71150-00001.E

# SY Series Actuators for Butterfly Valves

## Installation Instructions

Discover the advantages
www.belimo.us

BELIMO®

# Wire Size vs. Length of Run for SY Series Actuators On/Off

BELIMO

**24 VAC**

| | SY1 | SY2 | SY3 | SY4 | SY5 |
|---|---|---|---|---|---|
| | [A] | [A] | [A] | [A] | [A] |
| current | 1.6 | 3.4 | 3.1 | 9.4 | 8.9 |
| wire gauge | MAX distance between actuator and supply [feet] | | | | |
| 18 | 97 | 45 | 50 | | |
| 16 | 153 | 72 | 79 | 26 | 28 |
| 14 | 244 | 115 | 126 | 42 | 44 |
| 12 | 387 | 182 | 200 | 66 | 70 |
| 10 | 616 | 290 | 318 | 105 | 111 |
| 8 | 980 | 461 | 506 | 167 | 176 |

**120 VAC**

| | SY1 | SY2 | SY3 | SY4 | SY5 | SY6 | SY7 | SY8 | SY9 | SY10 | SY11 | SY12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] |
| current | 0.7 | 1.2 | 1.2 | 2.1 | 2 | 2.4 | 4.2 | 4.2 | 3 | 3.2 | 3.6 | 3.8 |
| wire gauge | MAX distance between actuator and supply [feet] | | | | | | | | | | | |
| 18 | 1,103 | 644 | 644 | 368 | 386 | 322 | 184 | 184 | 257 | 241 | 215 | 203 |
| 16 | 1,750 | 1,021 | 1,021 | 583 | 613 | 510 | 292 | 292 | 408 | 383 | 340 | 322 |
| 14 | 2,788 | 1,626 | 1,626 | 929 | 976 | 813 | 465 | 465 | 651 | 610 | 542 | 514 |
| 12 | 4,428 | 2,583 | 2,583 | 1,476 | 1,550 | 1,292 | 738 | 738 | 1,033 | 969 | 861 | 816 |
| 10 | 7,044 | 4,109 | 4,109 | 2,348 | 2,465 | 2,054 | 1,174 | 1,174 | 1,644 | 1,541 | 1,370 | 1,298 |
| 8 | 11,204 | 6,536 | 6,536 | 3,735 | 3,922 | 3,268 | 1,867 | 1,867 | 2,614 | 2,451 | 2,179 | 2,064 |

**230 VAC**

| | SY1 | SY2 | SY3 | SY4 | SY5 | SY6 | SY7 | SY8 | SY9 | SY10 | SY11 | SY12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] |
| current | 0.4 | 0.6 | 0.6 | 1.1 | 1 | 1.1 | 2 | 2 | 2.5 | 2.6 | 2.7 | 2.5 |
| wire gauge | MAX distance between actuator and supply [feet] | | | | | | | | | | | |
| 18 | 3,701 | 2,467 | 2,467 | 1,346 | 1,480 | 1,346 | 740 | 740 | 592 | 569 | 548 | 592 |
| 16 | 5,871 | 3,914 | 3,914 | 2,135 | 2,348 | 2,135 | 1,174 | 1,174 | 939 | 903 | 870 | 939 |
| 14 | 9,352 | 6,234 | 6,234 | 3,401 | 3,741 | 3,401 | 1,870 | 1,870 | 1,496 | 1,439 | 1,385 | 1,496 |
| 12 | 14,854 | 9,903 | 9,903 | 5,401 | 5,942 | 5,401 | 2,971 | 2,971 | 2,377 | 2,285 | 2,201 | 2,377 |
| 10 | 23,626 | 15,751 | 15,751 | 8,591 | 9,450 | 8,591 | 4,725 | 4,725 | 3,780 | 3,635 | 3,500 | 3,780 |
| 8 | 37,581 | 25,054 | 25,054 | 13,666 | 15,033 | 13,666 | 7,516 | 7,516 | 6,013 | 5,782 | 5,568 | 6,013 |

