

# GKB24-SR, GKX24-SR

Proportional Control, Electronic Fail-Safe, Direct Coupled, 24V, for 2 to 10 VDC and 4 to 20mA



Technical Data	GKB24-SR, GKX24-SR
Power supply	24VAC ±20% 50/60Hz 24VDC ±10%
Power consumption	12W (3W)
Transformer sizing	21VA (class 2 power source)
Electrical connection	18 GA plenum rated cable ½" conduit connector protected NEMA 2 (IP54) 3 ft [1m] 10 ft [3m] 16 ft [5m]
Overload protection	electronic throughout 0 to 95° rotation
Operation range Y	2 to 10 VDC, 4 to 20mA
Input impedance	100 kΩ (0.1 mA), 500 Ω
Feedback output U	2 to 10VDC, 0.5mA max
Angle of rotation	max. 95°, adjustable with mechanical stop electronically variable
Torque	360 in-lb [40 Nm]
Direction of rotation	reversible with  switch
Fail-safe position	adjustable with dial, 0 to 1 in 10° increments
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	
normal operation	150 seconds (default), variable 90 to 150 seconds
fail-safe	35 seconds
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Storage temperature	-40°F to +176°F [-40°C to +80°C]
Housing	NEMA2, IP54, UL enclosure type 2
Housing material	UL94-5VA
Agency list	cULus acc. to UL 60730-1A/-2-14 CAN/CSA E60730-1:02 CE acc. to 2004/108/EC and 2006/95/EC
Noise level	< 45dB(A)
Servicing	maintenance free
Quality standard	ISO 9001
Weight	3.85 lbs [1.75 kg]
Initial charge	5 to 20 seconds
Bridge time	2 second delay before fail-safe activates

Torque min. 360 in-lb for control damper surfaces up to 90 sq ft.

## Application

For fail-safe, proportional control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. The actuator is mounted directly to a damper shaft up to 1.05" in diameter by means of its universal clamp. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft. The actuator operates in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication. Not to be used for a master-slave application.

## Operation

The GK..24-SR actuator provides 95° of rotation and a visual indicator shows the position of the actuator. When reaching the damper or actuator end position the actuator automatically stops. The gear can be manually disengaged by pressing the button located on the actuator cover. The GK..24-SR actuators use a brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuators rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in a holding mode. The actuator is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement. Add-on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.

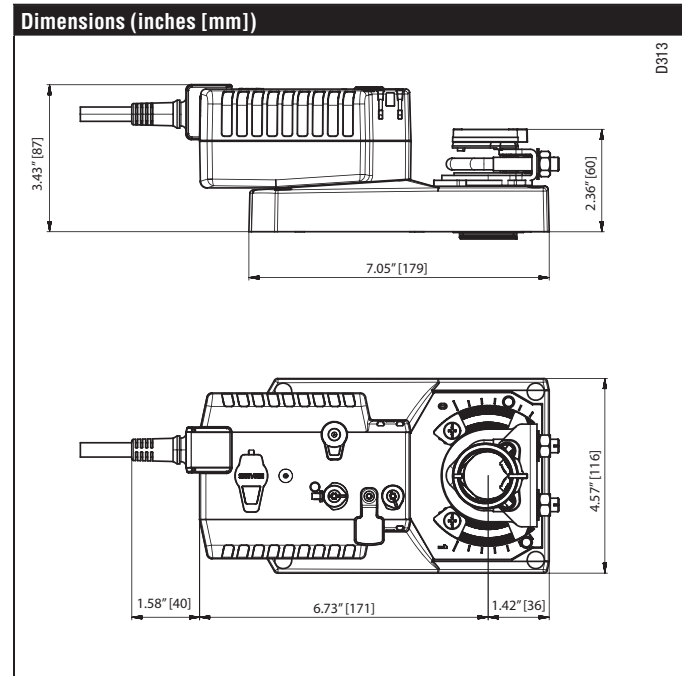
## Fail-Safe Indication

Green LED status indicator light sequence:

On: operation ok, no faults

Blinking: fail-safe mechanism is active

Off: fault is detected or not in operation / capacitors charging



PT10412 - 05/13 - Subject to change. © Belimo Aircontrols (USA), Inc.

### Accessories

K-GM20	3/4" [20mm] Shaft Clamp
ZG-102	Multiple Actuator Mounting Bracket
ZG-GMA	Crank arm Adaptor Kit
ZG-JSA (-1,2,3)	Jackshaft Adaptors for Hollow Jackshafts
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
ZS-260	Explosion Proof Housing
ZS-300 (-1) (-5)	NEMA 4X Housing
Tool-07	13 mm Wrench
PS-100	Actuator Power Supply Simulator
S1A, S2A	Auxiliary Switch(es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers

**Note:** When using GKB24-SR and GKX24-SR actuators, only use accessories listed on this page.

### Typical Specification

Proportional control damper actuators shall be electronic direct-coupled type, which require no crank arm and linkage and be capable of direct mounting to shaft up to 1.05" diameter. Actuators must provide proportional damper control response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. Actuators shall have brushless DC motor technology and be protected from overload at all angles of rotation. Actuators shall have reversing switch and manual override on the cover. Run time shall be constant and independent of torque. Actuators shall be cULus listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

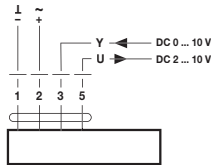
### Electrical Installation

Wiring diagram

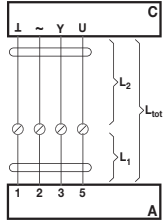
**Note**

- Connect via safety isolation transformer.
- Parallel connection of other actuators possible.

Note performance data for supply.

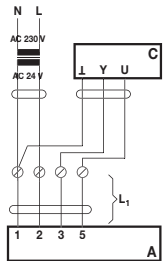


Cable lengths



**Note**

When several actuators are connected in parallel, the maximum cable length must be divided by the number of actuators.



**Note**

There are no special restrictions on installation if the supply and data cable are routed separately.

**Cable colors:**

- 1 = black
- 2 = red
- 3 = white
- 5 = orange

A = Actuator  
 C = Control unit  
 L1 = Belimo connecting cable, 1 m (4 x 0.75 mm<sup>2</sup>)  
 L2 = Customer cable  
 Ltot = Maximum cable length

Cross section Lz	Max. cable length Ltot = L1 + L2		Example for DC
	1/~	AC DC	
0.75 mm <sup>2</sup>	≤30 m	≤5 m	1 m (L1) + 4 m (L2)
1.00 mm <sup>2</sup>	≤40 m	≤8 m	1 m (L1) + 7 m (L2)
1.50 mm <sup>2</sup>	≤70 m	≤12 m	1 m (L1) + 11 m (L2)
2.50 mm <sup>2</sup>	≤100 m	≤20 m	1 m (L1) + 19 m (L2)

A = Actuator  
 C = Control unit  
 L1 = Belimo connecting cable, 1 m (4 x 0.75 mm<sup>2</sup>)

### Wiring Diagrams

#### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment Damage!**  
Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.

#### APPLICATION NOTES

- Meets UL requirements without the need of an electrical ground connection.
- The ZG-R01 500 Ω resistor may be used.

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

