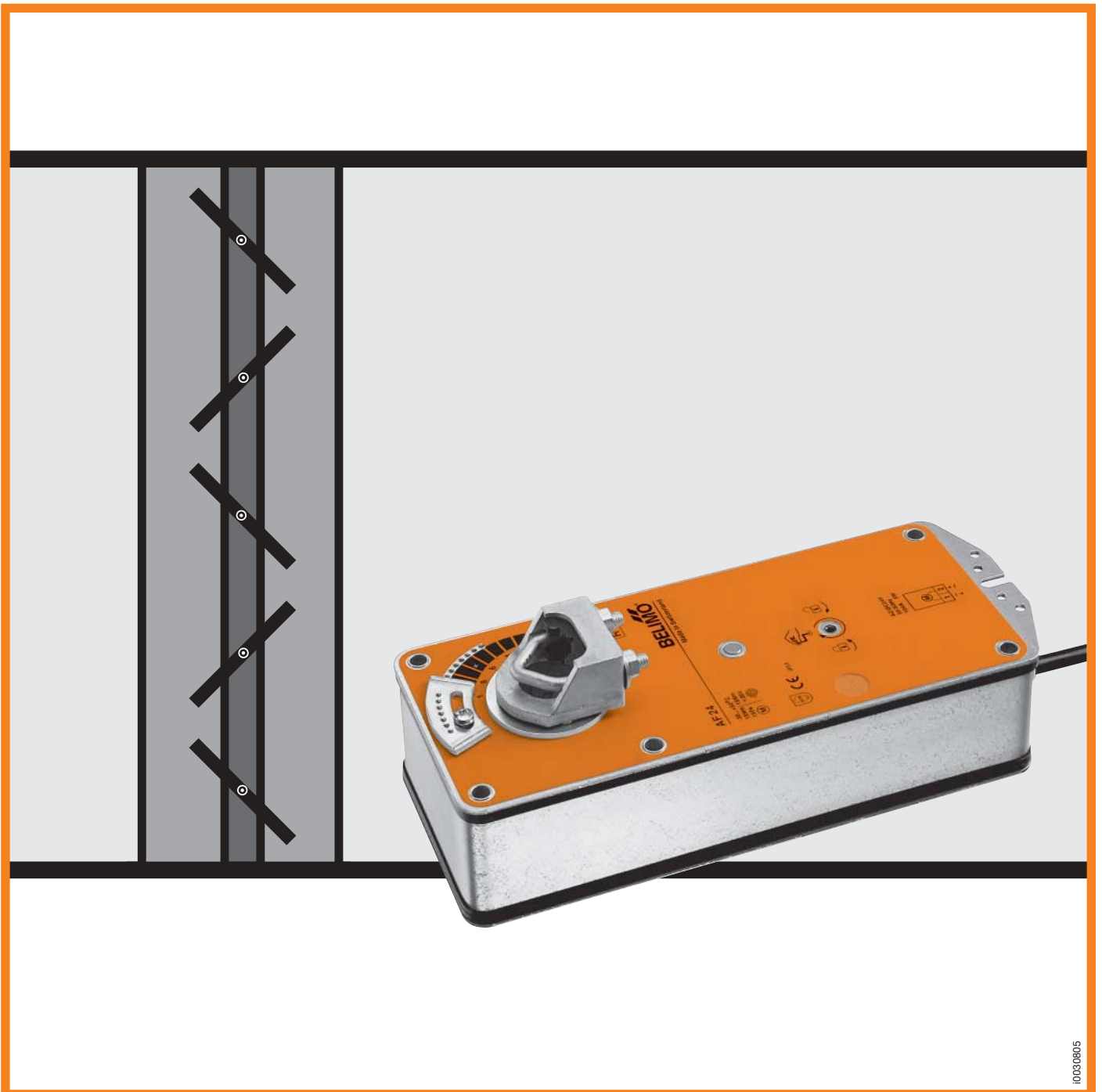


2. AF-5

Product Information

Damper actuators with spring return

AF



The complete range of damper actuators for general use in HVAC systems

Type	LM	NM	SM	AM	GM	LF	AF(R)
Torque	4 Nm	8 Nm	15 Nm	18 Nm	30 Nm	4 Nm	15 Nm
Spring return function	-	-	-	-	-		
For dampers up to approx.	0.8 m ²	1.5 m ²	3 m ²	3.6 m ²	6 m ²	0.8 m ²	3 m ²

10101805

For more information, please contact your Belimo Representative or order any brochures you need by fax.

Fax to: **BELIMO** (address overleaf)

Please send us product brochures on the following damper actuators:

LM... NM... SM... AM... GM... LF... AFR... Electrical accessories

Please also send information on:

- Motorized fire and smoke dampers
- Variable air-volume control (VAV-Control)
- Rotary-motion actuators and valves
- Linear-motion actuators and valves

Please call us back

Sender

Company: _____

Name: _____

Address: _____

Post code: _____ Country: _____

Tel.: _____ Fax: _____

E-Mail: _____ Date: _____

Selection table

		AF24	AF24-S	AF230	AF230-S	AF24-SR
Torque	15 Nm					
Nominal voltage	AC 24 V	•	•			•
	DC 24 V	•	•			•
	AC 230 V			•	•	
Running time	motor ≈ 150 s	•	•	•	•	•
	spring return ≈ 16 s	•	•	•	•	•
Control	Open/Close	•	•	•	•	
	modulating DC 0...10 V					•
Integral auxiliary switches (fixed/adjustable)			•		•	
Continuous position feedback						•
Manual operation with integral position stop		•	•	•	•	•

Spring return actuators, Open/Close

AF24	4
AF24-S	4
AF230	5
AF230-S	5

Spring return actuator, modulating

AF24-SR	6
Control / monitoring functions AF24-SR	7

Mechanical accessories

General mounting accessories	8
Damper linkage kit	9

Mounting instructions	10
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Important notes

Using BELIMO damper actuators

The actuators listed in this catalogue are intended for the operation of air dampers in HVAC systems.

Torque requirements

When calculating the torque required to operate dampers, it is essential to take into account all the data supplied by the damper manufacturer concerning cross sectional area, design, mounting and air flow conditions.

