

# Damper Actuators

Spring Return



## *Technical Databook*

Ver. 2



Product Naming	L	M	U	24	-SR
<b>Torque</b>					
Non-Spring Return					
40Nm			<b>G</b>		
20Nm			<b>S</b>		
10Nm			<b>N</b>		
5Nm			<b>L</b>		
2Nm			<b>C</b>		
Spring Return					
15Nm			<b>A</b>		
7Nm			<b>N</b>		
4Nm			<b>L</b>		
2Nm			<b>T</b>		
Non-Spring Return					<b>M</b>
Spring Return					<b>F</b>
<b>New Generation Non-Spring Return For Asia Pacific</b>					
<b>Power Supply</b>					
AC/DC 24 V				<b>24</b>	
AC 100-240 V(AC 230 for Spring Return)				<b>230</b>	
Non-Spring Return					
ON/OFF, 3-point					<b>Blank</b>
ON/OFF ( only for CMU230.. )					<b>-RES</b>
Modulating DC 2(0)...10 V Control					<b>-SR</b>
Auxiliary Switch					<b>-S</b>
Form fit					<b>-F</b>
Terminal Connection					<b>-T</b>
Spring Return					
ON/OFF					<b>Blank</b>
Modulating DC 2(0)-10 V Control					<b>-SR</b>
3-point					<b>-3</b>
Auxiliary Switch					<b>-S</b>

For customizing type of Non-Spring Return actuators please contact Belimo sales near you.



**Product overview**

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**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 contain selectrical 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.

New Generation Non-spring return actuator	CMU..	LMU..	NMU..	SMU..	GMU..
Open/Close, 3-point AC 24 V 50/60 Hz, DC 24 V	<b>2 Nm</b> CMU24(-F8/-F10)(-T)	<b>5 Nm</b> LMU24(-F/-T)	<b>10 Nm</b> NMU24(-F/-T)	<b>20 Nm</b> SMU24(-F/-T)	<b>40 Nm</b> GMU24*
Auxiliary switch build-in 1 SPDT		LMU24-S	NMU24-S	SMU24-S	
AC 100..240 V 50/60 Hz	CMU230(-F8/-F10)	LMU230	NMU230	SMU230	GMU230*
AC 230 V 50 Hz (Open/Close)	CMU230(-F8/-F10)-RES*				
Auxiliary switch build-in 1 SPDT		LMU230-S	NMU230-S	SMU230-S	
Modulating Control signal DC 2(0)..10 V, feedback DC 2...10 V					
AC 24 V 50/60 Hz, DC 24 V	CMU24-SR-R**	LMU24-SR	NMU24-SR	SMU24-SR	GMU24-SR
AC 100..240 V 50/60 Hz		LMU230SR	NMU230SR	SMU230SR	
Running time	75s	150s			
Shaft diameter	6...12.7mm	6... 20mm	8... 26mm	10... 20mm	14... 26mm
Sound power level	Max. 35 dB(A)	Max. 35 dB(A)	Max. 35 dB(A)	Max. 48 dB(A)	Max. 48 dB(A)
Manual override	Disengaging the gearing latch by means of a pushbutton, self-resetting				
Electrical connection	Cable 1 m (-T: Terminal)				
Direction of rotation	Selected by switch				
Angle of rotation	Max. 95°, can be limited at both ends with mechanical adjustable end stops				
Position indication	Mechanical, plug-on				
Degree of protection	IP54 in any direction (-T: IP20)				
EMC	CE according to 89/336/EEC				
Ambient temperature	- 30°C... + 50°C				
Non-operation temperature	- 40°C... + 80°C				
Humidity test	95% RH, non condensing (to EN 60730-1)				

\* Only Open/Close, no 3-point.

\*\* CMU24-SR-R: control signal 2(0) V at the right side, and the left side is available if request.

Spring return actuator	TF..	LF..	NF..	AF..	AFR..
Open/Close AC 24 V 50/60 Hz, DC 24 V	<b>2 Nm</b> TF24	<b>4 Nm</b> LF24-S	<b>7 Nm</b> NF24**	<b>15Nm</b> AF24	<b>15Nm</b> AFR24
Auxiliary switch build-in 1 SPDT	TF24-S	LF24-S			AFR24-S
Auxiliary switch build-in 2 SPDT			NF24-S**	AF24-S	
AC 230 V 50/60 Hz	TF230	LF230	NF230	AF230	AFR230
Auxiliary switch build-in 1 SPDT	TF230-S	LF230-S			AFR230-S
Auxiliary switch build-in 2 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 *	~75s		~150s
-spring return	< 25s	~20s	~ 60s		~16s
Shaft diameter	6... 12mm	8... 16mm	10... 20mm	10... 20mm	10... 20mm
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 1m				
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				
Humidity test	95% RH, non condensing (to EN 60730-1)				to EN 60335-1

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

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

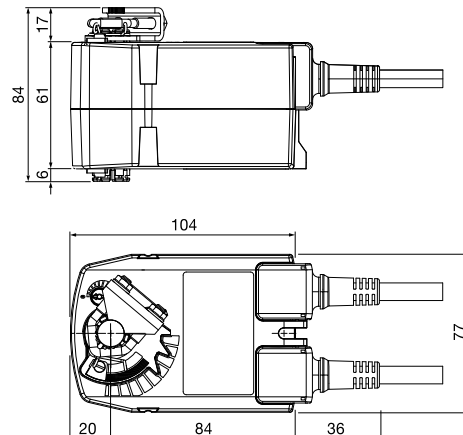


- For operation of air control dampers that perform safety function.
- Torque 2 Nm
- Nominal voltage AC/DC 24 V
- Control: Open/Close
- Integrated auxiliary switch TF24-S

Technical data

<b>Electrical data</b>	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 / 1.5 W @ holding	
	Wire/transformer sizing	5 VA	
	Auxiliary switch TF24-S	1 SPDT, 1 mA ... 3 (0.5) A, AC 250 V $\square$ , adjustable	
	Connection: Motor Auxiliary switch TF24-S	Cable 1m, 2 x 0.75mm <sup>2</sup> Cable 1m, 3 x 0.75mm <sup>2</sup>	
<b>Functional data</b>	Torque - Motor - Spring return	2 Nm @ nominal voltage 2 Nm	
	Direction of rotation	Selectable by mounting L/R	
	Angle of rotation	Max. 95°, 37...100% $\curvearrowright$ adjustable by mechanical stops	
	Running time - Motor - Spring return	75 s 25 s @ -20... 50°C/max. 60s @ -30°C	
	Sound power level	Motor max. 50 dB (A), Spring approx. 62 dB (A)	
	Position indication	Mechanical	
	Service life	> 60,000 full cycles	
	<b>Working conditions</b>	Protection class	III (safety extra-low voltage)
Degree of protection		IP42 in any direction	
EMC		CE according to 89/336/EEC	
Mode of operation		Type 1. AA to EN 60730-1	
Ambient temperature range		-30 ... + 50°C	
Non-operation temperature		-40 ... + 80°C	
Humidity test		95% RH, non condensing (EN 60730-1)	
Maintenance		Maintenance free	
<b>Dimensions / weight</b>	Dimensions (L x W x H)	140 x 77 x 84mm	
	Shaft length	Clamp up Clamp down	Min. 84mm Min. 20mm
	Shaft diameter		$\varnothing$ I $\square$ 6 ... 12mm
	Weight		Approx. 600g

Dimensions [mm]



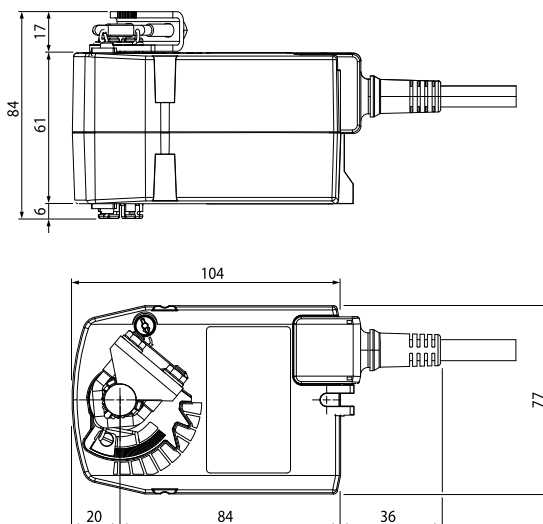
- For operation of air control dampers that perform safety function.
- Torque 2 Nm
- Nominal voltage AC 24 V
- Control: 3-point



