

Modulating damper actuator for adjusting dampers in technical building installations

- Air damper size up to approx. 8 m<sup>2</sup>
- Torque motor 40 Nm
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V
- Optimum weather protection for use outdoors (for use in ambient temperatures up to -40°C, there is a separate actuator available with built-in heater)



## Technical data

Part			
Nominal voltage frequency Nominal voltage range Power consumption in operation Power consumption in rest position Power consumption for wire sizing Power consumption for wire sizing Connection supply / control Parallel operation Parallel operation Position feedback Position feedback U Position feedback U Position of motion motor Poirection of motion motor Poirection of motion note Position of motion motor Position of motion note Position note Position of motion of motion note Position of motion note Position of motion note Position note Position of motion of motion note Position of motion note Posit	Electrical data	Nominal voltage	AC/DC 24 V
Power consumption in operation Power consumption in rest position Power consumption for wire sizing Connection supply / control Parallel operation Porating range Y Input impedance Position feedback U Direction of motion motor Direction of motion note Position for totation Manual override Angle of rotation Mechanical interface Position indication  Safety data  Protection class IEC/EN Pogree of protection NEMA/UL Enclosure Type 4X EMC Education Terminals 4 mm² (cable φ410 mm, 4-wire) Prower source U Direction of motion motor Performance data)  1 Cerrotation of Max Position feedback U Position for motion motor Selectable with switch 0/1 Position of motion motor Performance data Position position of motion of V Performance data Protection class incomplete of the visual position of (ccw rotation) / 1 (cw rotation) Position indication Position indication Mechanical, pluggable  Safety data Protection class IEC/EN Power source UL Class 2 Supply Degree of protection IEC/EN Pogree of protection NEMA/UL Enclosure UL Enclosure Type 4X EMC CE according to 2014/30/EU Low voltage directive CE according to 2014/30/EU		Nominal voltage frequency	50/60 Hz
Power consumption in rest position Power consumption for wire sizing Connection supply / control Parallel operation  Functional data  Torque motor Operating range Y Input impedance Position feedback U Position feedback U note Direction of motion motor Direction of motion motor  Manual override Angle of rotation Angle of rotation Angle of rotation note Running time motor Sound power level, motor Safety data  Position class IEC/EN Power source U Degree of protection NEMA/UL Position e protective NEMA (CE according to 2014/30/EU  Low voltage directive CE according to 2014/30/EU		Nominal voltage range	AC 19.228.8 V / DC 19.228.8 V
Power consumption for wire sizing Connection supply / control Parallel operation  Functional data  Torque motor Operating range Y Input impedance Position accuracy Direction of motion motor  Manual override Manual override Angle of rotation Angle of rotation note Running time motor Sound power level, motor Safety data  Fasher  Safety data  Protection view in the sizing Connection view in the with the view of protection NEMA/UL Enclosure EMC Edic Conservation  Torque motor A0 Nm  40 Nm Operating range Y 210 V Input impedance 100 kΩ Position of V 210 V Position feedback U note Max. 1 mA Position accuracy ±5% Direction of motion motor Selectable with switch 0/1 Direction of motion note Y = 0 V: At switch position 0 (ccw rotation) / 1 ((w rotation)) Manual override with push-button, can be locked (under protective housing) Angle of rotation Max. 95° Angle of rotation note Can be limited on both sides with adjustable mechanical end stops Running time motor 150 s / 90° Sound power level, motor 45 dB(A) Mechanical interface Universal shaft clamp 1426.7 mm Position indication Mechanical, pluggable  Frotection class IEC/EN Power source UL Class 2 Supply Degree of protection IEC/EN Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X EMC CE according to 2014/30/EU Cow voltage directive CE according to 2006/95/EC		Power consumption in operation	4.5 W
