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**Butterfly Valve:**  
**UFLK Series**      **Linkage Solution**  
                          **2-way Valves**  
                          **3-way Valves**

### Retrofit Solutions for Virtually any Valve

#### Manufacturers:

**Butterfly:** Bray, Centerline, Keystone, Flowseal and more

**Control:** On/Off, Floating, 2-10VDC  
 Multi-Function Technology®  
 Spring Return or  
 Non-Spring Return

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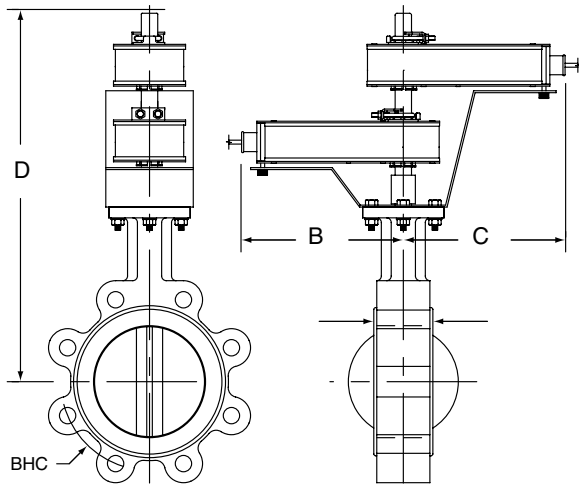


# Butterfly Valve Retrofit

Tips for choosing a butterfly valve retrofit solution

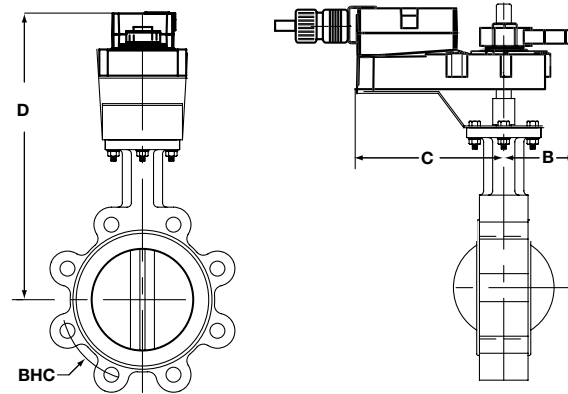


## Dimensions with 2-Way Valve



BF2WUDIM

## Dimensions with 2-Way Valve



AM\_GM\_LineRevised

### Maximum Dimensions (Inches)

| Size | B    | C    | D(Max) | Actuator |
|------|------|------|--------|----------|
| 2"   | 9    | 9    | 19.5   | AF       |
| 2"   | 7    | 7    | 15     | AMB(X)   |
| 2"   | 4.25 | 4.25 | 15.5   | SY1...   |
| 2"   | 8    | 13   | 20.25  | SY2...   |
| 2½"  | 9    | 9    | 20     | AF       |
| 2½"  | 9    | 9    | 20     | 2*AF     |
| 2½"  | 7    | 7    | 15.5   | AMB(X)   |
| 2½"  | 4.25 | 4.25 | 16     | SY1...   |
| 2½"  | 8    | 13   | 20.75  | SY2...   |
| 3"   | 7    | 7    | 16     | AMB(X)   |
| 3"   | 8    | 8    | 16     | GMB(X)   |
| 3"   | 9    | 9    | 20.5   | 2*AF     |
| 3"   | 4.25 | 4.25 | 16.25  | SY1...   |
| 3"   | 8    | 13   | 21     | SY2...   |
| 4"   | 8    | 8    | 17     | GMB(X)   |
| 4"   | 9    | 9    | 21     | 2*AF     |
| 4"   | 8    | 8    | 21     | 2*GMB(X) |
| 4"   | 8    | 13   | 21.75  | SY2...   |
| 5"   | 8    | 8    | 17.5   | GMB(X)   |
| 5"   | 9    | 9    | 22     | 2*AF     |
| 5"   | 8    | 13   | 22.25  | SY2...   |
| 6"   | 8    | 8    | 22.5   | GMB(X)   |
| 6"   | 8    | 13   | 23     | SY2...   |
| 6"   | 8    | 13   | 22.75  | SY3...   |
| 8"   | 8    | 13   | 24.25  | SY3...   |
| 8"   | 12   | 15   | 29     | SY4...   |
| 10"  | 8    | 13   | 25.5   | SY3...   |
| 10"  | 12   | 15   | 30     | SY4...   |
| 12"  | 8    | 13   | 27.25  | SY3...   |
| 12"  | 12   | 15   | 32     | SY4...   |
| 14"  | 12   | 15   | 33     | SY5...   |
| 16"  | 12   | 15   | 34.5   | SY6...   |
| 18"  | 14   | 21   | 39.25  | SY8...   |
| 20"  | 14   | 21   | 41.5   | SY8...   |
| 24"  | 14   | 22   | 53.25  | SY11...  |
| 30"  | 14   | 22   | 57.5   | SY12...  |

### Application Notes

1. Dimensions are approximate
2. Custom kits may be taller and varies by application needs
3. Dimension "D" allows for actuator removal without the need to remove the valve from the pipe.
4. Dual actuated valves have single actuators mounted on each valve shaft.

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## How to select a Butterfly Valve Retrofit Solution

Follow the four steps listed below when ordering a butterfly valve retrofit kit.

