP PSI (kPa)			
				Fail-Safe		
				2-Position	Floating	0 to 10 Vdc
				Actuator Prefix Code		
				171E*** (GMA121.1P)	171F*** (GMA131.1P)	171G*** (GMA161.1P)
599-10350	1/2 (15)	0.4 (0.34)	200 (1379)	171E-10350	171F-10350	171G-10350
599-10351		0.63 (0.54)		171E-10351	171F-10351	171G-10351
599-10352		1.0 (0.9)		171E-10352	171F-10352	171G-10352
599-10353		1.6 (1.4)		171E-10353	171F-10353	171G-10353
599-10354		2.5 (2.2)		171E-10354	171F-10354	171G-10354
599-10355		4.0 (3.4)		171E-10355	171F-10355	171G-10355
599-10356		6.3 (5.5)		171E-10356	171F-10356	171G-10356
599-10357*		10 (8.6)		171E-10357*	171F-10357*	171G-10357*
599-10358	3/4 (20)	6.3 (5.5)		171E-10358	171F-10358	171G-10358
599-10359		10 (8.6)		171E-10359	171F-10359	171G-10359
599-10360*		16 (14)		171E-10360*	171F-10360*	171G-10360*
599-10361	1 (25)	10 (8.6)		171E-10361	171F-10361	171G-10361
599-10362		16 (14)		171E-10362	171F-10362	171G-10362
599-10363*		25 (22)		171E-10363*	171F-10363*	171G-10363*
599-10364	1-1/4 (32)	16 (14)		171E-10364	171F-10364	171G-10364
599-10365		25 (22)		171E-10365	171F-10365	171G-10365
599-10366 *		40 (34)	171E-10366*	171F-10366*	171G-10366*	
599-10367		25 (22)	171E-10367	171F-10367	171G-10367	
599-10368	1-1/2 (40)	40 (34)	171E-10368	171F-10368	171G-10368	
599-10369*		63 (54)	171E-10369*	171F-10369*	171G-10369*	
599-10370	2 (50)	40 (34)	171E-10370	171F-10370	171G-10370	
599-10371		63 (54)	171E-10371	171F-10371	171G-10371	
599-10372*		100 (86)	171E-10372*	171F-10372*	171G-10372*	

\*Denotes a full-port valve without flow characterizer insert.

\*\*\*Fail-safe three-way ball valve assemblies fail to A, AB open and B, AB closed.

**NOTE:** Maximum operating differential pressure = 60 psi for 1/2" to 1-1/2"; 35 psi for 2" valves.

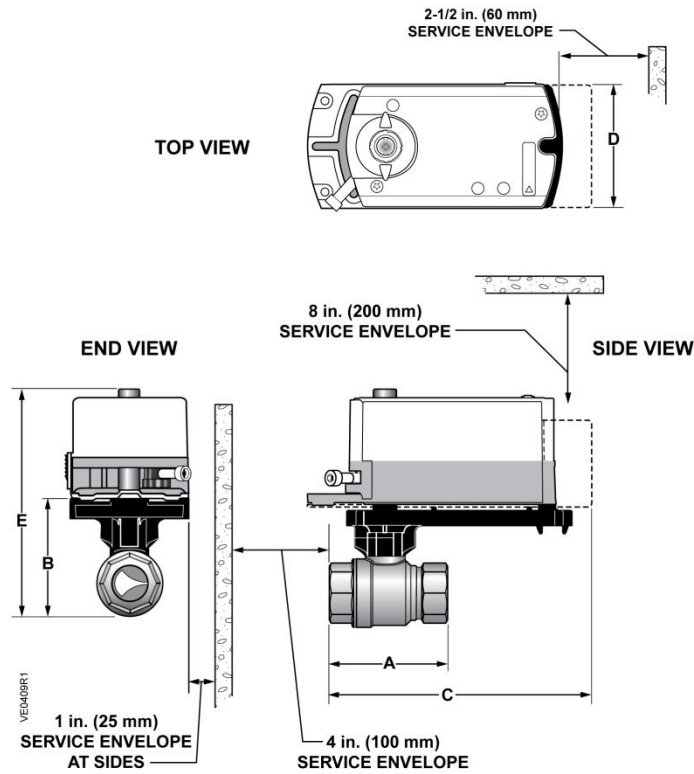
**Table 17. 3-Way Valve Fail-Safe Assemblies: Stainless Steel Ball and Stem.**

