

Damper Actuators

Spring Return LF ... series



Technical Databook



Spring return actuator	TF..	LF..	NF..	AF..	AFR..
ON/OFF	2 Nm	4 Nm	7 Nm	15Nm	15Nm
AC 24 V 50/60 Hz, DC 24 V	TF24	LF24-S	NF24**	AF24	AFR24
Auxiliary switch build-in 1 x SPDT	TF24-S	LF24-S			AFR24-S
Auxiliary switch build-in 2 x SPDT			NF24-S**	AF24-S	
AC 230 V 50/60 Hz	TF230	LF230	NF230	AF230	AFR230
Auxiliary switch build-in 1 x SPDT	TF230-S	LF230-S			AFR230-S
Auxiliary switch build-in 2 x SPDT			NF230-S	AF230-S	
3-point	TF24-3	LF24-3*			
Modulating					
AC 24 V 50/60 Hz, DC 24 V					
Control signal DC 2(0)..10V, feedback DC 2..10V	TF24-SR	LF24-SR	NF24-SR	AF24-SR	AFR24-SR
Running time -motor	<75s *	40-75 s *	~150 s	~150 s	
-spring return	<25s	~20 s	~ 60 s	~16 s	
Shaft diameter	6...12 mm	8...16 mm	10...20 mm	10...20 mm	10...20 mm
Sound power level -motor		Max. 50 dB(A)	Max. 55 dB(A)	Max. 45 dB(A)	Max. 45 dB(A)
-spring return		62 dB(A)	62 dB(A)	62 dB(A)	62 dB(A)
Electrical connection	Cable 1 m				
Direction of rotation	Selected by mounting L/R				
Angle of rotation	Max. 95°				
Mechanical limiter	YES				
Service life	>60,000 full cycles				
Position indicator	YES				
Degree of protection	IP42				IP54
EMC	CE according to 89/336/EEC				
Ambient temperature	-30°C ... +50°C				
Non-operation temperature	-40°C ... +80°C				

* LF24-3 and all -SR types are 150 s.

** NF24(-S) running time -motor 75 s, -spring return 60 s.

Note:

Using Belimo Damper actuators:

- The actuators listed in this catalogue are intended for the operation of air dampers in HVAC systems.
- The damper actuator is not allowed to be used outside the specified field of application, especially in aircraft.
- The enclosure of the actuator equipment may only be opened by the manufacturer. It contains no components which the user can replace or repair.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

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 condition.

Spring return actuators, Open/Close

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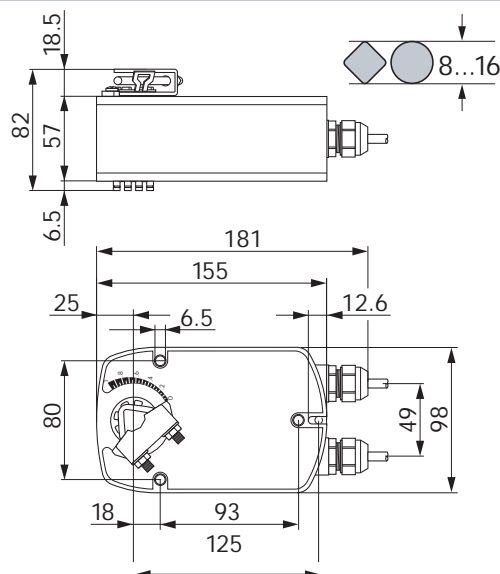


- For the operation of air dampers that perform safety functions
- Torque 4 Nm
- Nominal voltage AC/DC 24 V
- 1 wire control
- Integrated auxiliary switch(LF24-S)

