



**Greater Force
and Flexibility**

Globe Valves



Table of Contents
Globe Valve



Overview 3
Nomenclature 5
Product Range 6
Set-Up 9
Close-Off Pressure 12
Accessories 14
Repacking and Rebuild Kits 16
Installation Instructions. 17
Pressure and Temperature Ratings 21

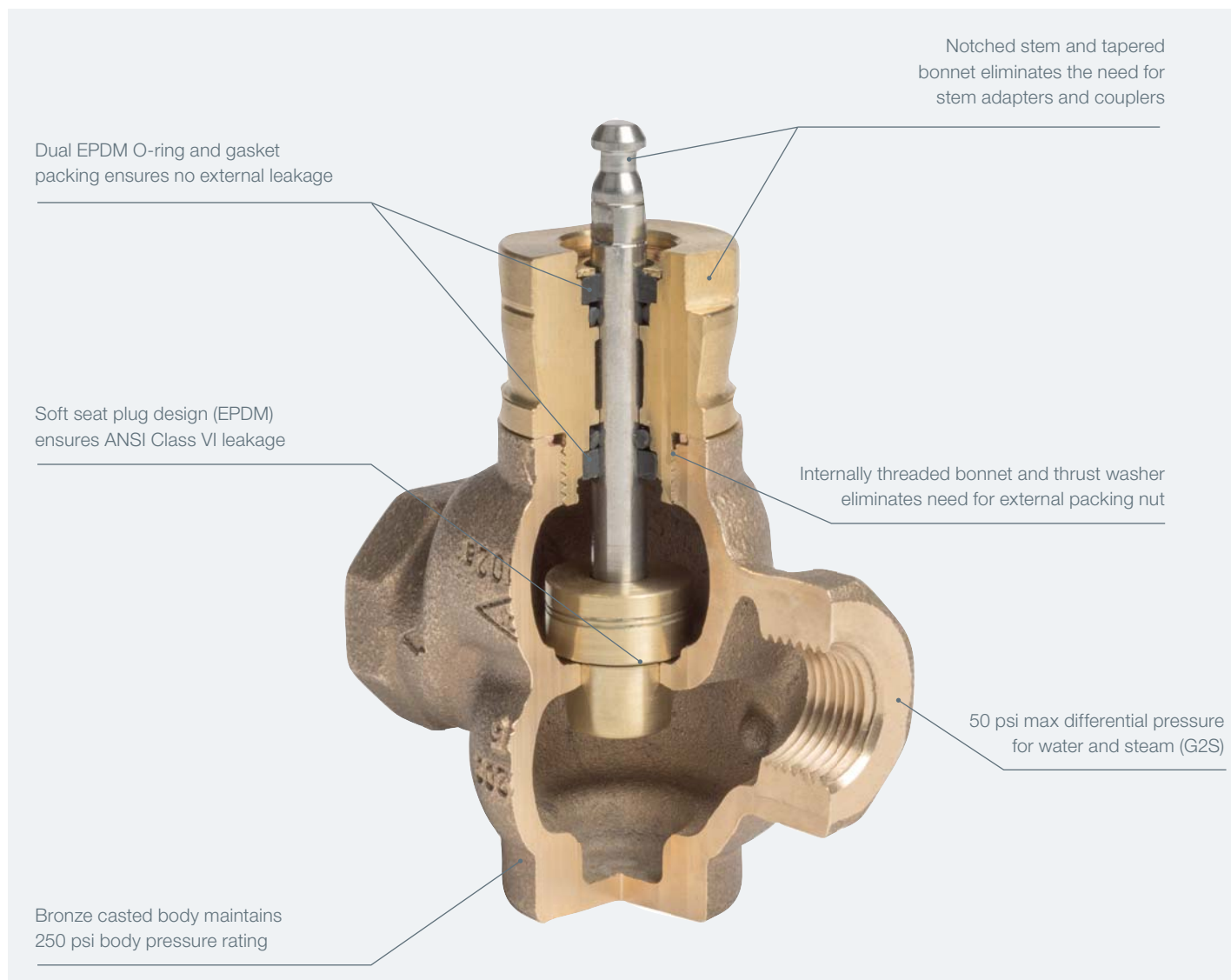
Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

Globe Valve

The Belimo globe valve assemblies provide high close-off pressure, precise positioning, easy installation, field adjustability, and reliable operation. The G2B, G2S and G3B series NPT threaded globe valves are easy to identify with the Belimo metal name plate stating the rating and certification details. They feature ANSI Class VI leakage to ensure tight close-off, accurate modulation at low flow with rangeability rating of 100:1, and pressure compensated valve design for 2-way valve bodies to achieve specified close-off with low actuator torque. G2S series with maximum 50 psi differential pressure specification accommodates 100 psi inlet steam applications.

The Belimo globe valve actuators are designed to withstand the rigorous demands of many HVAC applications. With its innovative quick connect coupler, the globe valve actuator can be retrofitted and installed and adapted in no time. The Belimo globe valve actuators incorporate not only strength but are highly adaptable making selection, installation and service hassle-free.

G2/G3 Valve Body Construction



Globe Valve Assembly Components

LED Button
Adapts to stroke of the valve

Fail-Safe Switch ("K" models only)
Selectable position to drive stem up or stem down

Coupler
Locking feature to prevent slipping
Doubles as position indicator

Cast Aluminum Linkage
Rugged design with zero deflection

ANSI Class VI Leakage
G2 and G3 Valve Bodies

Corrosion Resistant Metal Name Plate
Easy identification of model, temperature and pressure rating, Cv, and Canada Registration Number

Multi-Function Technology
Field selectable control signal, feedback signal, running time, travel limit and trending

Smaller Actuators
In many cases because of pressure compensated valve design

Manual Override
Ability to drive the valve up or down during power failure

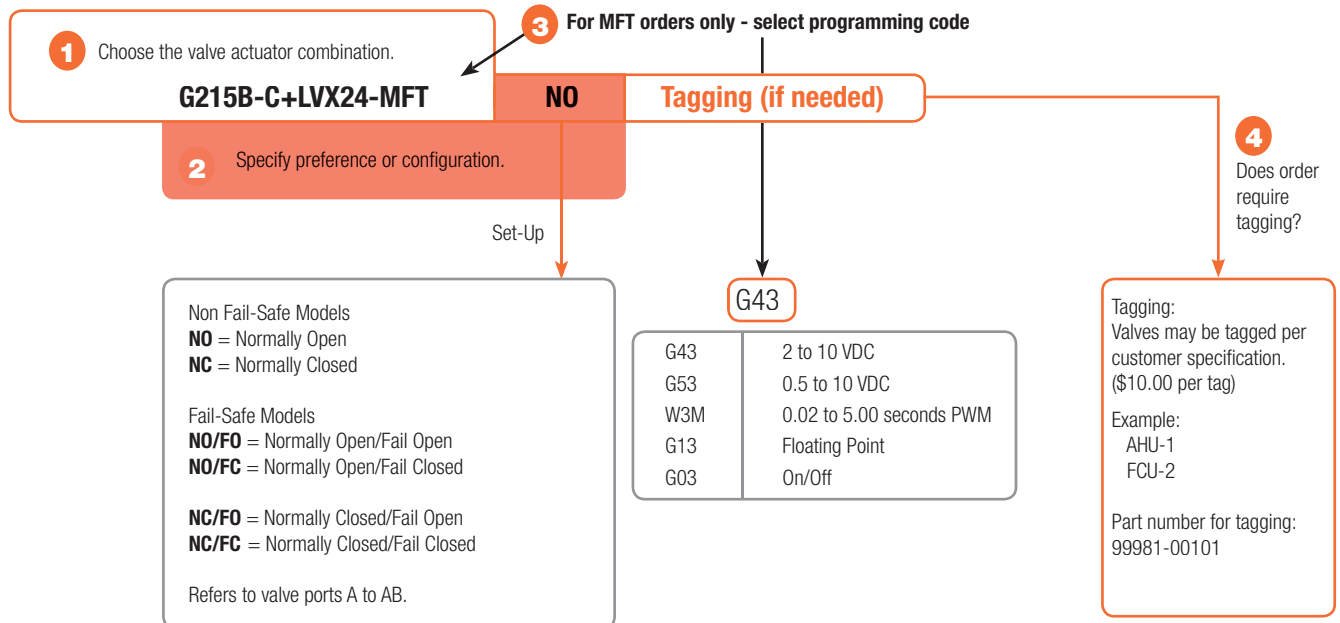
100:1 Rangeability Specification
Accurate modulation at low flow

G3, 3-way Valve Body
One valve for both mixing and diverting applications.

| G2 | 15 | B | -C | +LVX | 24 | -MFT |
|---|--|---|---|---|---|---|
| Valve Type G2 = 2-way NPT G3 = 3-way NPT G6 = 2-way Flanged G7 = 3-way Flanged | Valve Size NPT 15 = ½" 20 = ¾" 25 = 1" 32 = 1¼" 40 = 1½" 50 = 2" Flanged 65 = 2½" 80 = 3" 100 = 4" 125 = 5" 150 = 6" | Trim Material B = Bronze Trim S = Stainless Trim -250 = ANSI 250 Bronze Trim S-250 = ANSI 250 Stainless Trim C = Bronze Trim Pressure Compensated CS = Stainless Trim Pressure Compensated LCS = Linear Stainless Trim Pressure Compensated D = Diverting Bronze Trim DS = Diverting Stainless Trim | Cv -C = 0.4 -F = 1.3 -G = 2.2 -J = 4.4 (½") -J = 5.5 (¾") -K = 7.5 (¾") -K = 10 (1") -L = 14 -M = 20 -N = 28 (1½") -N = 40 (2") | Actuator Type Non Fail-Safe LVB, LVX SVB, SVX EVB, EVX RVB, RVX Fail-Safe Spring Return LF NFB, NFX AFB, AFX Electronic GKB, GKX LVKB, LVKX SVKB, SVKX AVKB, AVKX | Power Supply 24 = 24 VAC/DC 120 = 120 VAC UP = 24-240 VAC or 24-125 VDC | Control Blank = On/Off -3 = On/Off, Floating Point -SR = 2-10 VDC -MFT or -MFT-X1 = Multi-Function Technology -MFT95-X1 = 0-135 Ω |

"X" models are customizable. Refer to page 11 for programming options.