Connection supply / control Parallel operation Yes (note the performance data)  Functional data Torque motor Operating range Y Input impedance Position feedback U Position feedback U note Position of motion motor Direction of motion note Angle of rotation Angle of rotation note Running time motor Sound power level, motor Safety data  Fafety data Connection visual and source of protection NEMA/UL Degree of protection NEMA/UL Enclosure EMC CE according to 2014/30/EU  Low voltage directive  A NM ANM ANM ANM ANM ANM ANM ANM ANM ANM A		Power consumption in rest position	2 W
Functional data       Torque motor       40 Nm         Operating range Y       210 V         Input impedance       100 kΩ         Position feedback U       210 V         Position feedback U note       Max. 1 mA         Position accuracy       ±5%         Direction of motion motor       selectable with switch 0/1         Direction of motion note       Y = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)         Manual override       with push-button, can be locked (under protective housing)         Angle of rotation       Max. 95°         Angle of rotation note       can be limited on both sides with adjustable mechanical end stops         Running time motor       150 s / 90°         Sound power level, motor       45 dB(A)         Mechanical interface       Universal shaft clamp 1426.7 mm         Position indication       Mechanical, pluggable         Safety data       Protection class IEC/EN       III, Safety Extra-Low Voltage (SELV)         Power source UL       Class 2 Supply         Degree of protection IEC/EN       IP66/67         Degree of protection NEMA/UL       NEMA 4X         Enclosure       UL Enclosure Type 4X         EMC       CE according to 2014/30/EU         Low voltage directive       CE according		Power consumption for wire sizing	6.5 VA
Functional data  Torque motor Operating range Y Input impedance Position feedback U Position feedback U Position feedback U note Position of motion motor Direction of motion motor Direction of motion note  Angle of rotation Angle of rotation note Suenanical end stops Running time motor Sound power level, motor Sound power level, motor Affetty data Protection class IEC/EN Power source UL Degree of protection NEMA/UL Enclosure EMC EMC EMC EMC EMC CE according to 2014/30/EU  Low voltage directive  100 kΩ  Ammax. 1 mA  40 Nm 41 Nm 42 Nm 43 Nm 44 Nm 44 Nm 45 Nm 46 Nm 47 Nm 48 Nm 4		Connection supply / control	Terminals 4 mm² (cable ø410 mm, 4-wire)
Operating range Y Input impedance Position feedback U Position feedback U Position feedback U Position feedback U note Position accuracy  If y = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)  Manual override With push-button, can be locked (under protective housing)  Angle of rotation  Max. 95° Angle of rotation note Running time motor Sound power level, motor Aoston indication  Safety data Protection class IEC/EN Power source UL Degree of protection NEMA/UL Enclosure EMC EMC CE according to 2006/95/EC  Low voltage directive  Max. 1 mA  210 V  Universal switch note Max. 1 mA  Max. 1 mA  45 w  Max. 1 mA  Max. 1 mA  45 w  Max. 1 mA  To V: A t switch position 0 (ccw rotation) /  1 (cw rotation)  Max. 1 mA  Max. 1 mA  Max. 1 mA  To V: A t switch position 0 (ccw rotation) /  1 (cw rotation)  Max. 1 mA  Max. 1 mA  To V: A t switch position 0 (ccw rotation) /  1 (cw rotation)  Max. 1 mA  Max. 1 mA  To V: A t switch position 0 (ccw rotation) /  1 (cw rotation)  Max. 1 mA  Max. 1 mA  To V: A t switch position of (ccw rotation) /  1 (cw rotation)  Max. 1 mA  Max. 1 mA  To V: A t switch position of (ccw rotation) /  1 (cw rotation)  Max. 1 mA  Max. 1 mA  To V: A t switch position of (ccw rotation) /  1 (cw rotation)  Max. 1 mA  Max. 1 mA  To V: A t switch position of (ccw rotation) /  1 (cw rotation)  Max. 1 mA  To V: A t switch position of (ccw rotation) /  1 (cw rotation)  Max. 1 mA  To V: A t switch position of (ccw rotation) /  1 (cw rotation)  Max. 1 ma  To V: A t switch position of (ccw rotation)  I (cw rotation)  Max. 1 ma  To V: A t switch position of (ccw rotation)  I (cw rotation)  Max. 1 ma  To V: A t switch position of (ccw rotation)  I		Parallel operation	Yes (note the performance data)
