



- 50 psi bubble tight shut-off
- Long stem design allows for 2" insulation
- Valve face-to-face dimensions comply with API 609 & MSS-SP-67
- Completely assembled and tested, ready for installation

## Application

These valves are designed to meet the needs of HVAC and commercial applications requiring bubble tight shut-off for liquids. Typical applications include chiller isolation, cooling tower isolation, change-over systems, large air handler coil control, bypass and process control applications. The large  $C_v$  values provide for an economical control valve solution for larger flow applications. Designed for use in Victaulic piping systems when mated to Victaulic 41 series flange nipples.

## Jobsite Note

Valves should be stored in a weather protected area prior to construction. Complete installation recommendations can be found in Belimo's Installation and Maintenance Instructions for F6...HDU Butterfly Valves.

| Technical Data          |                                         |
|-------------------------|-----------------------------------------|
| Service                 | chilled, hot water, 60% glycol          |
| Flow characteristic     | modified equal percentage               |
| Controllable flow range | 82°                                     |
| Sizes                   | 2" to 12"                               |
| Type of end fitting     | for use with ANSI Class 125/150 flanges |
| Materials               |                                         |
| Body                    | ductile iron ASTM A536                  |
| Body finish             | epoxy powder coated                     |
| Disc                    | 304 stainless steel                     |
| Seat                    | EPDM                                    |
| Shaft                   | 416 stainless steel                     |
| O-ring                  | EPDM                                    |
| Bushings                | RPTFE                                   |
| Media temperature range | -22°F to 250°F [-30°C to 120°C]         |
| Body pressure rating    | ASME/ANSI Class 125                     |
| Close-off pressure      | 50 psi                                  |
| Rangeability            | 10:1 (for 30° to 70° range)             |
| Maximum velocity        | 12 FPS                                  |
| Leakage                 | bubble tight                            |

|           |           | Valve Nominal Size |         | Type     | Suitable Actuators |            |           |                      |
|-----------|-----------|--------------------|---------|----------|--------------------|------------|-----------|----------------------|
| $C_v$ 90° | $C_v$ 60° | IN                 | DN [mm] | 2-way    | Spring             | Non-Spring |           | Electronic Fail-Safe |
| 115       | 44        | 2"                 | 50      | F650HDU  | AF Series          | AM Series  |           |                      |
| 196       | 75        | 2½"                | 65      | F665HDU  |                    |            |           |                      |
| 302       | 116       | 3"                 | 80      | F680HDU  |                    |            |           |                      |
| 600       | 230       | 4"                 | 100     | F6100HDU |                    |            |           |                      |
| 1022      | 392       | 5"                 | 125     | F6125HDU |                    |            | GM Series |                      |
| 1579      | 605       | 6"                 | 150     | F6150HDU |                    |            |           |                      |
| 3136      | 1202      | 8"                 | 200     | F6200HDU |                    |            |           |                      |
| 5340      | 2047      | 10"                | 250     | F6250HDU |                    |            |           |                      |
| 8250      | 3062      | 12"                | 300     | F6300HDU |                    |            |           |                      |

| Valve    | Size | $C_v$ | MOD |     |     |      |      |      |      | ON/OFF |      |
|----------|------|-------|-----|-----|-----|------|------|------|------|--------|------|
|          |      |       | 10° | 20° | 30° | 40°  | 50°  | 60°  | 70°  | 80°    | 90°  |
| F650HDU  | 2"   | 115   | .06 | 3   | 7   | 15   | 27   | 44   | 70   | 105    | 115  |
| F665HDU  | 2½"  | 196   | .10 | 6   | 12  | 25   | 45   | 75   | 119  | 178    | 196  |
| F680HDU  | 3"   | 302   | .20 | 9   | 18  | 39   | 70   | 116  | 183  | 275    | 302  |
| F6100HDU | 4"   | 600   | .30 | 17  | 36  | 78   | 139  | 230  | 364  | 546    | 600  |
| F6125HDU | 5"   | 1022  | .50 | 29  | 61  | 133  | 237  | 392  | 620  | 930    | 1022 |
| F6150HDU | 6"   | 1579  | .80 | 45  | 95  | 205  | 366  | 605  | 958  | 1437   | 1579 |
| F6200HDU | 8"   | 3136  | 2   | 89  | 188 | 408  | 727  | 1202 | 1903 | 2854   | 3136 |
| F6250HDU | 10"  | 5340  | 3   | 151 | 320 | 694  | 1237 | 2047 | 3240 | 4859   | 5340 |
| F6300HDU | 12"  | 8250  | 4   | 234 | 495 | 1072 | 1911 | 3062 | 5005 | 7507   | 8250 |