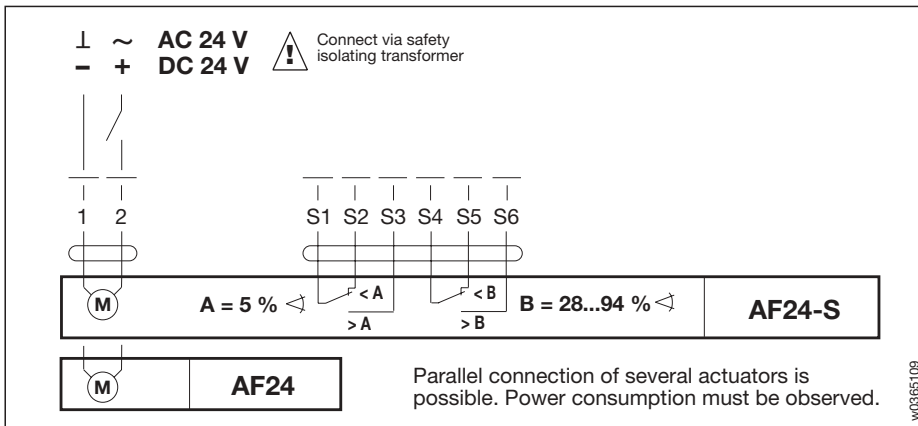
Danger

The enclosure of the actuators equipment may only be opened by the manufacturer. It contains no components which the user can replace or repair.



p0017805

Wiring diagram



Technical data	AF24, AF24-S
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V
Nominal voltage range	AC 19.2...28.8 V, DC 21.6...26.4 V
For wire sizing	10 VA
Power consumption	
– motoring	5 W
– holding	1.5 W
Connecting cable	– motor 1 m long, 2×0.75 mm ² – auxiliary switches (AF...-S) 1 m long, 6×0.75 mm ²
Auxiliary switch (AF...-S)	2×SPDT 6 (3) A, AC 250 V <input type="checkbox"/>
– Switching points	fixed 5% \sphericalangle , adjustable 28...94% \sphericalangle
Direction of rotation	selected by mounting L/R
Torque	– motor min. 15 Nm (at rated voltage) – spring return min. 15 Nm
Angle of rotation	max. 95° (adjustable from 33% in 5.5% steps \sphericalangle with a supplied limit stop)
Running time	motor \approx 150 s, spring return \approx 16 s
Sound power level	motor max. 45 dB(A), spring \approx 62 dB(A)
Service life	\approx 60 000 operations
Position indication	mechanical
Protection class	\diamond (safety extra-low voltage)
Degree of protection	IP 54
Ambient temp. range	–30... +50 °C
Non-operating temp.	–40... +80 °C
Humidity test	to EN 60730-1
EMC	CE according to 89/336/EEC
Low Voltage Directive	CE according to 73/23/EEC
Maintenance	maintenance free
Weight	3000 g

Dampers up to approx. 3 m²

Open/Close actuator (AC/DC 24 V)

Manual operation with integral position stop

Versatile applications

The AF... spring return actuators are intended for the operation of air dampers that perform safety functions (e.g. frost and smoke protection, hygiene, etc.).

Improved functional safety

The AF... actuator moves the damper to its normal working position while tensioning the return spring at the same time. If the power supply is interrupted, the energy stored in the spring moves the damper back to its safe position.

The actuator is overload proof, needs no limit switches and halts automatically at the end stop.

Variable end switch

The AF24-S actuator has one fixed auxiliary switch and one adjustable auxiliary switch which allows angle of rotation of 5% and between 28...94% to be signalled.

Simple installation and commissioning

The actuator is fitted with a universal spindle clamp for quick and easy mounting directly onto the damper spindle. The actuator is also supplied with an anti-rotation strap for fixing it in position. The damper can be operated manually and fixed in any required position. Release of the locking mechanism can be achieved manually or automatically by applying the supply voltage.

Mechanical accessories

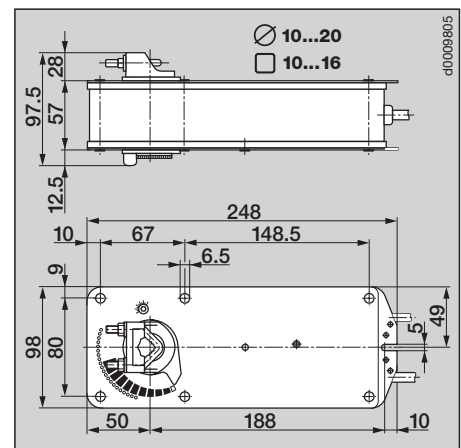
ZG-AF Damper linkage kit, page 9

Mounting instructions, page 10

Important

Read the notes about the use and torque requirements of the damper actuators on page 3.

Dimensions





Dampers up to approx. 3 m²

Open/Close actuator (AC 230 V)

Manual operation with integral position stop

Versatile applications

The AF... spring return actuators are intended for the operation of air dampers that perform safety functions (e.g. frost and smoke protection, hygiene, etc.).

Improved functional safety

The AF 230 actuator moves the damper to its normal working position while tensioning the return spring at the same time. If the power supply is interrupted, the energy stored in the spring moves the damper back to its safe position.

The actuator is overload proof, needs no limit switches and halts automatically at the end stop.

Variable end switch

The AF230-S actuator has one fixed auxiliary switch and one adjustable auxiliary switch which allows angle of rotation of 5% and between 28...94% to be signalled.

Simple installation and commissioning

The actuator is fitted with a universal spindle clamp for quick and easy mounting directly onto the damper spindle. The actuator is also supplied with an anti-rotation strap for fixing it in position. The damper can be operated manually and fixed in any required position. Release of the locking mechanism can be achieved manually or automatically by applying the supply voltage.

