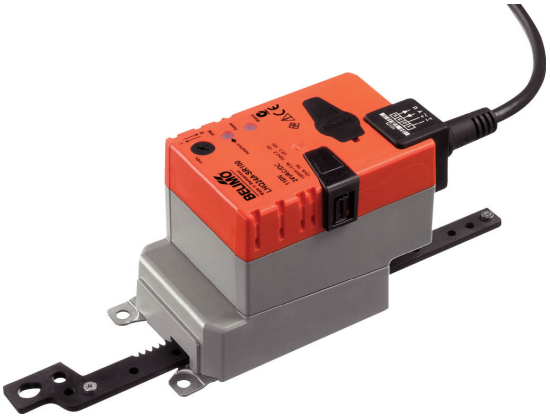
Modulating linear actuator for adjusting dampers and slide valves in technical building equipment

- Actuating force 100 N
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V
- Length of Stroke Max. 100 mm, adjustable in 20 mm increments
- Running time motor 3.5 s



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	13 W
	Power consumption in rest position	2 W
	Power consumption for wire sizing	23 VA
	Power consumption for wire sizing note	Imax 20 A @ 5 ms
	Connection supply / control	Cable 1 m, 4x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Actuating force motor	100 N
	Operating range Y	2...10 V
	Input impedance	100 kΩ
	Position feedback U	2...10 V
	Position feedback U note	Max. 0.5 mA
	Position accuracy	±5%
	Direction of motion motor	selectable with switch
	Direction of motion note	Y = 0 V: with switch 0 (retracted) / 1 (extended)
	Manual override	with push-button, can be locked
	Stroke	100 mm
	Length of Stroke	Max. 100 mm, adjustable in 20 mm increments
	Minimum stroke	40 mm
	Stroke limitation	can be limited on both sides with mechanical end stops
	Running time motor	3.5 s / 100 mm
	Adaptation setting range	manual (automatic on first power-up)
	Sound power level, motor	56 dB(A)
Safety data	Protection class IEC/EN	III, Safety Extra-Low Voltage (SELV)
	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14

Technical data

Safety data	UL Approval	cULus according to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1 The UL marking on the actuator depends on the production site, the device is UL-compliant in any case
	Hygiene test	According to VDI 6022 Part 1 / SWKI VA 104-01, cleanable and disinfectable, low emission
	Type of action	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Pollution degree	3
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	-30...40°C [-22...104°F]
	Ambient temperature note	Caution: 40...50°C utilisation possible only under certain restrictions. Please contact your supplier.
	Storage temperature	-40...80°C [-40...176°F]
	Servicing	maintenance-free
Weight	Weight	0.64 kg

Safety notes

- This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea) water, snow, ice, insolation or aggressive gases interfere directly with the device and that it is ensured that the ambient conditions remain within the thresholds according to the data sheet at any time.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- Cables must not be removed from the device.
- The rotary supports and coupling pieces available as accessories must always be used if transverse forces are likely. In addition, the actuator must not be tightly bolted to the application. It must remain movable via the rotary support (refer to «Installation notes»).
- If the actuator is exposed to severely contaminated ambient air, appropriate precautions must be taken on the system side. Excessive deposits of dust, soot etc. can prevent the gear rod from being extended and retracted correctly.
- If not installed horizontally, the maual override button may only be actuated when there is no pressure on the gear rod.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section and the design, as well as the installation situation and the ventilation conditions must be observed.
- If a rotary support and/or coupling piece is used, actuation force losses are to be expected.
- Self-adaptation is necessary when the system is commissioned or whenever the stroke limiting is adjusted (press the adaptation push-button).
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Operating mode
The actuator is connected with a standard control signal of 0...10 V and drives to the position defined by the control signal. Measuring voltage U serves for the electrical display of the damper position 0...100% and as control signal for other actuators.

Simple direct mounting
The actuator can be directly connected with the application using the enclosed screws. The head of the gear rod is connected to the moving part of the ventilating application individually on the mounting side or with the Z-KS2 coupling piece provided.

Manual override
Manual override with push-button possible (the gear train is disengaged for as long as the button is pressed or remains locked).

Adjustable stroke
If a stroke limitation will be adjusted, the mechanical operating range on this side of the gear rod can be used starting with an extension length of 20 mm and then can be limited respectively in increments of 20 mm by means of mechanical end stops Z-AS2.

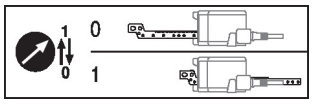
A minimum permissible stroke of 40 mm must be allowed for.

High functional reliability
The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Home position
The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaptation, which is when the operating range and position feedback adjust themselves to the mechanical setting range.

The detection of the mechanical end stops enables a gentle approach to the end positions, thus protecting the actuator mechanics.

The actuator then moves into the position defined by the control signal.



Adaptation and synchronisation
An adaptation can be triggered manually by pressing the "Adaptation" button. Both mechanical end stops are detected during the adaptation (entire setting range). Automatic synchronisation after pressing the manual override button is configured. The synchronisation is in the home position (0%).