**Example:** Centerline C200 Series, 2½" valve, using a **Non-Spring Return** Belimo actuator.

- 1** Identify the **Valve Manufacturer, Valve Series** and **Valve Size**.
- 2** Determine the type of actuator you require: Belimo Spring Return, Non-Spring or SY Series Industrial. Belimo Spring and Non-Spring actuators are typically only available on smaller sizes.  
Look at the solution using the Non-Spring Return Belimo Actuator. Looking at the **UFLK3500**, the **GM** Series actuator will provide a **200 psi close-off** for the **2½" valve** with **Non-Spring Return** actuation.
- 3** Use the actuator listings to make your final actuator selection. Decide between **GMX24-3-X1** and **GMX24-MFT-X1**.  
**ACTUATOR NOT INCLUDED IN THE LIST PRICE OF THE LINKAGE.**
- 4** HOW TO ORDER: **Item 1 1pc UFLK3500**  
**Item 2 1pc GMX24-MFT-X1**



**1** Select linkage solution based on the **Valve Number, Configuration, and Size**; select the proper **Linkage Solution** for your valve.

### EXAMPLE PAGE

#### Centerline

C200 Round Top Series Butterfly Valves  
Linkage/Actuator Selection Guide

| Valve Body Model                       | Valve Configuration | Size  | Failsafe | Close-Off psi | Belimo Actuator Series (Sold Separately) | Belimo Linkage |          |
|--|---------------------|-------|----------|---------------|--|----------------|----------|
| C200 Round Top Series Butterfly Valves | 2-way               | 2"    | No       | 200           | AM                                       | UFLK3500       |          |
|  |                     |       | Yes      | 200           | AF                                       | UFLK3500       |          |
|  |                     | 2½"   | No       | 200           | GM                                       | UFLK3500       |          |
|  |                     |       | Yes      | 200           | 2*AF                                     | UFLK3502       |          |
|  |                     | 3"    | No       | 200           | GM                                       | UFLK3500       |          |
|  |                     |       | Yes      | 200           | 2*AF                                     | UFLK3502       |          |
|  | 2-way               | 2-way | 2"       | No            | 200                                      | SY1            | UFLK3538 |
|  |                     |       |          | Yes           | 200                                      | SY2            | UFLK3540 |
|  |                     |       | 2½"      | No            | 200                                      | GM             | UFLK3500 |
|  |                     |       |          | Yes           | 200                                      | 2*AF           | UFLK3502 |
|  |                     |       | 3"       | No            | 200                                      | GM             | UFLK3500 |
|  |                     |       |          | Yes           | 200                                      | 2*AF           | UFLK3502 |

### UFLK1300

Example: **Centerline C200 Series, 2½" valve** using a **non-spring return** Belimo actuation.

Choose correct linkage **UFLK3500**.

- 2** Verify close-off is suitable for application.  
Looking at the **UFLK3500**, the **GM** Series actuator will provide **200 psi close-off** for the **2½" valve**.

| MODEL                 | Non-Spring Return Actuators |          |              |                           |           |             |
|-----------------------|-----------------------------|----------|--------------|---------------------------|-----------|-------------|
|                       | Control Input               | Feedback | Power Supply | Running Time(s) [Default] | VA Rating | Aux. Switch |
| <b>BASIC PRODUCTS</b> |                             |          |              |                           |           |             |
| GMB24-3-X1            | On/Off, Floating Point      | Add-on   | 24 VAC/DC    | 150 seconds               | 6         | Add-on      |
| GMB24-SR              | 2-10 VDC (4-20mA*)          | 2-10 VDC | 24 VAC/DC    | 150 seconds               | 6.5       | Add-on      |
| <b>CUSTOMIZE IT</b>   |                             |          |              |                           |           |             |
| GMX24-3               | On/Off, Floating Point      | Add on   | 24 VAC/DC    | 150 seconds               | 7         | Add-on      |
| GMX24-SR              | 2-10 VDC (4-20mA*)          | 2-10 VDC | 24 VAC/DC    | 150 seconds               | 6.5       | Add-on      |
| GMX24-PC              | 0-20 V Phasecut             | 2-10 VDC | 24 VAC/DC    | 150 seconds               | 7         | Add-on      |
| GMX24-MFT-X1          | Various                     | Various  | 24 VAC/DC    | Various                   | 7         | Add-on      |
| GMX24-MFT95-X1        | 0 to 135 Ω                  | 2-10 VDC | 24 VAC/DC    | 150 seconds               | 7         | Add-on      |
| GMX120-3              | On/Off, Floating Point      | Add on   | 100-240 VAC  | 150 seconds               | 9         | Add-on      |

‡ For applications that require more torque the GMB Series can be dual mounted. A maximum of 2 GMB/X... Series actuators can be mechanically connected to one damper or valve shaft. The torque is 640 in-lb. \*With the 500 Ω resistor added.

- 3** Select actuator based on needed control type.  
Decide between **GMB24-3-X1** and **GMX24-MFT-X1**.

Complete Ordering Example:

