

Three-Way Ball Valves

24 Vac, On/Off, Floating or Proportional Control

1/2 to 2-inch

Chrome-plated Ball & Brass Stem or Stainless Steel Ball & Stem

Spring Return or Non-Spring Return



3-Way Ball Valve and Actuator.

Description

Designed to provide excellent equal percentage flow control, Three-way Ball Valves are available in 1/2 to 2-inch line sizes and are 1/4-turn rotary control valves. These ball valves are designed to couple with an OpenAir actuator.

Features

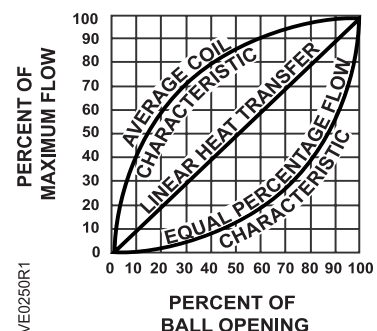
- Universal mounting plate accommodates different actuator sizes
- Variety of ball sizes and flow coefficients minimizes the need for downsizing pipes and accurately controls fluid through coils
- Industry leading close-off
- Actuator and plate can be rotated to facilitate installation and wiring
- Standoffs and mounting plate provide a thermal barrier between the actuator and valve
- Plastic mounting plate, extensions, and handle do not condensate in chilled or hot water applications
- Operating handle can manually operate valve in the event of a power failure
- Available as on/off (2P), floating (3P), or proportional control
- Spring return or non-spring return

Applications

Ball Valves can control hot or chilled water and up to 50% glycol solution in convectors, fan coil units, unit conditioners, radiation, and reheat coils.

Application Drawings

The parabolic shape of the flow optimizer orifice allows a slow opening valve. Equal movements of the valve stem at any point of the flow range changes the existing flow an equal percentage regardless of the existing flow. The ball valve equal percentage flow characteristic mirrors the flow characteristic of a coil, resulting in linear heat transfer.



Ball Valve Equal Percentage Flow Control.

Three-Way Ball Valve Specifications

Pressure Class ANSI 250 (600 WOG)
Static Pressure/Temp. 360 psig/250°F
Controlled Medium Water, Glycol Solutions up to 50%
Media Temperature
 1/2 to 1-1/4" 35 to 250°F (2 to 121°C)
 1-1/2 to 2" 35 to 230°F (2 to 110°C)
Materials
 Body Forged Brass ASTM B283, C37700
 Ball Chrome-plated Brass or Stainless Steel
 Ball Seals Glass-filled PTFE with EPDM O-Rings
 Flow Optimizer Glass-filled PTFE
 Stem Brass or Stainless Steel
 Stem Seals EPDM O-rings

End Connections NPT Female
Angle of Rotation 0 to 90 Degrees
Maximum Operating Differential Pressure
 1/2 to 1-1/2" 60 psi
 2" 35 psi
Close-off Ratings (per ANSI/FCI 70-2)
 For A → AB ANSI Class IV (0.01%)
 For B → AB ANSI Class III (0.1%)

Three-Way Ball Valve Assemblies Product Ordering


Mixing/Diverting 1/2 to 2"				Spring Return Actuator 		
				2-Position	Floating	0 to 10 Vdc
				3-foot (.9m) Wires		
3-Way Ball Valve Part No.	Valve Size in.	Flow Rate Cv	Close Off psi	GMA121.1P	GMA131.1P	GMA161.1P
Chrome-Plated Brass Ball and Brass Stem						
599-10350	1/2	0.4	200	171E-10350	171F-10350	171G-10350
599-10351		0.63	200	171E-10351	171F-10351	171G-10351
599-10352		1.0	200	171E-10352	171F-10352	171G-10352
599-10353		1.6	200	171E-1035S	171F-10353	171G-10353
599-10354		2.5	200	171E-10354	171F-10354	171G-10354
599-10355		4	200	171E-1035S	171F-10355	171G-10355
599-10356		6.3	200	171E-10356	171F-10356	171G-10356
599-10357*		10	200	171E-10357*	171F-10357*	171G-10357*
599-10358	3/4	6.3	200	171E-10358	171F-10358	171G-10358
599-10359		10	200	171E-10359	171F-10359	171G-10359
599-10360*		16	200	171E-10360*	171F-10360*	171G-10360*
599-10361	1	10	200	171E-10361	171F-10361	171G-10361
599-10362		16	200	171E-10362	171F-10362	171G-10362
599-10363*		25	200	171E-10363*	171F-10363*	171G-10363*
599-10364	1-1/4	16	200	171E-10364	171F-10364	171G-10364
599-10365		25	200	171E-10365	171F-10365	171G-10365
599-10366*		40	200	171E-10366*	171F-10366*	171G-10366*
599-10367	1-1/2	25	200	171E-10367	171F-10367	171G-10367
599-10368		40	200	171E-10368	171F-10368	171G-10368
599-10369*		63	200	171E-10369*	171F-10369*	171G-10369*
599-10370	2	40	200	171E-10370	171F-10370	171G-10370
599-10371		63	200	171E-10371	171F-10371	171G-10371
599-10372*		100	200	171E-10372*	171F-10372*	171G-10372*