Mechanical accessories

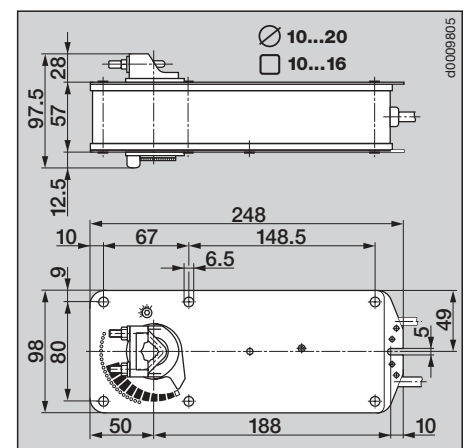
ZG-AF Damper linkage kit, page 9

Mounting instructions, page 10

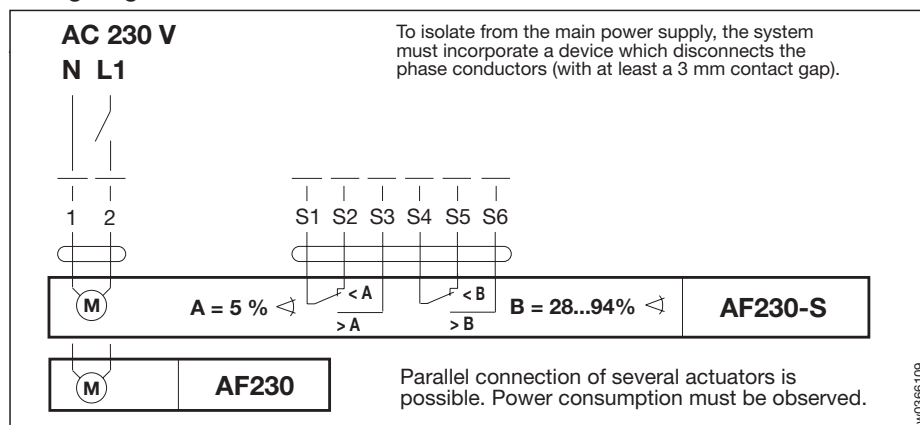
Important

Read the notes about the use and torque requirements of the damper actuators on page 3.

Dimensions



Wiring diagram



Technical data	AF230, AF230-S
Nominal voltage	AC 230 V 50/60 Hz
Nominal voltage range	AC 198...264 V
For wire sizing	11 VA
Power consumption	
– motoring	6.5 W
– holding	2.5 W
Connecting cable	– motor 1 m long, 2×0.75 mm ² – auxiliary switches (AF...-S) 1 m long, 6×0.75 mm ²
Auxiliary switch (AF...-S)	2×SPDT 6 (3) A, AC 250 V <input type="checkbox"/>
– Switching points	fixed 5% ∇ , adjustable 28...94% ∇
Direction of rotation	selected by mounting L/R
Torque	– motor min. 15 Nm (at rated voltage) – spring return min. 15 Nm
Angle of rotation	max. 95° (adjustable from 33% in 5.5% steps ∇ with a supplied limit stop)
Running time	motor \approx 150 s, spring return \approx 16 s
Sound power level	motor max. 45 dB(A), spring \approx 62 dB(A)
Service life	\approx 60 000 operations
Position indication	mechanical
Protection class	II (all insulated)
Degree of protection	IP 54
Ambient temp. range	–30... +50 °C
Non-operating temp.	–40... +80 °C
Humidity test	to EN 60730-1
EMC	CE according to 89/336/EEC
Low Voltage Directive	CE according to 73/23/EEC
Maintenance	maintenance free
Weight	3000 g



p0019805

Dampers up to approx. 3 m²

Modulating actuator (AC/DC 24 V)

Control DC 0...10 V

(The type AF24-SR20 is available with phasecut input)

Position feedback DC 2...10 V

Manual operation with integral position stop

Versatile applications

For the operation of air dampers that perform safety functions (e.g. frost and smoke protection, hygiene, etc.).

Improved functional safety

The AF24-SR actuator moves the damper to its normal working position while tensioning the return spring at the same time. If the power supply is interrupted, the energy stored in the spring moves the damper back to its safe position.

The actuator is overload proof, needs no limit switches and halts automatically at the end stop.

Simple installation and commissioning

The actuator is fitted with a universal spindle clamp for quick and easy mounting directly onto the damper spindle. The actuator is also supplied with an anti-rotation strap for fixing it in position. The damper can be operated manually and locked in any required position. Release of the locking mechanism can be achieved manually or automatically by applying the supply voltage.

If manual operation is used while the power supply is still switched on, the actuator will check itself by running first to the start position and then to the position dictated by the control signal Y.

Electrical accessories (see Doc. 2. Z-...)

SG...24 Positioners

ZAD24 Digital position indicator

Mechanical accessories

ZG-AF Damper linkage kit, page 9

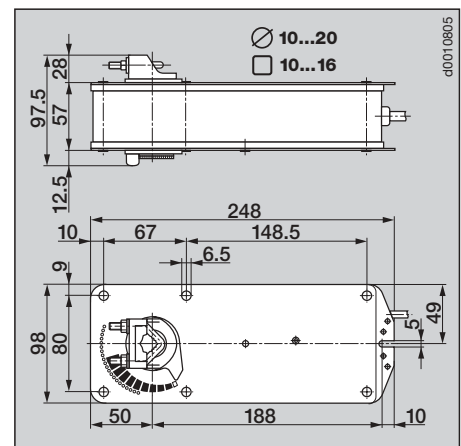
Control and monitoring functions, page 7

Mounting instructions, page 10

Important

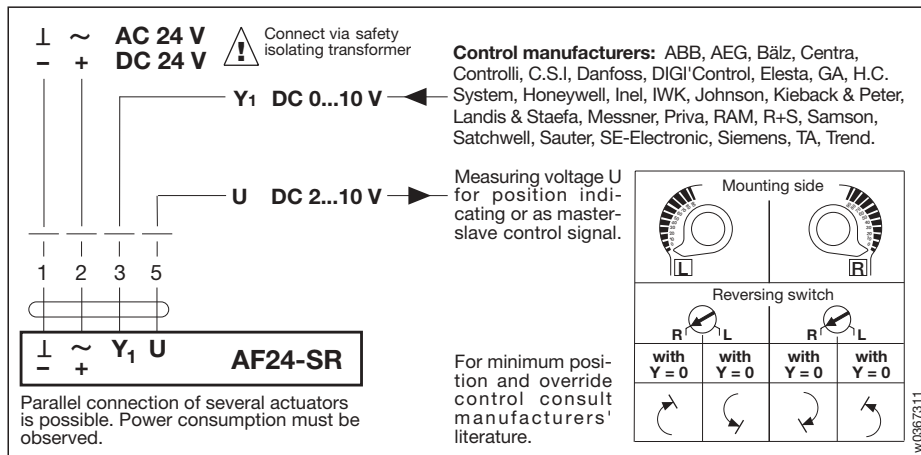
Read the notes about the use and torque requirements of the damper actuators on page 3.