- 4** Item 1: **UFLK3500**  
Item 2: **GMX24-MFT-X1**

### SY Series Actuators

| SERIES     | MODEL               | TORQUE                | RUN TIME(S)<br>90°@60Hz | POWER SUPPLY           | DUTY CYCLE | CONTROL      |         |                  | FEEDBACK         |
|------------|---------------------|-----------------------|-------------------------|------------------------|------------|--------------|---------|------------------|------------------|
|            |                     |                       |                         |                        |            | PROPORTIONAL | 3 POINT | ON/OFF           |                  |
| SY1        | SY1-110             | 35 Nm / 310 in-lb     | 12 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY1-24              | 35 Nm / 310 in-lb     | 12 seconds              | 24 VAC ±10%, 50/60 Hz  | 30%        |              | •       | •                | none, opt 1k     |
|            | SY1-220             | 35 Nm / 310 in-lb     | 12 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY1-110P            | 35 Nm / 310 in-lb     | 12 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
|            | SY1-24P             | 35 Nm / 310 in-lb     | 12 seconds              | 24 VAC ±10%, 50/60 Hz  | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
| SY1-220P   | 35 Nm / 310 in-lb   | 12 seconds            | 230 VAC ±10%, 50/60 Hz  | 75%                    | •          |              |         | 2-10 VDC/4-20 mA |                  |
| SY2        | SY2-110             | 90 Nm / 801 in-lb     | 15 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY2-24              | 90 Nm / 801 in-lb     | 15 seconds              | 24 VAC ±10%, 50/60 Hz  | 30%        |              | •       | •                | none, opt 1k     |
|            | SY2-220             | 90 Nm / 801 in-lb     | 15 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY2-120MFT          | 90 Nm / 801 in-lb     | 15 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
|            | SY2-24MFT           | 90 Nm / 801 in-lb     | 15 seconds              | 24 VAC ±10%, 50/60 Hz  | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
| SY2-230MFT | 90 Nm / 801 in-lb   | 15 seconds            | 230 VAC ±10%, 50/60 Hz  | 75%                    | •          |              |         | 2-10 VDC/4-20 mA |                  |
| SY3        | SY3-110             | 150 Nm / 1335 in-lb   | 22 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY3-24              | 150 Nm / 1335 in-lb   | 22 seconds              | 24 VAC ±10%, 50/60 Hz  | 30%        |              | •       | •                | none, opt 1k     |
|            | SY3-220             | 150 Nm / 1335 in-lb   | 22 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY3-24MFT           | 150 Nm / 1335 in-lb   | 22 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
|            | SY3-120MFT          | 150 Nm / 1335 in-lb   | 22 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
| SY3-230MFT | 150 Nm / 1335 in-lb | 22 seconds            | 230 VAC ±10%, 50/60 Hz  | 75%                    | •          |              |         | 2-10 VDC/4-20 mA |                  |
| SY4        | SY4-110             | 400 Nm / 3560 in-lb   | 16 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY4-24              | 400 Nm / 3560 in-lb   | 16 seconds              | 24 VAC ±10%, 50/60 Hz  | 30%        |              | •       | •                | none, opt 1k     |
|            | SY4-220             | 400 Nm / 3560 in-lb   | 16 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY4-24MFT           | 400 Nm / 3560 in-lb   | 16 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
|            | SY4-120MFT          | 400 Nm / 3560 in-lb   | 16 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
| SY4-230MFT | 400 Nm / 3560 in-lb | 16 seconds            | 230 VAC ±10%, 50/60 Hz  | 75%                    | •          |              |         | 2-10 VDC/4-20 mA |                  |
| SY5        | SY5-110             | 500 Nm / 4450 in-lb   | 22 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY5-24              | 500 Nm / 4450 in-lb   | 22 seconds              | 24 VAC ±10%, 50/60 Hz  | 30%        |              | •       | •                | none, opt 1k     |
|            | SY5-220             | 500 Nm / 4450 in-lb   | 22 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY5-24MFT           | 500 Nm / 4450 in-lb   | 22 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
|            | SY5-120MFT          | 500 Nm / 4450 in-lb   | 22 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
| SY5-230MFT | 500 Nm / 4450 in-lb | 22 seconds            | 230 VAC ±10%, 50/60 Hz  | 75%                    | •          |              |         | 2-10 VDC/4-20 mA |                  |
| SY6        | SY6-110             | 650 Nm / 5785 in-lb   | 28 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY6-220             | 650 Nm / 5785 in-lb   | 28 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY6-120MFT          | 650 Nm / 5785 in-lb   | 28 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
|            | SY6-230MFT          | 650 Nm / 5785 in-lb   | 28 seconds              | 230 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
| SY7        | SY7-110             | 1000 Nm / 8900 in-lb  | 46 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY7-220             | 1000 Nm / 8900 in-lb  | 46 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY7-120MFT          | 1000 Nm / 8900 in-lb  | 46 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
|            | SY7-230MFT          | 1000 Nm / 8900 in-lb  | 46 seconds              | 230 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
| SY8        | SY8-110             | 1500 Nm / 13350 in-lb | 46 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY8-220             | 1500 Nm / 13350 in-lb | 46 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •                | none, opt 1k     |
|            | SY8-120MFT          | 1500 Nm / 13350 in-lb | 46 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |
|            | SY8-230MFT          | 1500 Nm / 13350 in-lb | 46 seconds              | 230 VAC ±10%, 50/60 Hz | 75%        | •            |         |                  | 2-10 VDC/4-20 mA |

Proportional actuators will accept 0-10 VDC, 2-10 VDC, or 4-20 mA control signals as standard.

All SY actuators are non-spring return, but can be used with NSV-SY back up systems for fail-safe applications.

These products carry a two year warranty when sold as part of an assembly or with a UFLK retrofit kit.

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# Butterfly Valve Retrofit Actuators