Ordering Example



5 Complete Ordering Example: **G215B-C+LVX24-MFT**
 Configuration: **+NO**
 Programming: **+G43**

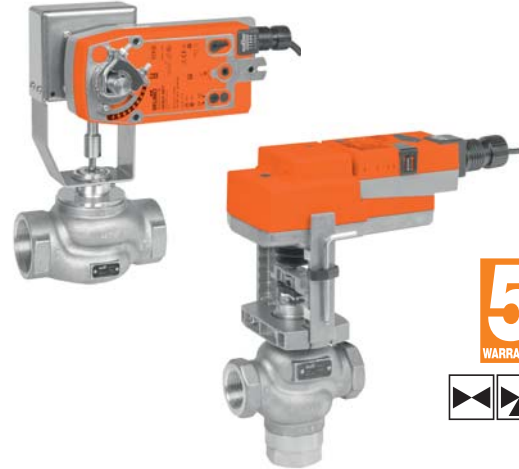
Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

Product Range

Globe Valve Threaded Body



| C _v | Valve Nominal Size | | Type | | Suitable Actuators | | | |
|----------------|--------------------|---------|-----------|-----------|--------------------|---------------|------------|-----------|
| | Inches | DN [mm] | 2-way NPT | 3-way NPT | Non Fail-Safe | Fail-Safe | | |
| | | | | | | Spring Return | Electronic | |
| 0.4 | ½ | 15 | G215B-C | | LV Series | LF Series | LVK Series | |
| 0.4 | ½ | 15 | G215S-C | | | | | |
| 1.3 | ½ | 15 | G215B-F | | | | | |
| 1.3 | ½ | 15 | G215S-F | | | | | |
| 2.2 | ½ | 15 | G215B-G | | | | | |
| 2.2 | ½ | 15 | G215S-G | | | | | |
| 4.4 | ½ | 15 | G215B-J | | | | | |
| 4.4 | ½ | 15 | G215S-J | | | | | |
| 5.5 | ¾ | 20 | G220B-J | | | | | |
| 5.5 | ¾ | 20 | G220S-J | | | | | |
| 7.5 | ¾ | 20 | G220B-K | | | | | |
| 7.5 | ¾ | 20 | G220S-K | | | | | |
| 10 | 1 | 25 | G225B-K | | | | | |
| 10 | 1 | 25 | G225S-K | | | | | |
| 14 | 1 | 25 | G225B-L | | | | | |
| 14 | 1 | 25 | G225S-L | | | | | |
| 20 | 1¼ | 32 | G232B-M | | | | | |
| 20 | 1¼ | 32 | G232S-M | | | | | |
| 28 | 1½ | 40 | G240B-N | | | | | |
| 28 | 1½ | 40 | G240S-N | | | | | |
| 40 | 2 | 50 | G250B-N | | | | | |
| 40 | 2 | 50 | G250S-N | | | | | |
| 2.2 | ½ | 15 | | G315B-G | SV Series | NF Series | SVK Series | |
| 4.4 | ½ | 15 | | G315B-J | | | | |
| 6.75 | ¾ | 20 | | G320B-K | | | | |
| 14 | 1 | 25 | | G325B-L | | | | |
| 20 | 1¼ | 32 | | G332B-M | | | | |
| 28 | 1½ | 40 | | G340B-N | | | | |
| 40 | 2 | 50 | | G350B-N | | | | AF Series |



Mode of Operation

The control valve is operated by an electronic actuator that responds to a standard voltage for on/off control, by a modulating 2-10 VDC/ 4-20 mA, 3-point control system. The actuator will then move the plug of the valve to the position dictated by the control signal thus changing the flow.

Product Features

New G2 and G3 globe valves offer a modified equal percentage flow characteristic for a wide variety of HVAC applications. Capable of being used for heating, cooling, and steam service. Repack kits are available to extend the life of the valve without full replacement.

Actuator Specifications

| | |
|-----------------------|---|
| Control type | on/off, floating point, 2-10 VDC, multi-function technology (MFT) |
| Manual override | all models except LF |
| Electrical connection | 3 ft [1 m] cable with ½" conduit fitting |

Valve Specifications

| | |
|------------------------------------|--|
| Service | chilled or hot water, 60% glycol, steam |
| Flow characteristic | modified equal percentage G3: linear flow from B to AB |
| Sizes | ½", ¾", 1", 1¼", 1½", 2" |
| End fitting | NPT female |
| Materials | |
| Body | bronze |
| Stem | stainless steel |
| Plug | G2B, G3B: brass G2S: stainless steel |
| Seat | G2B, G3B: bronze G2S: stainless steel |
| Stem packing | EPDM O-ring |
| Media temp. range | G2B, G3B: 20°F to 280°F [-7°C to +138°C] G2S: 20°F to 338°F [-7°C to +170°C] |
| Body pressure rating | ANSI Class 250 |
| Maximum inlet pressure | |
| Steam | G2B: 35 psi [241 kPa] G2S: 100 psi [690 kPa] |
| Maximum differential pressure (ΔP) | G2B: 35 psi G2S: 50 psi |
| Leakage | ANSI Class VI |
| Rangeability | 100:1 |

Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

| C _v | Valve Nominal Size | | Type | Suitable Actuators | | | |
|----------------|--------------------|---------|-------------|--------------------|---------------|---------------|------------|
| | Inches | DN [mm] | | 2-way Flanged | Non Fail-Safe | Fail-Safe | |
| | | | | | | Spring Return | Electronic |
| 65 | 2½ | 65 | G665C | EV Series | AFX Series | AVK Series | |
| 65 | 2½ | 65 | G665CS | | | | |
| 65 | 2½ | 65 | G665C-250 | | | | |
| 65 | 2½ | 65 | G665CS-250 | | | | |
| 65 | 2½ | 65 | G665LCS | | | | |
| 85 | 3 | 80 | G680C | | | | |
| 85 | 3 | 80 | G680CS | | | | |
| 85 | 3 | 80 | G680C-250 | | | | |
| 85 | 3 | 80 | G680CS-250 | | | | |
| 85 | 3 | 80 | G680LCS | | | | |
| 170 | 4 | 100 | G6100C | | | | |
| 170 | 4 | 100 | G6100CS | | | | |
| 170 | 4 | 100 | G6100C-250 | | | | |
| 170 | 4 | 100 | G6100CS-250 | | | | |
| 170 | 4 | 100 | G6100LCS | | | | |
| 263 | 5 | 125 | G6125C | | | | |
| 263 | 5 | 125 | G6125CS | | | | |
| 263 | 5 | 125 | G6125C-250 | | | | |
| 263 | 5 | 125 | G6125CS-250 | | | | |
| 263 | 5 | 125 | G6125LCS | | | | |
| 344 | 6 | 150 | G6150C | | | | |
| 344 | 6 | 150 | G6150CS | | | | |
| 344 | 6 | 150 | G6150C-250 | | | | |
| 344 | 6 | 150 | G6150CS-250 | | | | |
| 344 | 6 | 150 | G6150LCS | | | | |

The G...(C)(CS)(LCS) Series valve is a pressure compensated valve that allows high close-off ratings while utilizing standard actuation.



Mode of Operation

The control valve is operated by an electronic actuator that responds to a standard voltage for on/off control, a modulating 2-10 VDC/4-20 mA, or 3-point control system. The actuator will then move the plug of the valve to the position dictated by the control signal thus changing the flow.

Product Features

Equal percentage (G6) and linear (G7) flow curve options available for a wide variety of HVAC applications. Capable of being used for heating, cooling, and steam service. Repack and rebuild kits are available to extend the life of the valve without full replacement.