## Technical data

<b>Electrical data</b>	Nominal voltage	AC 24 V 50/60 Hz
	Nominal supply range	AC 19.2 ... 28.8 V
	Power consumption	2.5 W @ running / 1 W @ holding
	Wire/transformer sizing	4 VA
<b>Functional data</b>	Connection	Cable 1m, 4 x 0.75mm
	Torque - Motor	2 Nm @ nominal voltage
	- Spring return	2 Nm
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95°, 37...100% ↯ adjustable by mechanical stops
	Running time - Motor	150s (0...2 Nm)
	- Spring return	25s @ -20... 50°C/max. 60s @ -30°C
	Sound power level	Motor max. 35 dB (A), Spring approx. 62 dB (A)
<b>Working conditions</b>	Position indication	Mechanical
	Service life	> 60,000 full cycles
	Protection class	III (safety extra-low voltage)
	Degree of protection	IP42 in any direction
	EMC	CE according to 89/336/EEC
	Mode of operation	Type 1. AA to EN 60730-1
	Ambient temperature	-30 ... + 50°C
	Non-operation temperature	-40 ... + 80°C
	Humidity test	95% RH, non condensing (EN 60730-1)
	Maintenance	Maintenance free
<b>Dimensions / weight</b>	Dimensions (L x W x H)	140 x 77 x 84mm
	Shaft length	Clamp up Min. 84mm Clamp down Min. 20mm
	Shaft diameter	⌀ 6 ... 12mm
	Weight	Approx. 600g

## Dimensions [mm]



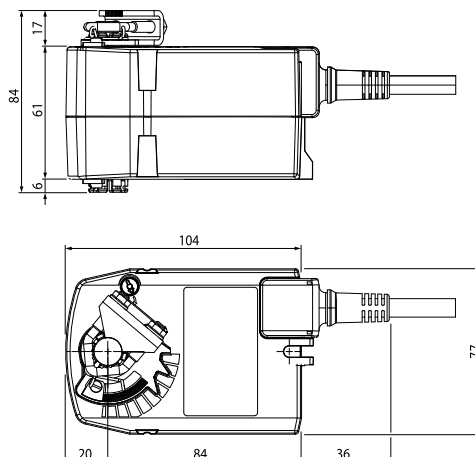


- For operation of air control dampers that perform safety function.
- Torque 2 Nm
- Nominal voltage AC/DC 24 V
- Control signal DC 2(0) ... 10 V
- Position feedback DC 2 ... 10 V

Technical data

<b>Electrical data</b>	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	4 VA
	Connection	Cable 1m, 4 x 0.75mm <sup>2</sup>
<b>Functional data</b>	Torque - Motor	2 Nm @ nominal voltage
	- Spring return	2 Nm
	Control signal	DC 2(0)... 10 V (input impedance 100 kΩ)
	Feedback signal	DC 2... 10 V
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95°, 37...100% ↺ adjustable by mechanical stops
	Running time - Motor	150s (0... 2Nm)
	- Spring return	25s @ -20... 50°C/max. 60s @ -30°C
	Sound power level	Motor max. 35 dB (A), Spring approx. 62 dB (A)
	Position indication	Mechanical
<b>Working conditions</b>	Service life	> 60,000 full cycles
	Protection class	III (safety extra-low voltage)
	Degree of protection	IP42 in any direction
	EMC	CE according to 89/336/EEC
	Mode of operation	Type 1,AA to EN 60730-1
	Ambient temperature range	-30 ... +50°C
	Non-operation temperature	-40 ... +80°C
	Humidity test	95% RH, non condensing (EN 60730-1)
	Maintenance	Maintenance free
	<b>Dimensions / weight</b>	Dimensions (L x W x H)
Shaft length		Clamp up Min. 84mm
		Clamp down Min. 20mm
Shaft diameter		⌀ 6 ... 12mm
Weight		Approx. 600g

Dimensions [mm]



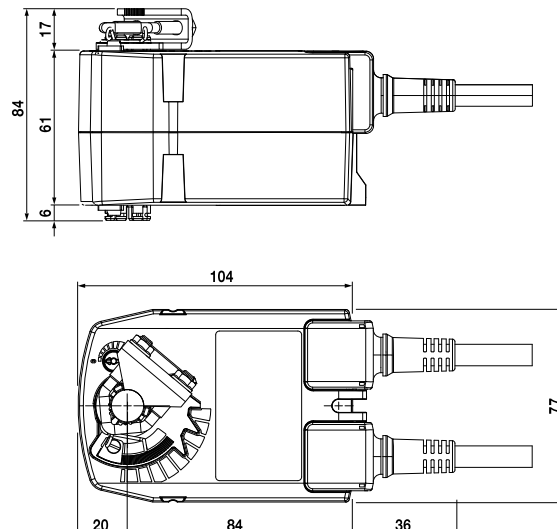
- For operation of air control dampers that perform safety function.
- Torque 2 Nm
- Nominal voltage AC 100...240 V
- Control: Open/Close
- Integrated auxiliary switch TF230-S



## Technical data

<b>Electrical data</b>	Nominal voltage	AC 100 ... 240 V 50/60 Hz	
	Nominal supply range	AC 85 ... 265 V	
	Power consumption	2.5 W @ running / 1.5 W @ holding	
	Wire/transformer sizing	5 VA	
	Auxiliary switch TF230-S	1 SPDT, 1 mA ... 3 (0.5) A, AC 250 V $\square$ , adjustable	
	Connection : Motor	Cable 1m, 2 x 0.75mm <sup>2</sup>	
	Auxiliary switch TF230-S	Cable 1m, 3 x 0.75mm <sup>2</sup>	
<b>Functional data</b>	Torque - Motor	2 Nm @ nominal voltage	
	- Spring return	2 Nm	
	Direction of rotation - Motor	Selectable by mounting L/R	
	Angle of rotation	Max. 95°, 37...100% $\curvearrowright$ adjustable by mechanical stops	
	Running time - Motor	75s	
	- Spring return	25s @ -20... 50°C/max. 60s @ -30°C	
	Sound power level	Motor max. 50 dB (A), Spring approx. 62 dB (A)	
	Position indication	Mechanical	
<b>Working conditions</b>	Service life	> 60,000 full cycles	
	Protection class	II (Totally insulated) $\square$	
	Degree of protection	IP42 in any direction	
	EMC	CE according to 89/336/EEC	
	Low voltage directive	CE according to 73/23/EEC	
	Mode of operation	Type 1. AA to EN 60730-1	
	Ambient temperature	-30... +50°C	
	Non-operation temperature	-40... +80°C	
	Humidity test	95% RH, non condensing (EN 60730-1)	
	Maintenance	Maintenance free	
<b>Dimensions / weight</b>	Dimensions (L x W x H)	140 x 77 x 84mm	
	Shaft length	Clamp up	Min. 84mm
		Clamp down	Min. 20mm
	Shaft diameter		$\bigcirc$ I $\diamond$ 6 ...12mm
	Weight		Approx. 600g

## Dimensions [mm]



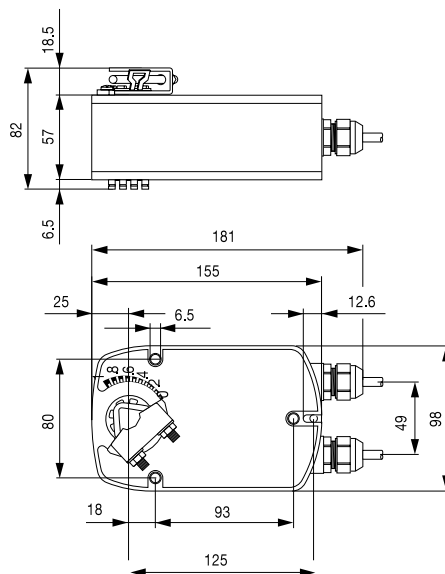


- For the operation of air dampers that perform safety function.
- Torque 4 Nm
- Nominal voltage AC/DC 24 V
- Control: Open/Close
- Integrated auxiliary switch LF24-S