# F6 Series, 2-Way, HDU Butterfly Valve Resilient Seat, 304 Stainless Disc



## Maximum Dimensions (Inches)

| Valve    | Size | C <sub>v</sub> 90° | C <sub>v</sub> 60° | A    | B    | C     | D(Max) | BHC   | No. of Holes | Lug Bolt   | Actuator | Close-Off (PSI) |                      |
|----------|------|--------------------|--------------------|------|------|-------|--------|-------|--------------|------------|----------|-----------------|----------------------|
| F650HDU  | 2"   | 115                | 44                 | 1.65 | 9.00 | 9.00  | 19.50  | 4.75  | 4            | 5/8-11 UNC | AF       | 50              | Spring Return        |
| F665HDU  | 2½"  | 196                | 75                 | 1.81 | 9.00 | 9.00  | 20.00  | 5.50  | 4            | 5/8-11 UNC |          | 50              |                      |
| F680HDU  | 3"   | 302                | 116                | 1.81 | 9.00 | 9.00  | 20.50  | 6.00  | 4            | 5/8-11 UNC |          | 50              |                      |
| F6100HDU | 4"   | 600                | 230                | 2.05 | 9.00 | 9.00  | 21.00  | 7.50  | 8            | 5/8-11 UNC |          | 50              |                      |
| F6125HDU | 5"   | 1022               | 392                | 2.19 | 9.00 | 9.00  | 22.00  | 8.50  | 8            | 3/4-10 UNC |          | 50              |                      |
| F6100HDU | 4"   | 600                | 230                | 2.05 | 8.00 | 8.00  | 17.00  | 7.50  | 8            | 5/8-11 UNC | GK       | 50              | Electronic Fail-Safe |
| F6125HDU | 5"   | 1022               | 392                | 2.19 | 8.00 | 8.00  | 17.50  | 8.50  | 8            | 3/4-10 UNC |          | 50              |                      |
| F6150HDU | 6"   | 1579               | 605                | 2.19 | 8.00 | 8.00  | 22.50  | 9.50  | 8            | 3/4-10 UNC | 2*GK     | 50              |                      |
| F650HDU  | 2"   | 115                | 44                 | 1.65 | 7.00 | 7.00  | 15.00  | 4.75  | 4            | 5/8-11 UNC | AM       | 50              | Non-Spring Return    |
| F665HDU  | 2½"  | 196                | 75                 | 1.81 | 7.00 | 7.00  | 15.50  | 5.50  | 4            | 5/8-11 UNC |          | 50              |                      |
| F680HDU  | 3"   | 302                | 116                | 1.81 | 7.00 | 7.00  | 16.00  | 6.00  | 4            | 5/8-11 UNC |          | 50              |                      |
| F6100HDU | 4"   | 600                | 230                | 2.05 | 8.00 | 8.00  | 17.00  | 7.50  | 8            | 5/8-11 UNC | GM       | 50              |                      |
| F6125HDU | 5"   | 1022               | 392                | 2.19 | 8.00 | 8.00  | 17.50  | 8.50  | 8            | 3/4-10 UNC |          | 50              |                      |
| F6150HDU | 6"   | 1579               | 605                | 2.19 | 8.00 | 8.00  | 22.50  | 9.50  | 8            | 3/4-10 UNC | 2*GM/GK  | 50              |                      |
| F6150HDU | 6"   | 1579               | 605                | 2.19 | 6.00 | 4.00  | 18.00  | 9.50  | 8            | 3/4-10 UNC | DR/DKR   | 50              |                      |
| F650HDU  | 2"   | 115                | 44                 | 1.65 | 4.25 | 4.25  | 15.50  | 4.75  | 4            | 5/8-11 UNC | SY1...   | 50              |                      |
| F665HDU  | 2½"  | 196                | 75                 | 1.76 | 4.25 | 4.25  | 16.00  | 5.50  | 4            | 5/8-11 UNC |          | 50              |                      |
| F680HDU  | 3"   | 302                | 116                | 1.78 | 4.25 | 4.25  | 16.25  | 6.00  | 4            | 5/8-11 UNC |          | 50              |                      |
| F6100HDU | 4"   | 600                | 230                | 2.05 | 8.00 | 13.00 | 22.00  | 7.50  | 8            | 5/8-11 UNC | SY2...   | 50              |                      |
| F6125HDU | 5"   | 1022               | 392                | 2.19 | 8.00 | 13.00 | 22.50  | 8.50  | 8            | 3/4-10 UNC |          | 50              |                      |
| F6150HDU | 6"   | 1579               | 605                | 2.19 | 8.00 | 13.00 | 23.00  | 9.50  | 8            | 3/4-10 UNC |          | 50              |                      |
| F6200HDU | 8"   | 3136               | 1202               | 2.37 | 8.00 | 13.00 | 24.25  | 11.75 | 8            | 3/4-10 UNC | SY3...   | 50              |                      |
| F6250HDU | 10"  | 5340               | 2047               | 2.67 | 8.00 | 13.00 | 25.50  | 14.25 | 12           | 7/8-9 UNC  |          | 50              |                      |
| F6300HDU | 12"  | 8250               | 3062               | 3.01 | 8.00 | 13.00 | 27.25  | 17.00 | 12           | 7/8-9 UNC  | SY4...   | 50              |                      |

