BELIMO

Technical data sheet LF230-S

Spring-return actuator with emergency control function for adjusting dampers in technical building installations

- **Air damper size up to approx. 0.8 m²**
- **Nominal torque 4 Nm**
- **Nominal voltage AC 230 V**
- **Control Open-close**
- **With integrated auxiliary switch**

Technical data

Electrical data	Nominal voltage	AC 230 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 198...264 V
	Power consumption in operation	5 W
	Power consumption in rest position	3 W
	Power consumption for wire sizing	7 VA
	Power consumption for wire sizing note	Imax 150 mA @ 10 ms
	Auxiliary switch	1 x SPDT, 0...100%
	Switching capacity auxiliary switch	1 mA...3 (0.5 inductive) A, AC 250 V
	Connection supply / control	Cable 1 m, 2 x 0.75 mm²
	Connection auxiliary switch	Cable 1 m, 3 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 4 Nm
	Torque spring return	Min. 4 Nm
	Direction of motion motor	Selectable by mounting L / R
	Direction of motion emergency control function	Selectable by mounting L / R
	Manual override	No
	Angle of rotation	Max. 95°
	Angle of rotation note	Adjustable 37...100% with integrated mechanical limitation
	Running time motor	40...75 s / 90°
	Running time emergency control position	<20 s / 90°
	Running time emergency setting position note	<20 s @ -20...50°C / <60 s @ -30°C
	Sound power level motor	50 dB(A)
	Spindle driver	Universal spindle clamp 8...16 mm
	Position indication	Mechanical
	Service life	Min. 60,000 emergency positions
Safety	Protection class IEC/EN	II Protective insulated
	Protection class auxiliary switch IEC/EN	II Protective insulated
	Degree of protection IEC/EN	IP54
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1.B
	Rated impulse voltage supply / control	4 kV
	Rated impulse voltage auxiliary switch	4 kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Non-operating temperature	-40...80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight approx.	1.8 kg

Safety notes

- The device must not be used outside the specified field of application, especially not 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 actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied 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.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section, the design, the installation site 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.

Product features

Mode of operation
The actuator moves the damper to the operating position at the same time as tensioning the return spring. The damper is turned back to the safety position by spring energy when the supply voltage is interrupted.

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

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

Adjustable angle of rotation
Adjustable angle of rotation with mechanical end stops.

Flexible signalization
With adjustable auxiliary switch (0 ... 100%)

Accessories

Electrical accessories

Description	Type
Auxiliary switch, 2 x SPDT	S2A-F
Feedback potentiometer, 200 Ohm, incl. installation accessories	P200A-F
Feedback potentiometer 1 kOhm, incl. installation accessories	P1000A-F

Mechanical accessories

Description	Type
Shaft extension 170 mm, for damper spindles Ø 6...20 mm	AV6-20
Shaft extension 250 mm, for damper spindles Ø 8...25 mm	AV8-25
Spindle clamp, for damper spindles Ø 16...20 mm	K6-1
Straight ball joint with M8, suitable for damper crank arms KH8	KG10A
Angled ball joint with M8, suitable for damper crank arms KH8	KG8
Damper crank arm, for damper spindles	KH8
Actuator arm, for damper spindles Ø 8...16 mm	KH-LF
Angle of rotation limiter, for LF with end stop	ZDB-LF
Additional shaft adapter 4-kt. 8x8mm for LF	ZF8-LF
Mounting kit for linkage operation LF..	ZG-LF1
Mounting kit for linkage operation LF.., suitable for damper spindles Ø 10...18 mm	ZG-LF3

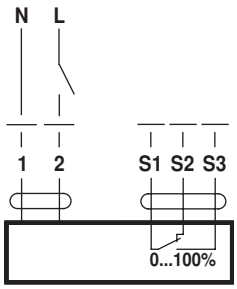
Electrical installation

Notes

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.