## Technical data

<b>Electrical data</b>	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	
	Auxiliary switch LF24-S	1 SPDT, 6 (1.5) A, AC 250 V $\square$ , adjustable	
	Connection : Motor	Cable 1m, 2 x 0.75mm <sup>2</sup>	
	Auxiliary switch LF24-S	Cable 1m, 3 x 0.75mm <sup>2</sup>	
<b>Functional data</b>	Torque - Motor	4 Nm @ nominal voltage	
	- Spring return	4 Nm	
	Direction of rotation	Selectable by mounting L/R	
	Angle of rotation	Max. 95°, 37... 100% $\curvearrowright$ adjustable by mechanical stops	
	Running time - Motor	40...75s (0...4 Nm)	
	- Spring return	Approx. 20s @ -20... 50°C/max. 60s @ -30°C	
<b>Working conditions</b>	Sound power level	Motor max. 50 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	To EN 60730-1	
	Maintenance	Maintenance free	
<b>Dimensions / weight</b>	Dimensions (L x W x H)	181 x 98 x 82mm	
	Shaft length	Clamp up	Min. 84mm
		Clamp down	Min. 20mm
	Shaft diameter	$\varnothing$ 8... 16mm	
	Weight	Approx. 1400g	

## Dimensions [mm]



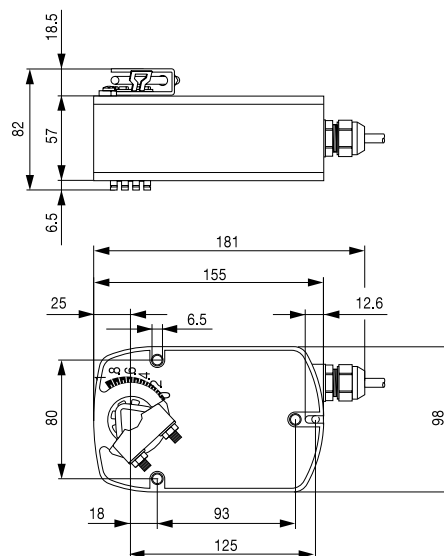
- For the operation of air dampers that perform safety function.
- Torque 4 Nm
- Nominal voltage AC/DC 24 V
- Control: 3-point



## Technical data

<b>Electrical data</b>	Nominal voltage	AC 24 V 50/60 Hz, DC 24 V
	Nominal 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
<b>Functional data</b>	Connection	Cable 1m, 4 x 0.75mm <sup>2</sup>
	Torque - Motor	4 Nm @ nominal voltage
	- Spring return	4 Nm
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95°, 37... 100% ↔ adjustable by mechanical stops
	Running time - Motor	150s
	- Spring return	Approx. 20s @ -20... 50°C/max. 60s @ -30°C
	Sound power level	Motor max. 30 dB (A), Spring approx. 62 dB (A)
<b>Working conditions</b>	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	-30... +50°C
	Non-operation temperature	-40... +80°C
	Humidity test	To EN 60730-1
	Maintenance	Maintenance free
	<b>Dimensions / weight</b>	Dimensions (L x W x H)
Shaft length		Clamp up Min. 84mm Clamp down Min. 20mm
Shaft diameter		⌀ 8... 16mm
Weight		Approx. 1400g

## Dimensions [mm]



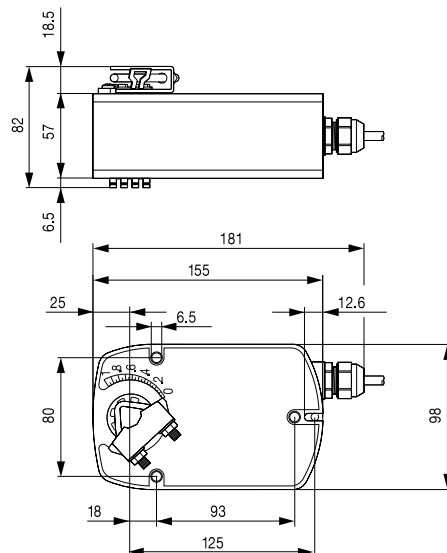


- For the operation of air dampers that perform safety function.
- Torque 4 Nm
- Nominal voltage AC/DC 24 V
- Control signal DC 2(0) ... 10 V
- Position feedback DC 2 ... 10 V

## Technical data

<b>Electrical data</b>	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
	Connection	Cable 1m, 4 x 0.75mm <sup>2</sup>
<b>Functional data</b>	Torque - Motor	4 Nm @ nominal voltage
	- Spring return	4 Nm
	Control signal	DC 2(0)... 10 V (input impedance 100kΩ)
	Feedback signal	DC 2... 10 V
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95°, 37...100% ↔ adjustable by mechanical stops
	Running time - Motor	150s
	- Spring return	Approx. 20s @ -20... 50°C/max. 60s @ -30°C
	Sound power level	Motor max. 30 dB (A), Spring approx. 62 dB (A)
	Position indication	Mechanical
<b>Working conditions</b>	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	To EN 60730-1
<b>Dimensions / weight</b>	Maintenance	Maintenance free
	Dimensions (L x W x H)	181 x 98 x 82mm
	Shaft length	Clamp up: Min. 84mm Clamp down: Min. 20mm
	Shaft diameter	⌀ 8... 16mm
	Weight	Approx. 1400g

## Dimensions [mm]



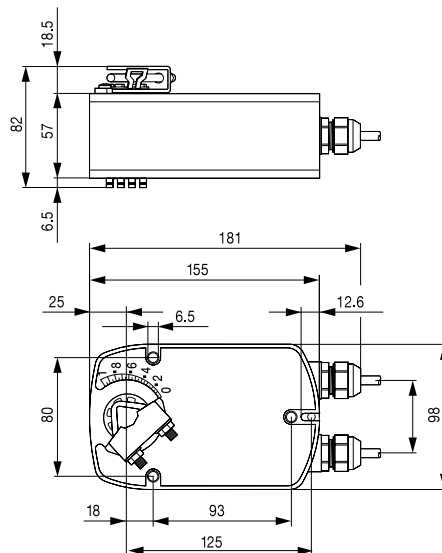
- For the operation of air dampers that perform safety function.
- Torque 4 Nm
- Nominal voltage AC 230 V
- Control: Open/Close
- Integrated auxiliary switch LF230-S



Technical data

<b>Electrical data</b>	Nominal voltage	AC 230 V, 50/60 Hz	
	Nominal supply range	AC 198... 264 V	
	Power consumption	5 W @ running / 3 W @ holding	
	Wire/transformer sizing	7 VA	
	Auxiliary switch LF230-S	1 SPDT, 6 (1.5) A, AC 250 V $\square$ , adjustable	
	Connection: Motor	Cable 1m, 2 x 0.75mm <sup>2</sup>	
	Auxiliary switch LF230-S	Cable 1m, 3 x 0.75mm <sup>2</sup>	
<b>Functional data</b>	Torque - Motor	4 Nm @ nominal voltage	
	- Spring return	4 Nm	
	Direction of rotation	Selectable by mounting L/R	
	Angle of rotation	Max. 95°, 37... 100% $\leftarrow$ adjustable by mechanical stops	
	Running time - Motor	40... 75 s (0...4 Nm)	
	- Spring return	Approx. 20s @ -20... 50°C/max. 60s @ -30°C	
	Sound power level	Motor max. 50 dB (A), Spring approx. 62 dB (A)	
	Position indication	Mechanical	
<b>Working conditions</b>	Service life	> 60,000 full cycles	
	Protection class	II (Totally insulated) $\square$	
	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	-30... +50°C	
	Non-operation temperature	-40... +80°C	
	Humidity test	To EN 60730-1	
<b>Dimensions / weight</b>	Maintenance	Maintenance free	
	Dimensions (L x W x H)	181 x 98 x 82mm	
	Shaft length	Clamp up Clamp down	Min. 84mm Min. 20mm
	Shaft diameter		$\varnothing$ 8 ... 16mm
	Weight		Approx. 1550g

Dimensions [mm]



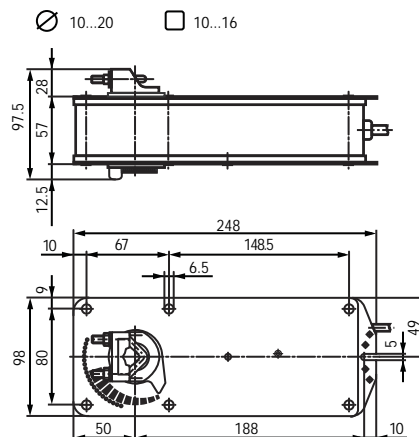


- For operation of air control dampers that perform safety function.
- Torque 7 Nm
- Nominal voltage AC/DC 24 V
- Control: Open/Close
- Integrated auxiliary switch NF24-S