Technical data

Electrical data	Nominal voltage	AC 24 V 50/60 Hz, DC 24 V	
	Power supply range	AC 19.2 ... 28.8 V DC 21.6 ... 28.8 V	
	Power consumption	5 W @ running / 2.5 W @ holding	
	Wire/transformer sizing	7 VA	
	Max.peak current	max 5.8 A @ 5 ms	
	Auxiliary switch LF24-S	1 x SPDT 6 (1.5) A, AC 250 V <input type="checkbox"/> 0 ... 100% adjustable	
Functional data	Connection cable - Motor - Auxiliary switch LF24-S	Cable 1 m, 2 x 0.75 mm ² Cable 1 m, 3 x 0.75 mm ²	
	Torque - Motor - Spring return	4 Nm @ nominal voltage 4 Nm	
	Direction of rotation	Selectable by L/R switch	
	Angle of rotation	Max. 95° 37...100% ↺ adjustable by mechanical stops	
	Running time - Motor - Spring return	40...75 s (0...4 Nm) Approx. 20 s @ -20...50°C/max. 60 s @ -30°C	
	Sound power level	Motor max. 50 dB (A), Spring approx. 62 dB (A)	
	Position indication	Mechanical	
	Service life	> 60,000 full cycles	
	Working conditions	Protection class	III (safety extra-low voltage)
		Degree of protection	IP54
EMC		CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC	
Ambient temperature range		-30 ... +50°C	
Non-operation temperature		-40 ... +80°C	
Humidity test		95% RH, non condensing (EN 60730-1)	
Dimensions / weight	Maintenance	Maintenance free	
	Dimensions (L x W x H)	181 x 98 x 82 mm	
	Shaft length	Clamp up Clamp down	Min. 84 mm Min. 20 mm
	Shaft diameter		8 ... 16 mm
	Weight		1400 g

Dimensions [mm]



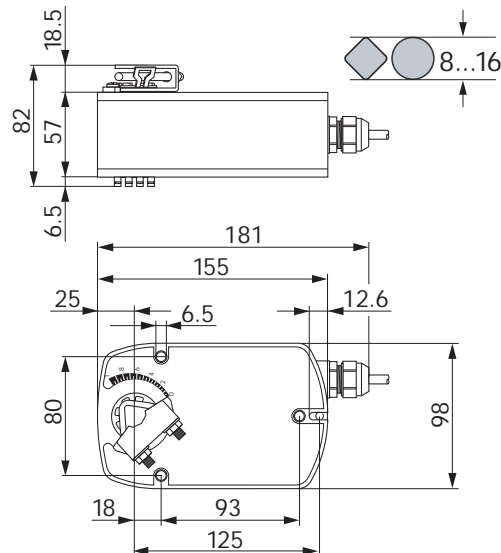
- For the operation of air dampers that perform safety functions
- Torque 4 Nm
- Nominal voltage AC/DC 24 V
- Control: 3-point



Technical data

Electrical data	Nominal voltage	AC 24 V 50/60 Hz, DC 24 V	
	Power supply range	AC 19.2 ... 28.8 V, DC 21.6 ... 28.8 V	
	Power consumption	2.5 W @ running / 1 W @ holding	
	Wire/transformer sizing	5 VA	
	Max. peak current	5.8 A @ 5 ms	
	Connection cable	Cable 1 m, 4 x 0.75 mm ²	
Functional data	Torque - Motor	4 Nm @ nominal voltage	
	- Spring return	4 Nm	
	Direction of rotation - Motor	Selectable by L/R switch	
	- Spring return	Selectable by mounting L/R	
	Angle of rotation	Max. 95° 37...100% ↔ adjustable by mechanical stops	
	Running time - Motor	<150 s	
	- Spring return	Approx. 20 s @ -20... 50°C/max. 60 s @ -30°C	
Working conditions	Sound power level	Motor max. 30 dB (A), Spring approx. 62 dB (A)	
	Position indication	Mechanical	
	Service life	> 60,000 full cycles	
	Protection class	III (safety extra-low voltage)	
	Degree of protection	IP54	
	EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC	
	Ambient temperature range	-30 ... +50°C	
	Non-operation temperature	-40 ... +80°C	
	Humidity test	EN 60335-1	
	Maintenance	Maintenance free	
Dimensions / weight	Dimensions (L x W x H)	181 x 98 x 82 mm	
	Shaft length	Clamp up Clamp down	
			Min. 84 mm Min. 20 mm
	Shaft diameter		⌀ 8 ... 16 mm
	Weight		1400 g

Dimensions [mm]