The actuator then moves into the position defined by the control signal.

Accessories

Electrical accessories

Description	Type
Signal converter voltage/current 100 kΩ 4...20 mA, Supply AC/DC 24 V	Z-UIC
Positioner for wall mounting	SGA24
Positioner for built-in mounting	SGE24
Positioner for front-panel mounting	SGF24
Positioner for wall mounting	CRP24-B1

Mechanical accessories

Description	Type
End stop kit, Multipack 20 pcs.	Z-AS2
Rotary support, for linear actuator, for compensation of transverse forces	Z-DS1
Coupling piece M6	Z-KS2

Electrical installation

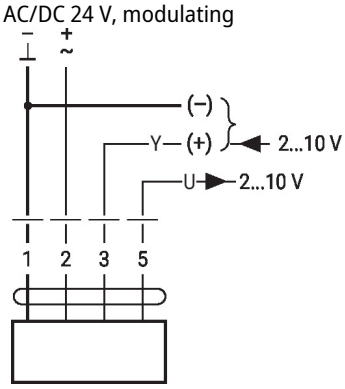
Supply from isolating transformer.

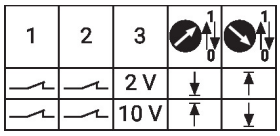
Parallel connection of other actuators possible. Observe the performance data.

Electrical installation

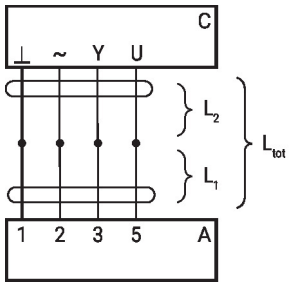
Wire colours:
1 = black
2 = red
3 = white
5 = orange

Wiring diagrams
AC/DC 24 V, modulating





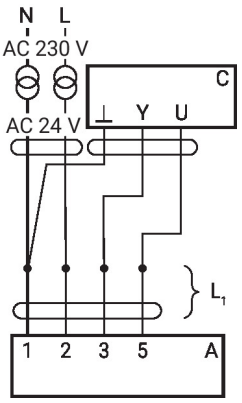
Signal cable lengths



L_2 ⊥/~	$L_{tot} = L_1 + L_2$	
	AC	DC
0.75 mm²	≤30 m	≤5 m
1.00 mm²	≤40 m	≤8 m
1.50 mm²	≤70 m	≤12 m
2.50 mm²	≤100 m	≤20 m

A = Actuator
C = Control unit (controlling unit)
L1 = Connecting cable of the actuator
L2 = Customer cable
Ltot = Maximum signal cable length

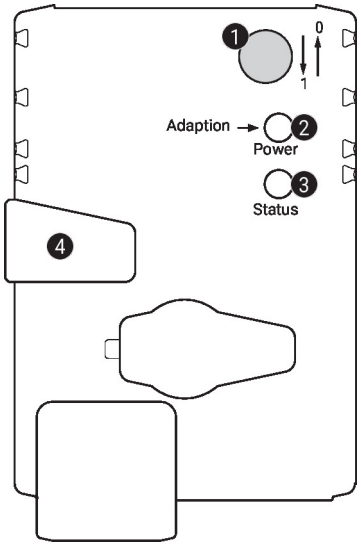
Note:
When several actuators are connected in parallel, the maximum signal cable length must be divided by the number of actuators.



A = Actuator
C = Control unit (controlling unit)
L1 = Connecting cable of the actuator

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

Operating controls and indicators



1 Direction of stroke switch

Switch over:	Direction of stroke changes

2 Push-button and LED display green

Off:	No power supply or malfunction
On:	In operation
Press button:	Triggers stroke adaptation, followed by standard mode

3 Push-button and LED display yellow

Off:	Standard mode
On:	Adaptation or synchronisation process active
Press button:	No function

4 Manual override button

Press button:	Gear train disengages, motor stops, manual override possible
Release button:	Gear train engages, synchronisation starts, followed by standard mode

Check power supply connection

2 Off and 3 On	Possible wiring error in power supply

Installation notes

If a rotary support and/or coupling piece is used, losses in the actuation force losses are to be expected.

Applications without transverse forces

The linear actuator is screwed directly to the housing at three points. Afterwards, the head of the gear rod is fastened to the moving part of the ventilation application (e.g. damper or slide valve).

Applications with transverse forces

Connect the coupling piece with the internal thread (Z-KS2) to the head of the gear rod. Screw the rotary support (Z-DS1) to the ventilation application. Afterwards, the linear actuator is screwed to the previously mounted rotary support with the enclosed screw. Then, the coupling piece, which is mounted to the head of the gear rod, is attached to the moving part of the ventilating application (e.g. damper or slide valve). The transverse forces can be compensated for to a certain limit with the rotary support and/or coupling piece. The maximum permissible swivel angle of the rotary support and coupling piece is 10°, laterally and upwards.

Negative force

Max. 50% of the actuating force (Caution: Application possible only under certain restrictions. Please contact your supplier.)

Dimensions