

599 Series 3-Way Ball Valves

Description

The 599 Series three-way Ball Valves are coupled with OpenAir® actuators to provide equal percentage flow control in either mixing or diverting applications. The Ball Valves are 1/4-turn rotary control valves and are available in 1/2-inch to 2-inch line sizes.

Product Numbers

Use the product numbers in Table 1 or Table 2 to order the valve and the actuator assembled together. The product number consists of a 4-digit prefix code, a hyphen, and a 5- or 6-digit suffix code. The prefix specifies an actuator. The suffix specifies the valve body.

Features

- ANSI 250 valve body rating.
- Available in either chrome-plated brass ball/brass stem or 316 stainless steel ball and stem
- May be used as either mixing or diverting valves
- Shutoff up to 200 psi
- Universal mounting plate
- Blow-out proof stem withstands high pressure
- Actuator and plate can be rotated
- Standoffs provide a thermal barrier between the actuator and the mounting plate
- Operating handle can manually operate valve

Table 1. Product Numbers for Fail-In- Place Assemblies.

Valve Body Product Number *	Valve Size Inches (mm)	Close-Off ΔP in psi (kPa)	Flow Rate Cv (Kvs)	Fail-in-Place			
							
				Control & Actuator Prefix Code			
				3-Position		0 to 10 Vdc	
				GDE131.1P 171A	GLB131.1P 171B	GDE161.1P 171C	GLB161.1P 171D
599-10350(S)	1/2 (15)	200 (1379)	0.4 (0.34)	171A-10350(S)		171C-10350(S)	
599-10351(S)			0.63 (0.54)	171A-10351(S)		171C-10351(S)	
599-10352(S)			1.0 (0.86)	171A-10352(S)		171C-10352(S)	
599-10353(S)			1.6 (1.4)	171A-10353(S)		171C-10353(S)	
599-10354(S)			2.5 (2.2)	171A-10354(S)		171C-10354(S)	
599-10355(S)			4 (3.5)	171A-10355(S)		171C-10355(S)	
599-10356(S)			6.3 (5.5)	171A-10356(S)		171C-10356(S)	
599-10357(S)*			10 (8.6)	171A-10357(S)*		171C-10357(S)*	
599-10358(S)	3/4 (20)	200 (1379)	6.3 (5.5)	171A-10358(S)		171C-10358(S)	
599-10359(S)			10 (8.6)	171A-10359(S)		171C-10359(S)	
599-10360(S)*			16 (14)	171A-10360(S)*		171C-10360(S)*	
599-10361(S)	1 (25)	200 (1379)	10 (8.6)	171A-10361(S)		171C-10361(S)	
599-10362(S)			16 (14)	171A-10362(S)		171C-10362(S)	
599-10363(S)*			25 (22)	171A-10363(S)*		171C-10363(S)*	
599-10364(S)	1-1/4 (32)	200 (1379)	16 (14)	171A-10364(S)		171C-10364(S)	
599-10365(S)			25 (22)	171A-10365(S)		171C-10365(S)	
599-10366(S)*			40 (35)	171A-10366(S)*		171C-10366(S)*	
599-10367(S)	1-1/2 (40)	200 (1379)	25 (22)	171B-10367(S)		171D-10367(S)	
599-10368(S)			40 (35)	171B-10368(S)		171D-10368(S)	
599-10369(S)*			63 (54)	171B-10369(S)*		171D-10369(S)*	
599-10370(S)	2 (50)	200 (1379)	40 (35)	171B-10370(S)		171D-10370(S)	
599-10371(S)			63 (54)	171B-10371(S)		171D-10371(S)	
599-10372(S)*			100 (86)	171B-10372(S)*		171D-10372(S)*	

*Denotes a full-port valve without flow optimizer insert.

S – Suffix denotes stainless steel ball and stem

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

Typical Specifications

Ball valves shall have female NPT type fittings and shall be 1/2 to 2-inch (15 to 50-mm) line and ball sizes. The valves shall have a forged brass body, chrome-plated brass or 316 stainless steel ball, and EPDM O-ring seals. Valves may contain a glass-filled polymer flow optimizer to provide an equal percentage control characteristic. This flow optimizer should be an integral part of the ball assembly. Ball valves shall utilize a 90-degree rotation for control. They shall provide automated flow control of hot or chilled water and up to 50% glycol solution for HVAC control applications.

Technical Data

Valve Body Rating	ANSI 250/600 WOG
Static Pressure	360 psi (2482 kPa)
Maximum Operating Differential Pressure	60 psi (414 kPa) for 1/2" to 1-1/2" valves 35 psi (345 kPa) for 2" valves
Controlled Media	Water, glycol solutions to 50%
Media Temperature	
1/2-inch to 1-1/4 inch	35°F to 250°F (2°C to 121°C)
1-1/2 inch and 2-inch	35°F to 230°F (2°C to 110°C)
Body	Forged Brass ASTM B283
Flow Optimizer	Glass-filled polymer
Ball	Chrome-plated brass or 316 stainless steel
Stem	Brass or 316 stainless steel
Ball Seals	Reinforced PTFE seals with EPDM O-rings
Stem Seals	EPDM O-rings
Angle of Rotation	0 to 90°

Table 2. Product Numbers for Fail-Safe Assemblies.