Technical data

<b>Electrical data</b>	Nominal voltage	AC 24 V 50/60 Hz, DC 24 V	
	Nominal voltage range	AC 19.2 ... 28.8, DC 21.6 ... 28.8 VV	
	Power consumption	5 W @ running / 3 W @ holding	
	Wire/transformer sizing	8 VA	
	Auxiliary switch NF24-S	2 SPDT, 6 (3) A, AC 250 V <input type="checkbox"/>	
	Switching points	10°, 85°	
	Connection cable - Motor - Auxiliary switches NF24-S	Cable 1m, 2 x 0.75mm <sup>2</sup> Cable 1m, 6 x 0.75mm <sup>2</sup>	
<b>Functional data</b>	Torque - Motor - Spring	min. 7 Nm @ nominal voltage min. 7 Nm	
	Direction of rotation	Selectable by mounting L/R	
	Angle of rotation	Max. 95° (35...100% adjustable by mechanical limiter)	
	Running time	Motor ~ 75 s, spring return ~ 60 s (Temp = 20°C)	
	Sound power level	Motor max. 55 dB(A), spring return = 62 dB(A)	
	Position indication	Mechanical	
	protection class	III (safety extra-low volatage)	
	Service life	> 60,000 full cycles	
	<b>Working conditions</b>	Degree of protection	IP54
		EMC	CE according to 89/336/EEC
Ambient temperature		-30... +50°C	
Non-operation temperature		-40... +80°C	
Humidity test		To EN 60730-1	
Maintenance		Maintenance free	
<b>Dimensions / weight</b>		Dimension (L x W x H)	248 x 98 x 97.5mm
	Weight	Approx. 3000g	

Dimensions [mm]



- For operation of air control dampers that perform safety function.
- Torque 7 Nm
- Nominal voltage AC/DC 24 V
- Control signal DC 2(0) ... 10 V
- Position feedback DC 2 ... 10 V

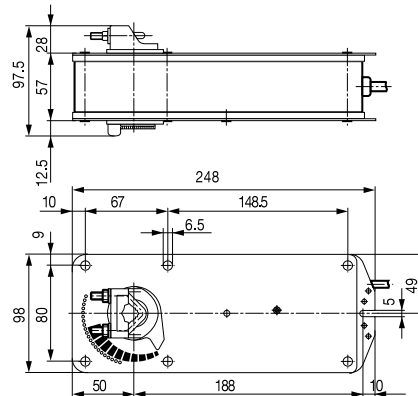


## Technical data

<b>Electrical data</b>	Nominal voltage	AC 24 V 50/60 Hz, DC 24 V
	Nominal supply range	AC 19.2 ... 28.8 V, DC 21.6 ... 26.4 V
	Power consumption	5 W @ running / 3 W @ holding
	Wire/transformer sizing	6 VA
	Connection	Cable 1m, 4 x 0.75mm <sup>2</sup>
<b>Functional data</b>	Torque - Motor	min. 7 Nm @ nominal voltage
	- Spring	min. 7 Nm
	Control signal	DC 2(0)... 10 V (input impedance 100 kΩ)
	Feedback signal	DC 2... 10 V
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95° (35...100% adjustable by rotation limiter)
	Running time	Motor 150s, Spring return < 60s ≈ (Temp=20°C)
	Sound power level	Motor max. 55 dB(A), spring Max. 62 dB(A)
	Position indication	Mechanical
<b>Working conditions</b>	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	-30... +50°C
	Non-operation temperature	-40... +80°C
	Humidity test	To EN 60730-1
	Maintenance	Maintenance free
<b>Dimensions / weight</b>	Dimensions (L x W x H)	248 x 98 x 97.5mm
	Weight	Approx. 3000g

## Dimensions [mm]

- ⊘ 10... 20
- 10...16



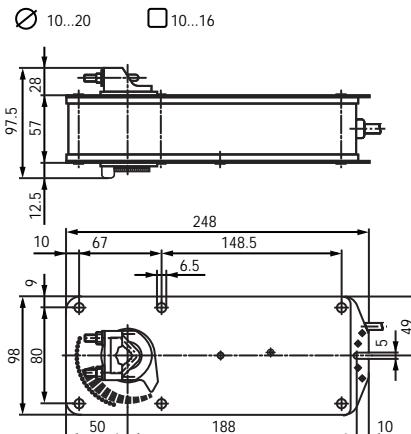


- For operation of air control dampers that perform safety function.
- Torque 7 Nm
- Nominal voltage AC 230 V
- Control: Open/Close
- Integrated auxiliary switch (NF230-S)

## Technical data

Electrical data	Nominal voltage	AC 230 V 50/60 Hz
	Nominal voltage range	AC 198 ... 264 V
	Power consumption	6 W @ running / 3.5 W @ holding
	Wire/transformer sizing	7 VA
	Auxiliary switch NF230-S	2 SPDT, 6 (3) A, AC 250 V <input type="checkbox"/>
	Switching points	10°, 85°
	Connection cable - Motor - Auxiliary switches NF230-S	Cable 1m, 2 x 0.75mm <sup>2</sup> Cable 1m, 6 x 0.75mm <sup>2</sup>
Functional data	Torque - Motor - Spring	min. 7 Nm @ nominal voltage min. 7 Nm
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95° (35...100% adjustable by rotation limiter)
	Running time	Motor <75s, Spring return < 60s (Temp=20°C)
	Sound power level	Motor max. 55 dB(A), spring ≈ 62 dB(A)
	Position indication	Mechanical
	Working conditions	Service life
Degree of protection		IP54
EMC		CE according to 89/336EEC
Low Voltage Directive		CE according to 73/23/EEC
Protection class		II (Totally insulated) <input type="checkbox"/>
Ambient temperature range		-30... +50°C
Non-operation temperature		-40... +80°C
Dimensions / weight	Humidity test	To EN 60730-1
	Maintenance	Maintenance free
	Dimensions (L x W x H)	248 x 98 x 97.5mm
	Weight	Approx. 3000g

## Dimensions [mm]



- For the operation of air dampers that perform safety function.
- Torque 15 Nm
- Nominal voltage AC/DC 24 V
- Control: Open/Close
- Integrated auxiliary switch AF24-S

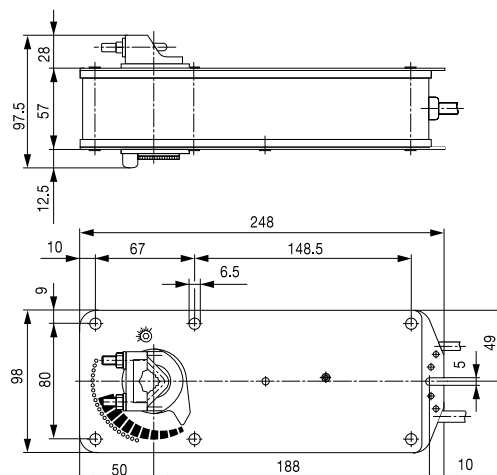


## Technical data

<b>Electrical data</b>	Nominal voltage	AC 24 V 50/60 Hz, DC 24 V
	Power supply range	AC 19.2 ... 28.8 V, DC 21.6 ... 26.4 V
	Power consumption	5 W @ running / 1.5 W @ holding
	Wire/transformer sizing	10 VA
	Auxiliary switch AF24-S	2 SPDT, 6 (3) A, AC 250 V <input type="checkbox"/> fixed 5%, adjustable 28... 94%
	Connection : Motor	Cable 1m, 2 x 0.75mm <sup>2</sup>
	Auxiliary switch AF24-S	Cable 1m, 6 x 0.75mm <sup>2</sup>
<b>Functional data</b>	Torque - Motor	15 Nm @ nominal voltage
	- Spring return	15 Nm
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95°, 33... 100% <math>\sphericalangle</math> adjustable by rotation limiter
	Running time - Motor	150s
	- Spring return	16s
	Sound power level	Motor max. 45 dB (A), Spring approx. 62 dB (A)
	Position indication	Mechanical
	Mannual operation	By manual override key
<b>Working conditions</b>	Service life	> 60,000 full cycles
	Protection class	III (safety extra-low voltage)
	Degree of protection	IP54
	EMC	CE according to 89/336/EEC
	Mode of operation	Type 1. AA to EN 60730-1
	Ambient temperature	-30... +50°C
	Non-operation temperature	-40 ...+80°C
	Humidity test	To EN60730-1
	Maintenance	Maintenance free
	<b>Dimensions / weight</b>	Dimensions (L x W x H)
Shaft length		Min. 95mm
Clamp up		Min. 20mm
Clamp down		Min. 20mm
Weight	Approx. 3000g	