Actuator Specifications

| | |
|-----------------------|--|
| Control type | on/off, floating point, 2-10 VDC multi-function technology (MFT) |
| Manual override | all models |
| Electrical connection | 3 ft [1 m] cable with ½" conduit fitting |

Valve Specifications

| | |
|------------------------------------|---|
| Service | chilled or hot water, 60% glycol, steam |
| Flow characteristic | G6 A-port equal percentage |
| G6LCS | linear |
| Sizes | 2½", 3", 4", 5", 6" |
| End fitting | ANSI flanged |
| Materials | |
| Body | cast iron |
| Stem | stainless steel |
| Plug | bronze |
| Seat | |
| G6 | stainless steel |
| G6...S | stainless steel |
| Stem packing | |
| G6 | bronze trimmed: NLP (EPDM) |
| G6S | stainless trimmed: NLP (EPDM) |
| Media temp. range | refer to valve specification pages in the Product Guide and Price List |
| Body pressure rating | |
| G6, 125# ANSI flange | 125 psi |
| G6, 250# ANSI flange | 250 psi |
| Maximum inlet pressure | |
| Water | 150 psi [1034 kPa] G6C, G6CS 250 psi [1724 kPa] G6C...250, G6CS...250 |
| Steam | 35 psi [241 kPa] G6C, G6C...250 100 psi [690 kPa] G6CS, G6CS...250 |
| Maximum differential pressure (ΔP) | |
| Water | 25 psi [172 kPa] G6C, G6C...250 50 psi [345 kPa] G6CS, G6CS...250 |
| Steam | 15 psi [103 kPa] G6C, G6C...250 |
| Rangeability | 85:1 (G665..), 91:1 (G680..) 98:1 (G6100..), 100:1 (G6125..) 98:1 (G6150..) |

Product Range

Globe Valve Flanged Body



| C _v | Valve Nominal Size | | 3-Way Flanged | Suitable Actuators | | |
|----------------|--------------------|---------|---------------|--------------------|---------------|------------|
| | Inches | DN [mm] | | Non Fall-Safe | Fall-Safe | |
| | | | | | Spring Return | Electronic |
| 68 | 2½ | 65 | G765 | EV / RV Series | AFX Series | AVK Series |
| 68 | 2½ | 65 | G765S | | | |
| 68 | 2½ | 65 | G765-250 | | | |
| 68 | 2½ | 65 | G765S-250 | | | |
| 85 | 3 | 80 | G780 | | | |
| 85 | 3 | 80 | G780S | | | |
| 85 | 3 | 80 | G780-250 | | | |
| 85 | 3 | 80 | G780S-250 | | | |
| 190 | 4 | 100 | G7100 | | | |
| 190 | 4 | 100 | G7100S | | | |
| 190 | 4 | 100 | G7100-250 | RV Series | AFX Series | GK Series |
| 190 | 4 | 100 | G7100S-250 | | | |
| 280 | 5 | 125 | G7125 | | | |
| 280 | 5 | 125 | G7125S | | | |
| 280 | 5 | 125 | G7125-250 | | | |
| 280 | 5 | 125 | G7125S-250 | | | |
| 340 | 6 | 150 | G7150 | | | |
| 340 | 6 | 150 | G7150S | | | |
| 340 | 6 | 150 | G7150-250 | | | |
| 340 | 6 | 150 | G7150S-250 | | | |
| 68 | 2½ | 65 | G765D | EV Series | AFX Series | AVK Series |
| 68 | 2½ | 65 | G765DS | | | |
| 68 | 2½ | 65 | G765DS-250 | | | |
| 85 | 3 | 80 | G780D | | | |
| 85 | 3 | 80 | G780DS | | | |
| 85 | 3 | 80 | G780DS-250 | | | |
| 154 | 4 | 100 | G7100D | | | |
| 154 | 4 | 100 | G7100DS | | | |
| 154 | 4 | 100 | G7100DS-250 | | | |
| 195 | 5 | 125 | G7125D | | | |
| 195 | 5 | 125 | G7125DS | | | |
| 195 | 5 | 125 | G7125DS-250 | | | |
| 248 | 6 | 150 | G7150D | | | |
| 248 | 6 | 150 | G7150DS | | | |
| 248 | 6 | 150 | G7150DS-250 | | | |



Mode of Operation

The control valve is operated by an electronic actuator that responds to a standard voltage for on/off control, a modulating 2-10 VDC/4-20 mA, or 3-point control system. The actuator will then move the plug of the valve to the position dictated by the control signal thus changing the flow.

Product Features

Equal percentage (G6) and linear (G7) flow curve options available for a wide variety of HVAC applications. Capable of being used for heating, cooling, and steam service. Repack and rebuild kits are available to extend the life of the valve without full replacement.

Actuator Specifications

| | |
|-----------------------|--|
| Control type | on/off, floating point, 2-10 VDC multi-function technology (MFT) |
| Manual override | all models |
| Electrical connection | 3 ft [1 m] cable with ½" conduit fitting |

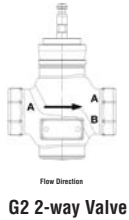
Valve Specifications

| | |
|------------------------------------|--|
| Service | chilled or hot water, 60% glycol |
| Flow characteristic | linear |
| Sizes | 2½", 3", 4", 5", 6" |
| End fitting | ANSI flanged |
| Materials | |
| Body | cast iron |
| Stem | stainless steel |
| Plug | bronze |
| Seat | |
| G7 | stainless steel |
| G7...S | stainless steel |
| Stem packing | |
| G7 | bronze trimmed: NLP (EPDM) |
| G7...S | stainless trimmed: NLP (EPDM) |
| Media temp. range | Refer to valve specification pages in the Product Guide and Price List |
| Body pressure rating | |
| G7, 125# ANSI flange | 125 psi |
| G7, 250# ANSI flange | 250 psi |
| Maximum inlet pressure | |
| Water | 150 psi [1034 kPa] G7, G7S 250 psi [1724 kPa] G7...250, G7S...250 |
| Maximum differential pressure (ΔP) | |
| Water | 25 psi [172 kPa] G7, G7...250 50 psi [345 kPa] G7S, G7S...250 |
| Rangeability | 50:1 |

Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

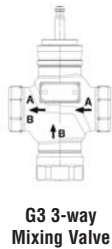
FLOW PATTERN AND VALVE ASSEMBLY SET-UP - Specify Upon Ordering

All valves shown stem down



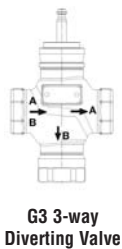
2-WAY VALVE (STEM UP OPEN A TO AB)

| | | | | | |
|---|------------------------------------|--|--|--|--|
| NON FAIL-SAFE ELECTRONIC FAIL-SAFE AND SPRING RETURN | LV Series | NC: Normally closed A to AB, valve will open upon increase in min. signal/power. | NO: Normally open A to AB, valve will close upon increase in min. signal/ power. | | |
| | LVK Series | NC/FO: Normally closed A to AB with power and min. signal applied. When loss of power will fail open A to AB. If desired both normal position and fail position can be reversed in field with direction switch. | NO/FO: Normally open A to AB with power and min. signal applied. When loss of power will fail open A to AB. If desired both normal position and fail position can be reversed in field with direction switch. | NC/FC: Normally closed A to AB with power and min. signal applied. When loss of power will fail closed A to AB. If desired both normal position and fail position can be reversed in field with direction switch. | NO/FC: Normally open A to AB with power and min. signal applied. When loss of power will fail closed A to AB. If desired both normal position and fail position can be reversed in field with direction switch. |
| | LVK, LF, NF Series (on/off) | NC/FC: Normally closed A to AB, valve will drive open with power. Fail Action: Will fail closed A to AB upon power loss. Can be reversed with direction switch or actuator remounting. | NO/FO: Normally open A to AB, valve will drive open with power. Fail Action: Will fail open A to AB upon power loss. Can be reversed with direction switch or actuator remounting. | | |
| | LF, NF, Series | NC/FO: Normally closed A to AB with power and min. signal applied. When loss of power will fail open A to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. | NO/FO: Normally open A to AB with power and min. signal applied. When loss of power will fail open A to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. | NC/FC: Normally closed A to AB with power and min. signal applied. When loss of power will fail closed A to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. | NO/FC: Normally open A to AB with power and min. signal applied. When loss of power will fail closed A to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. |



3-WAY MIXING VALVE (STEM UP OPEN B TO AB)

| | | | | | |
|---|------------------------------------|--|--|--|--|
| NON FAIL-SAFE ELECTRONIC FAIL-SAFE AND SPRING RETURN | SV Series | NC: Normally closed A to AB, valve will open upon increase in min. signal/power. | NO: Normally open A to AB, valve will close upon increase in min. signal/ power. | | |
| | SVK Series | NC/FO: Normally closed A to AB with power and min. signal applied. When loss of power will fail open A to AB. If desired both normal position and fail position can be reversed in field with direction switch. | NO/FO: Normally open A to AB with power and min. signal applied. When loss of power will fail open A to AB. If desired both normal position and fail position can be reversed in field with direction switch. | NC/FC: Normally closed A to AB with power and min. signal applied. When loss of power will fail closed A to AB. If desired both normal position and fail position can be reversed in field with direction switch. | NO/FC: Normally open A to AB with power and min. signal applied. When loss of power will fail closed A to AB. If desired both normal position and fail position can be reversed in field with direction switch. |
| | SVK, NF, AF Series (on/off) | NC/FC: Normally closed A to AB, valve will drive open with power. Fail Action: Will fail closed A to AB upon power loss. Can be reversed with direction switch or actuator remounting. | NO/FO: Normally open A to AB, valve will drive open with power. Fail Action: Will fail open A to AB upon power loss. Can be reversed with direction switch or actuator remounting. | | |
| | NF, AF Series | NC/FO: Normally closed A to AB with power and min. signal applied. When loss of power will fail open A to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. | NO/FO: Normally open A to AB with power and min. signal applied. When loss of power will fail open A to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. | NC/FC: Normally closed A to AB with power and min. signal applied. When loss of power will fail closed A to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. | NO/FC: Normally open A to AB with power and min. signal applied. When loss of power will fail closed A to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. |