Wiring diagrams

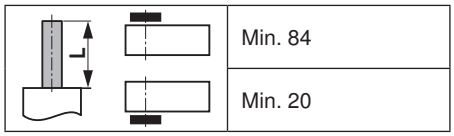
AC 230 V, open-close



Cable colours:
1 = blue
2 = brown
S1 = white
S2 = white
S3 = white

Dimensions [mm]

Spindle length

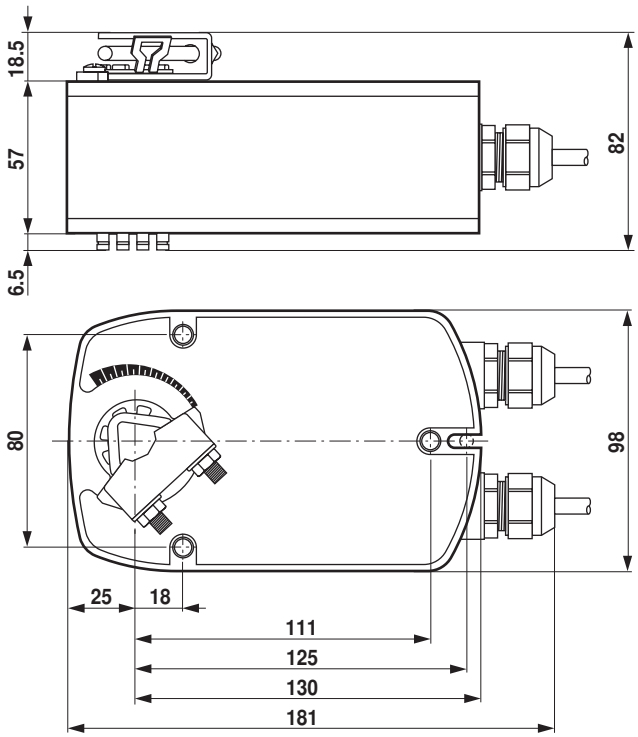


Min. 84
Min. 20

Clamping range

8...16	8...16

Dimensional drawings



Technical data sheet NFA-S2

Spring-return actuator with emergency control function for adjusting dampers in technical building installations

- **Air damper size up to approx. 2 m²**
- **Nominal torque 10 Nm**
- **Nominal voltage AC 24...240 V / DC 24...125 V**
- **Control Open-close**
- **with 2 integrated auxiliary switches**

Technical data

Electrical data	Nominal voltage	AC 24...240 V / DC 24...125 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...264 V / DC 21.6...137.5 V
	Power consumption in operation	6 W
	Power consumption in rest position	2.5 W
	Power consumption for wire sizing	9.5 VA
	Auxiliary switch	2 x SPDT, 1 x 10% / 1 x 11...90%
	Switching capacity auxiliary switch	1 mA...3 (0.5 inductive) A, AC 250 V
	Connection supply / control	Cable 1 m, 2 x 0.75 mm²
	Connection auxiliary switch	Cable 1 m, 6 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 10 Nm
	Torque spring return	Min. 10 Nm
	Direction of motion motor	Selectable by mounting L / R
	Direction of motion emergency control function	Selectable by mounting L / R
	Manual override	By means of hand crank and locking switch
	Angle of rotation	Max. 95°
	Angle of rotation note	adjustable starting at 33% in 2.5% steps (with mechanical end stop)
	Running time motor	75 s / 90°
	Running time emergency control position	<20 s / 90°
	Running time emergency setting position note	<20 s @ -20...50°C / <60 s @ -30°C
	Sound power level motor	45 dB(A)
	Spindle driver	Universal spindle clamp 10...25.4 mm
	Position indication	Mechanical
	Service life	Min. 60,000 emergency positions
Safety	Protection class IEC/EN	II Protective insulated
	Protection class UL	II Protective insulated
	Protection class auxiliary switch IEC/EN	II Protective insulated
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2014/30/EU
	Low voltage directive	CE according to 2014/35/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Certification UL	cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1:02
	Mode of operation	Type 1.AA.B
	Rated impulse voltage supply / control	4 kV
	Rated impulse voltage auxiliary switch	2.5 kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Non-operating temperature	-40...80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	2.3 kg

Safety notes

- The device must not be used outside the specified field of application, especially not 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 actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied 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.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section, the design, the installation site and the ventilation conditions must be observed.
- The two switches integrated in the actuator are to be operated either on power supply voltage or at safety extra-low voltage. The combination power supply voltage/ safety extra-low voltage is not permitted.
- 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

Mode of operation
The actuator is equipped with a universal voltage feed module that can utilise supply voltages of AC 24 ... 240V and DC 24 ... 125V.
The actuator moves the damper to the operating position at the same time as tensioning the return spring. The damper is turned back to the emergency position by spring force when the supply voltage is interrupted.