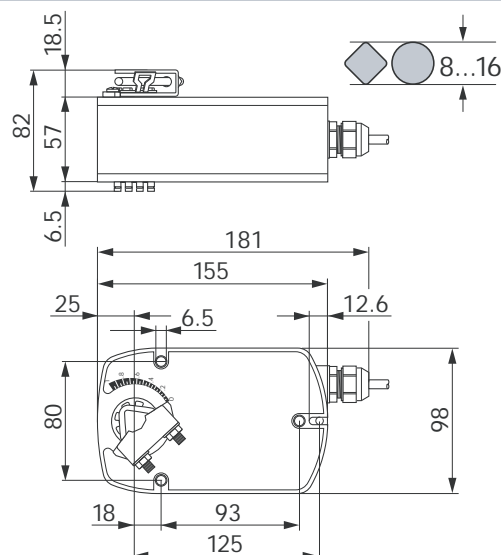


- For the operation of air dampers that perform safety functions
- Torque 4 Nm
- Nominal voltage AC/DC 24 V
- Control signal DC 2(0) ... 10 V
- Position feedback DC 2 ... 10 V

Technical data

Electrical data	Nominal voltage	AC 24 V 50/60 Hz, DC 24 V	
	Power supply range	AC 19.2 ... 28.8 V DC 21.6 ... 28.8 V	
	Power consumption	2.5 W @ running / 1 W @ holding	
	Wire/transformer sizing	5 VA	
Functional data	Max. peak current	5.8 A @ 5 ms	
	Connection cable	Cable 1 m, 4 x 0.75 mm ²	
	Torque - Motor	4 Nm @ nominal voltage	
	- Spring return	4 Nm	
	Control signal	2(0) ... 10 VDC, input impedance 100 kΩ	
	Operating range	2 ... 10 VDC for 0...100% ◀	
	Measurement voltage	2 ... 10 VDC, max. 0.7 mA for 0...100% ◀	
	Direction of rotation	Selectable by L/R switch	
	Angle of rotation	Max. 95° 37...100% ◀ adjustable by mechanical stops	
	Running time - Motor	<150 s	
- Spring return	Approx. 20 s @ -20... 50°C/max. 60 s @ -30°C		
Working conditions	Sound power level	Motor max. 30 dB (A), Spring approx. 62 dB (A)	
	Position indication	Mechanical	
	Service life	> 60,000 full cycles	
	Protection class	III (safety extra-low voltage)	
	Degree of protection	IP54	
	EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC	
	Ambient temperature range	-30 ... +50°C	
	Non-operation temperature	-40 ... +80°C	
Dimensions / weight	Humidity test	95% RH, non condensing (EN 60335-1)	
	Maintenance	Maintenance free	
	Dimensions (L x W x H)	181 x 98 x 82 mm	
	Shaft length	Clamp up Clamp down	Min. 84 mm Min. 20 mm
	Shaft diameter	⌀ 8 ... 16 mm	
	Weight	1400 g	

Dimensions [mm]



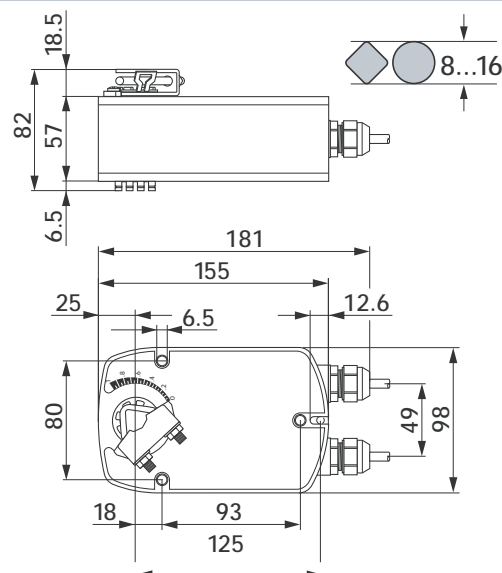
- For the operation of air dampers that perform safety functions
- Torque 4 Nm
- Nominal voltage AC 230 V
- 1 wire control
- Integrated auxiliary switch(LF230-S)