## Actuator Selection Guide



### SY Series Actuators

| SERIES | MODEL       | TORQUE                | RUN TIME(S)<br>90°@60Hz | POWER SUPPLY           | DUTY CYCLE | CONTROL      |         |        | FEEDBACK         |
|--------|-------------|-----------------------|-------------------------|------------------------|------------|--------------|---------|--------|------------------|
|        |             |                       |                         |                        |            | PROPORTIONAL | 3 POINT | ON/OFF |                  |
| SY9    | SY9-110     | 2000 Nm / 17800 in-lb | 58 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •      | none, opt 1k     |
|        | SY9-220     | 2000 Nm / 17800 in-lb | 58 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •      | none, opt 1k     |
|        | SY9-120MFT  | 2000 Nm / 17800 in-lb | 58 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |        | 2-10 VDC/4-20 mA |
|        | SY9-230MFT  | 2000 Nm / 17800 in-lb | 58 seconds              | 230 VAC ±10%, 50/60 Hz | 75%        | •            |         |        | 2-10 VDC/4-20 mA |
| SY10   | SY10-110    | 2500 Nm / 22250 in-lb | 58 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •      | none, opt 1k     |
|        | SY10-220    | 2500 Nm / 22250 in-lb | 58 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •      | none, opt 1k     |
|        | SY10-120MFT | 2500 Nm / 22250 in-lb | 58 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |        | 2-10 VDC/4-20 mA |
|        | SY10-230MFT | 2500 Nm / 22250 in-lb | 58 seconds              | 230 VAC ±10%, 50/60 Hz | 75%        | •            |         |        | 2-10 VDC/4-20 mA |
| SY11   | SY11-110    | 3000 Nm / 26700 in-lb | 58 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •      | none, opt 1k     |
|        | SY11-220    | 3000 Nm / 26700 in-lb | 58 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •      | none, opt 1k     |
|        | SY11-120MFT | 3000 Nm / 26700 in-lb | 58 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |        | 2-10 VDC/4-20 mA |
|        | SY11-230MFT | 3000 Nm / 26700 in-lb | 58 seconds              | 230 VAC ±10%, 50/60 Hz | 75%        | •            |         |        | 2-10 VDC/4-20 mA |
| SY12   | SY12-110    | 3500 Nm / 31150 in-lb | 58 seconds              | 120 VAC ±10%, 50/60 Hz | 30%        |              | •       | •      | none, opt 1k     |
|        | SY12-220    | 3500 Nm / 31150 in-lb | 58 seconds              | 230 VAC ±10%, 50/60 Hz | 30%        |              | •       | •      | none, opt 1k     |
|        | SY12-120MFT | 3500 Nm / 31150 in-lb | 58 seconds              | 120 VAC ±10%, 50/60 Hz | 75%        | •            |         |        | 2-10 VDC/4-20 mA |
|        | SY12-230MFT | 3500 Nm / 31150 in-lb | 58 seconds              | 230 VAC ±10%, 50/60 Hz | 75%        | •            |         |        | 2-10 VDC/4-20 mA |

Proportional actuators will accept 0-10 VDC, 2-10 VDC, or 4-20 mA control signals as standard.

All SY actuators are non-spring return, but can be used with NSV-SY back up systems for fail-safe applications.

These products carry a two year warranty when sold as part of an assembly or with a UFLK retrofit kit.

### ROTARY ACTUATORS

| SERIES     | MODEL          | Spring Return | Electronic Fail Safe | Control Input   | Feedback Position | Power Supply |
|------------|----------------|---------------|----------------------|---|-------------------|--------------|
| AF Series* | AF24 US, AFB24 | •             |                      | 24 VAC/DC   |                   | 24 VAC/DC    |
|            | AFX24-MFT-X1   | •             |                      | Variable with MFT<br>(VDC, PWM, Floating Pt., On/Off) | variable VDC      | 24 VAC/DC    |
| AM Series* | AMB24-3-X1     |               |                      | 24 VAC/DC   |                   | 24 VAC/DC    |
|            | AMX24-MFT-X1   |               |                      | Variable with MFT<br>(VDC, PWM, Floating Pt., On/Off) | variable VDC      | 24 VAC/DC    |
| GM Series* | GMB24-3-X1     |               |                      | 24 VAC/DC   |                   | 24 VAC/DC    |
|            | GMX24-MFT-X1   |               |                      | Variable with MFT<br>(VDC, PWM, Floating Pt., On/Off) | variable VDC      | 24 VAC/DC    |
| GK Series* | GKB24-3-X1     |               | •                    | 24 VAC/DC   |                   | 24 VAC/DC    |
|            | GKX24-MFT-X1   |               | •                    | Variable with MFT<br>(VDC, PWM, Floating Pt., On/Off) | variable VDC      | 24 VAC/DC    |

\*Please consult the Damper sections for a full list of product offerings. Standard run times should be considered in the selection. All air side products are applicable for retrofit kits.

Select "X1" actuators come with a handle.

### MULTI-FUNCTION TECHNOLOGY

| ROTARY ACTUATOR CODES | P-CODE  |     | Control Input         | Running Time | Built-in Feedback |
|-----------------------|---------|-----|-----------------------|--------------|-------------------|
|                       |         |     |                       |              |                   |
|                       | P-10001 | A01 | 2-10 VDC              | 150 seconds  | 2-10 VDC          |
|                       | P-10002 | A02 | 0-10 VDC              | 150 seconds  | 0-10 VDC          |
|                       | P-10028 | A28 | 0-10 VDC              | 150 seconds  | 0-10 VDC          |
|                       | P-10063 | A63 | 0.5-4.5 VDC           | 150 seconds  | 0.5-4.5 VDC       |
|                       | P-10064 | A64 | 5.5-10 VDC            | 150 seconds  | 5.5-10 VDC        |
|                       | P-20002 | W02 | 0.02-5.00 seconds PWM | 150 seconds  | 2-10 VDC          |
|                       | P-20003 | W03 | 0.10-25.5 seconds PWM | 150 seconds  | 2-10 VDC          |
|                       | P-30001 | F01 | Floating Pt.          | 150 seconds  | 2-10 VDC          |
|                       | P-40002 | J02 | On/Off                | 150 seconds  | 2-10 VDC          |

### SY MULTI-FUNCTION TECHNOLOGY

| Description | MFT-CODE | Control Input | Built-in Feedback | Loss of Signal | Running Time         |
|-------------|----------|---------------|-------------------|----------------|----------------------|
| MFT         | ACE      | 2...10V       | 2...10V           | stop           | actuator(s) constant |
| MFT         | ACF      | 0.5...10V     | 0.5...10V         | stop           | actuator(s) constant |
| MFT         | ACG      | 4...20mA      | 4...20mA          | stop           | actuator(s) constant |
| MFT         | ACH      | 4...20mA      | 2...10V           | stop           | actuator(s) constant |
| MFT         | ACJ      | 2...10V       | 2...10V           | open           | actuator(s) constant |
| MFT         | ACK      | 0.5...10V     | 0.5...10V         | open           | actuator(s) constant |
| MFT         | ACL      | 4...20mA      | 4...20mA          | open           | actuator(s) constant |
| MFT         | ACM      | 4...20mA      | 2...10V           | open           | actuator(s) constant |
| MFT         | ACN      | 2...10V       | 2...10V           | close          | actuator(s) constant |
| MFT         | ACP      | 0.5...10V     | 0.5...10V         | close          | actuator(s) constant |
| MFT         | ACR      | 4...20mA      | 4...20mA          | close          | actuator(s) constant |
| MFT         | ACS      | 4...20mA      | 2...10V           | close          | actuator(s) constant |

All other configurations carry a \$34.00 list price.