Dimensions



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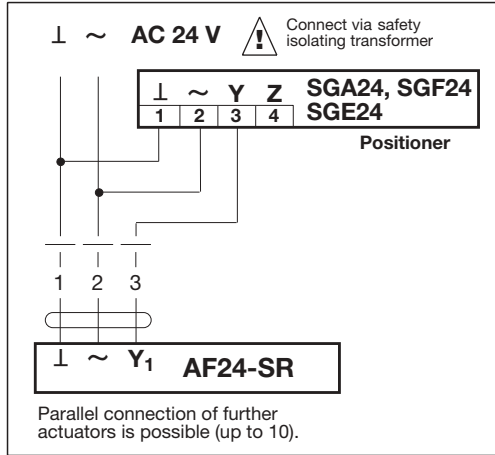
Wiring diagram



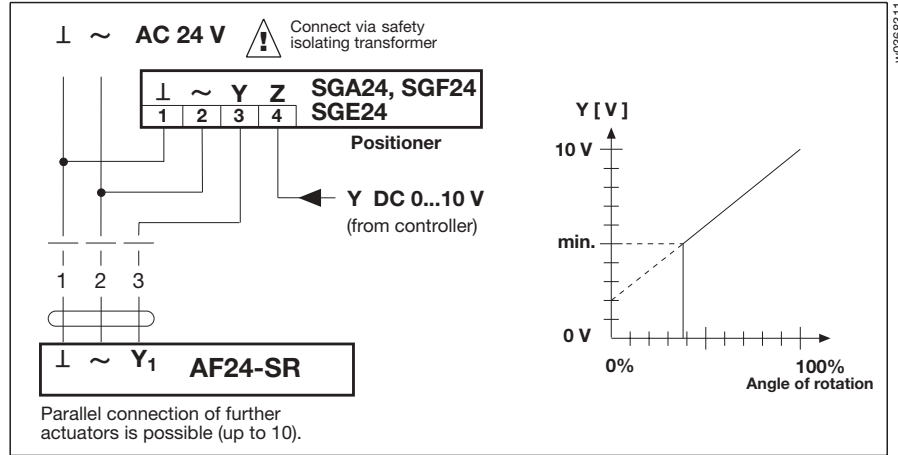
w0367311

Technical data	AF24-SR
Nominal voltage	AC 24 V 50/60 Hz, DC 24 V
Nominal voltage range	AC 19.2...28.8 V, DC 21.6...28.8 V
For wire sizing	10 VA
Power consumption	6 W motoring, 2.5 W holding
Connecting cable	1 m long, 4x0.75 mm ²
Control signal Y ₁	DC 0...10 V @ input resistance 100 kΩ (0.1 mA)
Operating range	DC 2...10 V
Measuring voltage U	DC 2...10 V @ max. 0.5 mA (for 0...100% angle of rotation)
Synchronisation tolerance	± 5%
Direction of rotation	- motor selected with switch L/R - spring selected by L/R mounting
Torque	- motor min. 15 Nm (at rated voltage) - spring return min. 15 Nm
Angle of rotation	max. 95° (adjustable from 33% in 5.5% steps ↯ with a supplied limit stop)
Running time	motor 150 s, spring return ≈ 16 s
Sound power level	motor max. 45 dB(A), spring ≈ 62 dB(A)
Service life	≈ 60 000 operations
Position indication	mechanical
Protection class	⚡ (safety extra-low voltage)
Degree of protection	IP 54
Ambient temperature range	-30...+50 °C
Non-operating temperature	-40...+80 °C
Humidity test	to EN 60730-1
EMC	CE according to 89/336/EEC
Maintenance	maintenance-free
Weight	2700 g