Input impedance 100 kΩ Position feedback U 210 V Position feedback U note Max. 1 mA Position accuracy ±5% Direction of motion motor selectable with switch 0/1 Direction of motion note Y = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)  Manual override with push-button, can be locked (under protective housing)  Angle of rotation Max. 95° Angle of rotation note can be limited on both sides with adjustable mechanical end stops  Running time motor 150 s / 90° Sound power level, motor 45 dB(A) Mechanical interface Universal shaft clamp 1426.7 mm Position indication Mechanical, pluggable  Safety data Protection class IEC/EN III, Safety Extra-Low Voltage (SELV) Power source UL Class 2 Supply Degree of protection IEC/EN IP66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X EMC CE according to 2014/30/EU Low voltage directive CE according to 2006/95/EC	Functional data	Torque motor	40 Nm
Position feedback U Position feedback U note Position feedback U note Position accuracy #5%  Direction of motion motor  Direction of motion note  Max. 1 mA  Position accuracy #5%  Direction of motion motor  Selectable with switch 0/1  Direction of motion note  Y = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)  Manual override with push-button, can be locked (under protective housing)  Angle of rotation  Max. 95°  Angle of rotation note can be limited on both sides with adjustable mechanical end stops  Running time motor 150 s / 90°  Sound power level, motor 45 dB(A)  Mechanical interface Universal shaft clamp 1426.7 mm  Position indication  Mechanical, pluggable  Safety data  Protection class IEC/EN III, Safety Extra-Low Voltage (SELV)  Power source UL Class 2 Supply  Degree of protection IEC/EN IP66/67  Degree of protection NEMA/UL NEMA 4X  Enclosure UL Enclosure Type 4X  EMC CE according to 2014/30/EU  Low voltage directive CE according to 2014/30/EU		Operating range Y	210 V
Position feedback U note		Input impedance	100 kΩ
Position accuracy  Direction of motion motor  Direction of motion note  P = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)  Manual override  With push-button, can be locked (under protective housing)  Angle of rotation  Angle of rotation note  Running time motor  Sound power level, motor  Position indication  Safety data  Protection class IEC/EN  Power source UL  Degree of protection NEMA/UL  Enclosure  EMC  CE according to 2014/30/EU  Low voltage directive  V: 4s switch position 0 (ccw rotation) / 1 (cw rotation) /		Position feedback U	210 V
Direction of motion motor  Direction of motion note  V = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)  Manual override  with push-button, can be locked (under protective housing)  Angle of rotation  Max. 95°  Angle of rotation note  can be limited on both sides with adjustable mechanical end stops  Running time motor  Sound power level, motor  Mechanical interface  Universal shaft clamp 1426.7 mm  Position indication  Mechanical, pluggable  Safety data  Protection class IEC/EN  III, Safety Extra-Low Voltage (SELV)  Power source UL  Class 2 Supply  Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  UL Enclosure Type 4X  EMC  CE according to 2014/30/EU  Low voltage directive  CE according to 2006/95/EC		Position feedback U note	Max. 1 mA
Direction of motion note  Y = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)  Manual override  with push-button, can be locked (under protective housing)  Angle of rotation  Max. 95°  Angle of rotation note  can be limited on both sides with adjustable mechanical end stops  Running time motor  Sound power level, motor  45 dB(A)  Mechanical interface  Universal shaft clamp 1426.7 mm  Position indication  Mechanical, pluggable  Safety data  Protection class IEC/EN  III, Safety Extra-Low Voltage (SELV)  Power source UL  Class 2 Supply  Degree of protection IEC/EN  IP66/67  Degree of protection NEMA/UL  Enclosure  UL Enclosure Type 4X  EMC  CE according to 2014/30/EU  Low voltage directive  CE according to 2006/95/EC		Position accuracy	±5%
1 (cw rotation)  Manual override with push-button, can be locked (under protective housing)  Angle of rotation Max. 95°  Angle of rotation note can be limited on both sides with adjustable mechanical end stops  Running time motor 150 s / 90°  Sound power level, motor 45 dB(A)  Mechanical interface Universal shaft clamp 1426.7 mm  Position indication Mechanical, pluggable  Safety data Protection class IEC/EN III, Safety Extra-Low Voltage (SELV)  Power source UL Class 2 Supply  Degree of protection IEC/EN IP66/67  Degree of protection NEMA/UL NEMA 4X  Enclosure UL Enclosure Type 4X  EMC CE according to 2014/30/EU  Low voltage directive CE according to 2006/95/EC		Direction of motion motor	selectable with switch 0/1