3-WAY DIVERTING VALVE (STEM UP OPEN AB TO B)

| | | | | | |
|---|------------------------------------|--|--|--|--|
| NON FAIL-SAFE ELECTRONIC FAIL-SAFE AND SPRING RETURN | SV Series | NC: Normally closed B to AB, valve will open upon increase in min. signal/power. | NO: Normally open B to AB, valve will close upon increase in min. signal/ power. | | |
| | SVK Series | NC/FO: Normally closed B to AB with power and min. signal applied. When loss of power will fail open B to AB. If desired both normal position and fail position can be reversed in field with direction switch. | NO/FO: Normally open B to AB with power and min. signal applied. When loss of power will fail open B to AB. If desired both normal position and fail position can be reversed in field with direction switch. | NC/FC: Normally closed B to AB with power and min. signal applied. When loss of power will fail closed B to AB. If desired both normal position and fail position can be reversed in field with direction switch. | NO/FC: Normally open B to AB with power and min. signal applied. When loss of power will fail closed B to AB. If desired both normal position and fail position can be reversed in field with direction switch. |
| | SVK, NF, AF Series (on/off) | NC/FC: Normally closed B to AB, valve will drive open with power. Fail Action: Will fail closed B to AB upon power loss. Can be reversed with direction switch or actuator remounting. | NO/FO: Normally open B to AB, valve will drive open with power. Fail Action: Will fail open B to AB upon power loss. Can be reversed with direction switch or actuator remounting. | | |
| | NF, AF Series | NC/FO: Normally closed B to AB with power and min. signal applied. When loss of power will fail open B to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. | NO/FO: Normally open B to AB with power and min. signal applied. When loss of power will fail open B to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. | NC/FC: Normally closed B to AB with power and min. signal applied. When loss of power will fail closed B to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. | NO/FC: Normally open B to AB with power and min. signal applied. When loss of power will fail closed B to AB. If desired both normal position and fail position can be reversed in field with direction switch and actuator remounting. |

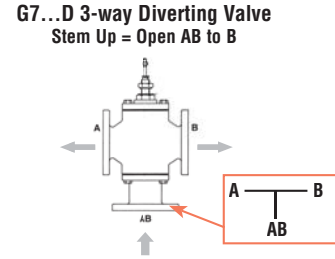
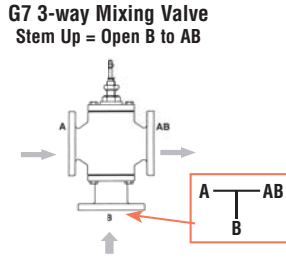
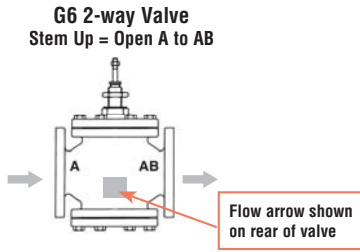
Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

Set-Up

Globe Valve Flanged Body



FLOW PATTERN – Flow Pattern is Marked on Valve



VALVE ASSEMBLY SET-UP - Specify Upon Ordering

2-WAY VALVE

| | | | |
|-------------------------|------------------------|--|--|
| NON FAIL-SAFE | EV, RV Series | NC: Normally closed A to AB, valve will open upon increase in signal/power. Note: To change valve to A to AB open, reverse the directional switch in actuator. | NO: Normally open A to AB, valve will close upon increase in signal/power. Note: To change valve to A to AB closed, reverse the directional switch in actuator. |
| | AFB, AFX Series On/Off | NO/FO: Normally open A to AB valve will drive closed. Spring Action: Will fail open A to AB upon power loss. | NC/FC: Normally closed A to AB valve will drive open. Spring Action: Will fail closed A to AB upon power loss. |
| | AFB, AFX MFT Series | NC/FO: Normally closed A to AB, valve will open upon increase in signal. Note: To change valve to A to AB open, reverse CW/CCW switch. Spring Action: Will fail open A to AB upon power loss. | NO/FC or NC/FC: Normally Open/Normally Closed: valve can be open or closed, will drive closed or open A to AB (can be chosen with CW/CCW switch). Spring Action: Closed A to AB upon power loss. NO/FO: Normally open A to AB. Spring Action: Will fail open A to AB upon power loss. (NO or NC action can be chosen with CW/CCW switch). |
| ELECTRONIC FAIL-SAFE | AVK, GK Series | NC/FO: Normally closed A to AB, valve will open upon increase in signal. Note: To change valve to A to AB open, reverse CW/CCW switch. Fail Position: Will default fail A to AB open, from the factory. Fail position can be set from 0%-100%, in 10% increments. | NO/FC or NC/FC: Valve: Can be open or closed, will drive closed or open A to AB (can be chosen with CW/CCW switch). Fail Position: Will default fail A to AB open, from the factory. Fail position can be set from 0%-100%, in 10% increments. NO/FO: Normally open A to AB. Fail Position: Will default fail A to AB open, from the factory. Fail position can be set from 0%-100%, in 10% increments. |

3-WAY MIXING VALVE

| | | | |
|-------------------------|------------------------|---|--|
| NON FAIL-SAFE | EV, RV Series | NC: Normally closed A to AB, will open upon increase in signal/power. Note: To change valve to A to AB open, reverse the directional switch in actuator. | NO: Normally open A to AB, will close upon increase in signal/power. Note: To change valve to A to AB closed, reverse the directional switch in actuator. |
| | AFB, AFX Series On/Off | NO/FO Normally open A to AB, valve will drive closed. Spring Action: Will fail open A to AB upon power loss. | NC/FC Normally closed A to AB, valve will drive open. Spring Action: Will fail closed A to AB upon power loss. |
| | AFB, AFX MFT Series | NC/FO Normally closed A to AB, valve will open upon increase in signal. Note: To change valve to A to AB open, reverse CW/CCW switch. Spring Action: Will fail open A to AB upon power loss. | NO/FC or NC/FC Normally Open/Normally Closed: valve be open or closed, will drive closed or open A to AB (can be chosen with CW/CCW switch). Spring Action: Closed A to AB upon power loss. NO/FO Normally open A to AB. Spring Action: Will fail open A to AB upon power loss. (NO or NC action can be chosen with CW/CCW switch). |
| ELECTRONIC FAIL-SAFE | AVK, GK Series | NC/FO Normally closed A to AB, valve will open upon increase in signal. Note: To change valve to A to AB open, reverse CW/CCW switch. Fail Position: Will default fail A to AB open, from the factory. Fail position can be set from 0%-100%, in 10% increments. | NO/FC or NC/FC Valve: Can be open or closed, will drive closed or open A to AB (can be chosen with CW/CCW switch). Fail Position: Will default fail A to AB open, from the factory. Fail position can be set from 0%-100%, in 10% increments. NO/FO Normally open A to AB. Fail Position: Will default fail A to AB open, from the factory. Fail position can be set from 0%-100%, in 10% increments. |

3-WAY DIVERTING VALVE

| | | | |
|-------------------------|------------------------|---|--|
| NON FAIL-SAFE | EV, RV Series | NC: Normally closed AB to B, will open upon increase in signal/power. Note: To change valve to AB to B open, reverse the directional switch in actuator. | NO: Normally open AB to B, will close upon increase in signal/power. Note: To change valve to AB to B closed, reverse the directional switch in actuator. |
| | AFB, AFX Series On/Off | NO/FO Normally open AB to B, valve will drive closed. Spring Action: Will fail open AB to B upon power loss. | NC/FC Normally closed AB to B, valve will drive open. Spring Action: Will fail closed AB to B upon power loss. |
| | AFB, AFX MFT Series | NC/FO Normally closed AB to B, valve will open upon increase in signal. Note: To change valve to AB to B open, reverse CW/CCW switch. Spring Action: Will fail open AB to B upon power loss. | NO/FC or NC/FC Normally Open/Normally Closed: valve be open or closed, will drive closed or open AB to B (can be chosen with CW/CCW switch). Spring Action: Closed AB to B upon power loss. NO/FO Normally open AB to B. Spring Action: Will fail open AB to B upon power loss. (NO or NC action can be chosen with CW/CCW switch). |
| ELECTRONIC FAIL-SAFE | AVK, GK Series | NC/FO Normally closed AB to B, valve will open upon increase in signal. Note: To change valve to AB to B open, reverse CW/CCW switch. Fail Position: Will default fail AB to B open, from the factory. Fail position can be set from 0%-100%, in 10% increments. | NO/FC or NC/FC Valve: Can be open or closed, will drive closed or open AB to B (can be chosen with CW/CCW switch). Fail Position: Will default fail AB to B open, from the factory. Fail position can be set from 0%-100%, in 10% increments. NO/FO Normally open AB to B. Fail Position: Will default fail AB to B open, from the factory. Fail position can be set from 0%-100%, in 10% increments. |

Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

Default and MFT Programming Codes

| | | | CONTROL | | | |
|-----------------|---------------------------|-----------------------|-----------------------|-----------------------|--------------------|-------------|
| ACTUATOR TYPE | CONFIGURATION DESCRIPTION | P-CODE | CONTROL INPUT | FEEDBACK POSITION | RUNNING TIME | |
| ROTARY ACTUATOR | -3 and -SR | N/A | 0 | 2-10 VDC (for -3) | 2-10 VDC (for -3) | 150 seconds |
| | | N/A | 2 | 2-10 VDC (for -SR) | 2-10 VDC (for -SR) | 90 seconds |
| | -MFT and -PC | P-10001 | A01 | 2-10 VDC | 2-10 VDC | 150 seconds |
| | | P-10002 | A02 | 0.5-10 VDC | 0-10 VDC | 150 seconds |
| | | P-10003 | A03 | 2-10 VDC | 0-5.0 VDC | 150 seconds |
| | | P-10004 | A04 | 4-7 VDC | 2-10 VDC | 150 seconds |
| | | P-10005 | A05 | 6-9 VDC | 2-10 VDC | 150 seconds |
| | | P-10006 | A06 | 10.5 -13.5 VDC | 2-10 VDC | 150 seconds |
| | | P-10007 | A07 | 0.5-5 VDC | 2-10 VDC | 150 seconds |
| | | P-10009 | A09 | 5-10 VDC | 2-10 VDC | 150 seconds |
| | | P-10010 | A10 | 5-10 VDC | 0-10 VDC | 150 seconds |
| | | P-10013 | A13 | 0.5-10 VDC | 2-10 VDC | 150 seconds |
| | | P-10015 | A15 | 2-5 VDC | 2-10 VDC | 150 seconds |
| | | P-10016 | A16 | 2-6 VDC | 2-10 VDC | 150 seconds |
| | | P-10017 | A17 | 6-10 VDC | 2-10 VDC | 150 seconds |
| | | P-10018 | A18 | 14-17 VDC | 2-10 VDC | 150 seconds |
| | | P-10019 | A19 | 2-10 VDC | 2-10 VDC | 100 seconds |
| | | P-10020 | A20 | 9-12 VDC | 2-10 VDC | 150 seconds |
| | | P-10028 | A28 | 0.5-10 VDC | 0.5-10 VDC | 100 seconds |
| | | P-10031 | A31 | 0.5- 4 VDC | 2-10 VDC | 150 seconds |
| | | P-10063 | A63 | 0.5-4.5 VDC | 0.5- 4.5 VDC | 150 seconds |
| | | P-10032 | A32 | 6-14 VDC | 2-10 VDC | 150 seconds |
| | | P-10064 | A64 | 5.5-10 VDC | 5.5-10.0 VDC | 150 seconds |
| | | N/A | AAT | 2-10 VDC | 2-10 VDC | 20 seconds |
| | | P-20001 | W01 | 0.59-2.93 seconds | 2-10 VDC | 150 seconds |
| | | P-20002 | W02 | 0.02 to 5.00 seconds | 2-10 VDC | 150 seconds |
| | | P-20003 | W03 | 0.10 to 25.50 seconds | 2-10 VDC | 150 seconds |
| | | P-20004 | W04 | 0.10 to 25.60 seconds | 2-10 VDC | 150 seconds |
| | | P-20005 | W05 | 0.10 to 5.20 seconds | 0-5.0 VDC | 150 seconds |
| | | P-30001 | F01 | Floating Point | 2-10 VDC | 150 seconds |
| | | P-30002 | F02 | Floating Point | 0-10 VDC | 150 seconds |
| | | P-40002 | J02 | On/Off | 2-10 VDC | 150 seconds |
| | | N/A | S01 (for -PC only) | Phasecut | 2-10 VDC | 150 seconds |
| | P-16001 | R01 (for -MFT95 only) | 0 to 135 Ω | 2-10 VDC | 150 seconds | |
| LINEAR ACTUATOR | -3 and -MFT | G01 | On/Off | 2-10 VDC MFT only | 35 seconds | |
| | | G02 | On/Off | 2-10 VDC MFT only | 60 seconds | |
| | | G03 | On/Off | 2-10 VDC MFT only | 90 seconds | |
| | | G04 | On/Off | 2-10 VDC MFT only | 150 seconds | |
| | | G11 | Floating Point | 2-10 VDC MFT only | 35 seconds | |
| | | G12 | Floating Point | 2-10 VDC MFT only | 60 seconds | |
| | | G13 | Floating Point | 2-10 VDC MFT only | 90 seconds | |
| | | G14 | Floating Point | 2-10 VDC MFT only | 150 seconds | |
| | -SR and -MFT | G41 (G21 for -SR) | 2-10 VDC | 2-10 VDC | 35 seconds | |
| | | G42 (G22 for -SR) | 2-10 VDC | 2-10 VDC | 60 seconds | |
| | | G43 (G23 for -SR) | 2-10 VDC | 2-10 VDC | 90 seconds | |
| | | G44 (G24 for -SR) | 2-10 VDC | 2-10 VDC | 150 seconds | |
| | -MFT | G51 | 0.5-10 VDC | 0.5-10 VDC | 35 seconds | |
| | | G52 | 0.5-10 VDC | 0.5-10 VDC | 60 seconds | |
| | | G53 | 0.5-10 VDC | 0.5-10 VDC | 90 seconds | |
| | | G54 | 0.5-10 VDC | 0.5-10 VDC | 150 seconds | |
| | | G2A | 5.5-10 VDC | 5.5-10 VDC | 150 seconds | |
| | | G2B | 0.5-4.5 VDC | 0.5-4.5 VDC | 150 seconds | |
| | | G2C | 2-10 VDC | 0.5-5 VDC | 150 seconds | |
| | | G2D | 6-9 VDC | 2-10 VDC | 150 seconds | |
| | | G2E | 10.5-13.5 VDC | 2-10 VDC | 150 seconds | |
| | | W3M** | 0.02-5.00 seconds PWM | 2-10 VDC | 90 seconds | |
| | | W3P** | 0.2-5.00 seconds PWM | 2-10 VDC | 90 seconds | |

*P-10001 is the default configuration for MFT.

**Not available on RV models.

Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

Close-Off Pressure Globe Valve Threaded Body



| | Non-Spring Return | | Spring Return | | | Electronic Fail-Safe | |
|------------------------|-------------------|-----|---------------|-----|-----|----------------------|-----|
| | LV | SV | LF | NF | AFB | LVK | SVK |
| 2-way | | | | | | | |
| G215B(S)-C | 250 | | 160 | | | 250 | |
| G215B(S)-F | 250 | | 160 | | | 250 | |
| G215B(S)-G | 250 | | 160 | | | 250 | |
| G215B(S)-J | 250 | | 160 | | | 250 | |
| G220B(S)-J | 250 | | 155 | | | 250 | |
| G220B(S)-K | 250 | | 155 | | | 250 | |
| G225B(S)-K | 250 | | 147 | | | 250 | |
| G225B(S)-L | 250 | | 147 | | | 250 | |
| G232B(S)-M | 250 | | 141 | | | 250 | |
| G240B(S)-N | 250 | | | 250 | 210 | 250 | |
| G250B(S)-N | 250 | | | 250 | 120 | 250 | |
| 3-way Mixing | | | | | | | |
| G315B-G | | 250 | | 250 | | | 250 |
| G315B-J | | 250 | | 250 | | | 250 |
| G320B-K | | 250 | | 250 | | | 250 |
| G325B-L | | 250 | | 179 | | | 250 |
| G332B-M | | 246 | | 133 | | | 246 |
| G340B-N | | 137 | | | 167 | | 137 |
| G350B-N | | 86 | | | 105 | | 86 |
| 3-way Diverting | | | | | | | |
| G315B-G | | 250 | | 166 | | | 250 |
| G315B-J | | 250 | | 166 | | | 250 |
| G320B-K | | 182 | | 101 | | | 182 |
| G325B-L | | 109 | | 60 | | | 109 |
| G332B-M | | 82 | | 44 | | | 82 |
| G340B-N | | 46 | | | 56 | | 46 |
| G350B-N | | 29 | | | 35 | | 29 |

Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.


| | Non-Spring Return | | Spring Return | | Electronic Fail-Safe | |
|-------------------------------------|-------------------|-----|---------------|------|----------------------|------|
| | EV | RV | AF | 2*AF | AVK | 2*GK |
| 2-way Pressure Comp ANSI 125 | | | | | | |
| G665C | 140 | | 140 | | 140 | |
| G680C | 140 | | 140 | | 140 | |
| G6100C | 140 | | | 140 | 140 | |
| G6125C | 140 | | | 140 | 140 | |
| G6150C | 140 | | | 110 | 140 | |
| 2-way Pressure Comp ANSI 125 | | | | | | |
| G665CS, G665LCS | 125 | | 125 | | 125 | |
| G680CS, G680LCS | 125 | | 125 | | 125 | |
| G6100CS, G6100LCS | 125 | | | 125 | 125 | |
| G6125CS, G6125LCS | 125 | | | 125 | 125 | |
| G6150C, G6150LCS | 125 | | | 125 | 125 | |
| 2-way Pressure Comp ANSI 250 | | | | | | |
| G665C-250 | 310 | | 232 | | 310 | |
| G680C-250 | 310 | | 181 | 310 | 310 | |
| G6100C-250 | 310 | | | 310 | 310 | |
| G6125C-250 | 310 | | | 241 | 300 | |
| G6150C-250 | 310 | | | 182 | 232 | |
| 2-way Pressure Comp ANSI 250 | | | | | | |
| G665CS-250, G665LCS-250 | 280 | | 232 | | 280 | |
| G680CS-250, G680LCS-250 | 280 | | 181 | | 280 | |
| G6100CS-250, G6100LCS-250 | 280 | | | | 280 | |
| G6125CS-250, G6125LCS-250 | 280 | | | | 280 | |
| G6150CS-250, G6150LCS-250 | 280 | | | | 280 | 280 |
| 3-way ANSI 125 Mixing | | | | | | |
| G765, G765S | 106 | 125 | 31 | 70 | 84 | 125 |
| G780, G780S | 73 | 125 | 21 | 48 | 57 | 102 |
| G7100, G7100S | 40 | 75 | | 26 | | 56 |
| G7125, G7125S | | 47 | | | | 35 |
| G7150, G7150S | | 32 | | | | 24 |
| 3-way ANSI 250 Mixing | | | | | | |
| G765-250, G765S-250 | 106 | 198 | 31 | 70 | 84 | 149 |
| G780-250, G780S-250 | 73 | 136 | 21 | 48 | 57 | 102 |
| G7100-250, G7100S-250 | 40 | 75 | | 26 | | 56 |
| G7125-250, G7125S-250 | | 47 | | | | |
| G7150-250, G7150S-250 | | 32 | | | | |
| 3-way ANSI 125/250 Diverting | | | | | | |
| G765D, G765DS | 140 | | 140 | | 140 | |
| G780D, G780DS | 140 | | 140 | | 140 | |
| G7100D, G7100DS | 140 | | 140 | | 140 | |
| G7125D, G7125DS | 140 | | | 140 | 140 | |
| G7150D, G7150DS | 140 | | | 140 | | |
| 3-way ANSI 125/250 Diverting | | | | | | |
| G765DS-250 | 310 | | 310 | | 310 | |
| G780DS-250 | 310 | | 310 | | 310 | |
| G100DS-250 | 310 | | 310 | | 310 | |
| G7125DS-250 | 310 | | | 310 | | |
| G7150DS-250 | 310 | | | 310 | | |



Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

| WEATHER SHIELDS | | GM | 2* GM | LF | NF | AF | 2* AF | GK | 2* GK | LV/SV | EV/RV | LVK/SVK | AVK |
|--|---|----|-------|----|----|----|-------|----|-------|-------|-------|---------|-----|
| | ZS-SPGV-60 For LF actuators on G2/G3 series | | | • | | | | | | | | | |
| | ZS-SPGV-10 For dual AF series actuators on flanged series | | | | | | • | | | | | | |
| | ZS-SPGV-20 For single NF, AF actuator series | | | | • | • | | | | | | | |
| | ZS-SPGV-40 For GM, GK series on flanged series | • | | | | | | | • | | | | |
| | ZS-SPGV-50 For dual GM, GK series on flanged series | | • | | | | | | • | | | | |
| | ZS-GV-001 For LV, SV actuators on NPT threaded series | | | | | | | | | | • | | • |
| ZS-GV-002 For EV, RV, AVK actuator on flanged series | | | | | | | | | | | • | | • |

| AUXILIARY SWITCHES & POTENTIOMETERS | | LR/LM | NR/NM | AR/AM | GR/GM | AK | GK/GKR | DR |
|---|---|-------|-------|-------|---------|-----|--------|----|
| | S1A Auxiliary switch 1x SPDT, 3A (0.5A inductive) @ 250 VAC | • | • | • | • | • | • | • |
| | S2A Auxiliary switch 2x SPDT, 3A (0.5A inductive) @ 250 VAC | • | • | • | • | • | • | • |
| | P140A GR Feedback potentiometer 140 Ω | • | • | • | • | • | • | • |
| | P500A GR Feedback potentiometer 500 Ω | • | • | • | • | • | • | • |
| | P500A GR Feedback potentiometer 500 Ω | • | • | • | • | • | • | • |
| | P1000A GR Feedback potentiometer 1000 Ω | • | • | • | • | • | • | • |
| | P2800A GR Feedback potentiometer 2800 Ω | • | • | • | • | • | • | • |
| | P5000A GR Feedback potentiometer 5000 Ω | • | • | • | • | • | • | • |
| P10000A GR Feedback potentiometer 10000 Ω | • | • | • | • | • | • | • | |
| | | LV/SV | EV | RV | LVK/SVK | AVK | SY | |
| | S2A-GV Auxiliary switch 2x SPDT, 3A (0.5A inductive) @ 250 VAC for LV, SV, EV, and AVK series actuators | • | • | • | • | • | | |
| | SY-1000-FB01 Feedback potentiometer 1000 Ω, 2 position, factory installed option only | | | | | | | • |
| | SY-1000-FB02 Feedback potentiometer 1000 Ω, modulating (models SYx...-MFT), factory installed option only | | | | | | | • |

Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

| ZTH REPLACEMENT CABLES | | VALVES | AM | GM | AR | GR | DR | GK | DK | SY |
|---|---|---|----|----|----|----|----|----|----|----|
|  | <p>ZK2-GEN Cable for use with ZTH US to connect to actuators not equipped with diagnostic/programming socket</p> | <i>Available for all MFT Actuators Only</i> | | | | | | | | |

| PROGRAMMING TOOLS | | |
|---|--|---|
|  | <p>MFT-P Belimo MFT configuration software (V3.X), includes PC-Tool software (interface cables [ZTH US] not included) Free download also available at www.belimo.us under "Document Downloads"</p> | <i>Available for all MFT Actuators Only</i> |
|  | <p>ZTH US Handheld interface module that allows field programming. Includes ZK1-GEN, ZK2-GEN, and ZK6-GEN cables</p> | <i>Available for all MFT Actuators Only</i> |

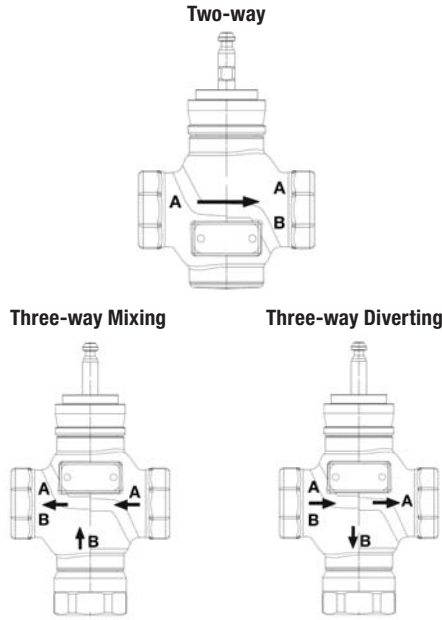
Repacking Kits

| Kit Part Number | Description |
|-----------------|---|
| ZG-GV60 | Repacking kit for all G2B(S) and G3B globe valves ½" to 2" |
| ZG-GV03 | Packing removal wrench for G2, G2S, G3 and G3D globe valves ½" to 2" |
| ZG-GV15 | Repacking kit for all G6, G6C, G6CS, G6LCS, G7, G7D, G7S, and G7DS (and all -250 globe valves 2½" to 6"). |

Rebuild Kits

| Size | Valve Part Number | Kit Part Number | Valve Part Number | Kit Part Number |
|------|-------------------|-----------------|-------------------|-----------------|
| 2½" | G665 | ZG-GV05 | G665S | ZG-GV29 |
| 3" | G680 | ZG-GV06 | G680S | ZG-GV30 |
| 4" | G6100 | ZG-GV07 | G6100S | ZG-GV31 |
| 5" | G6125 | ZG-GV08 | G6125S | ZG-GV32 |
| 6" | G6150 | ZG-GV09 | G6150S | ZG-GV33 |
| 2½" | G665-250 | ZG-GV05 | G665S-250 | ZG-GV29 |
| 3" | G680-250 | ZG-GV06 | G680S-250 | ZG-GV30 |
| 4" | G6100-250 | ZG-GV07 | G6100S-250 | ZG-GV31 |
| 5" | G6125-250 | ZG-GV08 | G6125S-250 | ZG-GV32 |
| 6" | G6150-250 | ZG-GV27 | G6150S-250 | ZG-GV34 |
| 2½" | G665C | ZG-GV16 | G665CS | ZG-GV35 |
| 3" | G680C | ZG-GV17 | G680CS | ZG-GV36 |
| 4" | G6100C | ZG-GV18 | G6100CS | ZG-GV37 |
| 5" | G6125C | ZG-GV19 | G6125CS | ZG-GV38 |
| 6" | G6150C | ZG-GV20 | G6150CS | ZG-GV39 |
| 2½" | G665C-250 | ZG-GV16 | G665CS-250 | ZG-GV35 |
| 3" | G680C-250 | ZG-GV17 | G680CS-250 | ZG-GV36 |
| 4" | G6100C-250 | ZG-GV18 | G6100CS-250 | ZG-GV37 |
| 5" | G6125C-250 | ZG-GV19 | G6125CS-250 | ZG-GV38 |
| 6" | G6150C-250 | ZG-GV21 | G6150CS-250 | ZG-GV40 |
| 2½" | G765 | ZG-GV10 | G765S | ZG-GV41 |
| 3" | G780 | ZG-GV11 | G780S | ZG-GV42 |
| 4" | G7100 | ZG-GV12 | G7100S | ZG-GV43 |
| 5" | G7125 | ZG-GV13 | G7125S | ZG-GV44 |
| 6" | G7150 | ZG-GV14 | G7150S | ZG-GV45 |
| 2½" | G765-250 | ZG-GV10 | G765S-250 | ZG-GV41 |
| 3" | G780-250 | ZG-GV11 | G780S-250 | ZG-GV42 |
| 4" | G7100-250 | ZG-GV12 | G7100S-250 | ZG-GV43 |
| 5" | G7125-250 | ZG-GV13 | G7125S-250 | ZG-GV44 |
| 6" | G7150-250 | ZG-GV28 | G7150S-250 | ZG-GV46 |
| 2½" | G765D | ZG-GV22 | G765DS | ZG-GV47 |
| 3" | G780D | ZG-GV23 | G780DS | ZG-GV48 |
| 4" | G7100D | ZG-GV24 | G7100DS | ZG-GV49 |
| 5" | G7125D | ZG-GV25 | G7125DS | ZG-GV50 |
| 6" | G7150D | ZG-GV26 | G7150DS | ZG-GV51 |
| 2½" | G765D-250 | ZG-GV22 | G765DS-250 | ZG-GV47 |
| 3" | G780D-250 | ZG-GV23 | G780DS-250 | ZG-GV48 |
| 4" | G710D-250 | ZG-GV24 | G710DS-250 | ZG-GV49 |
| 5" | G7125D-250 | ZG-GV25 | G7125DS-250 | ZG-GV50 |
| 6" | G7150D-250 | ZG-GV26 | G7150DS-250 | ZG-GV51 |