Valve Body Product Number *	Valve Size Inches (mm)	Close-Off ΔP in psi (kPa)	Flow Rate Cv (Kvs)	Fail-Safe		
						
				Control & Actuator Prefix Code		
				2-Position, GMA121.1P 171E	3-Position, GMA131.1P 171F	0 to 10 Vdc, GMA161.1P 171G
599-10350(S)	1/2 (15)	200 (1379)	0.4 (0.34)	171E-10350(S)	171F-10350(S)	171G-10350(S)
599-10351(S)			0.63 (0.54)	171E-10351(S)	171F-10351(S)	171G-10351(S)
599-10352(S)			1.0 (0.86)	171E-10352(S)	171F-10352(S)	171G-10352(S)
599-10353(S)			1.6 (1.4)	171E-10353(S)	171F-10353(S)	171G-10353(S)
599-10354(S)			2.5 (2.2)	171E-10354(S)	171F-10354(S)	171G-10354(S)
599-10355(S)			4 (3.5)	171E-10355(S)	171F-10355(S)	171G-10355(S)
599-10356(S)			6.3 (5.5)	171E-10356(S)	171F-10356(S)	171G-10356(S)
599-10357(S)*	3/4 (20)	200 (1379)	10 (8.6)	171E-10357(S)*	171F-10357(S)*	171G-10357(S)*
599-10358(S)			6.3 (5.5)	171E-10358(S)	171F-10358(S)	171G-10358(S)
599-10359(S)			10 (8.6)	171E-10359(S)	171F-10359(S)	171G-10359(S)
599-10360(S)*			16 (14)	171E-10360(S)*	171F-10360(S)*	171G-10360(S)*
599-10361(S)	1 (25)	200 (1379)	10 (8.6)	171E-10361(S)	171F-10361(S)	171G-10361(S)
599-10362(S)			16 (14)	171E-10362(S)	171F-10362(S)	171G-10362(S)
599-10363(S)*			25 (22)	171E-10363(S)*	171F-10363(S)*	171G-10363(S)*
599-10364(S)	1-1/4 (32)	200 (1379)	16 (14)	171E-10364(S)	171F-10364(S)	171G-10364(S)
599-10365(S)			25 (22)	171E-10365(S)	171F-10365(S)	171G-10365(S)
599-10366(S)*			40 (35)	171E-10366(S)*	171F-10366(S)*	171G-10366(S)*
599-10367(S)	1-1/2 (40)	200 (1379)	25 (22)	171E-10367(S)	171F-10367(S)	171G-10367(S)
599-10368(S)			40 (35)	171E-10368(S)	171F-10368(S)	171G-10368(S)
599-10369(S)*			63 (54)	171E-10369(S)*	171F-10369(S)*	171G-10369(S)*
599-10370(S)	2 (50)	200 (1379)	40 (35)	171E-10370(S)	171F-10370(S)	171G-10370(S)
599-10371(S)			63 (54)	171E-10371(S)	171F-10371(S)	171G-10371(S)
599-10372(S)*			100 (86)	171E-10372(S)*	171F-10372(S)*	171G-10372(S)*

* Denotes a full-port valve without flow optimizer insert.

S – Suffix denotes stainless steel ball and stem

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

Table 2. 3-Way, Full-Port (Without Flow Optimizer) Ball Valve Product Numbers and Flow Coefficients.

Valve Size in Inches (mm)	Valve Body 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(S)	10.00 (8.62)	6.94 (5.93)	6.19 (5.29)	--	--	--	--	--	--	--	--
3/4 (20)	599-10360(S)	--	16.00 (13.79)	13.9 (11.98)	12.4 (10.69)	--	--	--	--	--	--	--
1 (25)	599-10363(S)	--	--	25.00 (21.55)	22.5 (19.40)	21.2 (18.27)	--	--	--	--	--	--
1-1/4 (32)	599-10366(S)	--	--	--	40.00 (34.48)	36.9 (31.81)	33.3 (28.70)	--	--	--	--	--
1-1/2 (40)	599-10369(S)	--	--	--	--	63.00 (54.31)	55.3 (47.67)	51.00 (43.96)	--	--	--	--
2 (50)	599-10372(S)	--	--	--	--	--	100 (86.21)	94.3 (81.29)	86.1 (74.23)	--	--	--

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

Table 3. Dimensions in Inches (Millimeters).

Technical drawings of the 599 Series 3-Way Ball Valve showing Top View, End View, and Side View with dimensions. Top View shows a 2-1/2 in. (63 mm) SERVICE ENVELOPE. End View shows a 1 in. (25 mm) SERVICE ENVELOPE AT SIDES. Side View shows a 4 in. (100 mm) SERVICE ENVELOPE. A note indicates: "Anti-Rotation Screw Must Be Driven in Fully for GDE/OLB Actuators Only".

- All dimensions are in inches (mm) and weights are in pounds (kg).
- Stamping on valve body indicates the ball size, not necessarily the line size.
- Dimension "C" is maximum length, measured from the actuator, end fitting, or mounting plate, whichever extends the furthest.
- Dimension "D", Depth, is 3 inches (76 mm).
- Dimension "E", Handle, is 4 inches (102 mm).

Line Size Inches (mm)	Product Number	A Length	C Length * for Actuator Codes 171A-D	C Length * for Actuator Codes 171E-G	B Height	G Height	F Height	Weight
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) 599-10363(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)
1-1/4 (32)	599-10364(S) 599-10365(S)	3-5/8 (92)	6-7/8 (174)	8-1/2 (216)	4 (102)	2-1/8 (54)	9-3/4 (248)	3.50 (1.59)
	599-10366(S)	3-15/16 (100)	7 (178)			2-5/16 (59)	10-1/4 (260)	4.30 (1.95)
1-1/2 (40)	599-10367(S) 599-10368(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)
	599-10369(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)
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) 599-10372(S)				5-3/4 (146)		11-3/16 (284)	

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