Standard delivery may vary, please consult your customer service representative for the latest lead time(s).

800-543-9038 USA

866-805-7089 CANADA

203-791-8396 LATIN AMERICA

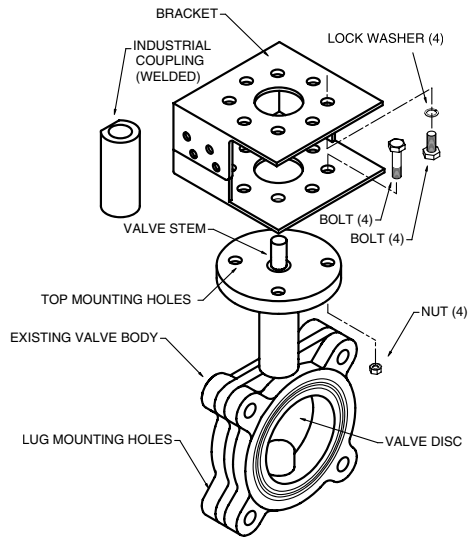


| Valve Body Model                         | Valve Configuration | Size | Failsafe | Close-Off psi | Belimo Actuator Series (Sold Separately) | Belimo Linkage |          |
|--|---------------------|------|----------|---------------|--|----------------|----------|
| Figure 1000/2000 Series Butterfly Valves | 2-way               | 2"   | No       | 150           | GM                                       | UFLK1900       |          |
|  |                     |      |          |               |  | SY1            | UFLK1936 |
|  |                     |      |          |               | SY2                                      | UFLK1938       |          |
|  |                     | Yes  | 150      | 2*AF          | UFLK1902                                 |                |          |
|  |                     |      |          |               | GK                                       | UFLK1900       |          |
|  |                     | 2½"  | No       | 150           | GM                                       | UFLK1900       |          |
|  |                     |      |          |               |  | SY1            | UFLK1936 |
|  |                     |      |          |               |  | SY2            | UFLK1938 |
|  |                     | Yes  | 150      | 2*AF          | UFLK1902                                 |                |          |
|  |                     |      |          |               | GK                                       | UFLK1900       |          |
|  |                     | 3"   | No       | 150           | GM                                       | UFLK1900       |          |
|  |                     |      |          |               |  | SY1            | UFLK1936 |
|  |                     |      |          |               |  | SY2            | UFLK1938 |
|  |                     | Yes  | 150      | 2*AF          | UFLK1902                                 |                |          |
|  |                     |      |          |               | GK                                       | UFLK1900       |          |
|  |                     | 4"   | No       | 150           | 2*GM                                     | UFLK1908       |          |
|  |                     |      |          |               |  | SY2            | UFLK1940 |
|  |                     |      | Yes      | 150           | 2*GK                                     | UFLK1908       |          |
|  |                     | 5"   | No       | 150           | SY3                                      | UFLK1942       |          |
|  |                     | 6"   | No       | 150           | SY4                                      | UFLK1956       |          |
|  | 8"                  | No   | 150      | SY4           | UFLK1944                                 |                |          |
|  | 10"                 | No   | 150      | SY5           | UFLK1946                                 |                |          |
|  | 12"                 | No   | 150      | SY7           | UFLK1948                                 |                |          |
|  | 14"                 | No   | 150      | SY7           | UFLK1948                                 |                |          |
|  | 16"                 | No   | 150      | SY9           | UFLK1950                                 |                |          |
|  | 18"                 | No   | 150      | SY10          | UFLK1952                                 |                |          |
|  | 20"                 | No   | 150      | SY10          | UFLK1954                                 |                |          |
|  | 3-way               | 2"   | No       | 150           | GM                                       | UFLK4900       |          |
|  |                     |      |          |               |  | SY2            | UFLK4936 |
|  |                     |      | Yes      | 150           | 2*AF                                     | UFLK4902       |          |
|  |                     |      |          |               | GK                                       | UFLK4900       |          |
|  |                     | 2½"  | No       | 150           | GM                                       | UFLK4900       |          |
|  |                     |      |          |               |  | SY2            | UFLK4936 |
|  |                     | Yes  | 150      | 2*AF          | UFLK4902                                 |                |          |
|  |                     |      |          | GK            | UFLK4900                                 |                |          |
| 3"                                       |                     | No   | 150      | 2*GM          | UFLK4902                                 |                |          |
|  |                     |      |          |               | SY2                                      | UFLK4936       |          |
| Yes                                      |                     | 150  | 2*GK     | UFLK4902      |  |                |          |
| 4"                                       |                     | No   | 150      | SY3           | UFLK4938                                 |                |          |
| 5"                                       |                     | No   | 150      | SY4           | UFLK4940                                 |                |          |
| 6"                                       |                     | No   | 150      | SY4           | UFLK4940                                 |                |          |
| 8"                                       | No                  | 150  | SY5      | UFLK4942      |  |                |          |
| 10"                                      | No                  | 150  | SY7      | UFLK4944      |  |                |          |
| 12"                                      | No                  | 150  | SY8      | UFLK4946      |  |                |          |
| 14"                                      | No                  | 150  | SY9      | UFLK4948      |  |                |          |
| 16"                                      | No                  | 150  | SY11     | UFLK4950      |  |                |          |

All close-off pressures listed are approximate and based on valve condition and application.