## Dimensions [mm]

- 10...20
- 10...16



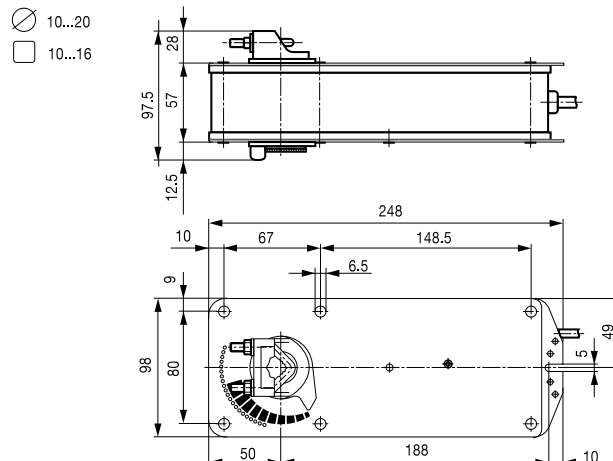


- For the operation of air dampers that perform safety function.
- Torque 15 Nm
- Nominal voltage AC/DC 24 V
- Control signal DC 2(0) ... 10 V
- Position feedback DC 2 ... 10 V

Technical data

<b>Electrical data</b>	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	6 W @ running / 2.5 W @ holding
	Wire/transformer sizing	10 VA
	Connection	Cable 1 m, 4 x 0.75 mm <sup>2</sup>
<b>Functional data</b>	Torque - Motor	15 Nm @ nominal voltage
	- Spring return	15 Nm
	Control signal	DC 2(0) ... 10 V (input impedance 100 k Ω)
	Feedback signal	DC 2 ... 10 V
	Direction of rotation - Motor	selectable with switch L/R
	- Spring return	selectable by mounting L/R
	Angle of rotation	Max. 95°, 33...100% ↔ adjustable by rotation limiter
	Running time - Motor	150s
	- Spring return	16s
	Sound power level	Motor max. 45 dB (A), Spring approx. 62 dB (A)
<b>Working conditions</b>	Position indication	Mechanical
	Manual operation	By manual override key
	Service life	> 60,000 full cycles
	Protection class	III (safety extra-low voltage)
	Degree of protection	IP54
	EMC	CE according to 89/336/EEC
	Ambient temperature range	-30... +50°C
	Non-operation temperature	-40... +80°C
	Humidity test	95% RH, non condensing (EN 60730-1)
	Maintenance	Maintenance free
<b>Dimensions / weight</b>	Dimensions (L x W x H)	248 x 98 x 97.5mm
	Shaft length	Clamp up Min. 95mm
		Clamp down Min. 20mm
	Weight	Approx. 2700g

Dimensions [mm]



- For operation of air control dampers that perform safety function.
- Torque 15 Nm
- Nominal voltage AC 230 V
- Control: Open/Close
- Integrated auxiliary switch AF230-S

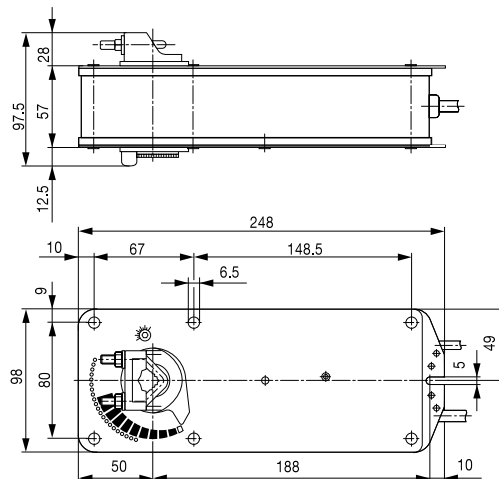


## Technical data

<b>Electrical data</b>	Nominal voltage	AC 230 V 50/60 Hz
	Power supply range	AC 198... 264 V
	Power consumption	6.5 W @ running / 2.5 W @ holding
	Wire/transformer sizing	11 VA
	Auxiliary switch AF230-S	2 SPDT, 6 (3) A, AC 250 V <input type="checkbox"/> Fixed 5%, adjustable 28... 94%
<b>Functional data</b>	Connection : Motor	Cable 1m, 2 x 0.75mm <sup>2</sup>
	Auxiliary switch AF230-S	Cable 1m, 6 x 0.75mm <sup>2</sup>
	Torque - Motor	15 Nm @ nominal voltage
	- Spring return	15 Nm
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95°, 33...100% adjustable by rotation limiter
	Running time - Motor	<150s
	- Spring return	<16s
	Sound power level	Motor max. 45 dB (A), Spring approx. 62 dB (A)
	Position indication	Mechanical
<b>Working conditions</b>	Manual operation	By manual override key
	Service life	> 60,000 full cycles
	Protection class	II (Totally insulated) <input type="checkbox"/>
	Degree of protection	IP54
	EMC	CE according to 89/336/EEC
	Low Voltage Directive	CE according to 73/23/EEC
	Ambient temperature	-30... +50°C
	Non-operation temperature	-40... +80°C
	Humidity test	To EN 60730-1
	Maintenance	Maintenance free
<b>Dimensions / weight</b>	Dimensions (L x W x H)	248 x 98 x 97.5mm
	Shaft length	Clamp up Min. 95mm Clamp down Min. 20mm
	Weight	Approx. 3000g

## Dimensions [mm]

- ⌀ 10...20
- 10...16



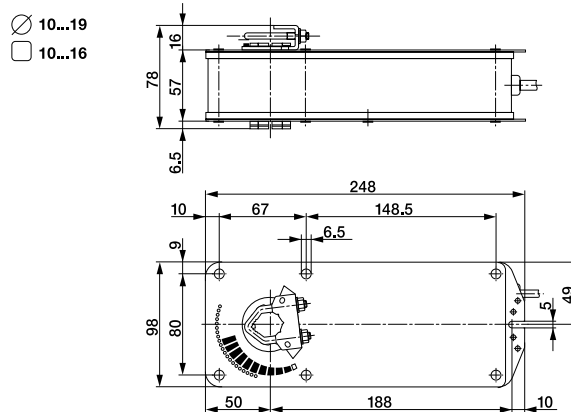


- For operation of air control dampers that perform safety function.
- Torque 15 Nm
- Nominal voltage AC/DC 24 V
- Control: Open/Close
- Integrated auxiliary switch AFR24-S

## Technical data

<b>Electrical data</b>	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/1.5 W @ holding
	Wire/transformer sizing	10 VA
	Auxiliary switch AFR24-S	1 SPDT, 6 (3) A, AC 250 V <input type="checkbox"/> 0 ... 89% adjustable
<b>Functional data</b>	Connection : Motor	Cable 1m, 2 x 0.75mm <sup>2</sup>
	Auxiliary switch AFR24-S	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Torque - Motor	15 Nm @ nominal voltage
	- Spring return	15 Nm
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95°, (33...100% adjustable by rotation limiter ZDB - AF - optional)
	Running time - Motor	150s
	- Spring return	16s
	Sound power level	Motor max. 45 dB (A), Spring approx. 62 dB (A)
	Position indication	Mechanical
<b>Working conditions</b>	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	To EN 60335-1
	Maintenance	Maintenance free
<b>Dimensions / weight</b>	Dimensions (L x W x H)	248 x 98 x 78mm
	Shaft length	Clamp up Min. 95mm Clamp down Min. 20mm
	Weight	Approx. 3000g

## Dimensions [mm]



- For the operation of air dampers that perform safety function.
- Torque 15 Nm
- Nominal voltage AC/DC 24 V
- Control signal DC 2(0) ... 10 V
- Position feedback DC 2 ... 10 V

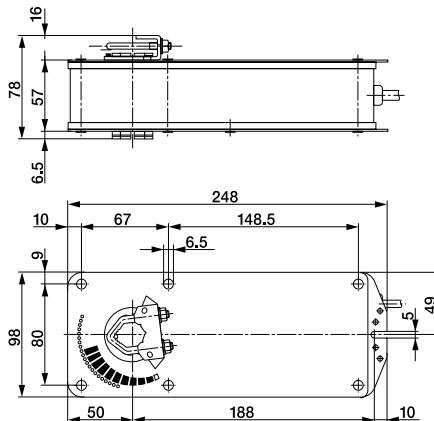


## Technical data

<b>Electrical data</b>	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	6 W @ running / 2.5 W @ holding	
	Wire/transformer sizing	10 VA	
	Connection	Cable 1m, 4 x 0.75mm <sup>2</sup>	
<b>Functional data</b>	Torque - Motor	15 Nm @ nominal voltage	
	- Spring return	15 Nm	
	Control signal	DC2(0)... 10 V (input impedance 100kΩ)	
	Feedback signal	DC 2... 10 V	
	Direction of rotation - Motor	selected with switch L/R	
	- Spring return	selected by mounting L/R	
	Angle of rotation	Max. 95° (33-100% adjustable by rotation limiter ZDB - AF - optional)	
<b>Working conditions</b>	Running time - Motor	150s	
	- Spring return	16s	
	Sound power level	Motor max. 45 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	-30... +50°C	
	Non-operation temperature	-40... +80°C	
<b>Dimensions / weight</b>	Humidity test	95% RH, non condensing (EN 60335-1)	
	Maintenance	Maintenance free	
	Dimensions (L x W x H)	248 x 98 x 78 mm	
	Shaft length	Clamp up Clamp down	Min. 95mm Min. 20mm
	Weight	Approx. 2700g	