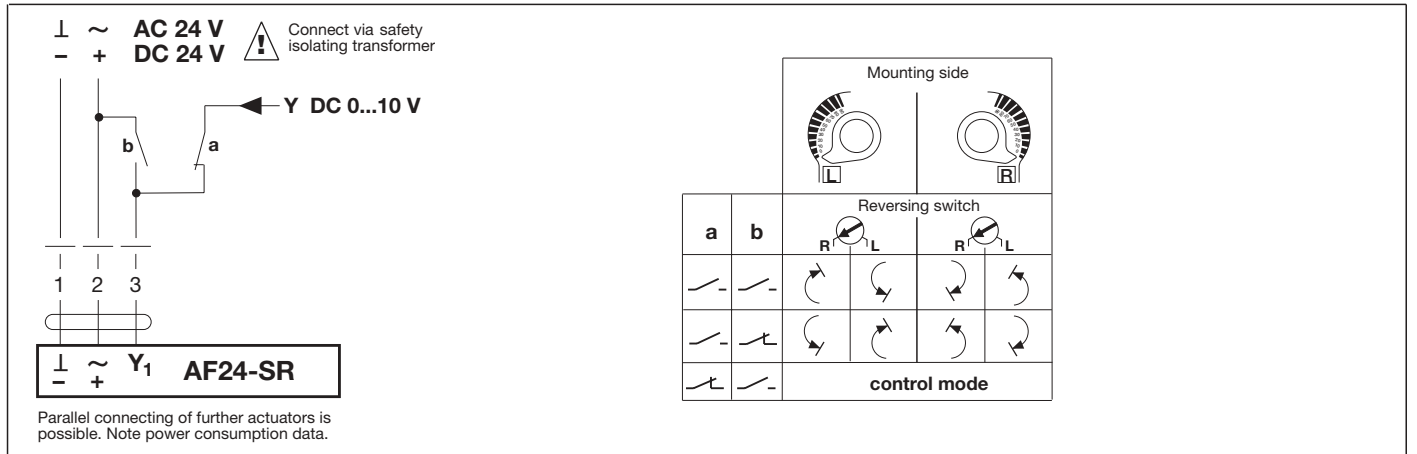
Remote control 0...100%



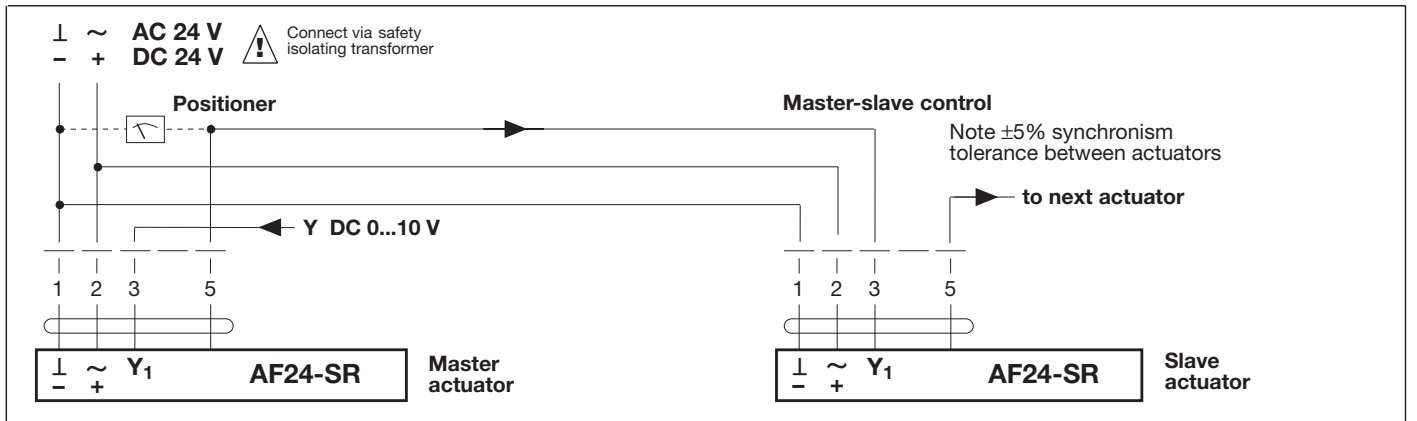
Minimum position



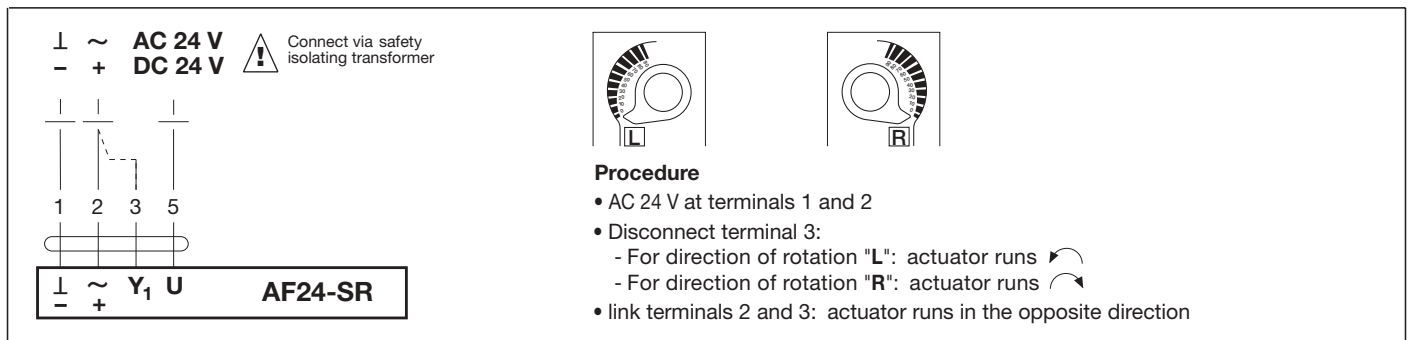
Override control



Position indication and/or master-slave control (depending on position)



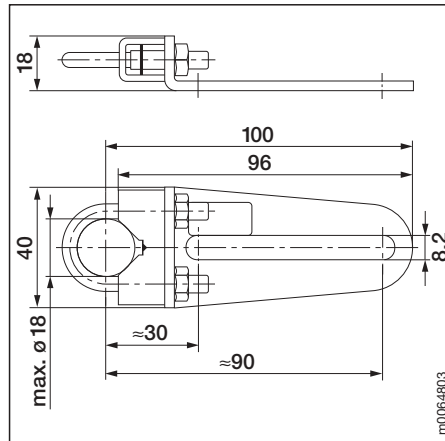
Function monitoring



KH8, KH6



m0063803



m0064803

KH8 Universal crank arm

Zinc-plated steel; suitable for damper spindles 10...18 mm diameter or 10...14 mm², slot width 8.2 mm.

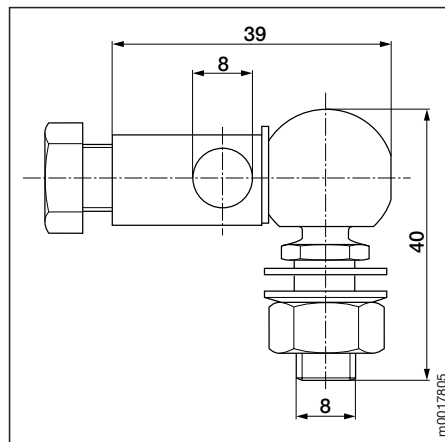
KH6 Universal crank arm

as Type KH8, but slot width 6.2 mm.

KG8



m0016712



m0017805

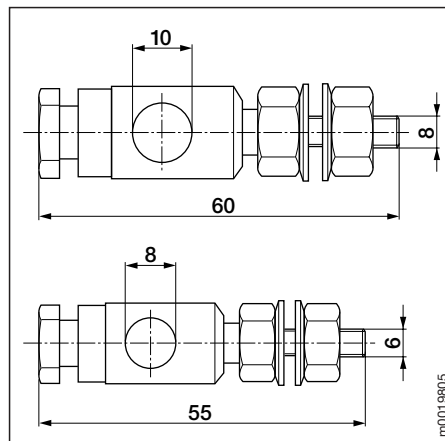
KG8 Ball joint

Zinc-plated steel; suitable for use with KH8 universal crank arms and round steel rod 8 mm diameter.

KG10, KG6



m0016707



m0019805

KG10 Ball joint

Zinc-plated steel; suitable for use with KH8 and KH6 universal crank arms and round steel rod 10 mm diameter.

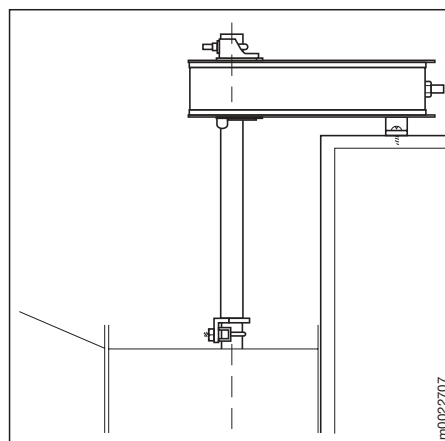
KG6 Ball joint

Zinc-plated steel; suitable for use with KH6 universal crank arms and round steel rod 8 mm diameter.