**The NEC mandates that 24 VAC over 100 VA power requires CLASS 1 wiring conduit. Local codes may vary. Do NOT mix CLASS 1 & CLASS 2 circuits in the same conduit. Generally, 24 VAC actuators over 100 VA should be changed to 120 VAC models.**

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

BELIMO

# Wire Size vs. Length of Run for SY Series Actuators Modulating

**24 VAC**

| | SY1 | SY2 | SY3 | SY4 | SY5 |
|---|---|---|---|---|---|
| | [A] | [A] | [A] | [A] | [A] |
| current | 2.8 | 3.4 | 3.1 | 9.4 | 8.9 |
| wire gauge | MAX distance between actuator and supply [feet] | | | | |
| 18 | 55 | 45 | 50 | | |
| 16 | 88 | 72 | 79 | 26 | 28 |
| 14 | 139 | 115 | 126 | 42 | 44 |
| 12 | 221 | 182 | 200 | 66 | 70 |
| 10 | 352 | 290 | 318 | 105 | 111 |
| 8 | 560 | 461 | 506 | 167 | 176 |

**120 VAC**

| | SY1 | SY2 | SY3 | SY4 | SY5 | SY6 | SY7 | SY8 | SY9 | SY10 | SY11 | SY12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] |
| current | 0.6 | 0.8 | 0.7 | 2.1 | 1.9 | 2 | 2 | 2.8 | 2.7 | 3 | 4.3 | 4.5 |
| wire gauge | MAX distance between actuator and supply [feet] | | | | | | | | | | | |
| 18 | 1,287 | 966 | 1,103 | 368 | 407 | 386 | 386 | 276 | 286 | 257 | 180 | 172 |
| 16 | 2,042 | 1,531 | 1,750 | 583 | 645 | 613 | 613 | 438 | 454 | 408 | 285 | 272 |
| 14 | 3,253 | 2,440 | 2,788 | 929 | 1,027 | 976 | 976 | 697 | 723 | 651 | 454 | 434 |
| 12 | 5,167 | 3,875 | 4,428 | 1,476 | 1,632 | 1,550 | 1,550 | 1,107 | 1,148 | 1,033 | 721 | 689 |
| 10 | 8,218 | 6,163 | 7,044 | 2,348 | 2,595 | 2,465 | 2,465 | 1,761 | 1,826 | 1,644 | 1,147 | 1,096 |
| 8 | 13,072 | 9,804 | 11,204 | 3,735 | 4,128 | 3,922 | 3,922 | 2,801 | 2,905 | 2,614 | 1,824 | 1,743 |

**230 VAC**

| | SY1 | SY2 | SY3 | SY4 | SY5 | SY6 | SY7 | SY8 | SY9 | SY10 | SY11 | SY12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] | [A] |
| current | 0.4 | 0.4 | 0.4 | 1.1 | 1 | 1 | 1.2 | 1.6 | 1.1 | 1.4 | 2.2 | 2.5 |
| wire gauge | MAX distance between actuator and supply [feet] | | | | | | | | | | | |
| 18 | 3,701 | 3,701 | 3,701 | 1,346 | 1,480 | 1,480 | 1,234 | 925 | 1,346 | 1,057 | 673 | 592 |
| 16 | 5,871 | 5,871 | 5,871 | 2,135 | 2,348 | 2,348 | 1,957 | 1,468 | 2,135 | 1,677 | 1,067 | 939 |
| 14 | 9,352 | 9,352 | 9,352 | 3,401 | 3,741 | 3,741 | 3,117 | 2,338 | 3,401 | 2,672 | 1,700 | 1,496 |
| 12 | 14,854 | 14,854 | 14,854 | 5,401 | 5,942 | 5,942 | 4,951 | 3,713 | 5,401 | 4,244 | 2,701 | 2,377 |
| 10 | 23,626 | 23,626 | 23,626 | 8,591 | 9,450 | 9,450 | 7,875 | 5,906 | 8,591 | 6,750 | 4,296 | 3,780 |
| 8 | 37,581 | 37,581 | 37,581 | 13,666 | 15,033 | 15,033 | 12,527 | 9,395 | 13,666 | 10,738 | 6,833 | 6,013 |