Dimension "A" is compressed, add .125" for relaxed state.

AF, AM and GM maximum actuator ambient temperature is 122°F.

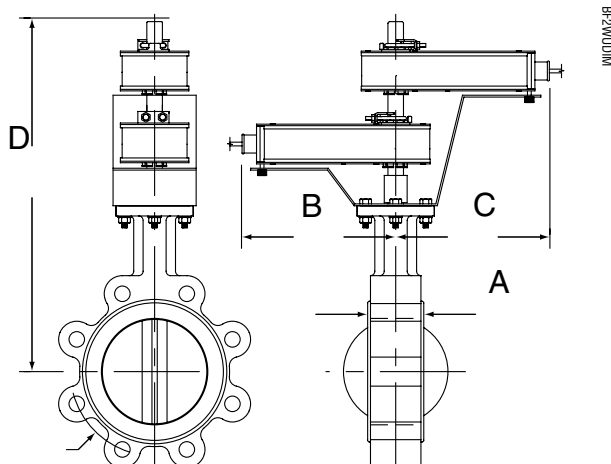
SY maximum actuator ambient temperature is 150°F.

Model SY1... does not have handwheel - override is via 8mm wrench on bottom side of actuator.

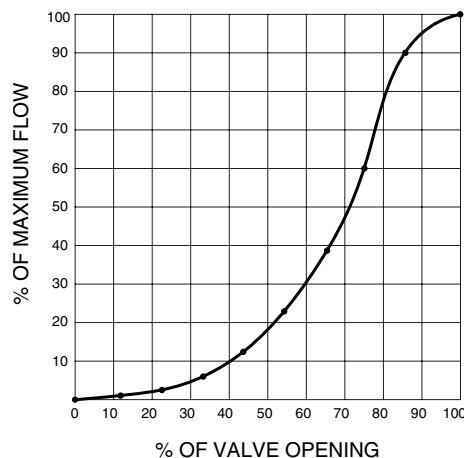
## Application Notes

- Valves are rated at 50 psi differential pressure in the closed position.
- Valves are furnished with lugs tapped for use with ANSI Class 125/150 flanges. Installation flanges and hardware are not included.
- 2-way assemblies are furnished assembled and tested, ready for installation.
- Dimension "D" allows for actuator removal without the need to remove the valve from the pipe.
- Weather shields are available, dimensional data upon request.
- Dual actuated valves have actuators mounted on a common valve shaft.
- Belimo SY Series actuators are NEMA 4X rated.

