

# SIEMENS

## 599 Series

**Technical Instructions**  
Document No. 155-703P25  
VF 599-9  
July 7, 2014

### 2-Way Ball Valves



#### Description

The 599 Series 2-way Ball Valves are coupled with OpenAir™ 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 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.

#### 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.

|                 |                                                                                     |                                                                                           |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>WARNING:</b> |  | Personal injury or loss of life may occur if you do not perform a procedure as specified. |
| <b>CAUTION:</b> |  | Equipment damage may occur if you do not perform a procedure as specified.                |

#### Product Numbers

See Table 2 through Table 10.

#### Accessories/Kits

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

|                       |                                      |                                                        |
|-----------------------|--------------------------------------|--------------------------------------------------------|
| <b>Specifications</b> | Body                                 | Brass: ASTM B283, C37700                               |
|                       | Ball                                 | Chrome-plated brass or stainless steel                 |
| <b>Material</b>       | Ball seals                           | Glass filled PTFE with EPDM O-rings                    |
|                       | Flow characterizer                   | Glass filled PTFE                                      |
|                       | End connections                      | Female NPT                                             |
|                       | Stem                                 | Brass or stainless steel                               |
|                       | Stem seals                           | EPDM O-rings                                           |
| <b>Operating</b>      | Valve body rating                    | ANSI 250/600 WOG                                       |
|                       | Media temperature                    | 35°F to 250°F (2°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)                                |
| <b>Miscellaneous</b>  | Canadian Registration Number         | OC8213.5ADD4                                           |
|                       | Mounting location                    | NEMA 1 (interior only)<br>NEMA 3R (with weathershield) |
|                       | Dimensions, service envelope, weight | See Figure 5 and Table 12.                             |

## 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 | OpenAir Actuator * | 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 | OpenAir Actuator * | Control                                                         |
|----------------------|--------------------|-----------------------------------------------------------------|
| 172P                 | GMA126.1P          | 2-position, fail-safe, normally closed, dual auxiliary switches |
| 173A                 | GDE131.1Q**        | Floating, fail-in-place                                         |
| 173B                 | GLB131.1Q**        | Floating, fail-in-place                                         |
| 173C                 | GDE161.1Q**        | 0 to 10 Vdc, fail-in-place                                      |
| 173D                 | GLB161.1Q**        | 0 to 10 Vdc, fail-in-place                                      |

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

\*\*When ordered as an assembly, the actuator is provided with conduit adapter and 6-foot (1.8 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 5 for valves with a chrome-plated ball and brass stem or Table 6 through Table 9 for valves with stainless steel ball and stem.



Figure 1.

**Table 2. Fail-In-Place Assemblies: Chrome-Plated Ball with Brass Stem.**

| 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 (.9 m) Wires                                                                |             | Conduit Adapter & 6-foot (1.8 m) Wires |             | 3 foot (.9m) Wires |            | Conduit Adapter & 6-foot (1.8 m) Wires |            |
|                             |                        |                    |                           | Actuator Prefix Code                                                               |             |                                        |             |                    |            |                                        |            |
|                             |                        |                    |                           | 171A                                                                               | 171B        | 173A                                   | 173B        | 171C               | 171D       | 173C                                   | 173D       |
| 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* |                    |            |                                        |            |
| 599-10312                   | 1 (25)                 | 10 (9.0)           |                           | 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 characterizer insert.

**Table 3. Fail-Safe 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-Safe                                                                           |             |                       |             |                          |             |
|----------------------------|------------------------|--------------------|---------------------------|-------------------------------------------------------------------------------------|-------------|-----------------------|-------------|--------------------------|-------------|
|                            |                        |                    |                           |  |             |                       |             |                          |             |
|                            |                        |                    |                           | 2-Position<br>GQD121.1P                                                             |             | Floating<br>GQD131.1P |             | 2 to 10 Vdc<br>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)          |                           | 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 4. Fail-Safe 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-Safe                                                                            |             |                       |             |                          |             |
|-----------------------------|------------------------|--------------------|---------------------------|--------------------------------------------------------------------------------------|-------------|-----------------------|-------------|--------------------------|-------------|
|                             |                        |                    |                           |  |             |                       |             |                          |             |
|                             |                        |                    |                           | 2-Position<br>GMA121.1P                                                              |             | Floating<br>GMA131.1P |             | 0 to 10 Vdc<br>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)            |                           | 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)            |                           | 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)            |                           | 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 5. 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 characterizers insert.

**Table 6. Fail-In-Place Assemblies: Stainless Steel Ball and Stem.**

| 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 (.9 m) Wires                                                                |              | Conduit Adapter & 6-foot (1.8 m) Wires |              | 3 foot (.9 m) Wires |            | Conduit Adapter & 6-foot (1.8 m) Wires |            |
|                             |                        |                    |                           | Actuator Prefix Code                                                               |              |                                        |              |                     |            |                                        |            |
| 171A                        | 171B                   | 173A               | 173B                      | 171C                                                                               | 171D         | 173C                                   | 173D         |                     |            |                                        |            |
| 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                  | 3/4 (20)               | 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                  |                        | 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* |                     |            |                                        |            |
| 599-10312S                  | 1 (25)                 | 10 (9.0)           |                           | 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                  |                        | 16 (14)            |                           | 171A-10317S                                                                        | 173A-10317S  | 171C-10317S                            | 173C-10317S  |                     |            |                                        |            |
| 599-10318S                  | 1-1/4 (32)             | 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                  |                        | 25 (22)            |                           | 171B-10322S                                                                        | 173B-10322S  | 171D-10322S                            | 173D-10322S  |                     |            |                                        |            |
| 599-10323S                  |                        | 40 (34)            |                           | 171B-10323S                                                                        | 173B-10323S  | 171D-10323S                            | 173D-10323S  |                     |            |                                        |            |
| 599-10324S*                 | 1-1/2 (40)             | 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                  |                        | 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*                 | 2 (50)                 | 160 (140)          |                           | 171B-10330S*                                                                       | 173B-10330S* | 171D-10330S*                           | 173D-10330S* |                     |            |                                        |            |