**The NEC mandates that 24 VAC over 100 VA power requires CLASS 1 wiring conduit. Local codes may vary. Do NOT mix CLASS 1 & CLASS 2 circuits in the same conduit. Generally, 24 VAC actuators over 100 VA should be changed to 120 VAC models.**

Power Supply 24 VAC/VDC Single Phase

| Model # | Torque | Speed 50 Hz/60 Hz | Current Draw (60 Hz) | VA (60 Hz) | Override | Weight |
|---|---|---|---|---|---|---|
| PRBUP-3-T* | 1400 in-lbs/ 160 Nm | 35 seconds | 0.8 A | 20 | Manual override crank | 5.8 kg/12.8 lbs. |
| PRXUP-3-T* | 1400 in-lbs/ 160 Nm | 35, 30-120 seconds | 0.8 A | 20 | Manual override crank | 5.8 kg/12.8 lbs. |
| SY4-24 | 3540 in-lbs/ 400 Nm | 16 seconds | 9.5 A | 228 | Hand wheel | 22 kg/48.5 lbs. |
| SY5-24 | 4430 in-lbs/ 500 Nm | 35 seconds | 9.4 A | 227 | Hand wheel | 22 kg/48.5 lbs. |

Power Supply 120 VAC Single Phase

| Model # | Torque | Speed 60 Hz | Current Draw (60 Hz) | VA (60 Hz) | Override | Weight |
|---|---|---|---|---|---|---|
| PRBUP-3-T* | 1400 in-lbs/ 160 Nm | 35 seconds | 0.2 A | 23 | Manual override crank | 5.8 kg/12.8 lbs. |
| PRXUP-3-T* | 1400 in-lbs/ 160 Nm | 35, 30-120 seconds | 0.2 A | 23 | Manual override crank | 5.8 kg/12.8 lbs. |
| SY4-110 | 3540 in-lbs/ 400 Nm | 18 seconds | 1.8 A | 216 | Hand wheel | 22 kg/48.5 lbs. |
| SY5-110 | 4430 in-lbs/ 500 Nm | 25 seconds | 1.8 A | 216 | Hand wheel | 22 kg/48.5 lbs. |
| SY6-110 | 5750 in-lbs/ 650 Nm | 32 seconds | 1.8 A | 216 | Hand wheel | 22 kg/48.5 lbs. |
| SY7-110 | 8850 in-lbs/ 1000 Nm | 49 seconds | 3.5 A | 420 | Hand wheel | 36 kg/79.5 lbs. |
| SY8-110 | 13280 in-lbs/ 1500 Nm | 50 seconds | 4.8 A | 576 | Hand wheel | 36 kg/79.5 lbs. |
| SY9-110 | 17700 in-lbs/ 2000 Nm | 57 seconds | 2.8 A | 336 | Hand wheel | 72 kg/176.4 lbs. |
| SY10-110 | 22130 in-lbs/ 2500 Nm | 62 seconds | 2.9 A | 348 | Hand wheel | 72 kg/176.4 lbs. |
| SY11-110 | 26550 in-lbs/ 3000 Nm | 69 seconds | 3.6 A | 432 | Hand wheel | 72 kg/176.4 lbs. |
| SY12-110 | 30980 in-lbs/ 3500 Nm | 60 seconds | 3.8 A | 456 | Hand wheel | 72 kg/176.4 lbs. |