## Dimensions



## Flow Pattern



# GM/GR Actuators, On/Off, Floating Point



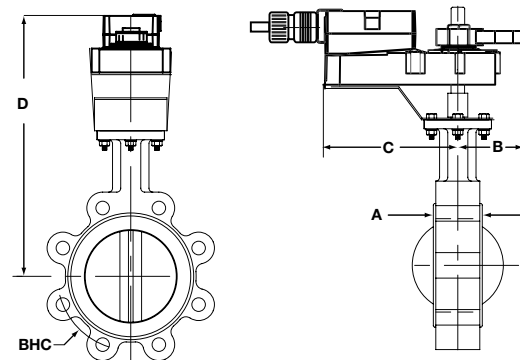
## Models

GMB24-3-X1  
GRB24-3-X1  
GRB24-3-5  
GRB24-3-7

| Technical Data        |                                                                                                             |
|-----------------------|-------------------------------------------------------------------------------------------------------------|
| Power supply          | 24 VAC $\pm$ 20% 50/60 Hz<br>24 VDC $\pm$ 10%                                                               |
| Power consumption     | running 4.0 W<br>holding 2 W                                                                                |
| Transformer sizing    | 6 VA (class 2 power source)                                                                                 |
| Electrical connection | 3 ft, 18 GA appliance cable,<br>1/2" conduit connector                                                      |
| Overload protection   | electronic throughout 0 to 95° rotation                                                                     |
| Control signal        | On/Off, Floating Point                                                                                      |
| Input impedance       | 600 $\Omega$                                                                                                |
| Angle of rotation     | mechanically limited to 95°                                                                                 |
| Direction of rotation | reversible with switch A/B                                                                                  |
| Position indication   | 0 to 1 and reversible indicator                                                                             |
| Running time          | 150 sec.                                                                                                    |
| Humidity              | 5 to 95% RH non-condensing                                                                                  |
| Ambient temperature   | -22°F to 122°F [-30°C to 50°C]                                                                              |
| Storage temperature   | -40°F to 176°F [-40°C to 80°C]                                                                              |
| Housing               | NEMA 2/IP54                                                                                                 |
| Housing material      | UL94-5VA (flammability rating)                                                                              |
| Agency listings       | cULus according to UL60730-1A/-2-14,<br>CAN/CSA E60730-1, CSA C22.2 No.24-93,<br>CE according to 89/336/EEC |
| Noise level           | max. 45 dB (A)                                                                                              |
| Servicing             | maintenance free                                                                                            |
| Quality standard      | ISO 9001                                                                                                    |