AV10-18



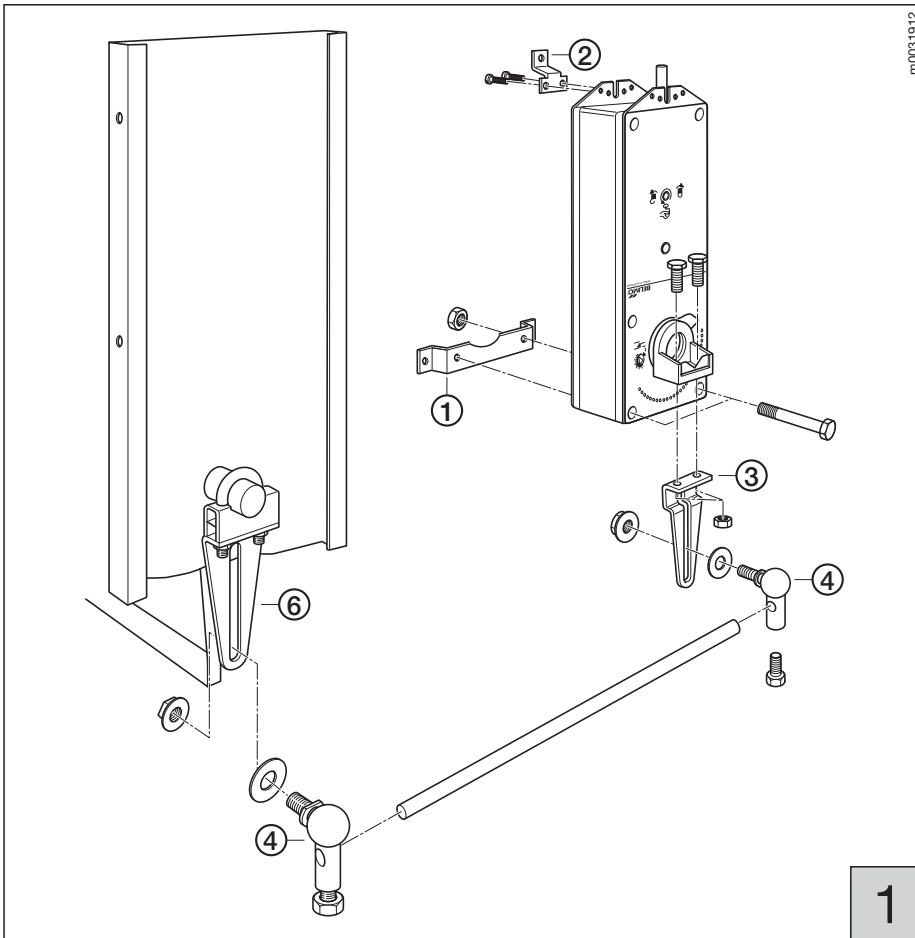
m0020707



m0020707

AV10-18 Universal spindle extension

approx. 240 mm long; for damper spindles 10...18 mm diameter or 10...14 mm².



1

Application

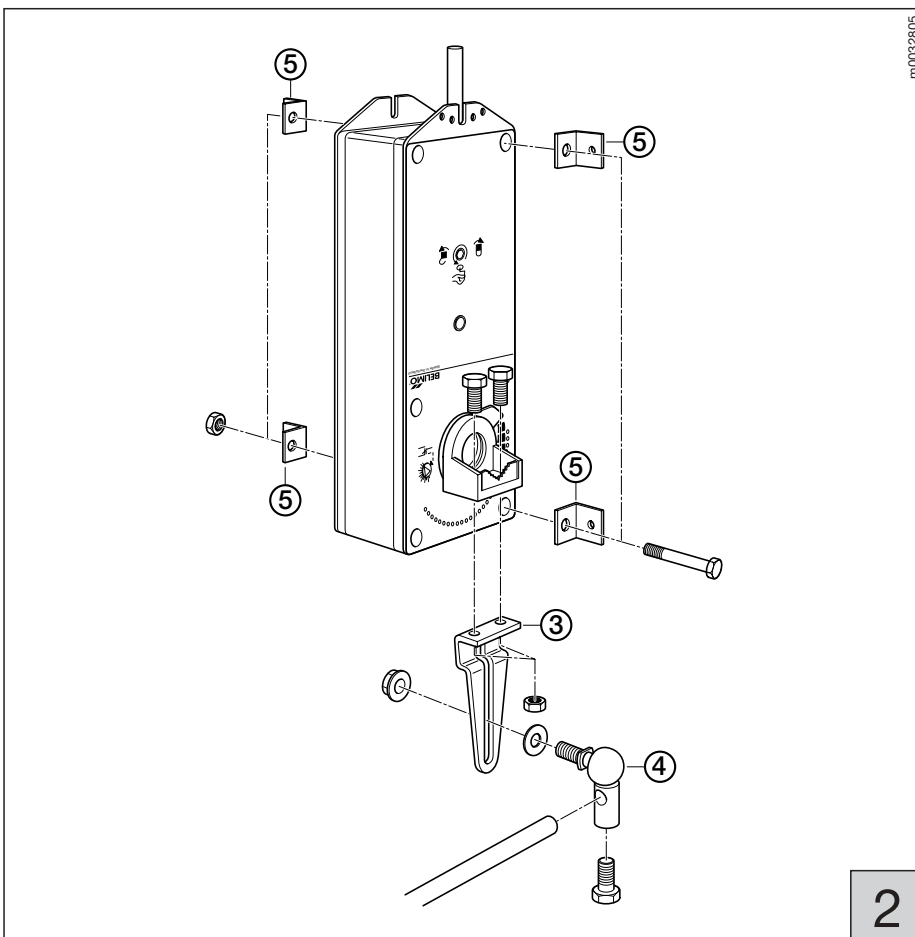
The ZG-AF mounting accessory is used for fitting this type of spring return actuator and for actuating safety dampers when it is impossible to mount the actuator directly on the damper spindle.

Kit specification

- ① – Front mounting bracket
- ② – Rear mounting bracket
- ③ – Crank arm AF
- ④ – 2 ball joints KG8
- ⑤ – 4 mounting brackets
 - 2 screws M6 x 16
 - 2 screws M6 x 65 with nuts
 - 5 self-tapping screws
- ⑥ – Universal crank arm:
order separately, not included with the ZG-AF mounting accessory.

Flat mounting (Fig. 1)

The spring return actuator is attached to the air duct by means of the two brackets.