Power Supply 230 VAC Single Phase

| Model # | Torque | Speed 60 Hz | Current Draw (60 Hz) | VA (60 Hz) | Override | Weight |
|---|---|---|---|---|---|---|
| PRBUP-3-T* | 1400 in-lbs/ 160 Nm | 35 sec. | 0.2 A | 52 | Manual override crank | 5.8 kg/12.8 lbs. |
| PRXUP-3-T* | 1400 in-lbs/ 160 Nm | 35, 30-120 sec. | 0.2 A | 52 | Manual override crank | 5.8 kg/12.8 lbs. |
| SY4-220 | 3540 in-lbs/ 400 Nm | 18 seconds | 0.9 A | 207 | Hand wheel | 22 kg/48.5 lbs. |
| SY5-220 | 4430 in-lbs/ 500 Nm | 25 seconds | 0.9 A | 207 | Hand wheel | 22 kg/48.5 lbs. |
| SY6-220 | 5750 in-lbs/ 650 Nm | 31 seconds | 0.9 A | 207 | Hand wheel | 22 kg/48.5 lbs. |

*-200 and -250 versions have the same ratings.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

Power Supply 24 VAC/VDC Single Phase

| Model # | Torque | Speed 50 Hz/60 Hz | Current Draw (60 Hz) | VA (60 Hz) | Override | Weight |
|---|---|---|---|---|---|---|
| PRBUP-MFT-T* | 1400 in-lbs/160 Nm | 30-120 sec. | 0.9 A | 20 | Manual override crank | 5.8 kg/12.8 lbs. |
| PRXUP-MFT-T* | 1400 in-lbs/160 Nm | 30-120 sec. | 0.9 A | 20 | Manual override crank | 5.8 kg/12.8 lbs. |
| PKRXUP-MFT-T* | 1400 in-lbs/160 Nm | 30-120 sec. | 2.2 A | 55 | Manual override crank | 6.4 kg/14.1 lbs. |
| SY4-24MFT | 3540 in-lbs/ 400 Nm | 16 seconds | 11.0 A | 264 | Hand wheel | 22 kg/48.5 lbs. |
| SY5-24MFT | 4430 in-lbs/ 500 Nm | 30 seconds | 10.2 A | 245 | Hand wheel | 22 kg/48.5 lbs. |

Power Supply 120 VAC Single Phase

| Model # | Torque | Speed 60 Hz | Current Draw (60 Hz) | VA (60 Hz) | Override | Weight |
|---|---|---|---|---|---|---|
| PRBUP-MFT-T* | 1400 in-lbs/160 Nm | 30-120 sec. | 0.2 A | 23 | Manual override crank | 5.8 kg/12.8 lbs. |
| PRXUP-MFT-T* | 1400 in-lbs/160 Nm | 30-120 sec. | 0.2 A | 23 | Manual override crank | 5.8 kg/12.8 lbs. |
| PKRXUP-MFT-T* | 1400 in-lbs/160 Nm | 30-120 sec. | 0.3 A | 43 | Manual override crank | 6.4 kg/14.1 lbs. |
| SY4-120MFT | 3540 in-lbs/ 400 Nm | 17 seconds | 2.4 A | 288 | Hand wheel | 22 kg/48.5 lbs. |
| SY5-120MFT | 4430 in-lbs/ 500 Nm | 21 seconds | 2.3 A | 276 | Hand wheel | 22 kg/48.5 lbs. |
| SY6-120MFT | 5750 in-lbs/ 650 Nm | 29 seconds | 2.2 A | 264 | Hand wheel | 22 kg/48.5 lbs. |
| SY7-120MFT | 8850 in-lbs/ 1000 Nm | 44 seconds | 1.7 A | 204 | Hand wheel | 36 kg/79.5 lbs. |
| SY8-120MFT | 13280 in-lbs/ 1500 Nm | 48 seconds | 2.6 A | 312 | Hand wheel | 36 kg/79.5 lbs. |
| SY9-120MFT | 17700 in-lbs/ 2000 Nm | 47 seconds | 3.4 A | 408 | Hand wheel | 72 kg/176.4 lbs. |
| SY10-120MFT | 22130 in-lbs/ 2500 Nm | 51 seconds | 4.0 A | 480 | Hand wheel | 72 kg/176.4 lbs. |
| SY11-120MFT | 26550 in-lbs/ 3000 Nm | 56 seconds | 3.0 A | 360 | Hand wheel | 72 kg/176.4 lbs. |
| SY12-120MFT | 30980 in-lbs/ 3500 Nm | 62 seconds | 3.4 A | 408 | Hand wheel | 72 kg/176.4 lbs. |