## Dimensions [mm]

- ⊘ 10...19
- 10...16



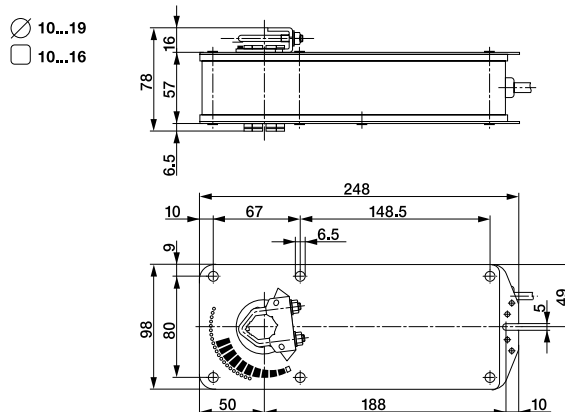


- For the operation of air dampers that perform safety functions
- Torque 15 Nm
- Nominal voltage AC 230 V
- Control: Open/Close
- Integrated auxiliary switch AFR230-S

Technical data

<b>Electrical data</b>	Nominal voltage	AC 230 50/60 Hz
	Power supply range	AC 198 ... 264 V
	Power consumption	6,5 W @ running / 2,5 W @ holding
	Wire/transformer sizing	11 VA
	Auxiliary switch AFR230-S	1 SPDT, 6 (3) A, AC 250 V <input type="checkbox"/> 0 ... 89% adjustable
<b>Functional data</b>	Connection: Motor	Cable 1m, 2 x 0.75mm
	Auxiliary switch AFR230-S	Cable 1m, 3 x 0.75mm
	Torque - Motor	15 Nm @ nominal voltage
	- Spring return	15 Nm
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95° (33-100% adjustable by rotation limiter ZDB - AF - optional)
	Running time - Motor	150s
- Spring return	16s	
<b>Working conditions</b>	Sound power level	Motor max. 45 dB (A), Spring approx. 62 dB (A)
	Position indication	Mechanical
	Service life	> 60,000 full cycles
	Protection class	II (Totally insulated) <input type="checkbox"/>
	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	To EN 60335-1
<b>Dimensions / weight</b>	Maintenance	Maintenance free
	Dimensions (L x W x H)	248 x 98 x 78mm
	Shaft length	Clamp up Min. 95mm Clamp down Min. 20mm
	Weight	Approx. 3000g

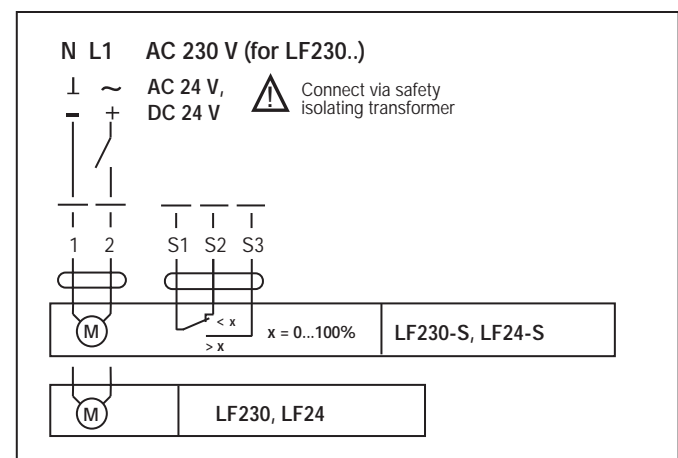
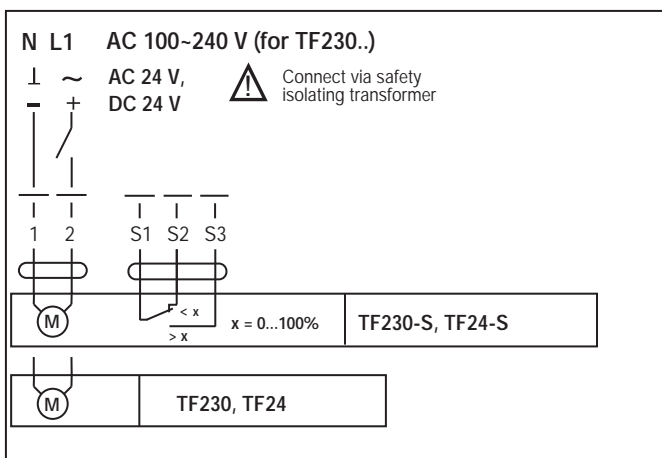
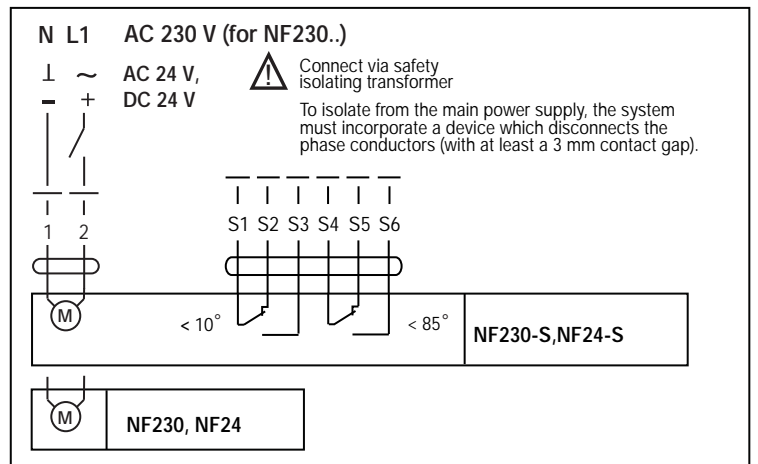
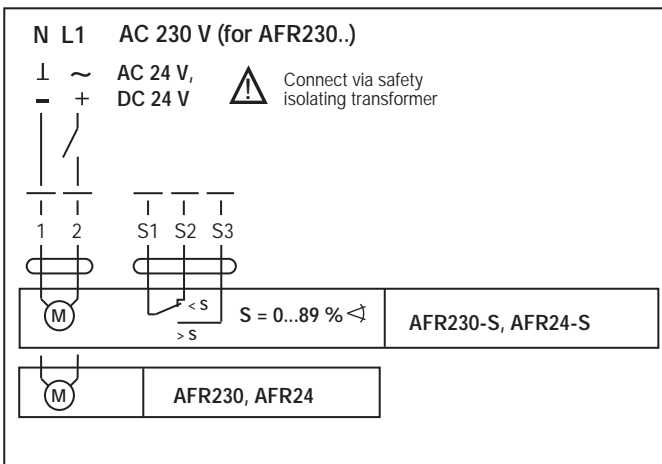
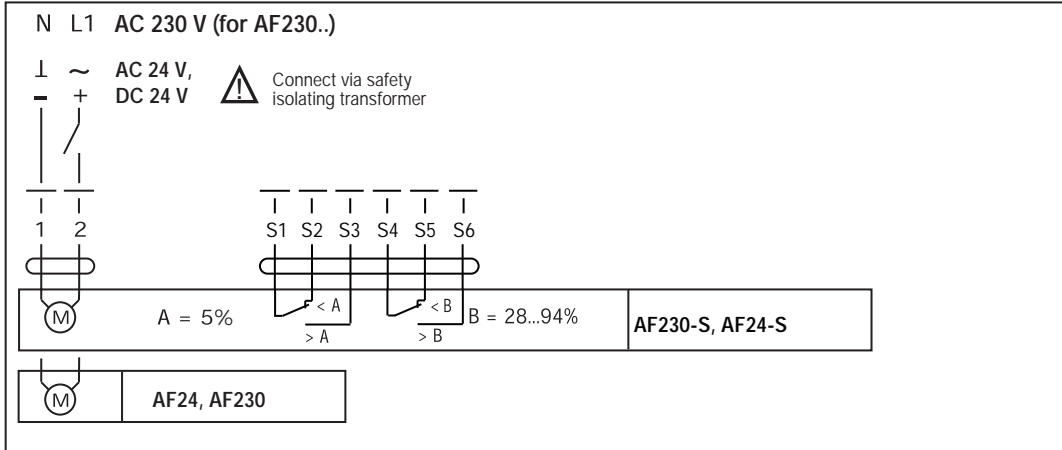
Dimensions [mm]



Wiring diagram: Open/Close actuators.