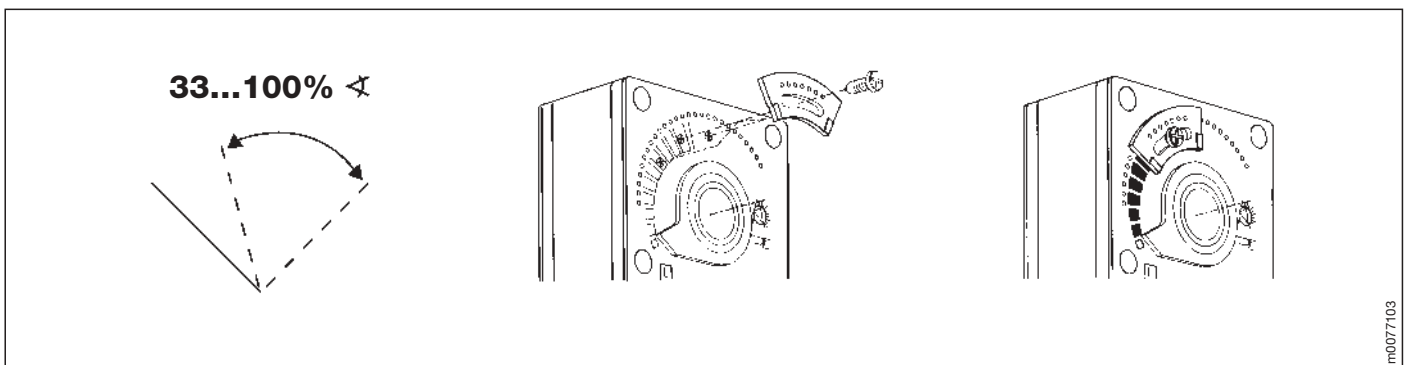
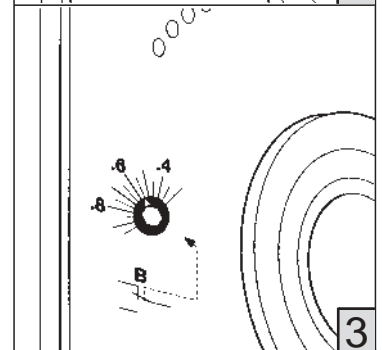
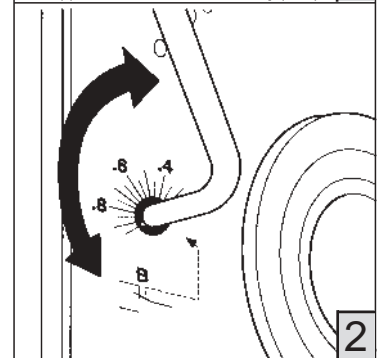
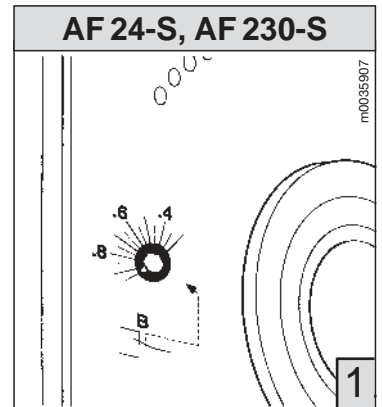
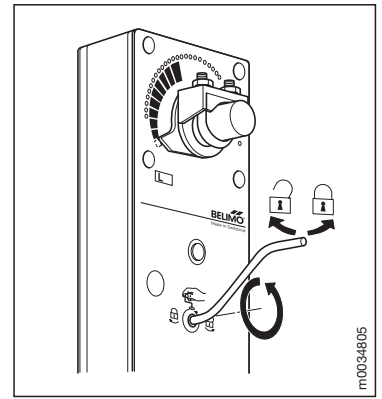
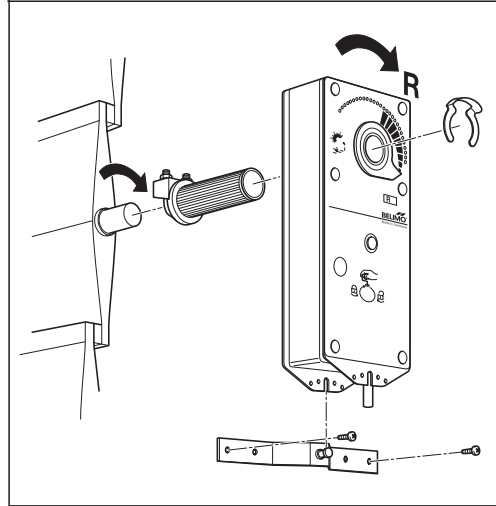
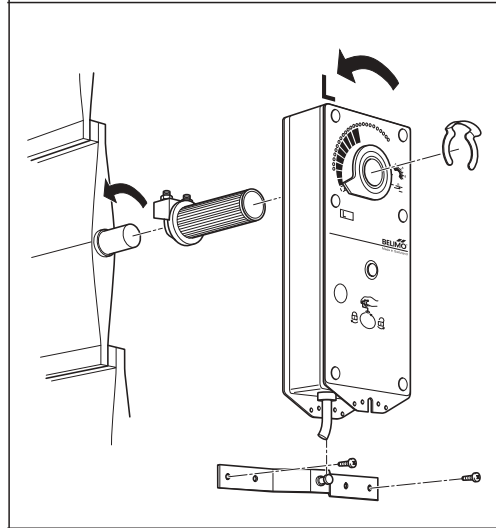
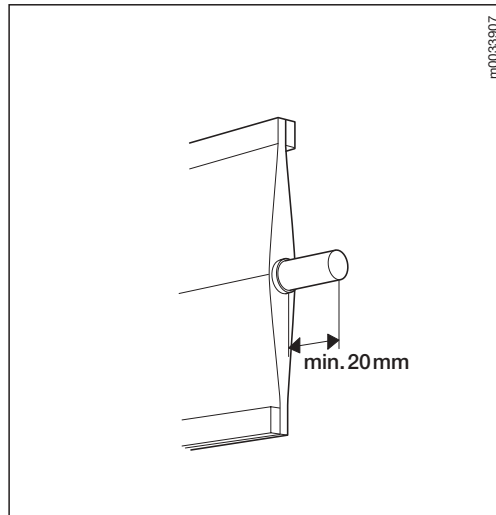
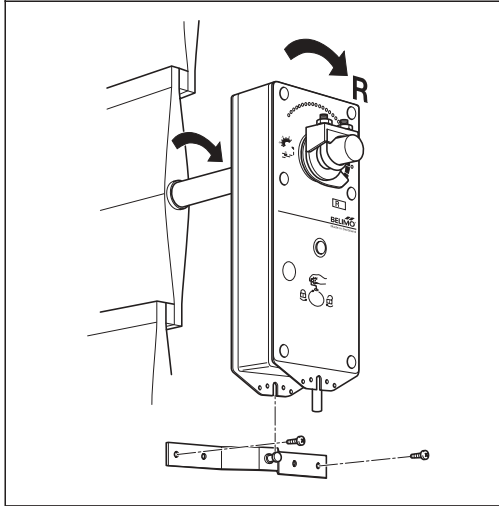
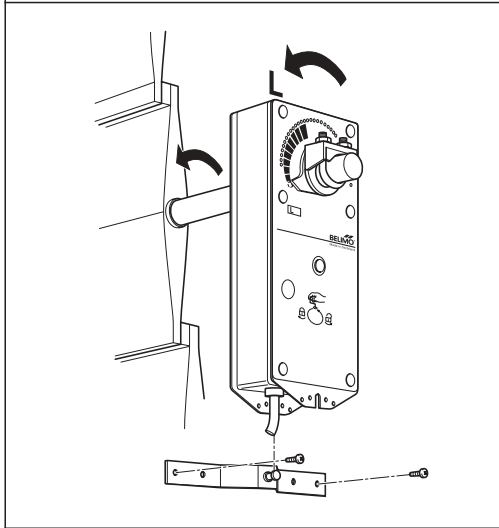
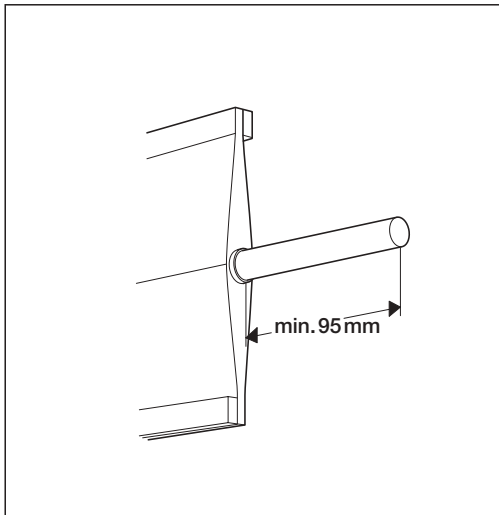
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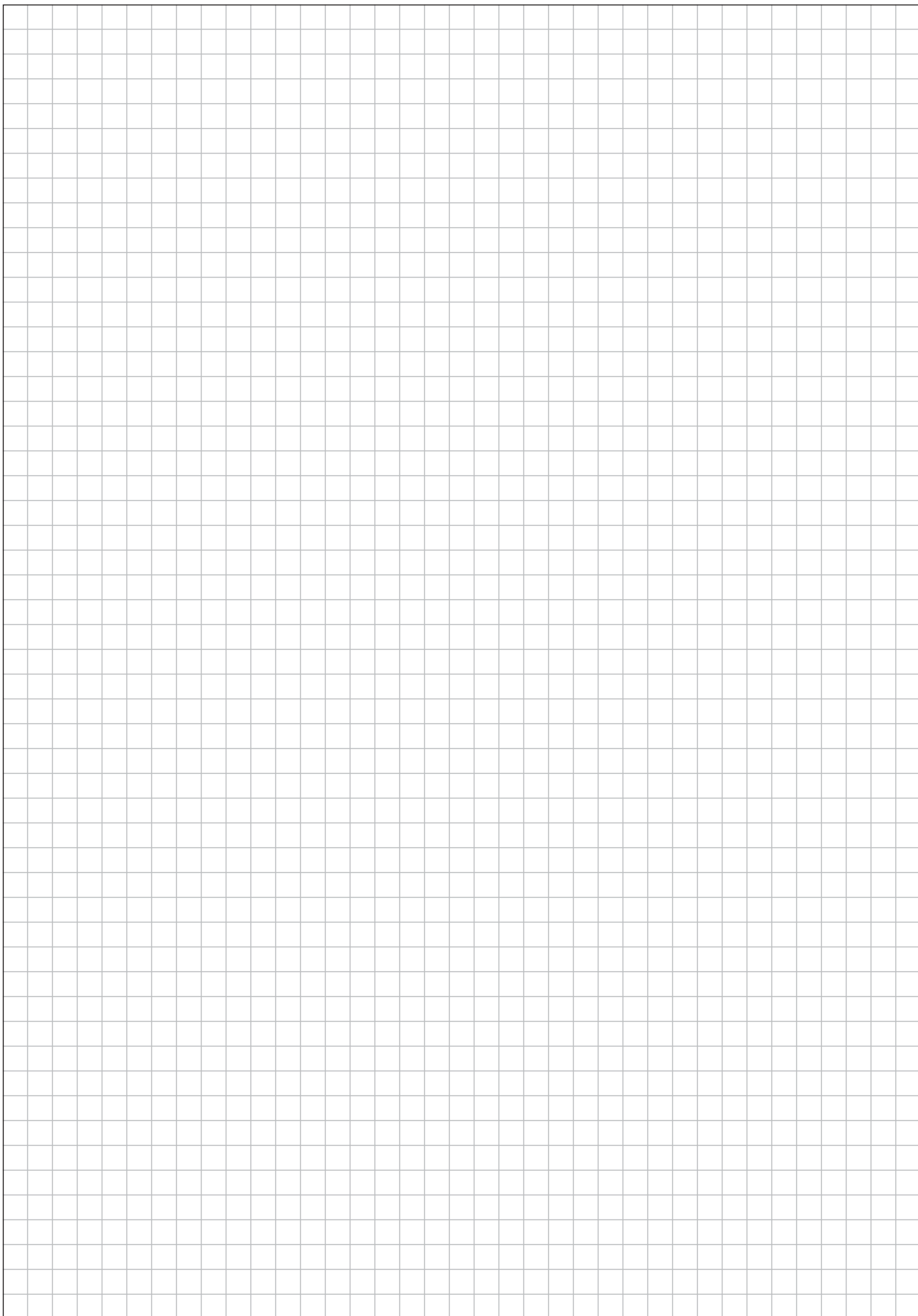
Side mounting (Fig. 2)

In this case four identical brackets are used for attaching the actuator instead of the other two brackets.

Linkage mounting (Figs. 1 and 2)

A slotted lever (KH8) is substituted for the U-bolt in the shaft adaptor of the spring return actuator. A second slotted lever is attached to the damper spindle. The rotation of the actuator is transmitted to the damper spindle by means of a connecting rod and two ball joints bolted to the slotted levers.





Air applications



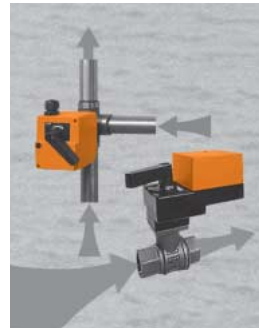
Standard actuators and spring-return actuators for air control dampers in HVAC systems



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