Power Supply 230 VAC Single Phase

| Model # | Torque | Speed 60 Hz | Current Draw (60 Hz) | VA (60 Hz) | Override | Weight |
|---|---|---|---|---|---|---|
| PRBUP-MFT-T* | 1400 in-lbs/160 Nm | 30-120 sec. | 0.1 A | 52 | Manual override crank | 5.8 kg/12.8 lbs. |
| PRXUP-MFT-T* | 1400 in-lbs/160 Nm | 30-120 sec. | 0.1 A | 52 | Manual override crank | 5.8 kg/12.8 lbs. |
| PKRXUP-MFT-T* | 1400 in-lbs/160 Nm | 30-120 sec. | 0.2 A | 68 | Manual override crank | 6.4 kg/14.1 lbs. |
| SY4-230MFT | 3540 in-lbs/ 400 Nm | 17 seconds | 1.1 A | 253 | Hand wheel | 22 kg/48.5 lbs. |
| SY5-230MFT | 4430 in-lbs/ 500 Nm | 22 seconds | 1.0 A | 230 | Hand wheel | 22 kg/48.5 lbs. |
| SY6-230MFT | 5750 in-lbs/ 650 Nm | 32 seconds | 1.1 A | 253 | Hand wheel | 22 kg/48.5 lbs. |
| SY7-230MFT | 8850 in-lbs/ 1000 Nm | 44 seconds | 0.8 A | 184 | Hand wheel | 36 kg/79.5 lbs. |
| SY8-230MFT | 13280 in-lbs/ 1500 Nm | 57 seconds | 1.4 A | 322 | Hand wheel | 36 kg/79.5 lbs. |
| SY9-230MFT | 17700 in-lbs/ 2000 Nm | 61 seconds | 1.1 A | 253 | Hand wheel | 72 kg/176.4 lbs. |
| SY10-230MFT | 22130 in-lbs/ 2500 Nm | 70 seconds | 1.4 A | 322 | Hand wheel | 72 kg/176.4 lbs. |
| SY11-230MFT | 26550 in-lbs/ 3000 Nm | 48 seconds | 1.9 A | 437 | Hand wheel | 72 kg/176.4 lbs. |
| SY12-230MFT | 30980 in-lbs/ 3500 Nm | 51 seconds | 2.0 A | 460 | Hand wheel | 72 kg/176.4 lbs. |

*-200 and -250 versions have the same ratings.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

| MODEL | DIM A (MAX) | Add to Dim A for cover removal | DIM B | DIM C (MAX) | DIM D |
|---|---|---|---|---|---|
| | Inches [mm] | Inches [mm] | Inches [mm] | Inches [mm] | Inches [mm] |
| SY4-6 | 12.40 [315] | 8.86 [225] | 9.21 [234] | 14.96 [380] | 11.81 [300] |
| SY7-8 | 16.54 [420] | 8.86 [225] | 9.21 [234] | 17.72 [450] | 13.39 [340] |
| SY9-12 | 23.23 [590] | 8.86 [225] | 10.24 [260] | 18.50 [470] | 13.78 [350] |

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

## Actuators: SYx-MFT

***INSTALLATION NOTES***

***CAUTION***

**Notes:**

1. Motor CAMS have been factory calibrated and should not be moved.
2. An adaption must be performed if any limit switch is adjusted. This will calibrate the beginning and end stopping points. Press the adaption button for 3 seconds and release.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

***CAUTION***

## Electrical Travel Adjustment

### SY4-12

Factory pre-set see chart below. Field adjustable if required

LS4
Auxiliary Switch for Closed Indication

LS3
Auxiliary Switch for Opened Indication

Factory pre-set and calibrated. Do not adjust without consulting factory. This will void the warranty