Product Number *	Valve Size Inches (mm)	Flow Rate Cv (Kvs)	Close-off $\Delta$ P PSI (kPa)			
				Fail-Safe		
				2-Position	Floating	0 to 10 Vdc
				Actuator Prefix Code		
				171E*** (GMA121.1P)	171F*** (GMA131.1P)	171G*** (GMA161.1P)
599-10350S	1/2 (15)	0.4 (0.34)	200 (1379)	171E-10350S	171F-10350S	171G-10350S
599-10351S		0.63 (0.54)		171E-10351S	171F-10351S	171G-10351S
599-10352S		1.0 (0.9)		171E-10352S	171F-10352S	171G-10352S
599-10353S		1.6 (1.4)		171E-10353S	171F-10353S	171G-10353S
599-10354S		2.5 (2.2)		171E-10354S	171F-10354S	171G-10354S
599-10355S		4.0 (3.4)		171E-10355S	171F-10355S	171G-10355S
599-10356S		6.3 (5.5)		171E-10356S	171F-10356S	171G-10356S
599-10357S*		10 (8.6)		171E-10357S*	171F-10357S*	171G-10357S*
599-10358S	3/4 (20)	6.3 (5.5)		171E-10358S	171F-10358S	171G-10358S
599-10359S		10 (8.6)		171E-10359S	171F-10359S	171G-10359S
599-10360S*		16 (14)		171E-10360S*	171F-10360S*	171G-10360S*
599-10361S	1 (25)	10 (8.6)		171E-10361S	171F-10361S	171G-10361S
599-10362S		16 (14)		171E-10362S	171F-10362S	171G-10362S
599-10363S*		25 (22)		171E-10363S*	171F-10363S*	171G-10363S*
599-10364S		16 (14)		171E-10364S	171F-10364S	171G-10364S
599-10365S	1-1/4 (32)	25 (22)		171E-10365S	171F-10365S	171G-10365S
599-10366S*		40 (34)		171E-10366S*	171F-10366S*	171G-10366S*
599-10367S	1-1/2 (40)	25 (22)		171E-10367S	171F-10367S	171G-10367S
599-10368S		40 (34)		171E-10368S	171F-10368S	171G-10368S
599-10369S*		63 (54)		171E-10369S*	171F-10369S*	171G-10369S*
599-10370S		40 (34)	171E-10370S	171F-10370S	171G-10370S	
599-10371S	2 (50)	63 (54)	171E-10371S	171F-10371S	171G-10371S	
599-10372S*		100 (86)	171E-10372S*	171F-10372S*	171G-10372S*	

\*Denotes a full-port valve without flow characterizer insert.

\*\*\*Fail-safe three-way ball valve assemblies fail to A, AB open and B, AB closed.