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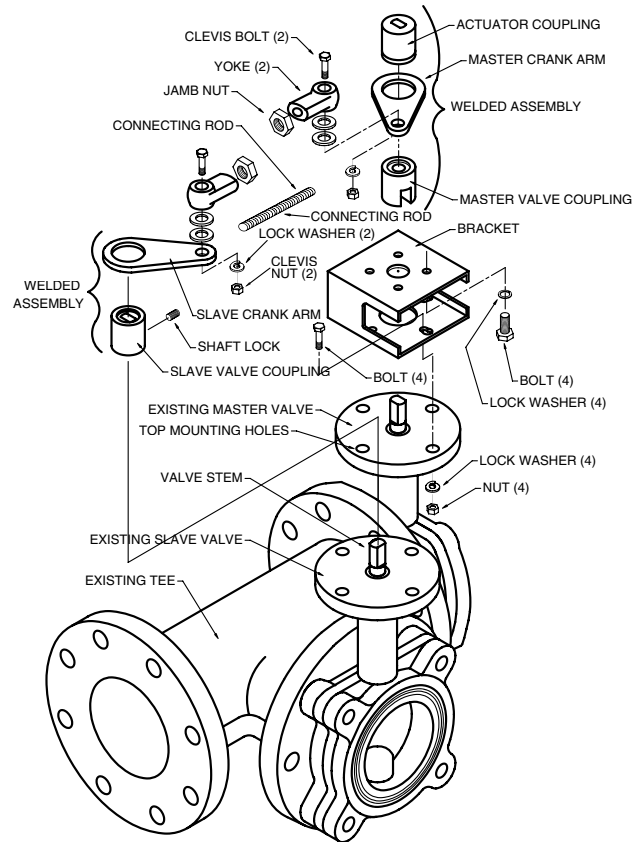
**Industrial Electric 2-way  
Generic – Must complete BFV Retrofit Form**



**UFSP0020  
UFSP0022**

**SY1 - SY8  
SY9 - SY12**

**Industrial Electric 3-way  
Generic – Must complete BFV Retrofit Form**



**UFSP0024  
UFSP0026**

**SY1 - SY8  
SY9 - SY12**

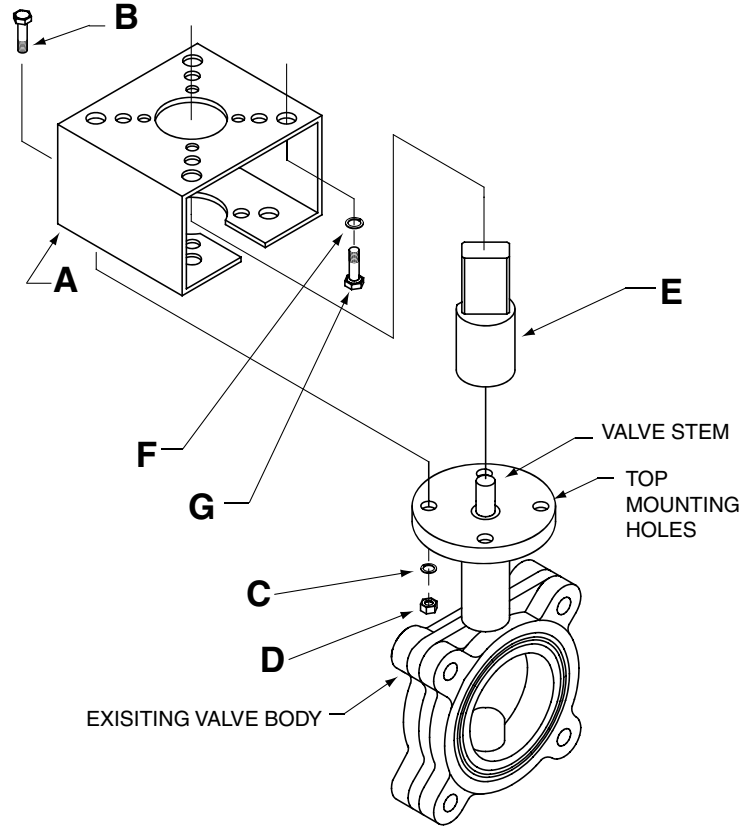
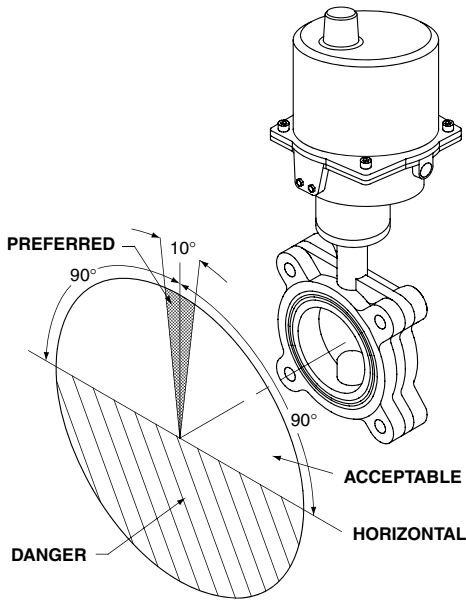
**NOTE: 3-way bracket configuration shown is only one of many possible arrangements.**

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**Assembly Procedure for SY...Retrofit Solution**

**Retrofit Requirement:**

The initial step is to determine if your application can accept a retrofit solution. As shown below (Fig. 1), the valve stem must not be located below the horizontal plane. If this condition exists, the SY actuator could not be used in this situation. A Belimo technical support person is available to help determine what solution best fits your application. A typical solution is shown in Fig. 2.



**Assembly Procedure (Mechanical)**

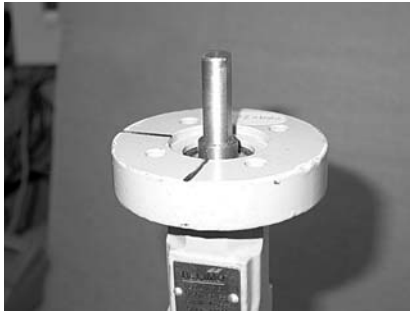


**Step 1)** The valve must be stripped down to its basic form. Remove all other linkage components before starting the assembly sequence below. The linkage components have been designed to attach to the existing valve flange rather than to any existing hardware.