Table Note:

*Denotes a full-port valve with no flow optimizer insert.
NOTE: Maximum operating differential pressure = 60 psi for 1/2" to 1-1/2", 35 psi for 2"

A-208

Valves

Three-Way Ball Valve Assemblies Product Ordering


Mixing/Diverting 1/2 to 2"				Spring Return Actuator 		
				2-Position	Floating	0 to 10 Vdc
				3-foot (.9m) Wires		
3-Way Ball Valve Part No.	Valve Size in.	Flow Rate Cv	Close Off psi	GMA121.1P	GMA131.1P	GMA161.1P
Stainless Steel Ball and Stem						
599-10350S	1/2	0.4	200	171E-10350S	171F-10350S	171G-10350S
599-10351S		0.63	200	171E-10351S	171F-10351S	171G-10351S
599-10352S		1.0	200	171E-10352S	171F-10352S	171G-10352S
599-10353S		1.6	200	171E-10353S	171F-10353S	171G-10353S
599-10354S		2.5	200	171E-10354S	171F-10354S	171G-10354S
599-10355S		4	200	171E-10355S	171F-10355S	171G-10355S
599-10356S		6.3	200	171E-10356S	171F-10356S	171G-10356S
599-10357S*		10	200	171E-10357S*	171F-10357S*	171G-10357S*
599-10358S	3/4	6.3	200	171E-10358S	171F-10358S	171G-10358S
599-10359S		10	200	171E-10359S	171F-10359S	171G-10359S
599-10360S*		16	200	171E-10360S*	171F-10360S*	171G-10360S*
599-10361S	1	10	200	171E-10361S	171F-10361S	171G-10361S
599-10362S		16	200	171E-10362S	171F-10362S	171G-10362S
599-10363S*		25	200	171E-10363S*	171F-10363S*	171G-10363S*
599-10364S	1-1/4	16	200	171E-10364S	171F-10364S	171G-10364S
599-10365S		25	200	171E-10365S	171F-10365S	171G-10365S
599-10366S*		40	200	171E-10366S*	171F-10366S*	171G-10366S*
599-10367S	1-1/2	25	200	171E-10367S	171F-10367S	171G-10367S
599-10368S		40	200	171E-10368S	171F-10368S	171G-10368S
599-10369S*		63	200	171E-10369S*	171F-10369S*	171G-10369S*
599-10370S	2	40	200	171E-10370S	171F-10370S	171G-10370S
599-10371S		63	200	171E-10371S	171F-10371S	171G-10371S
599-10372S*		100	200	171E-10372S*	171F-10372S*	171G-10372S*

Table Note:

*Denotes a full-port valve with no flow optimizer insert.