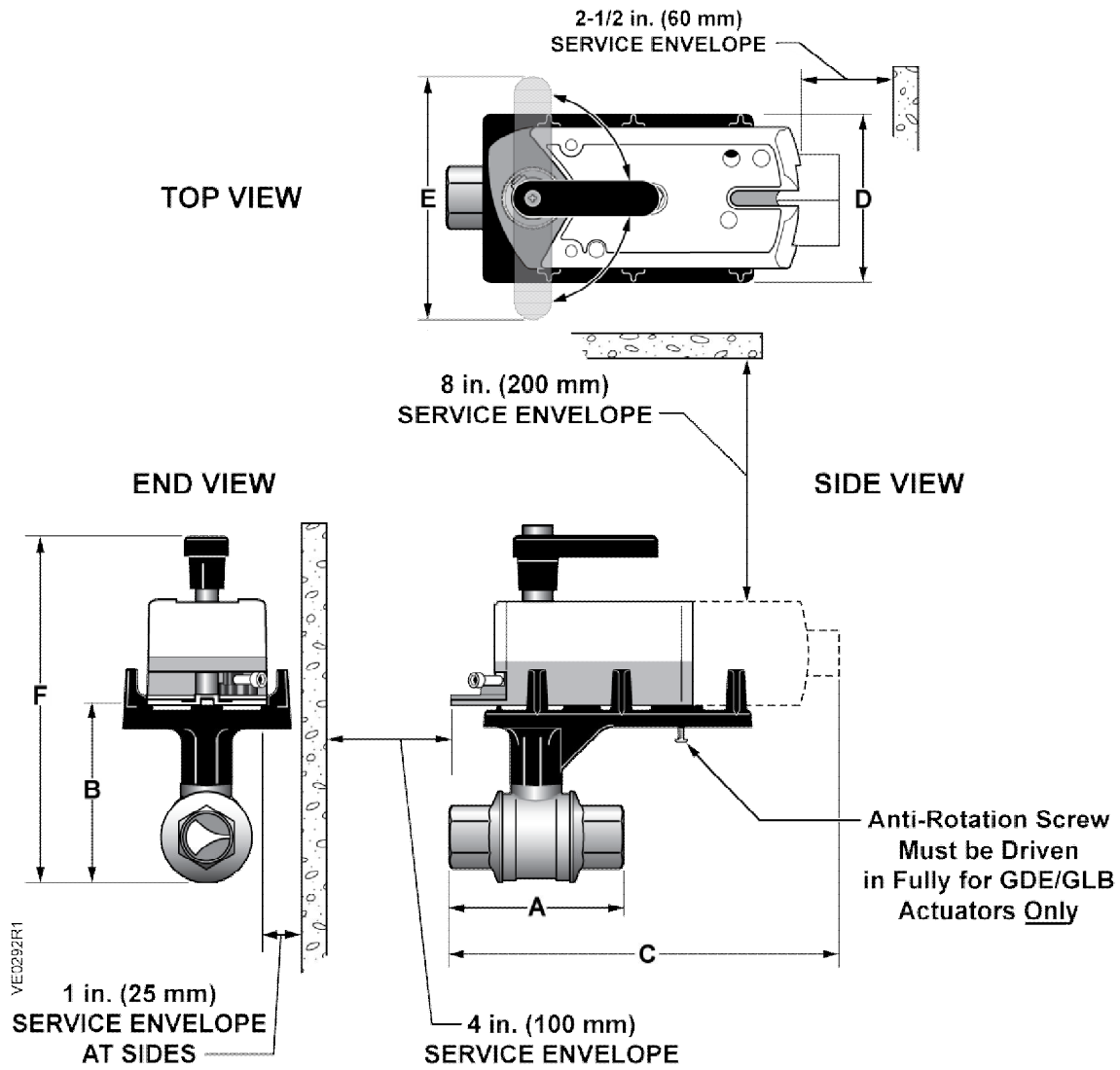
**NOTE:** Maximum operating differential pressure = 60 psi for 1/2" to 1-1/2"; 35 psi for 2" valves.



**Figure 1. 2-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	173A-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)	5-3/4 (146)	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)	6 (153)	5-3/8 (136)		5-1/4 (133)	1.3 (0.60)

**Dimensions**



**NOTES:**

1. All dimensions are in inches (mm) and weights are in pounds (kg).
2. Dimension D, Depth, is 3 inches (76 mm).
3. Dimension E, Handle, is 4 inches (102 mm).