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

Manual override
By using the hand crank the damper can be actuated manually and engaged with the locking switch at any position. Unlocking is carried out manually or automatically by applying the operating voltage.

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

Adjustable angle of rotation
Adjustable angle of rotation with mechanical end stops.

Flexible signalization
The actuator has one auxiliary switch with a fixed setting and one adjustable auxiliary switch. They permit a 10% or 11...90% angle of rotation to be signaled.

Accessories

Electrical accessories

Description	Type
Auxiliary switch, 2 x SPDT	S2A-F
Feedback potentiometer, 200 Ohm, incl. installation accessories	P200A-F
Feedback potentiometer 1 kOhm, incl. installation accessories	P1000A-F

Mechanical accessories

Description	Type
Shaft extension 250 mm, for damper spindles Ø 8...25 mm	AV8-25
End stop indicator for NF..A / SF..A	IND-AFB
Spindle clamp set for NF..A/SF..A (1", 3/4", 1/2")	K7-2
Straight ball joint with M8, suitable for damper crank arms KH8	KG10A
Angled ball joint with M8, suitable for damper crank arms KH8	KG8
Damper crank arm, for damper spindles	KH8
Damper crank arm for NF..A / SF..A, for 3/4" spindles	KH-AFB
Form fit insert 10x10 mm, for spring return actuators NG	ZF10-NSA-F
Form fit insert 12x12 mm, for spring return actuators NG	ZF12-NSA-F
Form fit insert 16x16 mm, for spring return actuators NG	ZF16-NSA-F

Accessories

Description	Type
Damper crank arm, for spring return actuators NG	ZG-AFB
Base plate extensions for NF..A/SF..A	Z-SF

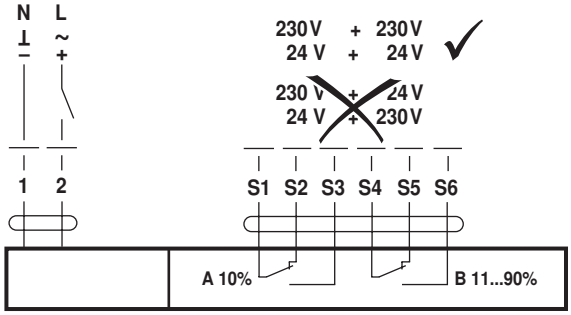
Electrical installation

Notes

- Caution: Power supply voltage!
- Parallel connection of other actuators possible. Observe the performance data.

Wiring diagrams

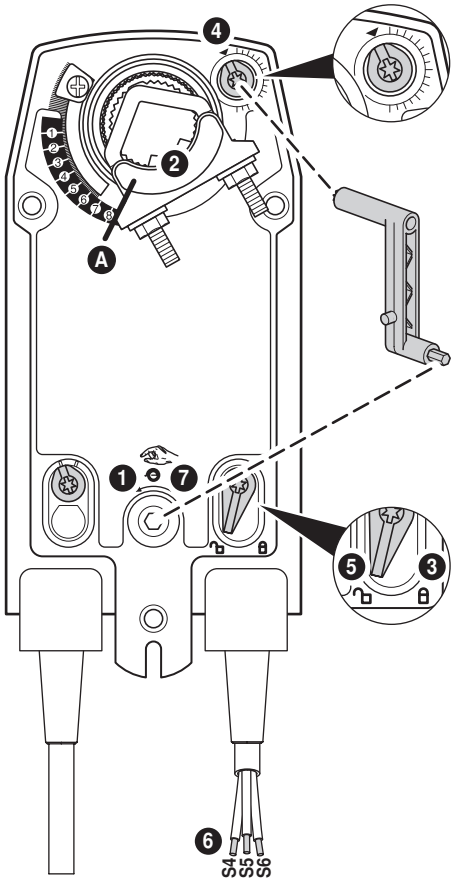
AC 24...240 V / DC 24...125 V, open-close



Cable colours:
1 = blue
2 = brown
S1 = violet
S2 = red
S3 = white
S4 = orange
S5 = pink
S6 = grey

Operating controls and indicators

Auxiliary switch settings



Note Perform settings on the actuator only in deenergised state.