Technical data

Electrical data	Nominal voltage	AC 230 V, 50/60 Hz	
	Nominal voltage range	AC 198...264 V	
	Power consumption	5 W @ running / 3 W @ holding	
	Wire/transformer sizing	7 VA	
	Max. peak current	150 mA @ 10 ms	
	Auxiliary switch LF230-S	1 x SPDT, 6 (1.5) A, AC 250 V <input type="checkbox"/>	
Functional data	0 ... 100% adjustable		
	Connection cable - Motor	Cable 1 m, 2 x 0.75 mm ²	
	- Auxiliary switch LF230-S	Cable 1 m, 3 x 0.75 mm ²	
	Torque - Motor	4 Nm @ nominal voltage	
	- Spring return	4 Nm	
	Direction of rotation	Selectable by L/R switch	
	Angle of rotation	Max. 95°	
	37...100%↔ adjustable by mechanical stops		
	Running time - Motor	40...75 s (0...4 Nm)	
	- Spring return	Approx. 20 s @ -20...50°C/max. 60 s @ -30°C	
Working conditions	Sound power level	Motor max. 50 dB (A), Spring approx. 62 dB (A)	
	Position indication	Mechanical	
	Service life	> 60,000 full cycles	
	Protection class	II (all insulated)	
	Degree of protection	IP54	
	EMC	CE according to 89/336/EEC, 92/31/EEC, 93/68/EEC	
	Low voltage directive	CE according to 73/23/EEC	
	Ambient temperature range	-30 ... +50°C	
	Non-operation temperature	-40 ... +80°C	
	Humidity test	95% RH, non condensing (EN 60730-1)	
Dimensions / weight	Maintenance	Maintenance free	
	Dimensions (L x W x H)	181 x 98 x 82 mm	
	Shaft length	Clamp up	Min. 84 mm
		Clamp down	Min. 20 mm
	Shaft diameter	8 ... 16 mm	
	Weight	Approx. 1550 g	

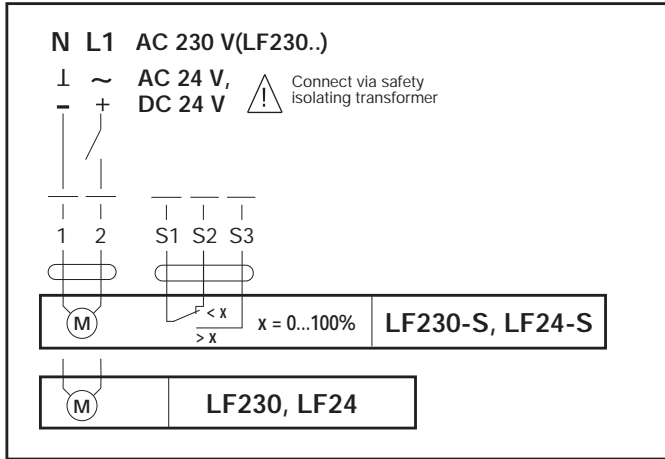
Dimensions [mm]



Wiring diagram: LF..