**Figure 1. 2-Way Ball Valve with Actuator Dimensions and Service Envelope.**

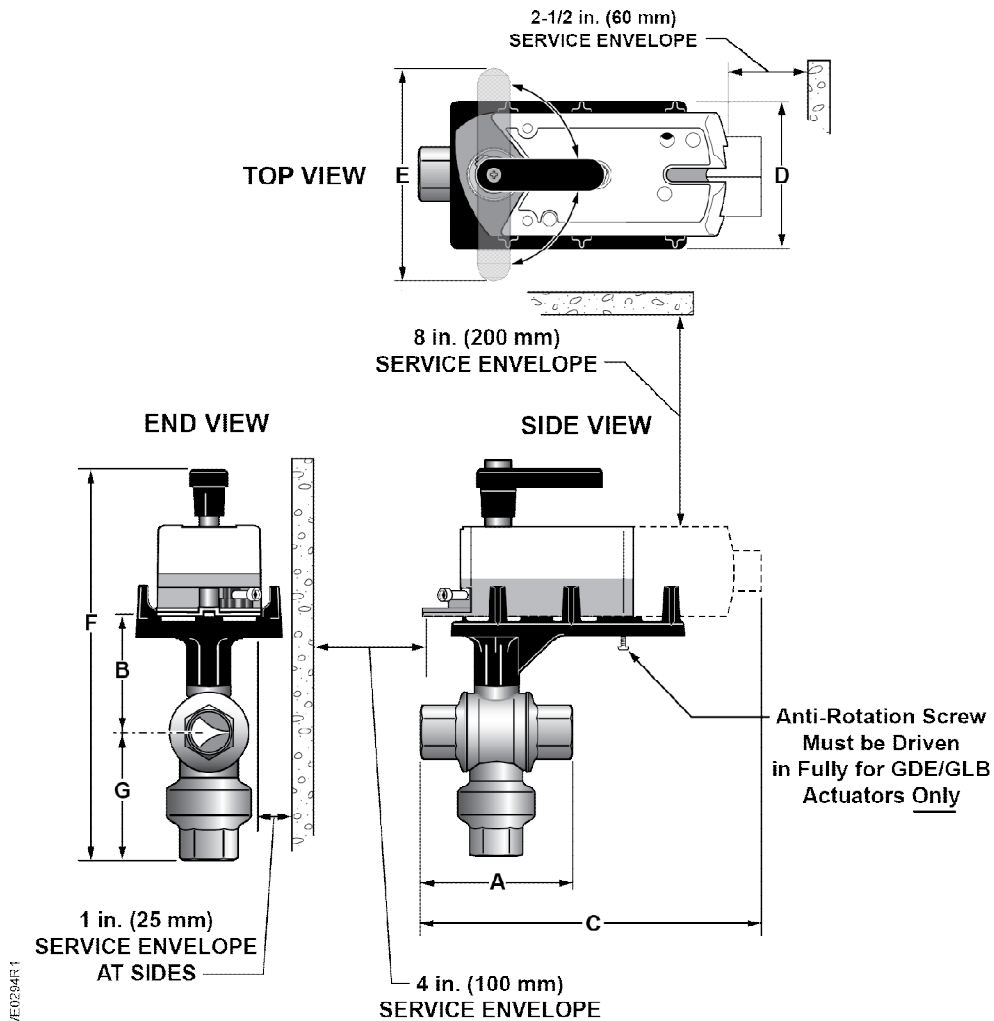
**Dimensions, Continued**

**Table 18. 2-Way Ball Valves with Actuator Dimensions and Service Envelope.**

Line Size Inches (mm)	Cv Range	A Length	C Length * Actuator Codes 171A-D, 173A-D GDE/GLB	C Length * Actuator Codes 171H,J,K,L, N GQD	C Length* 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 (204)	1.6 (0.73)
	16, 40, 63	3-1/4 (82)		—	8-3/8 (213)	8-5/15 (212)	1.8 (0.82)
	25	3-7/8 (98)	7 (178)	—	8-11/16 (221)	8-13/16 (223)	1.8 (0.82)
1-1/4 (30)	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)		7-1/16 (180)	—	8-7/16 (214)	8-13/16 (223)
	40, 100, 160	3-15/16 (100)	—		8-3/4 (223)	9-1/4 (235)	3.3 (1.50)
2 (50)	40, 100	4 (102)	7-1/2 (190)	—		9-1/8 (223)	9-3/8 (238)
	63	4-5/8 (118)		—	10-1/16 (255)		5.25 (2.38)
	160		—	—	5.3 (2.40)		