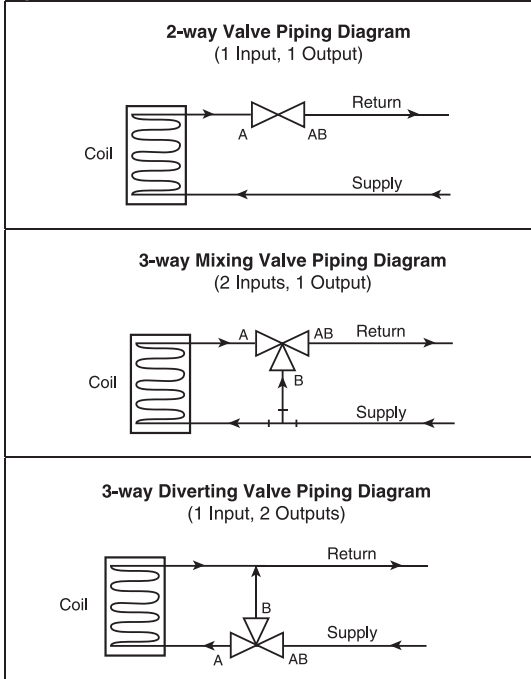
Flow Pattern



Mounting

| | |
|---|--|
| <p>Preferred Mounting</p> | <p>Optional Mounting</p> |
| <p>DO NOT INSTALL WITH ACTUATOR BELOW PIPE</p> | <p>Allow 6" for actuator/adaptor bracket removal. NOTE: DO NOT COVER ADAPTOR BRACKET WITH INSULATION MATERIAL.</p> |

Operation



Installation

1. Inspect shipping package, valve, linkage, and actuator for physical damage. If shipping damage has occurred notify appropriate carrier. Do not install.
2. If a replacement, remove existing valve, linkage and actuator from the piping system.
3. If actuator and linkage are removed, they must be reinstalled correctly. The actuator must be rotated so that the valve sits properly for close off.
4. Install valve with the proper ports as inlets and outlets. Check that inlet and outlet of 2-way valves are correct; check that the "A", "B", and "AB" ports of 3-way valves are piped correctly for mixing or diverting. See supplied drawings on previous page.
5. Blow out all piping and thoroughly clean before valve installation.
6. Clean male pipe threads with wire brush and rag. If threads have been damaged or exposed to weather, running a tap or die over the threads may straighten them. Clean pipes, threads, and valve threads before installation; check for any foreign material that can become lodged in trim components. Strainers should be cleaned after initial startup.
7. Pipe sealing compound should be applied sparingly after cleaning and may not be applied to the two lead threads of a screwed pipe, which are innermost inside the valve. Sealing compound is to be placed on male threads only. The purpose is to lubricate the pipes when tightening.
8. Valve must be installed per the mounting drawings shown.
9. Start the connection by turning the valve or pipe by hand as far as possible. Be certain the threads mate by the "feel" of the connection.
10. Use wrenches to tighten the valve to the pipe. Do not over tighten or strip the threads. Two wrenches are necessary to avoid damaging the valve.
11. Two-way valve Normally Open or Closed configurations must be verified by examining both the mechanical drawings and the valve and actuator. See details below.
12. Three-way valve Normally Open or Closed configurations for the Control Port and the Bypass Port must be verified by examining both the mechanical drawings and the valve and actuator.

In the piping diagrams the A and B ports may need to be reversed or the actuator set up spring open or fail safe open differently than shown. The specific application determines what fail safe mode is required for freeze or moisture control if applicable.

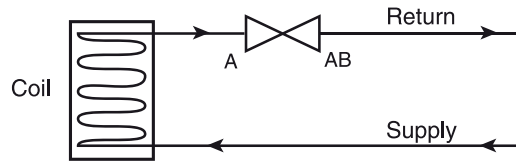
Warning!

Valve should not be used for combustible gas applications. Gas leaks and explosions may result. Do not install in systems which exceed the ratings of the valve.

- Avoid installations where valve may be exposed to excessive moisture, corrosive fumes, vibration, high ambient temperatures, elements, or high traffic areas with potential for mechanical damage.
- Valve assembly location must be within ambient ratings of actuator.
- The valve assembly will require heat shielding, thermal isolation, or cooling if combined effect of medium and ambient temperatures – conduction, convection, and radiation – is above 122°F for prolonged time periods at the actuator.
- Strainers should be installed before coil and valve.
- Visual access must be provided. Assembly must be accessible for routine scheduled service. Contractor should provide unions for removal from line and isolation valves.
- Avoid excessive stresses. Mechanical support must be provided where reducers have been used and the piping system may have less structural integrity than full pipe sizes.
- Sufficient upstream and downstream piping runs must be provided to ensure proper valve capacity and flow response. Five diameters in each direction are recommended.
- Life span of valve stems and packing is dependent on maintaining non-damaging conditions. Poor water treatment or filtration, corrosion, scale, other particulate can result in damage to trim components. A water treatment specialist should be consulted.
- Normal thread engagement between male pipe thread and valve body should be observed. Pipe run that is in too far will damage the valve.

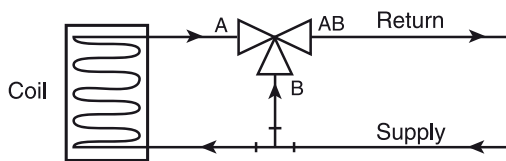
2-WAY

2-way Valve Piping Diagram
 (1 Input, 1 Output)

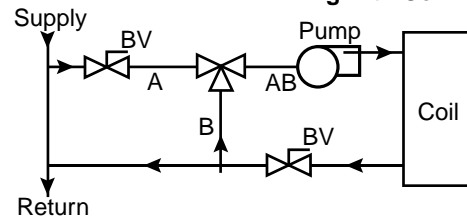


3-WAY MIXING

3-way Mixing Valve Piping Diagram
 (2 Inputs, 1 Output)

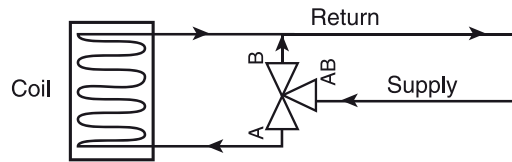


Mixing with Coil Pump



3-WAY DIVERTING

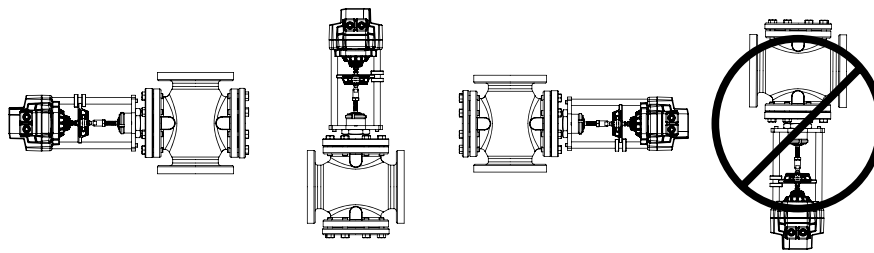
3-way Diverting Valve Piping Diagram
 (1 Input, 2 Outputs)



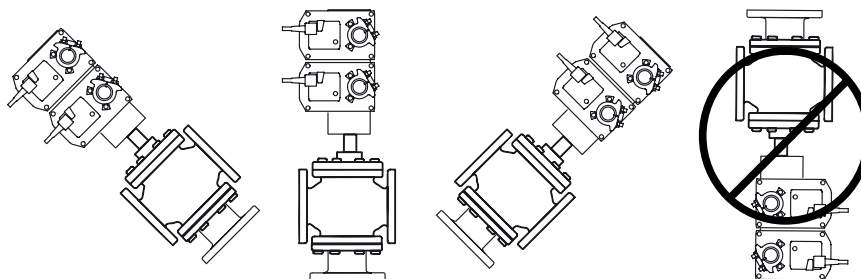
INSTALLATION

Valve must be installed in these orientations only.

Linear Actuators



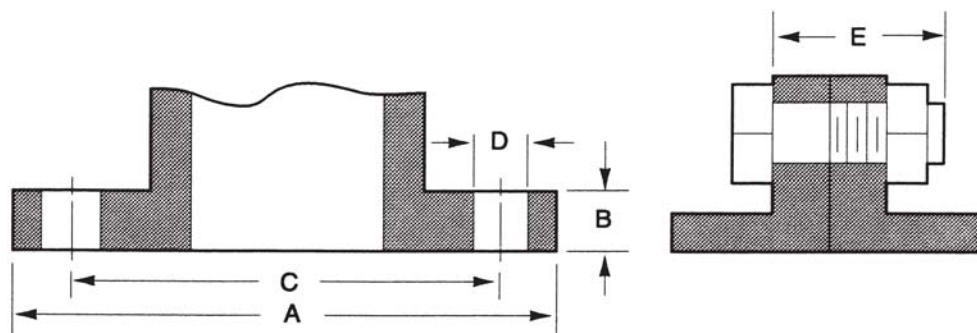
UGLK Linkage



Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

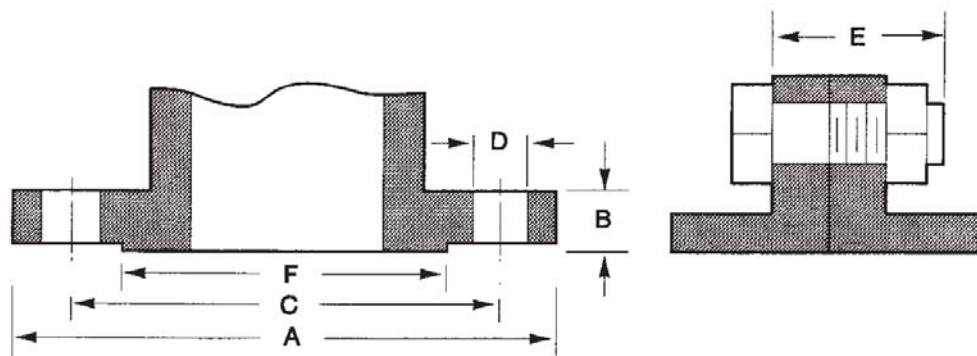
Flange Detail for American Standard 125 lb. Cast Iron Pipe Flanges