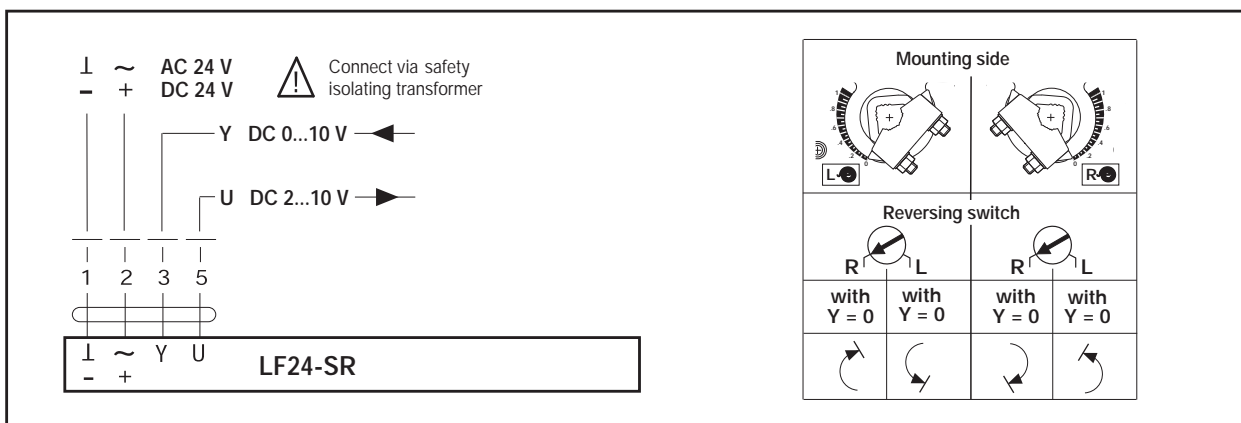
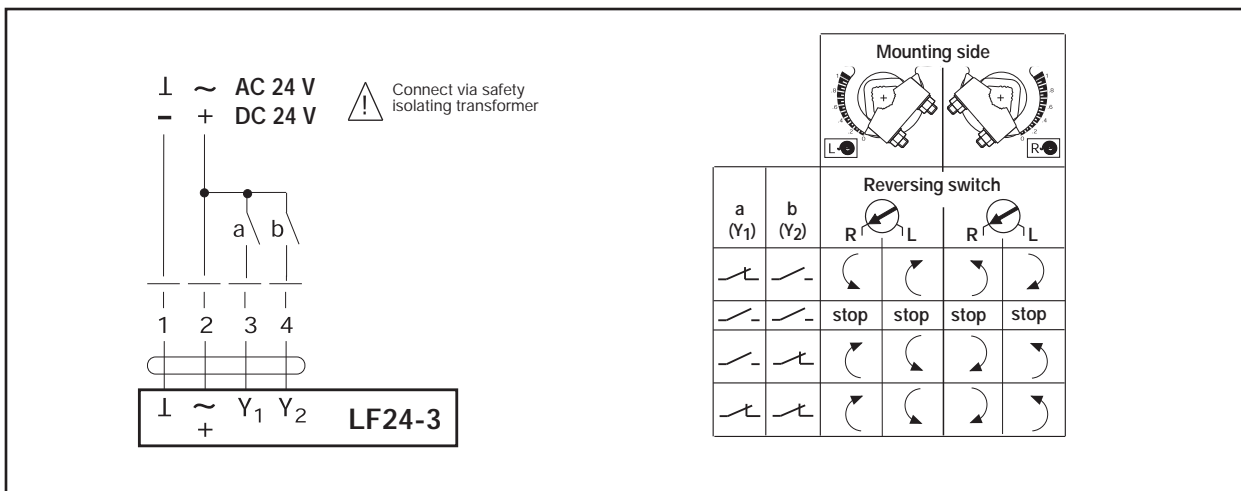
Notes:

- Parallel connection of several actuators is possible.
- Power consumption must be observed.



Notes:

- Connection via safety isolating transformer!
- Parallel connection of several actuators is possible.
- Power consumption must be observed.



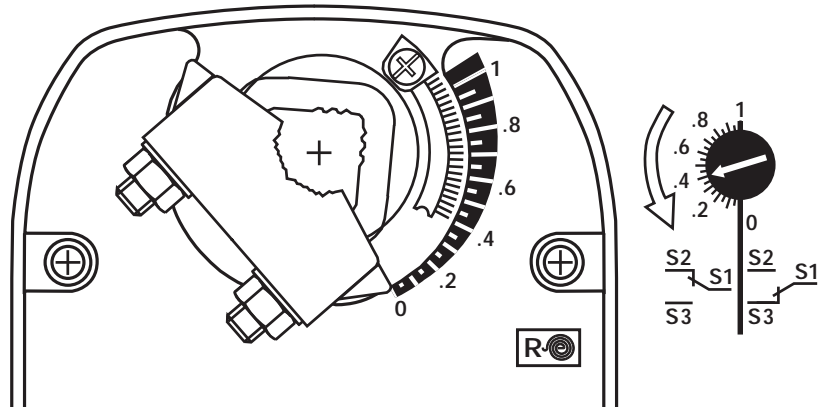
Auxiliary switch adjustment for Spring Return actuators