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

Three-Way Ball Valve Assemblies Product Ordering


Mixing/Diverting 1/2 to 2"				Non-Spring Return Actuator 			
				Floating		0 to 10 Vdc	
3-Way Ball Valve Part No.	Valve Size in.	Flow Rate Cv	Close Off psi	3-foot (.9m) Wires	Conduit Adapter & 6-foot (1.8m) Wires	3-foot (.9m) Wires	Conduit Adapter & 6-foot (1.8m) Wires
				GDE131.1P (171A) and GLB131.1P (171B)	GDE131.1Q (173A) and GLB131.1Q (173B)	GDE161.1P (171C) and GLB161.1P (171D)	GDE161.1Q (173C) and GLB161.1Q (173D)
Chrome-Plated Brass Ball and Brass Stem							
599-10350	1/2	0.4	200	171A-10350	173A-10350	171C-10350	173C-10350
599-10351		0.63	200	171A-10351	173A-10351	171C-10351	173C-10351
599-10352		1.0	200	171A-10352	173A-10352	171C-10352	173C-10352
599-10353		1.6	200	171A-10353	173A-10353	171C-10353	173C-10353
599-10354		2.5	200	171A-10354	173A-10354	171C-10354	173C-10354
599-10355		4	200	171A-10355	173A-10355	171C-10355	173C-10355
599-10356		6.3	200	171A-10356	173A-10356	171C-10356	173C-10356
599-10357*		10	200	171A-10357*	173A-10357*	171C-10357*	173C-10357*
599-10358	3/4	6.3	200	171A-10358	173A-10358	171C-10358	173C-10358
599-10359		10	200	171A-10359	173A-10359	171C-10359	173C-10359
599-10360*		16	200	171A-10360*	173A-10360*	171C-10360*	173C-10360*
599-10361	1	10	200	171A-10361	173A-10361	171C-10361	173C-10361
599-10362		16	200	171A-10362	173A-10362	171C-10362	173C-10362
599-10363*		25	200	171A-10363*	173A-10363*	171C-10363*	173C-10363*
599-10364	1-1/4	16	200	171A-10364	173A-10364	171C-10364	173C-10364
599-10365		25	200	171A-10365	173A-10365	171C-10365	173C-10365
599-10366*		40	200	171A-10366*	173A-10366*	171C-10366*	173C-10366*
599-10367	1-1/2	25	200	171B-10367	173B-10367	171D-10367	173D-10367
599-10368		40	200	171B-10368	173B-10368	171D-10368	173D-10368
599-10369*		63	200	171B-10369*	173B-10369*	171D-10369*	173D-10369*
599-10370	2	40	200	171B-10370	173B-10370	171D-10370	173D-10370
599-10371		63	200	171B-10371	173B-10371	171D-10371	173D-10371
599-10372*		100	200	171B-10372*	173B-10372*	171D-10372*	173D-10372*

Table Note:

*Denotes a full-port valve with no flow optimizer insert.
NOTE: Maximum operating differential pressure = 60 psi for 1/2" to 1-1/2", 35 psi for 2"

A-210

Valves

Three-Way Ball Valve Assemblies Product Ordering



Mixing/Diverting 1/2 to 2" 				Non-Spring Return Actuator 			
				Floating		0 to 10 Vdc	
3-Way Ball Valve Part No.	Valve Size in.	Flow Rate Cv	Close Off psi	3-foot (.9m) Wires	Conduit Adapter & 6-foot (1.8m) Wires	3-foot (.9m) Wires	Conduit Adapter & 6-foot (1.8m) Wires
				GDE131.1P (171A) and GLB131.1P (171B)	GDE131.1Q (173A) and GLB131.1Q (173B)	GDE161.1P (171C) and GLB161.1P (171D)	GDE161.1Q (173C) and GLB161.1Q (173D)
Stainless Steel Ball and Stem							
599-10350S	1/2	0.4	200	171A-10350S	173A-10350S	171C-10350S	173C-10350S
599-10351S		0.63	200	171A-10351S	173A-10351S	171C-10351S	173C-10351S
599-10352S		1.0	200	171A-10352S	173A-10352S	171C-10352S	173C-10352S
599-10353S		1.6	200	171A-10353S	173A-10353S	171C-10353S	173C-10353S
599-10354S		2.5	200	171A-10354S	173A-10354S	171C-10354S	173C-10354S
599-10355S		4	200	171A-10355S	173A-10355S	171C-10355S	173C-10355S
599-10356S		6.3	200	171A-10356S	173A-10356S	171C-10356S	173C-10356S
599-10357S*		10	200	171A-10357S*	173A-10357S*	171C-10357S*	173C-10357S*
599-10358S	3/4	6.3	200	171A-10358S	173A-10358S	171C-10358S	173C-10358S
599-10359S		10	200	171A-10359S	173A-10359S	171C-10359S	173C-10359S
599-10360S*		16	200	171A-10360S*	173A-10360S*	171C-10360S*	173C-10360S*
599-10361S	1	10	200	171A-10361S	173A-10361S	171C-10361S	173C-10361S
599-10362S		16	200	171A-10362S	173A-10362S	171C-10362S	173C-10362S
599-10363S*		25	200	171A-10363S*	173A-10363S*	171C-10363S*	173C-10363S*
599-10364S	1-1/4	16	200	171A-10364S	173A-10364S	171C-10364S	173C-10364S
599-10365S		25	200	171A-10365S	173A-10365S	171C-10365S	173C-10365S
599-10366S*		40	200	171A-10366S*	173A-10366S*	171C-10366S*	173C-10366S*
599-10367S	1-1/2	25	200	171B-10367S	173B-10367S	171D-10367S	173D-10367S
599-10368S		40	200	171B-10368S	173B-10368S	171D-10368S	173D-10368S
599-10369S*		63	200	171B-10369S*	173B-10369S*	171D-10369S*	173D-10369S*
599-10370S	2	40	200	171B-10370S	173B-10370S	171D-10370S	173D-10370S
599-10371S		63	200	171B-10371S	173B-10371S	171D-10371S	173D-10371S
599-10372S*		100	200	171B-10372S*	173B-10372S*	171D-10372S*	173D-10372S*