Angle of rotation Max. 95° Angle of rotation note can be limited on both sides with adjustable mechanical end stops Running time motor 150 s / 90° Sound power level, motor 45 dB(A) Mechanical interface Universal shaft clamp 1426.7 mm Position indication Mechanical, pluggable  Safety data Protection class IEC/EN III, Safety Extra-Low Voltage (SELV) Power source UL Class 2 Supply Degree of protection IEC/EN IP66/67 Degree of protection NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X EMC CE according to 2014/30/EU Low voltage directive CE according to 2006/95/EC		Direction of motion note	
Angle of rotation note  Can be limited on both sides with adjustable mechanical end stops  Running time motor  Sound power level, motor  Mechanical interface  Position indication  Safety data  Protection class IEC/EN  Power source UL  Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  UL Enclosure Type 4X  EMC  CE according to 2014/30/EU  Low voltage directive  Can be limited on both sides with adjustable mechanical end stops  and with adjustable mechanical end stops  How a day and		Manual override	•
Running time motor Sound power level, motor 45 dB(A) Mechanical interface Universal shaft clamp 1426.7 mm Position indication Mechanical, pluggable  Safety data Protection class IEC/EN III, Safety Extra-Low Voltage (SELV) Power source UL Class 2 Supply Degree of protection IEC/EN IP66/67 Degree of protection NEMA/UL Enclosure UL Enclosure Type 4X EMC CE according to 2014/30/EU Low voltage directive CE according to 2006/95/EC		Angle of rotation	Max. 95°
Sound power level, motor  Mechanical interface Position indication  Mechanical, pluggable  Protection class IEC/EN Power source UL Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure UL Enclosure Type 4X EMC CE according to 2014/30/EU Low voltage directive  Vulviversal shaft clamp 1426.7 mm Mechanical, pluggable  III, Safety Extra-Low Voltage (SELV) Class 2 Supply IP66/67 DEGREE OF PROTECTION NEMA/UL NEMA 4X Enclosure UL Enclosure Type 4X EMC CE according to 2014/30/EU CE according to 2006/95/EC		Angle of rotation note	
Mechanical interface Position indication  Mechanical, pluggable  Protection class IEC/EN Power source UL Degree of protection IEC/EN Degree of protection NEMA/UL Enclosure UL Enclosure UL Enclosure UL Enclosure Type 4X EMC CE according to 2014/30/EU Low voltage directive  Universal shaft clamp 1426.7 mm Mechanical, pluggable  III, Safety Extra-Low Voltage (SELV) Class 2 Supply IP66/67 NEMA 4X ENC CE according to 2014/30/EU CE according to 2014/30/EU		Running time motor	150 s / 90°
Position indication Mechanical, pluggable  Protection class IEC/EN III, Safety Extra-Low Voltage (SELV)  Power source UL Class 2 Supply  Degree of protection IEC/EN IP66/67  Degree of protection NEMA/UL NEMA 4X  Enclosure UL Enclosure Type 4X  EMC CE according to 2014/30/EU  Low voltage directive CE according to 2006/95/EC		Sound power level, motor	45 dB(A)
Safety data  Protection class IEC/EN  Power source UL  Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  EMC  Low voltage directive  III, Safety Extra-Low Voltage (SELV)  IP66/67  NEMA 4X  Enclosure Type 4X  CE according to 2014/30/EU  CE according to 2006/95/EC		Mechanical interface	Universal shaft clamp 1426.7 mm
Power source UL  Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  UL Enclosure Type 4X  EMC  CE according to 2014/30/EU  Low voltage directive  Class 2 Supply  IP66/67  NEMA 4X  EMC UL Enclosure Type 4X  CE according to 2014/30/EU  CE according to 2006/95/EC		Position indication	Mechanical, pluggable
Degree of protection IEC/EN  Degree of protection NEMA/UL  Enclosure  UL Enclosure Type 4X  EMC  CE according to 2014/30/EU  Low voltage directive  CE according to 2006/95/EC	Safety data	Protection class IEC/EN	III, Safety Extra-Low Voltage (SELV)
Degree of protection NEMA/UL  Enclosure  UL Enclosure Type 4X  EMC  CE according to 2014/30/EU  Low voltage directive  CE according to 2006/95/EC		Power source UL	Class 2 Supply
Enclosure UL Enclosure Type 4X  EMC CE according to 2014/30/EU  Low voltage directive CE according to 2006/95/EC		Degree of protection IEC/EN	IP66/67
EMC CE according to 2014/30/EU  Low voltage directive CE according to 2006/95/EC		Degree of protection NEMA/UL	NEMA 4X
Low voltage directive CE according to 2006/95/EC		Enclosure	UL Enclosure Type 4X
		EMC	CE according to 2014/30/EU
Certification IEC/EN IEC/EN 60730-1 and IEC/EN 60730-2-14		Low voltage directive	CE according to 2006/95/EC
		Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14