LF..-S (Mounting side R)

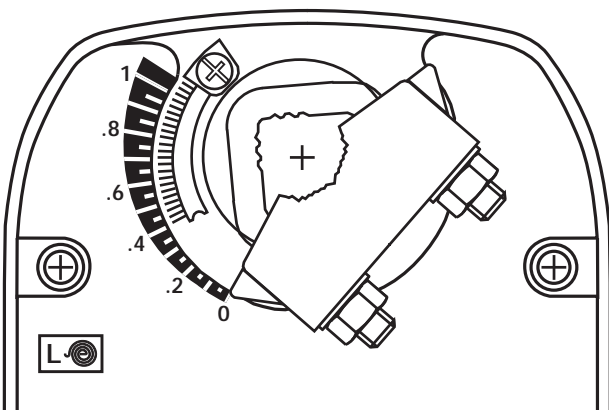
Starting point: Actuator in safe position

Procedure

- Turn the knob of the auxiliary switch until the tip of the arrow is pointing to the required switching position (see right).
Example: Switching point setting = .4 corresponds to 40% angle of rotation.
- When the actuator runs to the operating position (ccw ↺), the switch knob will also rotate counter-clockwise (ccw ↺) and the auxiliary switch will operate as the tip of the arrow passes the scale zero (S1-S3 linked).



LF..-S (Mounting side L)



Starting point: Actuator in safe position

Procedure

- Turn the knob of the auxiliary switch until the tip of the arrow is pointing to the required switching position (see left).
Example: Switching point setting = .4 corresponds to 40% angle of rotation.
- When the actuator runs to the operating position (cw ↻), the switch knob will also rotate clockwise (cw ↻) and the auxiliary switch will operate as the tip of the arrow passes the scale zero (S1-S3 linked).

. s e g n a a h c l a c i n h c e t o t t c e j b u s

K6-1



K6-1

Spindle clamp

Suitable for damper spindles 16...20 mm diameter.



The spindle clamp is secured to the actuator by means of a circlip.

KH-LF (Application example see page 14)



KH-LF

Crank arm with slot width 8.2 mm

Suitable for damper spindles 8...16 mm diameter.



The crank arm is secured to the actuator by means of a circlip.

ZDB-LF (Application example see page 13)



KH-LF1

Crank arm with slot width 8.2 mm

Suitable for damper spindles 16...20 mm diameter.



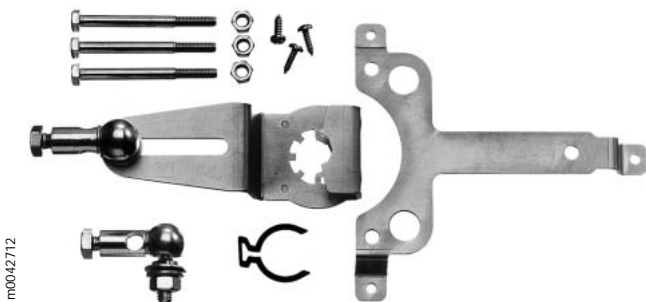
The crank arm is secured to the actuator by means of a circlip.

ZDB-LF

Angle of rotation limiting and pointer

The pointer is secured to the actuator by means of a circlip.

ZG-LF1 (Application example see page 14, fig. 1)



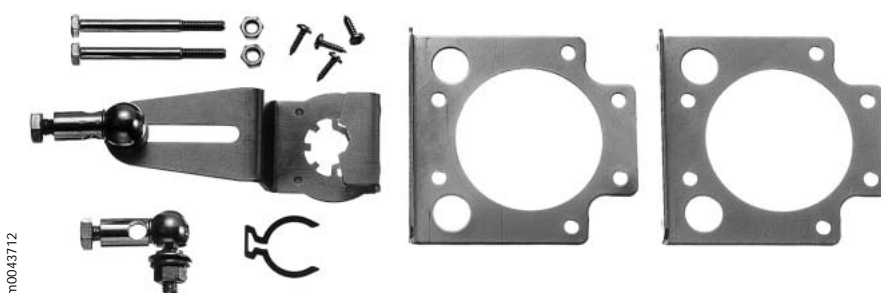
ZG-LF1

Damper linkage kit for flat mounting (with 2 ball joints KG8)