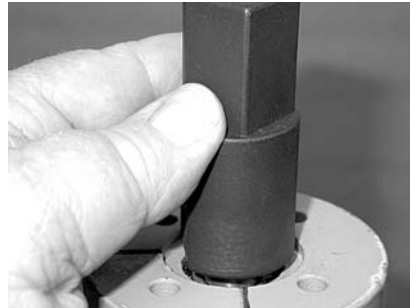


**Step 2)** The valve has either flats, a key slot, holes or a mark indicating the position of the disc with respect to the shaft. Usually, the flats, keys, holes and marks are PARALLEL to the valve disc. The photo at left shows the flattened shaft in the CLOSED position.



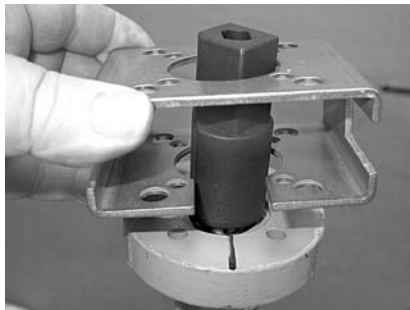


**Step 3)** The valve MUST be in the OPEN position before starting the retrofit process. The photo at the left shows the shaft flats are PARALLEL to the piping, but the disc is PARALLEL to the flats, thereby indicating the valve disc is in the fully OPEN position. You MUST verify the disc is fully OPEN before proceeding.



**Step 4)** Place the coupling (E) over the valve stem. It can be assembled in two different positions 180 degrees apart, but either position is OK. It would be helpful at this time to make a mark on the coupling and on the valve body so you

can easily reference the position of the valve after the actuator is attached.



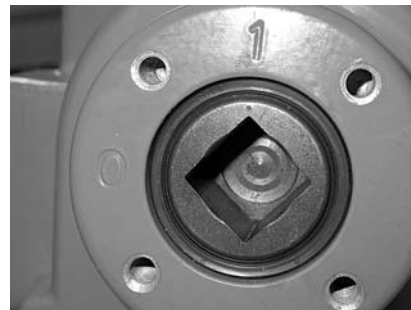
**Step 5)** Install the actuator mounting bracket (A) onto the valve top works flange as shown.



**Step 6)** Insert the four mounting bolts (B), lockwashers (C), and the hex nuts (D). Do NOT tighten at this time.



**Step 7)** The SY actuator is shipped in the OPEN position. Make sure the actuator is in the OPEN position before attaching to the valve/coupling assembly. The SY actuator turns counter clockwise (CCW) to the OPEN position, when viewed from ABOVE the actuator.



**Step 8)** Verify that the SY actuator is in the OPEN position also by looking at the bottom of the actuator. There is a dimple mark punched in the output shaft which will align with the "1" mark when the actuator is in the OPEN position.



actuator with the square drive or keys in the coupling (C). The SY actuator will slide completely over the drive square and will rest ON the mounting bracket (A).

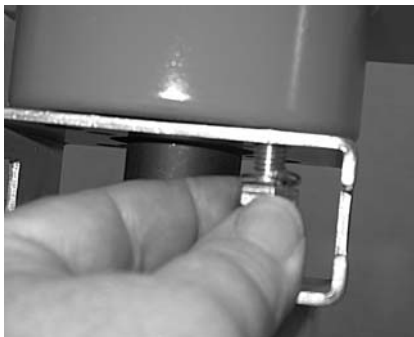
**Step 9)** Stand with the valve face (where the piping flange connects to the valve body) towards you. Hold the SY actuator with the handwheel on the RIGHT, and the EMT connectors to your LEFT. Align the square drive or keyway in the SY



**Step 10)** Attach the hand knob to the hand wheel as shown below (if not already completed).



**Step 11)** Tighten the jam nut to prevent the hand knob from becoming loose.



**Step 12)** Insert the four hex bolts (G) and lock washers (F) through the bracket and into the bottom of the SY actuator as shown. Do NOT tighten until all four sets have been installed. Slight twisting of the entire SY actuator will facilitate alignment of the bolts.



**Step 13)** After all four have been inserted, tighten accordingly.



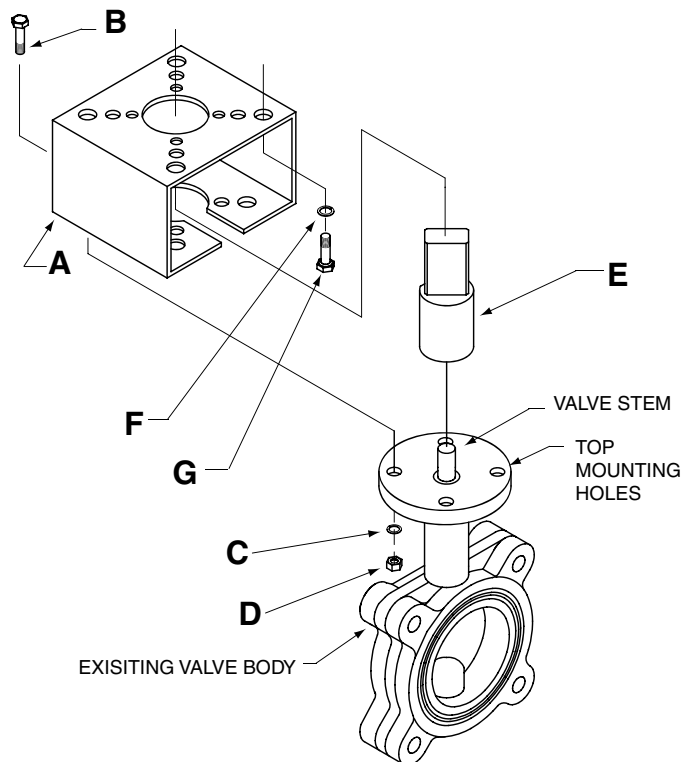
**Step 14)** Now tighten the four bracket bolts (B, C, D) assembled previously in step 6 .