\* Dimension C is maximum length, measured from the actuator, end fitting, or mounting plate, whichever extends the furthest.

**Dimensions, Continued**



**NOTES:**

1. All dimensions are in inches (mm) and weights are in pounds (kg).
2. Dimension D, Depth, is 3-inches (76 mm).
3. Dimension E, Handle, is 4-inches (102 mm).

**Figure 2. 3-Way Ball Valve with Actuator Dimensions and Service Envelope.**

**Dimensions, Continued****Table 19. 3-Way Ball Valve with Actuator Dimensions and Service Envelope.**

Line Size Inches (mm)	Product Number	A Length	C Length * for Actuator Codes 171A-D Codes 173A-D	C Length * for Actuator Codes 171E-G	B Height	G Height	F Height	Weight lbs (kg)
1/2 (15)	599-10350(S) through 599-10357(S)	2-9/16 (65)	6-11/16 (170)	7-3/4 (197)	3-1/4 (83)	1-3/8 (35)	8-5/8 (219)	1.50 (0.68)
3/4 (20)	599-10358(S) 599-10359(S)	2-3/4 (70)	6-11/16 (170)	8 (203)	3-1/4 (83)	1-3/8 (35)	8-5/8 (219)	1.60 (0.73)
	599-10360(S)	3-1/8 (79)				1-11/16 (43)		2.20 (1.00)
1 (25)	599-10361(S)	3-1/8 (79)	6-11/16 (170)	8 (203)	3-3/4 (95)	1-11/16 (43)	9-1/8 (232)	2.37 (1.08)
	599-10362(S)	3-13/16 (97)	6-15/16 (176)	8-1/2 (216)	4 (102)	2 (51)	9-5/8 (244)	2.74 (1.24)
	599-10363(S)		8-1/2 (216)	4 (102)	2 (51)	9-5/8 (244)	2.74 (1.24)	
1-1/4 (32)	599-10364(S)	3-5/8 (92)	6-7/8 (174)	8-1/2 (216)	4 (102)	2-1/8 (54)	9-3/4 (248)	3.5 (1.59)
	599-10365(S)	3-15/16 (100)	7 (178)	8-1/2 (216)		2-5/16 (59)	10-1/4 (260)	4.30 (1.95)
	599-10366(S)		7 (178)	8-1/2 (216)		2-5/16 (59)	10-1/4 (260)	3.90 (1.76)
1-1/2 (40)	599-10367(S)	3-15/16 (100)	7 (178)	8-1/2 (216)	4 (102)	2-5/16 (59)	10-1/4 (260)	3.90 (1.76)
	599-10368(S)	4-5/8 (117)	7-1/4 (184)	8-3/4 (222)	4-1/2 (114)	2-13/16 (71)	11 (279)	7.83 (3.55)
	599-10369(S)		7-1/4 (184)	8-3/4 (222)	4-1/2 (114)	2-13/16 (71)	11 (279)	7.83 (3.55)
2 (50)	599-10370(S)	4-5/8 (117)	7-1/4 (184)	8-3/4 (222)	4-1/2 (114)	2-7/8 (73)	10-3/8 (264)	6.70 (3.04)
	599-10371(S)				5-3/4 (146)		11-3/16 (284)	
	599-10372(S)				5-3/4 (146)	11-3/16 (284)	6.70 (3.04)	

\* Dimension C, is maximum length, measured from the actuator, end fitting, or mounting plate, whichever extends the furthest.

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