1 Manual override
Turn the hand crank until the desired switching position is set.

2 Spindle clamp
Edge line **A** displays the desired switching position of the actuator on the scale.

3 Fasten the locking device
Turn the locking switch to the "Locked padlock" symbol.

4 Auxiliary switch
Turn rotary knob until the notch points to the arrow symbol.

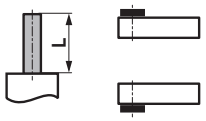
5 Unlock the locking device
Turn the locking switch to the "Unlocked padlock" symbol or unlock with the hand crank.

6 Cable
Connect continuity tester to S4 + S5 or to S4 + S6.

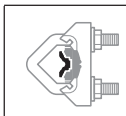
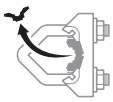
7 Manual override
Turn the hand crank until the desired switching position is set and check whether the continuity tester shows the switching point.

Dimensions [mm]

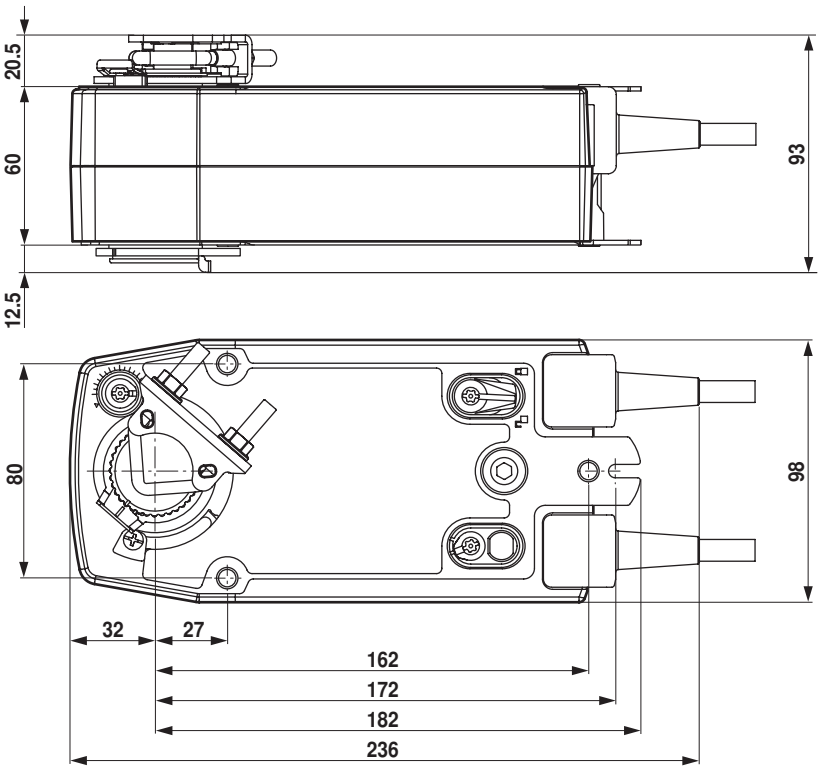
Spindle length

	Min. 85
	Min. 15

Clamping range

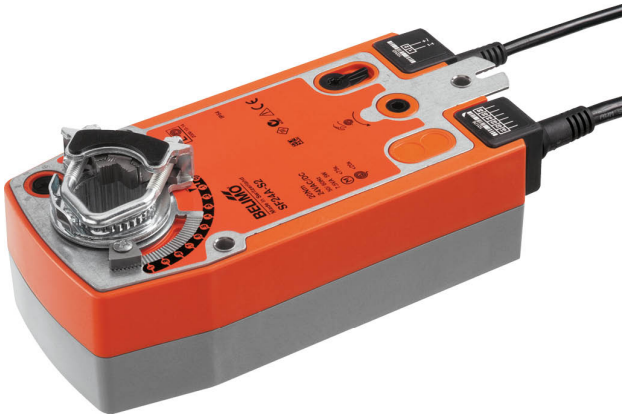
			
	10...22	10	14...25.4
			
	19...25.4	12...18	

Dimensional drawings



Rotary actuator fail-safe for adjusting dampers in technical building installations