Table Note:

*Denotes a full-port valve with no flow optimizer insert.

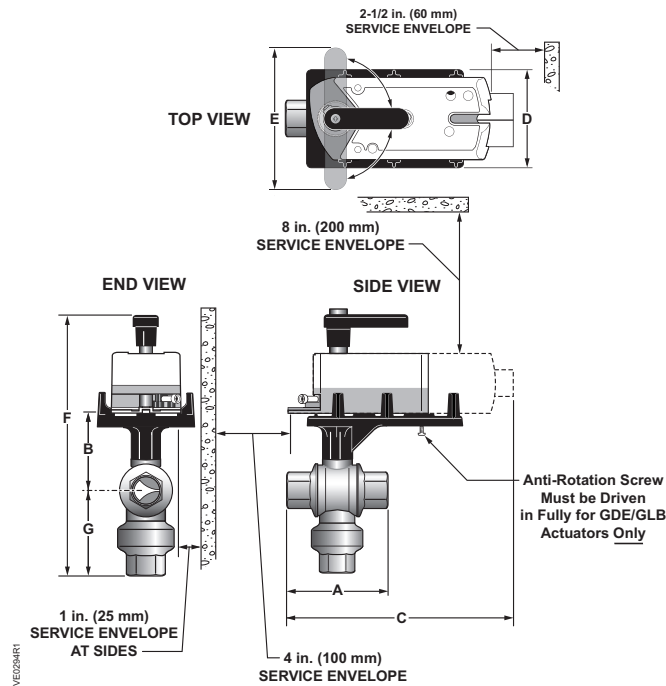
NOTE: Maximum operating differential pressure = 60 psi for 1/2" to 1-1/2", 35 psi for 2"

A-211

Valves

Dimensions and Weights

Three-Way Ball Valves with Actuator Dimensions and Service Envelope



Dimensions shown in inches (mm).