| Nominal Pipe Size | FLANGES | | DRILLING | | BOLTING | | E Length of Machine Bolts |
|-------------------|-------------------|--------------------|---------------------------|--------------------------|-----------------|-------------------|---------------------------|
| | A Flange Diameter | B Flange Thickness | C Diameter of Bolt Circle | D Diameter of Bolt Holes | Number of Bolts | Diameter of Bolts | |
| 2½" | 7" | 1¼" | 5½" | ¾" | 4 | 5/8" | 2½" |
| 3" | 7½" | ¾" | 6" | ¾" | 4 | 5/8" | 2½" |
| 4" | 9" | 15/16" | 7½" | ¾" | 8 | 5/8" | 3" |
| 5" | 10" | 15/16" | 8½" | 7/8" | 8 | ¾" | 3" |
| 6" | 11" | 1" | 9½" | 7/8" | 8 | ¾" | 3¼" |



Flange Detail for American Standard 250 lb. Cast Iron Pipe Flanges

| Nominal Pipe Size | FLANGES | | | DRILLING | | BOLTING | | E Length of Machine Bolts |
|-------------------|-------------------|--------------------|---------------------------|---------------------------|--------------------------|-----------------|-------------------|---------------------------|
| | A Flange Diameter | B Flange Thickness | F Diameter of Raised Face | C Diameter of Bolt Circle | D Diameter of Bolt Holes | Number of Bolts | Diameter of Bolts | |
| 2½" | 7½" | 1" | 4 15/16" | 5 7/8" | 7/8" | 8 | ¾" | 3¼" |
| 3" | 8¼" | 1/8" | 5 11/16" | 6 5/8" | 7/8" | 8 | ¾" | 3¼" |
| 4" | 10" | 1¼" | 6 15/16" | 7 7/8" | 7/8" | 8 | ¾" | 3¾" |
| 5" | 11" | 1 1/8" | 8 5/16" | 9 1/4" | 7/8" | 8 | ¾" | 4" |
| 6" | 12½" | 7/16" | 9 11/16" | 10 5/8" | 7/8" | 12 | ¾" | 4" |



Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

Warning!

Valve should not be used for combustible gas applications. Gas leaks and explosions may result. Do not install in systems which exceed the ratings of the valve.

- Avoid installations where the valve may be exposed to excessive moisture, corrosive fumes, vibration, high ambient temperatures, elements, or high traffic areas with the potential for mechanical damage.
- Valve assembly location must be within ambient ratings of the actuator. If the temperature is below -22°F, a heater is required.
- The valve assembly will require heat shielding, thermal isolation, or cooling at the actuator if the combined effect of medium and ambient temperatures (conduction, convection, and radiation) is above 122°F for prolonged time periods.
- Strainers should be installed before coil and valve.
- Visual access must be provided. Assembly must be accessible for routine service. Contractor should provide unions for removal from line and isolation valves.
- Avoid excessive stresses. Mechanical support must be provided where reducers have been used and the piping systems may have less structural integrity than full pipe sizes.
- Vertical pipes with valves and dual actuators may require linkage support.
- Sufficient upstream and downstream piping runs must be provided to ensure proper valve capacity and flow response. Five diameters in each direction are recommended.
- The lifespan of the valve stems and packing is dependent on maintaining non-damaging conditions. Poor water treatment or filtration, corrosion, scale or particulate deposits can result in damage to trim components. A water treatment specialist should be consulted.
 1. Inspect shipping package, valve, linkage, and actuator for physical damage. If shipping damage has occurred, notify appropriate carrier. Do not install.
 2. If this is a replacement, remove the existing valve, linkage, and actuator from the piping system.
 3. If actuator and linkage are removed, the replacements must be installed correctly to ensure close-off is achieved when commanded closed, and fail-safe actuator moves the stem to the proper fail-safe position with a loss of power.
 4. Install valve with the proper ports as inlets and outlets. See piping charts on page 18. Check that inlet and outlet of the 2-way valves are correct; check that the "A", "B", and "AB" ports of 3-way valves are piped correctly. Flow direction arrows must be correct.
 5. Blow out all piping and thoroughly clean before valve installation.
 6. Clean male pipe threads with wire brush and rag. If threads have been damaged or exposed to weather, running a tap or die over the threads may straighten them. Clean pipes, threads, and valve threads before installation. Check for any foreign material that can become lodged in trim components. Strainers should be cleaned after initial startup.
 7. Pipe sealing compound may not be applied to either flange or gasket. Flanged bodies must be used with flanges which are rated for the service. 125 lb flanges have flat faces and may not be bolted to raised face flanges. Gasket ratings must comply with application specifications for: medium, temperature, and pressure.
 8. Valve must be installed with the stem above horizontal to avoid water damage to the actuator.
 9. Tighten bolts alternatively and evenly around the flange.
 10. 2-way valve Normally Open (NO) or Normally Closed (NC) configurations must be verified by examining both the mechanical drawings and the valve and actuator.
 11. 3-way valve Normally Open (NO) or Normally Closed (NC) configurations for the control port and the bypass port must be verified by examining both the mechanical drawings and the valve and actuator.

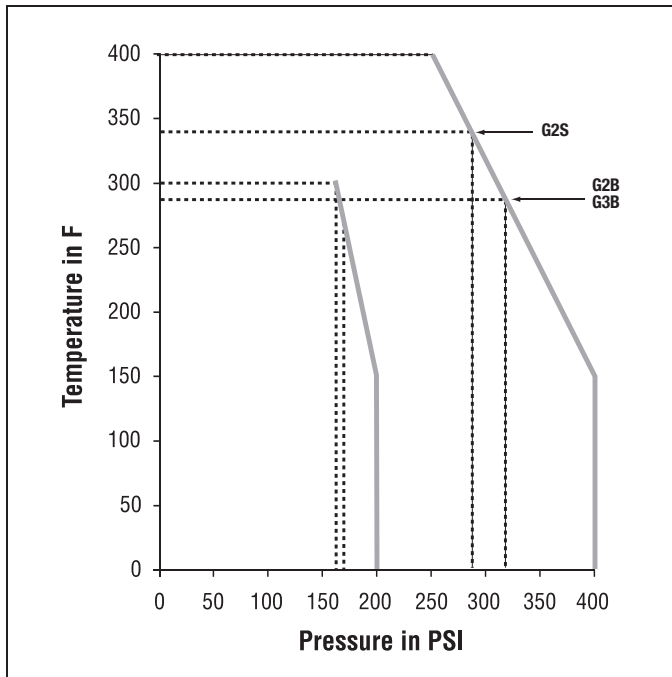
Check specifications for every application to be sure of ports and designations.

U, L, and C designations

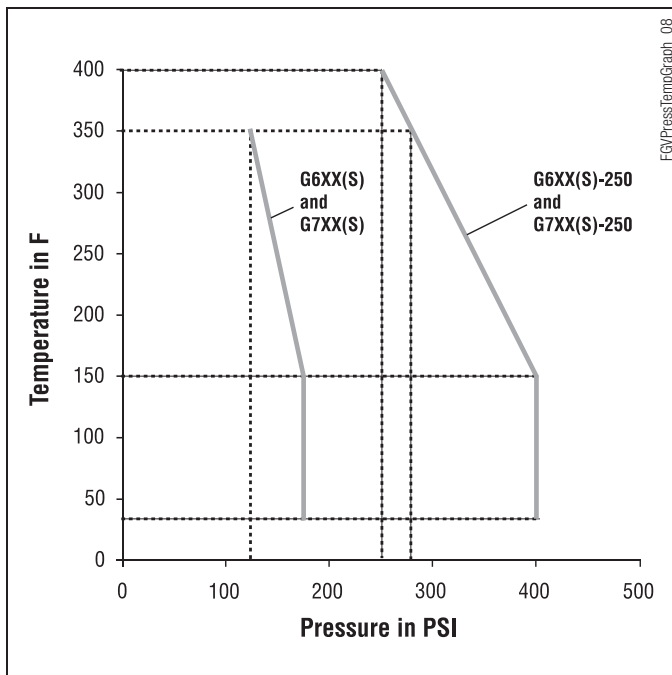
U is for Upper, the control port. L is for Lower, the bypass port. C is for Common.

Viewed with the bonnet upwards; the U port is on the left, the L port is on the bottom, and the C port is on the right. With the stem up the L port is open to Common; and with the stem down the U port is open to Common.

**Maximum Temperature and Pressure Ratings
for Threaded Globe Valve Bodies**



**Maximum Temperature and Pressure Ratings
for Flanged Globe Valve Bodies**



Tech.Doc - 4/18 - Subject to change. © Belimo Aircontrols (USA), Inc.

FGVPresTempGraph_08



Belimo Americas

USA, Latin America, and the Caribbean: www.belimo.us

Canada: www.belimo.ca

Brazil: www.belimo.com.br

Belimo Worldwide: www.belimo.com