- Air damper size up to approx. 4 m²
- Torque motor 20 Nm
- Nominal voltage AC 24...240 V / DC 24...125 V
- Control Open/close
- With 2 integrated auxiliary switches



Technical data

Electrical data	Nominal voltage	AC 24...240 V / DC 24...125 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...264 V / DC 21.6...137.5 V
	Power consumption in operation	7 W
	Power consumption in rest position	3.5 W
	Power consumption for wire sizing	18 VA
	Auxiliary switch	2x SPDT, 1x 10% / 1x 11...100%
	Switching capacity auxiliary switch	1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V
	Connection supply / control	Cable 1 m, 2x 0.75 mm²
	Connection auxiliary switch	Cable 1 m, 6x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	20 Nm
	Torque fail-safe	20 Nm
	Direction of motion motor	selectable by mounting L/R
	Direction of motion fail-safe	selectable by mounting L/R
	Manual override	by means of hand crank and locking switch
	Angle of rotation	Max. 95°
	Angle of rotation note	can be limited by adjustable mechanical end stop
	Running time motor	75 s / 90°
	Running time fail-safe	<20 s @ -20...50°C / <60 s @ -30°C
	Sound power level, motor	45 dB(A)
	Mechanical interface	Universal shaft clamp 10...25.4 mm
	Position indication	Mechanical
	Service life	Min. 60'000 fail-safe positions
Safety data	Protection class IEC/EN	II, reinforced insulation
	Protection class UL	II, reinforced insulation
	Protection class auxiliary switch IEC/EN	II, reinforced insulation
	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
	Low voltage directive	CE according to 2014/35/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.AA.B
	Rated impulse voltage supply / control	4 kV
	Rated impulse voltage auxiliary switch	2.5 kV
	Pollution degree	3
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	-30...50°C [-22...122°F]
	Storage temperature	-40...80°C [-40...176°F]
	Servicing	maintenance-free
Weight	Weight	2.3 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.
- Caution: Power supply voltage!
- 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.
- 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 two switches integrated in the actuator are to be operated either on power supply voltage or at safety extra-low voltage. The combination power supply voltage/safety extra-low voltage is not permitted.
- 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 equipped with a universal power supply module that can utilise supply voltages of AC 24...240 V and DC 24...125V.

The actuator moves the damper to the operating position at the same time as tensioning the return spring. The damper is turned back to the fail-safe position by spring force when the supply voltage is interrupted.

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

By using the hand crank the damper can be actuated manually and engaged with the locking switch at any position. Unlocking is carried out manually or automatically by applying the operating voltage.

Product features

Adjustable angle of rotation Adjustable angle of rotation with mechanical end stops.

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

Flexible signalling The actuator has one auxiliary switch with a fixed setting and one adjustable auxiliary switch. They permit a 10% or 11...100% angle of rotation to be signaled.

Accessories

Electrical accessories

Description	Type
Auxiliary switch 2x SPDT	S2A-F
Feedback potentiometer 1 kΩ	P1000A-F