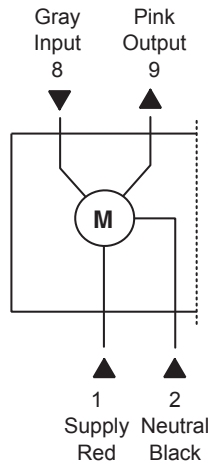
Part No.	Line Size Inches (mm)	A	C	C	B	G	F	Weight lbs (kg)
		Length	Length* Actuator Codes 171A-D 173A-D	Length* Actuator Codes 171E-G	Height	Height	Height	
599-10350(S) to 599-10357(S)	1/2" (15 mm)	2-9/16" (65 mm)	6-11/16" (170 mm)	8-3/8" (213 mm)	3-1/4" (83 mm)	1-3/8" (35 mm)	8-5/8" (219 mm)	1.50 lb. (0.68 kg)
599-10358(S)	3/4" (20 mm)	2-3/4" (70 mm)	6-11/16" (170 mm)	8-3/8" (213 mm)	3-1/4" (83 mm)	1-3/8" (35 mm)	8-5/8" (219 mm)	1.60 lb. (0.73 kg)
599-10359(S) to 599-10360(S)		3-1/8" (79 mm)	6-11/16" (170 mm)	8-3/8" (213 mm)	3-1/4" (83 mm)	1-11/16" (43 mm)	8-5/8" (219 mm)	2.20 lb. (1.00 kg)
599-10361(S)	1" (25 mm)	3-1/4" (83 mm)	6-11/16" (170 mm)	8-3/8" (213 mm)	3-3/4" (95 mm)	1-11/16" (43 mm)	9-1/8" (232 mm)	2.37 lb. (1.08 kg)
599-10362(S) 599-10363(S)		3-13/16" (77 mm)	6-15/16" (176 mm)	8-5/8" (219 mm)	4" (102 mm)	2" (51 mm)	9-5/8" (244 mm)	2.74 lb. (1.24 kg)
599-10364(S) 599-10365(S)	1-1/4" (32 mm)	3-5/8" (92 mm)	6-7/8" (174 mm)	8-9/16" (217 mm)	4" (102 mm)	2-1/8" (54 mm)	9-3/4" (248 mm)	2.85 lb. (1.29 kg)
599-10366(S)		3-15/16" (100 mm)	7" (178 mm)	8-11/16" (221 mm)	4" (102 mm)	2-5/16" (59 mm)	10-1/4" (260 mm)	4.30 lb. (1.95 kg)
599-10367(S) 599-10368(S)	1-1/2" (40 mm)	3-15/16" (100 mm)	7" (178 mm)	8-11/16" (221 mm)	4" (102 mm)	2-5/16" (59 mm)	10-1/4" (260 mm)	3.90 lb. (1.61 kg)
599-10369(S)		4-5/8" (117 mm)	7-1/4" (184 mm)	7-7/8" (200 mm)	4-1/2" (114 mm)	2-13/16" (71 mm)	11" (279 mm)	7.83 lb. (17.16 kg)
599-10370(S)	2" (50 mm)	4-5/8" (117 mm)	7-1/4" (184 mm)	8-11/16" (221 mm)	4-1/2" (114 mm)	2-7/8" (73 mm)	10-3/8" (264 mm)	6.70 lb. (3.04 kg)
599-10371(S) 599-10372(S)		4-5/8" (117 mm)	7-1/4" (184 mm)	9-1/16" (230 mm)	5-3/4" (146 mm)	2-7/8" (73 mm)	11-3/16" (284 mm)	6.70 lb. (3.04 kg)

Table Notes:

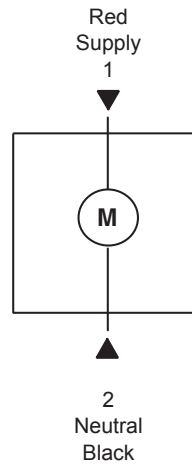
*Dimension "C" is maximum length, measured from the actuator, end fitting, or mounting plate, whichever extends the furthest.

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).

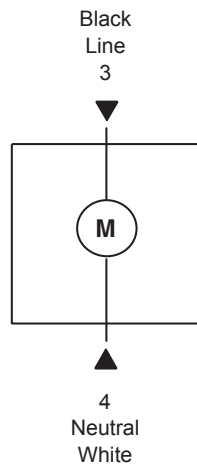
Wiring Diagrams



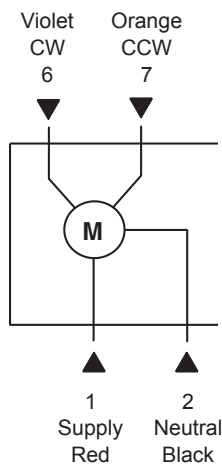
**Modulating (0 to 10 Vdc), 24 Vac
(Applies to all)**



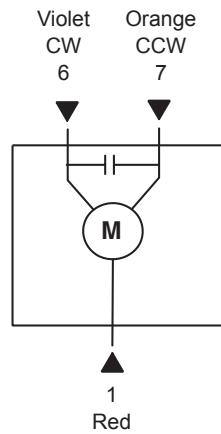
**2-position, 24 Vac
(GMA, GQD 2-position)**



**2-position, 120 Vac
(GMA, GQD)**



**3-position, 24 Vac-SR
(GMA, GQD)**



**3-position, 24 Vac-NSR
(GDE/GLB)**