

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 | GDE131.1Q 173A | GLB131.1Q 173B |
| 3-foot (.9 m) Wires | | Conduit Adapter & 6-ft (1.8 m) Wires | | 3-foot (.9 m) Wires | | Conduit Adapter & 6-ft (1.8 m) Wires | |
| 599-10350(S) | 1/2 (15) | 200 (1379) | 0.4 (0.34) | 171A-10350(S) | 173A-10350(S) | 171C-10350(S) | 173C-10350(S) |
| 599-10351(S) | | | 0.63 (0.54) | 171A-10351(S) | 173A-10351(S) | 171C-10351(S) | 173C-10351(S) |
| 599-10352(S) | | | 1.0 (0.86) | 171A-10352(S) | 173A-10352(S) | 171C-10352(S) | 173C-10352(S) |
| 599-10353(S) | | | 1.6 (1.4) | 171A-10353(S) | 173A-10353(S) | 171C-10353(S) | 173C-10353(S) |
| 599-10354(S) | | | 2.5 (2.2) | 171A-10354(S) | 173A-10354(S) | 171C-10354(S) | 173C-10354(S) |
| 599-10355(S) | | | 4 (3.5) | 171A-10355(S) | 173A-10355(S) | 171C-10355(S) | 173C-10355(S) |
| 599-10356(S) | | | 6.3 (5.5) | 171A-10356(S) | 173A-10356(S) | 171C-10356(S) | 173C-10356(S) |
| 599-10357(S)* | | | 10 (8.6) | 171A-10357(S)* | 173A-10357(S)* | 171C-10357(S)* | 173C-10357(S)* |
| 599-10358(S) | 3/4 (20) | 200 (1379) | 6.3 (5.5) | 171A-10358(S) | 173A-10358(S) | 171C-10358(S) | 173C-10358(S) |
| 599-10359(S) | | | 10 (8.6) | 171A-10359(S) | 173A-10359(S) | 171C-10359(S) | 173C-10359(S) |
| 599-10360(S)* | | | 16 (14) | 171A-10360(S)* | 173A-10360(S)* | 171C-10360(S)* | 173C-10360(S)* |
| 599-10361(S) | 1 (25) | 200 (1379) | 10 (8.6) | 171A-10361(S) | 173A-10361(S) | 171C-10361(S) | 173C-10361(S) |
| 599-10362(S) | | | 16 (14) | 171A-10362(S) | 173A-10362(S) | 171C-10362(S) | 173C-10362(S) |
| 599-10363(S)* | | | 25 (22) | 171A-10363(S)* | 173A-10363(S)* | 171C-10363(S)* | 173C-10363(S)* |
| 599-10364(S) | 1-1/4 (32) | 200 (1379) | 16 (14) | 171A-10364(S) | 173A-10364(S) | 171C-10364(S) | 173C-10364(S) |
| 599-10365(S) | | | 25 (22) | 171A-10365(S) | 173A-10365(S) | 171C-10365(S) | 173C-10365(S) |
| 599-10366(S)* | | | 40 (35) | 171A-10366(S)* | 173A-10366(S)* | 171C-10366(S)* | 173C-10366(S)* |
| 599-10367(S) | 1-1/2 (40) | 200 (1379) | 25 (22) | 171B-10367(S) | 173B-10367(S) | 171D-10367(S) | 173D-10367(S) |
| 599-10368(S) | | | 40 (35) | 171B-10368(S) | 173B-10368(S) | 171D-10368(S) | 173D-10368(S) |
| 599-10369(S)* | | | 63 (54) | 171B-10369(S)* | 173B-10369(S)* | 171D-10369(S)* | 173D-10369(S)* |
| 599-10370(S) | 2 (50) | 200 (1379) | 40 (35) | 171B-10370(S) | 173B-10370(S) | 171D-10370(S) | 173D-10370(S) |
| 599-10371(S) | | | 63 (54) | 171B-10371(S) | 173B-10371(S) | 171D-10371(S) | 173D-10371(S) |
| 599-10372(S)* | | | 100 (86) | 171B-10372(S)* | 173B-10372(S)* | 171D-10372(S)* | 173D-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)* | | | 10 (8.6) | 171E-10357(S)* | 171F-10357(S)* | 171G-10357(S)* |
| 599-10358(S) | 3/4 (20) | 200 (1379) | 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".

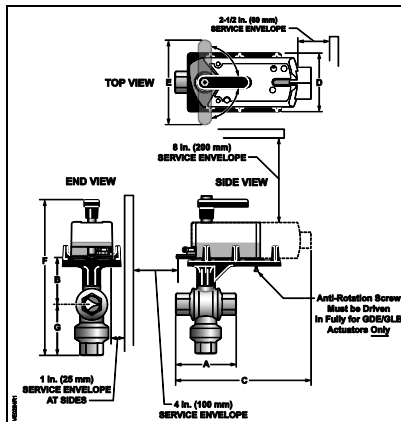
Table 2. 3-Way, Full-Port (Without Flow Optimizer) Ball Valve Product Numbers and Flow Coefficients.

| 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).

| 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) | | |
| 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) |
| 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) |
| 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 (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) | |



- 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).

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