LS2
"CLOSE"

Clockwise Decrease Closed Angle

Counter-clockwise Increase Closed Angle

LS1
"OPEN"

Clockwise Increase Opening Angle

Counter-clockwise Decrease Opening Angle

***WARNING***

**Switches at left are shown with actuator fully open.**

***INSTALLATION NOTES***

***CAUTION***

**Notes:**

1. An adaption must be performed when the limit switches are adjusted. For the SYx-MFT actuators. This will calibrate the beginning and end stopping points. Press the adaption button for 3 seconds and release.
2. Contact Technical Support if travel adjustment is required.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

## Actuators: SY4...12-110 SY4...12-220

W546

### *Hazard Identification*

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

### *CAUTION*

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**Indicates an action or condition that may cause irreversible damage to the actuator(s) or associated equipment.**

Equipment damage!
Power consumption and input impedance must be observed.

### *NOTES* SY4...5-24

33 Each actuator should be powered by a single, isolated control transformer.

- Isolation relays must be used in parallel connection of multiple actuators using a common control signal input.
- "H" cannot be connected to terminal #3 and #4 simultaneously.
- **Required:** Terminal #7 needs to be field wired to enable heater circuit.

### *INSTALLATION NOTES*

Observe class 1 and class 2 wiring restrictions.

Transformer sizing = SY actuator draw X 1.25 (safety margin)
(Ex. SY2-24 requires 3.0A x 1.25 = 3.75A,
3.75A X 24 VAC = 90VA Transformer).

### *NOTES* SY4...12-110 (220)

- **Caution:** Power Supply Voltage
- Isolation relays must be used in parallel connection of multiple actuators using a common control signal input.
- "H" (L2) cannot be connected to terminal #3 and #4 simultaneously.
- **Required:** Terminal #7 needs to be field wired to enable heater circuit.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

# Wiring for Multiple SY
# On/Off, 24V, 120/230V

BELIMO

## Actuators: SY1...5-24 SY1...12-110 SY1...12-220

### *Hazard Identification*

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

### *CAUTION*

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**Indicates an action or condition that may cause irreversible damage to the actuator(s) or associated equipment.**

Equipment damage!
Power consumption and input impedance must be observed.

### *INSTALLATION NOTES*

Observe class 1 and class 2 wiring restrictions.

Transformer sizing = SY actuator draw X 1.25 (safety margin)
(Ex. SY2-24 requires 3.0A x 1.25 = 3.75A,
3.75A X 24 VAC = 90VA Transformer).

### *NOTES*

- **Caution:** Power Supply Voltage.
- Isolation relays must be used in parallel connection of multiple actuators using a common control signal input.
- "H" (L2) cannot be connected to terminal #3 and #4 simultaneously.
- **Required:** Terminal #7 needs to be field wired to enable heater circuit.

**SY1 Contact Arrangements**

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

## Actuators: SY4...5-24MFT SY4...12-120MFT SY4...12-230MFT

### *Hazard Identification*

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

### *CAUTION*

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**Indicates an action or condition that may cause irreversible damage to the actuator(s) or associated equipment.**

Equipment damage!
Power consumption and input impedance must be observed.

### *INSTALLATION NOTES*

Observe Class 1 and Class 2 wiring restrictions.

Transformer sizing = SY actuator draw X 1.25 (safety margin)
(Ex. SY2-24 requires 3.0A x 1.25 = 3.75A, 3.75A X 24 VAC = 90VA Transformer)

### *APPLICATION NOTES*

34 Ground shielded wire at control panel chassis. Tape back ground at actuator.

36 Use of feedback is optional.

### *NOTES* SY4...5-24MFT

33 Each actuator should be powered by a single, isolated control transformer.

- Power supply Com/Neutral and Control Signal "–" wiring to a common is prohibited.