**Note:** GR Actuators are on 2-way valves  
GM Actuators are on 3-way valves

## Dimensions with 2-Way Valve

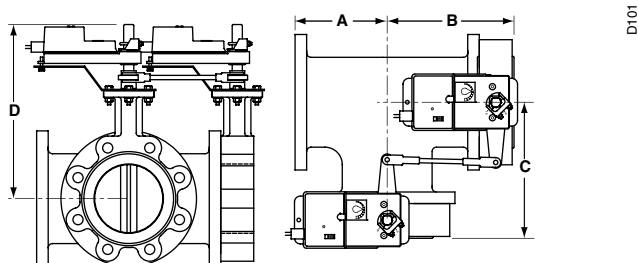


AM\_GM\_LineRevised

| Valve        | Size | Dimensions (Inches) |      |      |        |      | Non-Fail Safe (psi) |      |
|--------------|------|---------------------|------|------|--------|------|---------------------|------|
|              |      | A                   | B    | C    | D(Max) | BHC  | GM                  | 2*GM |
| F680HD       | 3"   | 1.78                | 7.00 | 7.00 | 16.00  | 6.00 | 200                 |      |
| F6100HD      | 4"   | 2.05                | 8.00 | 8.00 | 17.00  | 7.50 |                     | 200  |
| F6100H DU    | 4"   | 2.05                | 8.00 | 8.00 | 17.00  | 7.50 | 50                  |      |
| F6125H DU    | 5"   | 2.14                | 8.00 | 8.00 | 17.50  | 8.50 | 50                  |      |
| F6150H DU    | 6"   | 2.19                | 8.00 | 8.00 | 22.50  | 9.50 |                     | 50   |
| F650-150SHP  | 2"   | 1.75                | 9.00 | 9.00 | 19.50  | 4.75 | 285                 |      |
| F665-150SHP  | 2½"  | 1.88                | 9.00 | 9.00 | 20.00  | 5.50 | 285                 |      |
| F680-150SHP  | 3"   | 1.92                | 9.00 | 9.00 | 20.50  | 6.00 | 285                 |      |
| F6100-150SHP | 4"   | 2.13                | 9.00 | 9.00 | 21.00  | 7.50 | 150                 | 285  |
| F650-300SHP  | 2"   | 1.75                | 9.00 | 9.00 | 19.50  | 5.00 | 285                 | 400  |
| F665-300SHP  | 2½"  | 1.88                | 9.00 | 9.00 | 20.00  | 5.88 | 285                 | 400  |
| F680-300SHP  | 3"   | 1.92                | 9.00 | 9.00 | 20.50  | 6.63 | 285                 | 400  |
| F6100-300SHP | 4"   | 2.13                | 9.00 | 9.00 | 21.00  | 7.88 | 150                 | 285  |
| F665VIC      | 2½"  | 3.77                | 7.00 | 7.00 | 15.50  | -    | 200                 |      |
| F680VIC      | 3"   | 3.77                | 7.00 | 8.00 | 15.50  | -    | 200                 |      |
| F6100VIC     | 4"   | 4.63                | 8.00 | 8.00 | 16.00  | -    |                     | 200  |

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### Dimensions with 3-Way Valve



| Dimensions (Inches) |      |      |       |       |        | Non-Fail Safe (psi) |         |
|---------------------|------|------|-------|-------|--------|---------------------|---------|
| Valve               | Size | A    | B     | C     | D(Max) | BHC                 | GM 2*GM |
| F765HD              | 2½"  | 5.00 | 6.70  | 6.70  | 16.00  | 5.50                | 200     |
| F780HD              | 3"   | 5.50 | 7.20  | 7.20  | 16.25  | 6.00                | 200     |
| F780H DU            | 3"   | 5.50 | 7.20  | 7.20  | 16.25  | 6.00                | 50      |
| F7100H DU           | 4"   | 6.50 | 8.45  | 8.45  | 17.00  | 7.50                | 50      |
| F7125H DU           | 5"   | 7.50 | 9.60  | 9.60  | 17.50  | 8.50                | 50      |
| F7150H DU           | 6"   | 8.00 | 10.08 | 10.08 | 18.00  | 9.50                | 50      |
| F750-150SHP         | 2"   | 4.50 | 6.25  | 6.25  | 16.50  | 4.75                | 150 285 |
| F765-150SHP         | 2½"  | 5.00 | 6.88  | 6.88  | 17.00  | 5.50                | 150 285 |
| F780-150SHP         | 3"   | 5.50 | 7.42  | 7.42  | 17.50  | 6.00                | 150 285 |
| F7100-150SHP        | 4"   | 6.50 | 8.63  | 8.63  | 18.00  | 7.50                | 150     |
| F750-300SHP         | 2"   | 5.00 | 6.75  | 6.75  | 15.50  | 5.00                | 285     |
| F765-300SHP         | 2½"  | 5.50 | 7.38  | 7.38  | 16.00  | 5.88                | 285     |
| F780-300SHP         | 3"   | 6.00 | 7.92  | 7.92  | 16.25  | 6.63                | 285     |
| F7100-300SHP        | 4"   | 7.00 | 9.13  | 9.13  | 18.00  | 7.88                | 150     |
| F750VIC             | 2"   | 5.00 | 6.70  | 6.70  | 15.50  | -                   | 50      |
| F765VIC             | 2½"  | 5.25 | 7.25  | 7.25  | 15.50  | -                   | 200     |
| F780VIC             | 3"   | 6.00 | 7.25  | 7.25  | 16.00  | -                   | 50      |

### Wiring Diagrams

#### INSTALLATION NOTES

- 2 CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.
- 3** Actuators may also be powered by 24 VDC.
- 5** Actuators with plenum rated cable do not have numbers on wires; use color codes instead. Actuators with appliance cables are numbered.

#### APPLICATION NOTES

- Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

#### WARNING Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