**Step 15)** When mechanical assembly is complete, the SY actuator and valve body should be oriented as shown below. The actuator is in the OPEN position, and the valve disc is fully OPEN. All bolts are tight, and electrical checkout is now possible.

**Application Note:**

The hand wheel on the SY actuator is engaged at all times but does not rotate when the actuator is running. It is possible at anytime to turn the hand wheel by simply rotating it CW or CCW. The hand wheel does NOT need to be pulled or pushed into the actuator to make it operational. However, it should be noted that if a control signal and power is present at the actuator when the hand wheel is turned, the actuator will return to its controlled position. If it is desired to have the actuator maintain its position after turning the hand wheel, it will be necessary to remove power from the actuator, either at the source or by use of an optional SY-HOA local switch.



**Assembly Procedure (Electrical), On/Off Models**



**WARNING**

Hazard identification warnings appear at appropriate sections throughout this manual. Read these carefully.



**Step 1)** Remove the four hex bolts securing the cover to the base casting.

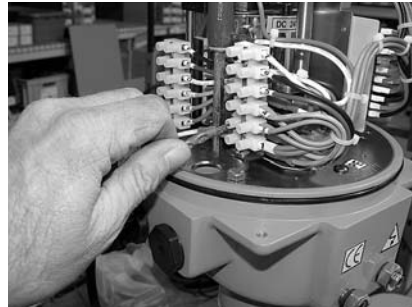


**Step 6)** Apply proper voltage to terminals 1 (Neutral) & 7 (Hot). Apply proper actuator voltage to terminals 1 (Neutral) & 4 (Hot) to drive the actuator CLOSED until the end-of-travel cam STOPS the actuator movement.

**7.** Visually check the position of the valve to make sure it reaches its full CLOSED position.



**Step 2)** Remove cover from the SY actuator. A flat blade screwdriver inserted carefully into the provided slot (as shown) will facilitate removal of the cover.



**Step 8)** Apply proper voltage to terminals 1 (Neutral) & 7 (Hot). Apply proper actuator voltage to terminals 1 (Neutral) & 3 (Hot) to drive the actuator OPEN until the end-of-travel cam STOPS the actuator movement.

**Step 9)** Visually check the position of the valve disc to make sure it reaches its full OPEN position.

**Step 10)** If the valve functions properly, mechanical assembly and electrical checkout are complete.

**Step 3)** Conduit entries into the SY actuator must be selected for their operating location (indoors protected, indoors wash down, outdoors, etc). Be sure to follow standard NEC guidelines when selecting conduit and connector types.

**Step 4)** Follow the wire sizing chart in the Installation Operation Manual (IOM) (Belimo p/n 71150-00001.C page 10) to make sure you use the correctly size wire when connecting the SY to your power source. Failure to follow the recommendations in the table could cause actuator failure or nuisance tripping.

**Step 5)** Follow the wiring diagrams in the IOM pages 18 (single) & 23 (multiple) for proper power and control wiring to the SY actuator. Make note of the following:

- a. Do NOT connect multiple actuators in parallel without isolation relays.
- b. Be sure "Hot" is connected to terminal #7 to enable the heater circuit, and "Neutral" is connected to terminal #1.



**WARNING**

**FACTORY NOTE:**

The SY actuators have been calibrated at the factory before shipping to you for use in this retrofit kit. The SY actuator calibration will suffice 99% of the time for your application. Improper calibration to the actuator may void your warranty. If you have any questions, please contact a Belimo technical support representative at 800-543-9038 for assistance.

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# SY... Series Butterfly Valve Retrofit Solution

Retrofitting 2-way Valves with Belimo SY Proportional Non-Spring Return Actuator



## Assembly Procedure (Electrical), Proportional Models

### Hazard Identification

Warnings appear at appropriate sections throughout this manual. Read these carefully.



**Step 1)** Remove the four hex bolts securing the cover to the base casting.

**Step 6)** Connect the proper electrical power and control wiring per the wiring diagrams located on pages 14-37.

**Step 7)** Check the operation of the actuator by commanding the control system to generate control signals matching the needs of the job to run the valve from fully CLOSED to fully OPEN, as well as a MID-POINT position. The indicator on the top of the SY actuator will be an indicator as to the position of the actuator, and therefore, the valve position.

**Step 8)** If the valve functions properly, mechanical assembly and electrical checkout are complete.



**Step 2)** Remove cover from the SY actuator. A flat blade screwdriver inserted carefully into the provided slot (as shown) will facilitate removal of the cover.

### WARNING

#### **FACTORY NOTE:**

The SY actuators have been calibrated at the factory before shipping to you for use in this retrofit kit. The SY actuator calibration will suffice 99% of the time for your application. Improper calibration to the actuator may void your warranty. If you have any questions, please contact a Belimo technical support representative at 800-543-9038 for assistance.

**Step 3)** Conduit entries into the SY actuator must be selected for their operating location (indoors protected, indoors wash down, outdoors, etc). Be sure to follow standard NEC guidelines when selecting conduit and connector types.

**Step 4)** Follow the wire sizing chart in the Installation Operation manual (IOM) (Belimo p/n 70103-00001D page 17) to make sure you use the correct size wire when connecting the SY to your power source. Failure to follow the recommendations in the table could cause actuator failure or nuisance tripping.

**Step 5)** Follow the wiring diagrams in the IOM pages 14 through 37 for proper power and control wiring to the SY actuator.

Note: All SY1-P and SY2..12-MFT actuators are factory pre-set with the proper customer requested control programming.

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