ZG-LF2

Damper linkage kit for flat mounting (without ball joints KG8)

ZG-LF3 (Application example see page 14, fig. 2)



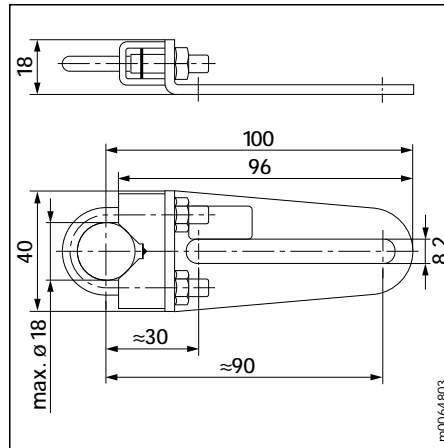
ZG-LF3

Damper linkage kit for side mounting (with 2 ball joints KG8)

KH8



m0063803



m0064803

KH8

Universal crank arm

Zinc-plated steel; suitable for damper spindles

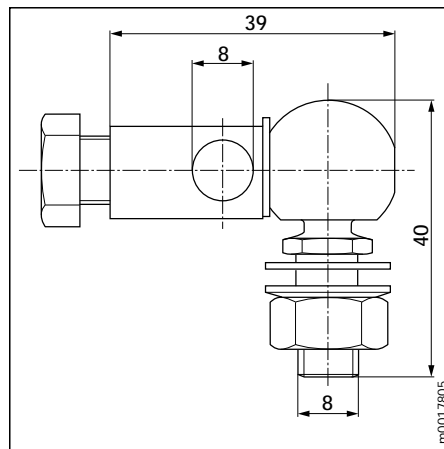
Ø 10...18 mm or

□ 10...14 mm, slot width 8.2 mm.

KG8



m0016712



m0017805

KG8

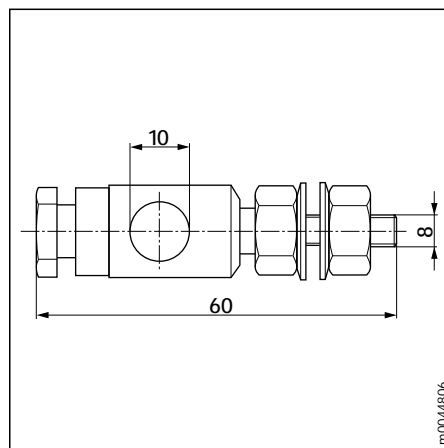
Ball joint

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

KG10



m0018707



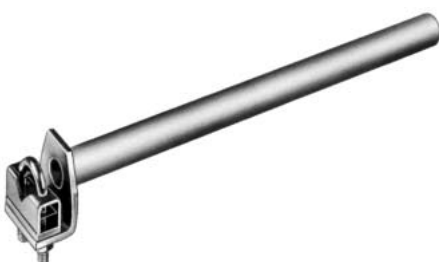
m004806

KG10

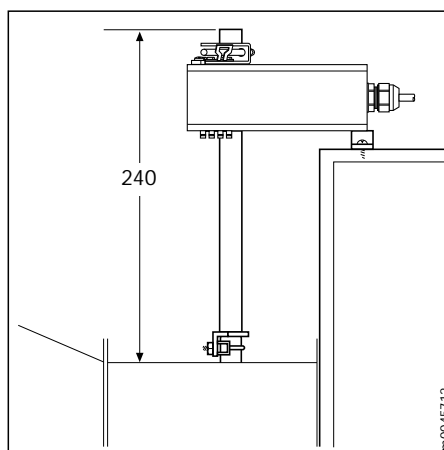
Ball joint

Zinc-plated steel; suitable for use with KH8 universal crank arm and round steel rod Ø 10 mm.

AV10-18



m0020707



m0045712

AV10-18

Universal spindle extension

Suitable for damper spindles 10...18 mm diameter.



If an AV10-18 is to be used in conjunction with an LF..., the actuator must be fitted with a K6-1 spindle clamp.

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