Mechanical accessories

Description	Type
Shaft extension 240 mm ø20 mm for damper shaft ø8...22.7 mm	AV8-25
End stop indicator	IND-AFB
Shaft clamp reversible, for central mounting, for damper shafts ø12.7 / 19.0 / 25.4 mm	K7-2
Ball joint suitable for damper crank arm KH8 / KH10	KG10A
Ball joint suitable for damper crank arm KH8	KG8
Damper crank arm Slot width 8.2 mm, clamping range ø10...18 mm	KH8
Actuator arm, for 3/4" shafts, clamping range ø10...22 mm, Slot width 8.2 mm	KH-AFB
Form fit insert 10x10 mm, Multipack 20 pcs.	ZF10-NSA-F
Form fit insert 12x12 mm, Multipack 20 pcs.	ZF12-NSA-F
Form fit insert 15x15 mm, Multipack 20 pcs.	ZF15-NSA-F
Form fit insert 16x16 mm, Multipack 20 pcs.	ZF16-NSA-F
Mounting kit for linkage operation for flat and side installation	ZG-AFB
Baseplate extension	Z-SF
Anti-rotation mechanism 230 mm, Multipack 20 pcs.	Z-ARS230L
Hand crank 63 mm	ZKN2-B

Electrical installation

Caution: Power supply voltage!

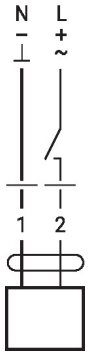
Parallel connection of other actuators possible. Observe the performance data.

Wire colours:
1 = blue
2 = brown
S1 = violet
S2 = red
S3 = white
S4 = orange
S5 = pink
S6 = grey

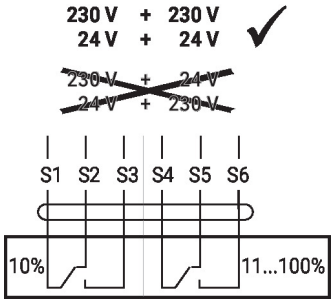
Electrical installation

Wiring diagrams

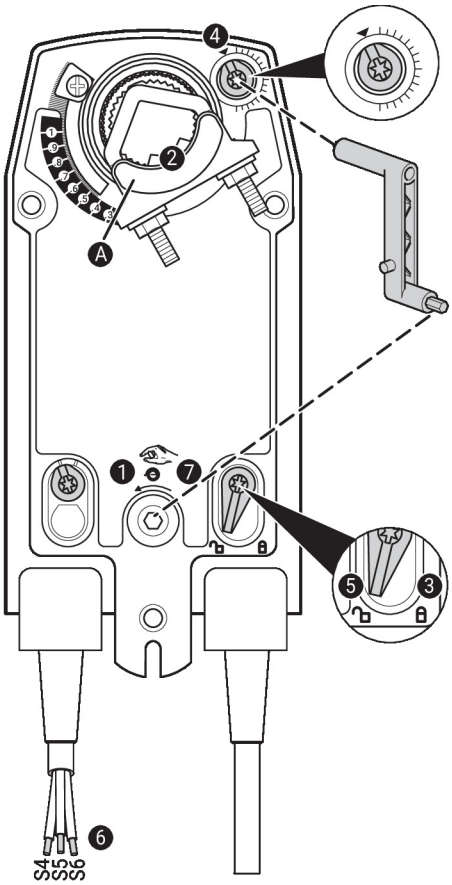
AC 24...240 V / DC 24...125 V, open/ close



Auxiliary switch



Operating controls and indicators



Auxiliary switch settings

Note: Perform settings on the actuator only in deenergised state.

For the auxiliary switch position settings, carry out points ❶ to ❼ successively.

❶ **Manual override**
Turn the hand crank until the desired switching position is set.

❷ **Shaft clamp**
Edge line Ⓐ displays the desired switching position of the actuator on the scale.

❸ **Fasten the locking device**
Turn the locking switch to the „Locked padlock“ symbol.

❹ **Auxiliary switch**
Turn rotary knob until the notch points to the arrow symbol.

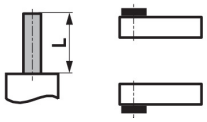
❺ **Unlock the locking device**
Turn the locking switch to the „Unlocked padlock“ symbol or unlock with the hand crank.

❻ **Cable**
Connect continuity tester to S4 + S5 or to S4 + S6.

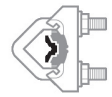
❼ **Manual override**
Turn the hand crank until the desired switching position is set and check whether the continuity tester shows the switching point.

Dimensions

Spindle length

	Min. 85
	Min. 15

Clamping range

	⌀	□	◇
	10...22	10	14...25.4
	⌀	□	
	19...25.4	12...18