#### **Technical 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		
Type of action	Type 1		
Rated impulse voltage supply / control	0.8 kV		
Pollution degree	4		
Ambient humidity	Max. 100% RH		
Ambient temperature	-3050°C [-22122°F]		
Ambient temperature note	-4050°C for actuator with integrated heating		
Storage temperature	-4080°C [-40176°F]		
Servicing	maintenance-free		
Weight	3.4 kg		

## Safety notes



Weight

Safety data

- 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.
- Junction boxes must at least correspond with enclosure IP degree of protection!
- The cover of the protective housing may be opened for adjustment and servicing. When it is closed afterwards, the housing must seal tight (see installation instructions).
- 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.
- 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.
- 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.
- The device is not designed for applications where chemical influences (gases, fluids) are present or for utilisation in corrosive environments in general.
- The actuator may not be used in plenary applications (e.g. suspended ceilings or raised floors).
- The materials used may be subject to external influences (temperature, pressure, construction fastening, effect of chemical substances, etc.), which cannot be simulated in laboratory tests or field trials. In case of doubt, we definitely recommend that you carry out a test. This information does not imply any legal entitlement. Belimo will not be held liable and will provide no warranty.
- If cables which are not authorised for UL (NEMA) Type 4X applications are used, then flexible
  metallic cable conduits or suitable threaded cable conduits of equal value are to be used.
- When used under high UV loads, e.g. extreme sunlight, the use of flexible metallic or equivalent cable conduits is recommended.



#### **Product features**

### Fields of application

The actuator is particularly suitable for utilisation in outdoor applications and is protected against the following weather conditions:

- UV radiation
- Rain / Snow
- Dirt / Dust
- Air humidity
- Alternating climate / frequent and severe temperature fluctuations (Recommendation: use the actuator with integrated factory-installed heating which can be ordered separately to prevent internal condensation)

### 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

Simple direct mounting on the damper shaft with a universal shaft clamp, supplied with an anti-rotation device to prevent the actuator from rotating.

### Manual override

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

The housing cover must be removed for manual override.

#### Adjustable angle of rotation

Adjustable angle of rotation with mechanical end stops. Standard setting 0...90°. The housing cover must be removed to set the angle of rotation.

## High functional reliability

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

### **Accessories**

Electrical accessories	Description	Type S2A GR	
	Auxiliary switch 2x SPDT add-on, grey		
	Feedback potentiometer 140 $\Omega$ add-on	P140A P1000A P10000A Z-SPA	
	Feedback potentiometer 1 $k\Omega$ add-on		
	Feedback potentiometer 10 k $\Omega$ add-on		
	Adapter for auxiliary switch and feedback potentiometer, Multipack 20 pcs.		
	Signal converter voltage/current 100 kΩ 420 mA, Supply AC/DC 24 V	Z-UIC	
	Positioner for wall mounting	SGA24 SGE24 SGF24	
	Positioner for built-in mounting		
	Positioner for front-panel mounting		
	Positioner for wall mounting	CRP24-B1	
Mechanical accessories	Description	Туре	
	Cable gland for cable diameter ø410 mm	Z-KB-PG11	
Options ex works only	Description	Туре	
	Heater, with adjustable thermostat	HT24-MG	
	Heater, with mechanical humidistat	HH24-MG	

## **Electrical installation**



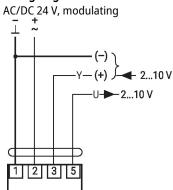
Supply from isolating transformer.

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



# **Electrical installation**

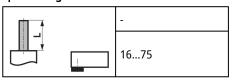
## Wiring diagrams



1	2	3		
1	ł	2 V	~	ζ,
7	7	10 V		

# **Dimensions**





# Clamping range damper shaft