### *NOTES* SY4...12-120 (230MFT)

- **Caution:** Power supply voltage.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

## Actuators: SY4...5-24MFT

W550-2

### *Hazard Identification*

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

### *CAUTION*

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**Indicates an action or condition that may cause irreversible damage to the actuator(s) or associated equipment.**

Equipment damage!
Power consumption and input impedance must be observed.

### *INSTALLATION NOTES*

Observe class 1 and class 2 wiring restrictions.

Transformer sizing = SY actuator draw X 1.25 (safety margin)
(Ex. SY2-24 requires 3.0A x 1.25 = 3.75A,
3.75A X 24 VAC = 90VA Transformer).

### *NOTES* SY4...5-24MFT

33 Each actuator should be powered by a single, isolated control transformer.

### *APPLICATION NOTES*

35 Recommended twisted shielded pair for control wiring.
Ground shielded wire at control panel chassis.
Tape back ground at actuator.

36 Use of feedback is optional.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

## Actuators: SY4...12-120MFT SY4...12-230MFT

W552-2

### *Hazard Identification*

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

### *CAUTION*

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**Indicates an action or condition that may cause irreversible damage to the actuator(s) or associated equipment.**

Equipment damage!
Power consumption and input impedance must be observed.

### *INSTALLATION NOTES*

Observe class 1 and class 2 wiring restrictions.

### *APPLICATION NOTES*

35 Recommended twisted shielded pair for control wiring. Ground shielded wire at control panel chassis. Tape back ground at actuator.

36 Use of feedback is optional.

### *NOTES* SY4...12-120 (230MFT)

- **Caution:** Power supply voltage.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

# Typical Retrofit Mounting
# SY4-SY12 Actuators

Note: Certain Belimo Factory assemblies use direct mount style linkages. Stem styles and mounting vary. For illustration purposes only.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

Verify that Control Signal and Power are present at the actuator.

- Measure between Control Signal + and – and power + and – on control board. (See photo of control boards below for locations).
- Check fuses on both boards. If fuses are blown, replace before proceeding.

Verify that the green LED is lit on the control board – this indicates power is present.

If yes:

- Push the button labelled “Adaption”, hold for 3-5 seconds then release. (see left photo for 24V, right photo for 120V)
- The LED next to green LED should light up (amber in color)
- Actuator should click. Drive fully in one direction. It will stop there for 5-10 seconds. Click and drive fully in the opposite direction.
- The amber light should go out.

If the sequence does not happen as above, please have the tech make a note of what does happen.

Possibilities include

- Amber light goes on, actuator clicks but does not move at all.
- Amber light goes on, actuator clicks and drives in one direction, and clicks but does not drive in the other direction.
- Amber light does not light, and the actuator does nothing at all.

If something else occurs, please make a note and communicate to a Belimo Technical Support Representative as the actuator most likely will need to be replaced.

If the actuator adapts correctly:

1. Verify correct wiring of control signal (confirm correct polarity of field wiring and meter). Must have “Control +” and “Control –” and not share the “Control –” with the 24V common, or 120V Neutral (4 wires are required, 2 for power and 2 for Control Signal).
2. Provide a DC control signal other than minimum or maximum (suggest 6 VDC or 50% command).
3. Measure with DC voltmeter on “Control +” and “Control –” at actuator and verify that a voltage other than 0(2) or 10V is present on those terminals. If actuator does not drive to approximately the mid position and voltage is present, the actuator most likely will need to be replaced.

The following information is helpful to determine warranty coverage and additional steps that might need to be taken:

1. PO# or Belimo SO# or ID# (ID is located on actuator cover under the model #).
2. Is this a retrofit or was it factory assembled to a valve?
3. Has this actuator ever worked on this site (brand new install that did not work, or has been working correctly for a certain period of time).
4. Proper transformer sizing (see PGPL for current VA requirements).
5. Confirm correct wire size vs. length or run for SY actuators.

71150-00001.E 04/19 - Subject to change. © Belimo Aircontrols (USA), Inc.

**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