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

Table 7. Fail-Safe Assemblies: Stainless Steel Ball and Stem (1/2-inch and 3/4-inch).

| Valve Body Product Number* | 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*                | 10 (8.6)           |                        |                           | 171H-10307S*                                                                       | 172H-10307S* | 171J-10307S* | 172J-10307S* | 171K-10307S* | 172K-10307S* |
| 599-10308S                 | 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 8. 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<br>(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<br>(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<br>(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<br>(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 9. 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 characterizers insert.

**Table 10. Fail-Safe Assemblies: Full-Port, Stainless Steel Ball and Stem, 24V with Dual Auxiliary Switches.**

| Valve Body Product Number* | Valve Size Inches (mm) | Flow Rate Cv (Kvs) | Close-off Δ P 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.

**NOTE:** Use Table 11 to determine the effective Cv when using a full-port ball valve where the ball size and the line sizes differ.

**Table 11. 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<br>599-10307S | 10.00<br>(8.62)                 | 6.94<br>(5.93)   | 6.19<br>(5.29)   | —                 | —                  | —                 | —                | —                | —       | —       | —       |
| 3/4 (20)                       | 599-10311<br>599-10311S | —                               | 25.00<br>(21.55) | 18.66<br>(15.95) | 15.35<br>(13.12)  | —                  | —                 | —                | —                | —       | —       | —       |
| 1 (25)                         | 599-10316<br>599-10316S | —                               | —                | 63.00<br>(54.31) | 39.78<br>(34.00)  | 33.56<br>(28.69)   | —                 | —                | —                | —       | —       | —       |
| 1-1/4 (32)                     | 599-10321<br>599-10321S | —                               | —                | —                | 100.00<br>(86.21) | 69.19<br>(59.13)   | 51.45<br>(43.98)  | —                | —                | —       | —       | —       |
| 1-1/2 (40)                     | 599-10324<br>599-10324S | —                               | —                | —                | —                 | 63.00<br>(54.31)   | 55.34<br>(47.30)  | 51.00<br>(43.59) | —                | —       | —       | —       |
|                                | 599-10326<br>599-10326S | —                               | —                | —                | —                 | 160.00<br>(137.93) | 93.80<br>(80.17)  | 76.34<br>(65.25) | —                | —       | —       | —       |
| 2 (50)                         | 599-10329<br>599-10329S | —                               | —                | —                | —                 | —                  | 100.00<br>(86.21) | 94.30<br>(80.60) | 86.12<br>(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 5 and Table 12 for valve body dimensions and service envelope.

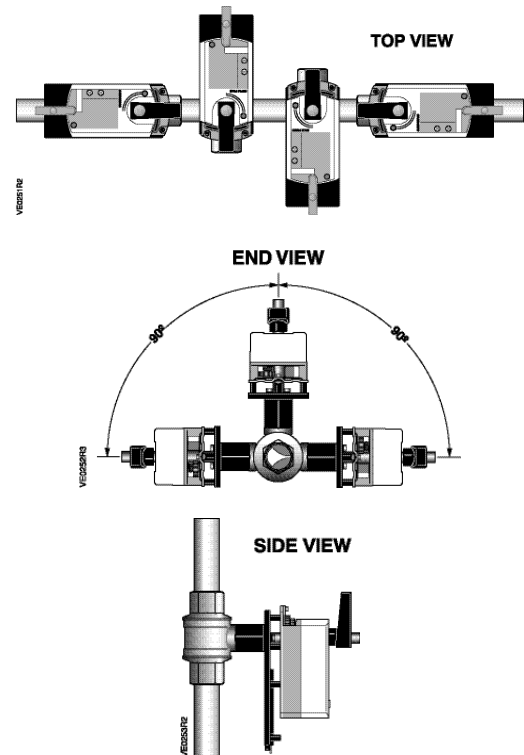


Figure 4. Mounting Positions.

## Service

Replace the valve or actuator if inoperable.

## Dimensions



Figure 5. 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 (94.5mm).
- Dimension E, Handle, is 5.3 inches (135.9 mm).

## Dimensions, Continued

**Table 12. Dimensions in Inches (Millimeters) and Weights in Pounds (Kg).**

| Line Size<br>Inch<br>(mm) | Cv Range     | A<br>Length   | C Length *<br>Actuator Codes<br>171A-D,<br>173A-D<br><br>GDE/GLB | C Length *<br>Actuator<br>Codes<br>171H,J,K,L,<br>N<br><br>GQD | C Length*<br>Actuator<br>Codes<br>171E,F,G,M,P<br>172E,F,G,M,P<br>Fail-Safe<br>GMA | F<br>Height   | Valve and Bracket<br>Weight<br>lbs<br>(kg) |
|---------------------------|--------------|---------------|------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------|---------------|--------------------------------------------|
| 1/2 (15)                  | 0.4 to 10.0  | 2-7/16 (61)   | 6-11/16 (170)                                                    | 6 (153)                                                        | —                                                                                  | 7-5/8 (193)   | 1.1 (0.50)                                 |
| 3/4 (20)                  | 6.3 to 25    | 2-3/4 (70)    |                                                                  | 6 (153)                                                        | —                                                                                  | 8 (203)       | 1.4 (0.60)                                 |
| 1 (25)                    | 10           | 3 (77)        |                                                                  | —                                                              | 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)                                 |

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

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