Notes:

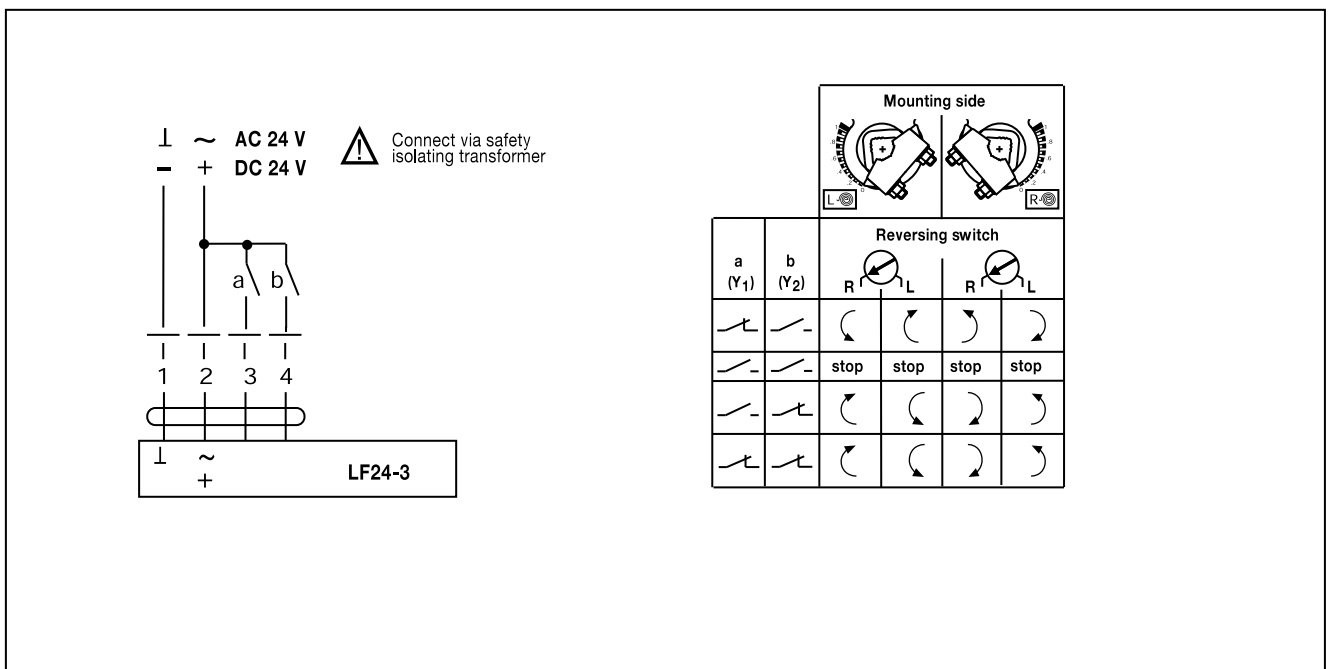
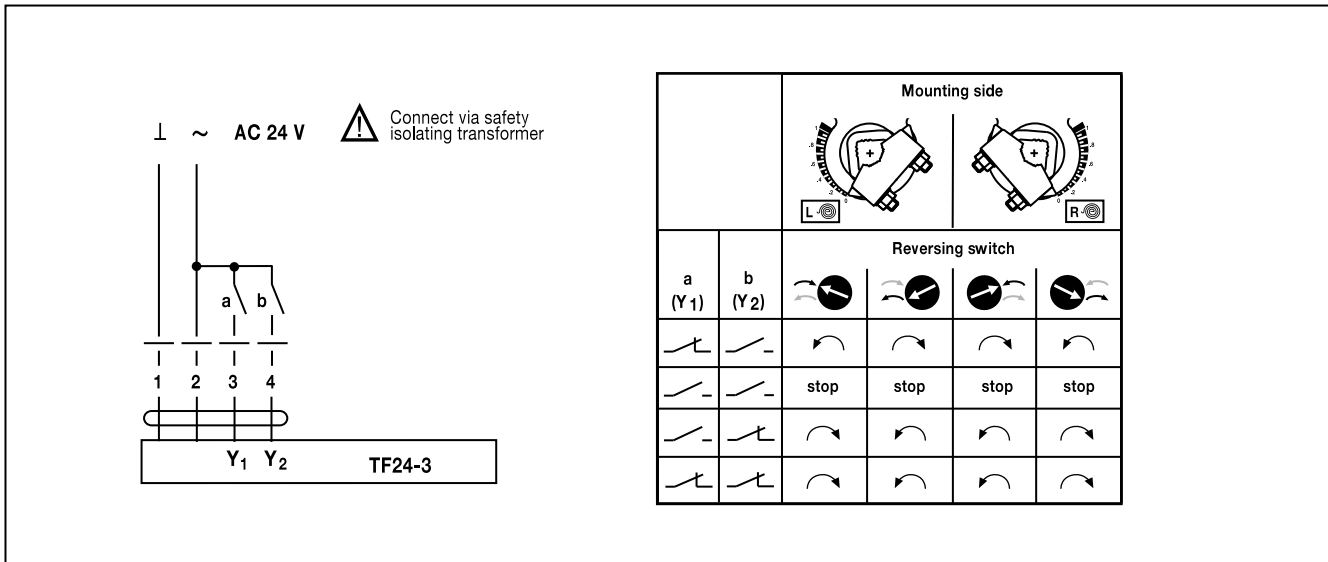
- Parallel connection of several actuators is possible.
- Power consumption must be observed.



Wiring diagram: 3-Point actuators.

Notes:

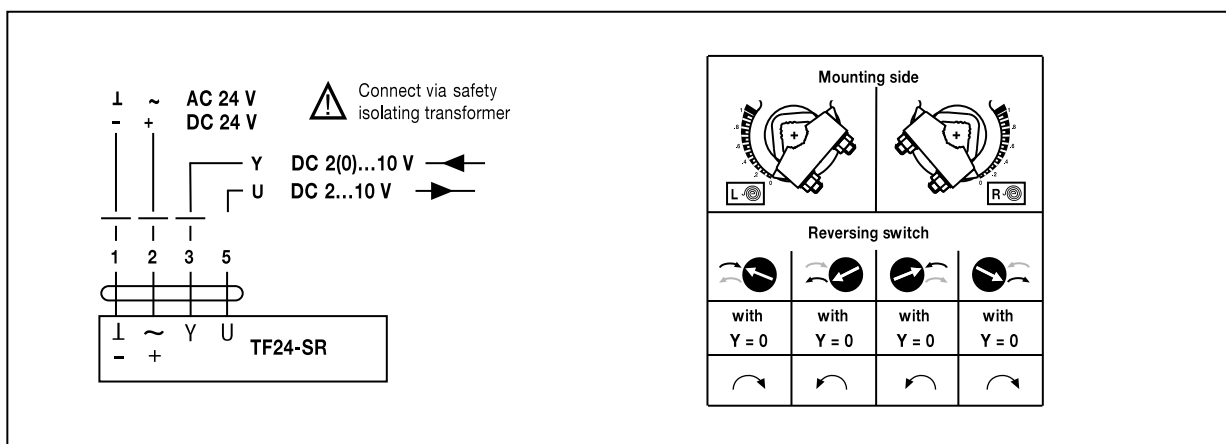
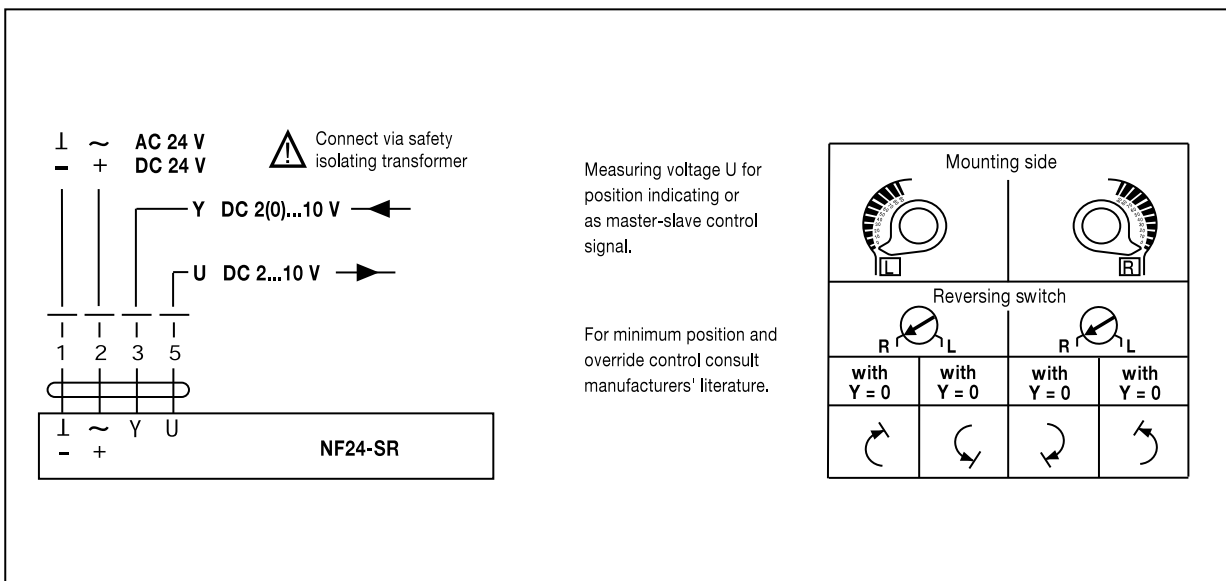
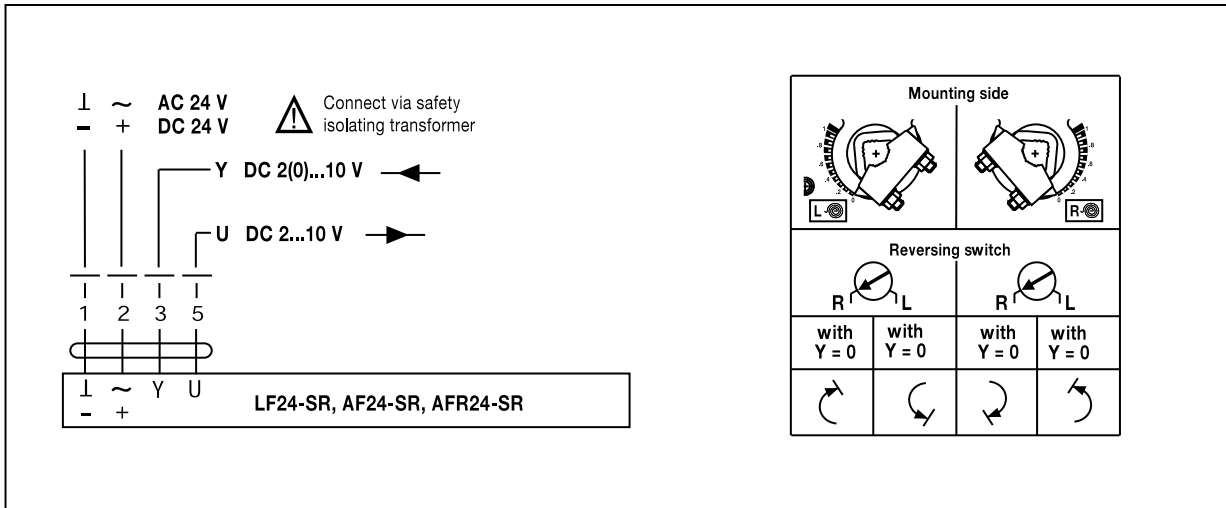
- Connection via safety isolating transformer
- Parallel connection of several actuators is possible
- Power consumption must be observed.



**Wiring diagram: Modulating actuators.**

**Notes:**

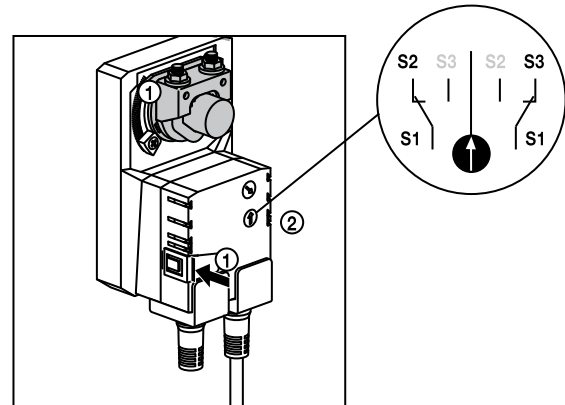
- Connection via safety isolating transformer
- Parallel connection of several actuators is possible
- Power consumption must be observed.



## Auxiliary switch adjustment for Non-Spring Return actuators

1. Press the push button, manually operate the universal clamp to desired switch position.
2. Turn switch pointer to the middle line.
3. When actuator moves clockwise (counterclockwise) to switch position, switch indicator passes the middle line counterclockwise (clockwise), the contact between S1 and S3 is broken (made) and the contact between S1 and S2 is made (broken).

Note: The switching point should be about 5° from the mechanical end stops (1 short step on the scale).



## Auxiliary switch adjustment for Spring Return actuators

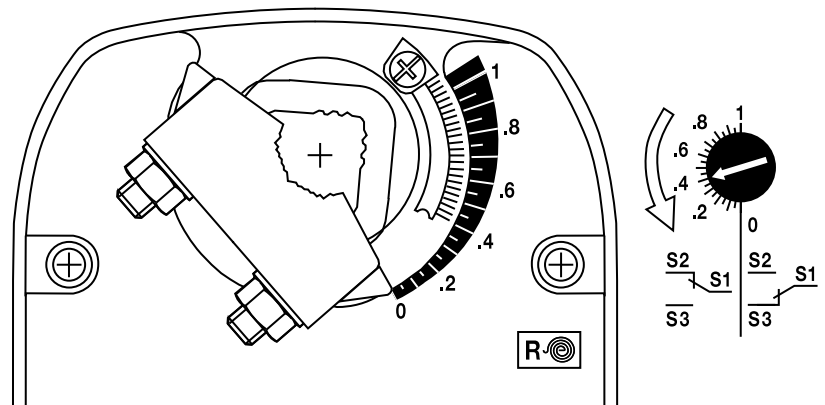
### LF..-S (Mounting side R)








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.












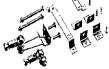


--- When the actuator runs to the operating position (ccw ↺), the switch knob will also rotate counterclockwise (ccw ↺) and the auxiliary switch will operate as the tip of the arrow passes the scale zero (S1-S3 linked).














		Actuators									
		CMU	LMU	NMU	SMU	GMU	TF	LF	NF	AF	AFR
 <b>S..A..</b> Auxiliary switch, add-on	<b>S1A..</b> 1 SPDT 3 A (0.5 A), AC 250 V		•	•	•	•					
	<b>S2A..</b> 2 SPDT 3 A (0.5 A), AC 250 V		•	•	•	•					
 <b>P.</b> Feedback potentiometer, add-on	<b>P140A..</b> 140 Ohm		•	•	•	•					
	<b>P500A..</b> 500 Ohm		•	•	•	•					
	<b>P1000A..</b> 1000 Ohm		•	•	•	•					
	<b>P2800A..</b> 2800 Ohm		•	•	•	•					
	<b>P5000A..</b> 5000 Ohm		•	•	•	•					
	<b>P10000A..</b> 10000 Ohm		•	•	•	•					
 <b>SGA24</b> Positioner for surface mounting 0...100% Reversible operating range DC 0...10 V or DC 2...10 V	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	
 <b>SGR24</b> Positioner for surface mounting 0...100% Reversible operating range DC 0...10 V or DC 2...10 V	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	
 <b>SGE24</b> Positioner for rack mounting 0...100% Reversible operating range DC 0...10 V or DC 2...10 V	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	
 <b>SGF24</b> Positioner for front -panel mounting 0...100% Reversible operating range DC 0...10 V or DC 2...10 V	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	
 <b>ZAD24</b> Digital position indicator for front -panel mounting 0...99% Front size 72 x 72 mm Operating range DC 2 ...10 V	1)	2)	2)	2)	2)	1)	1)	1)	1)	1)	

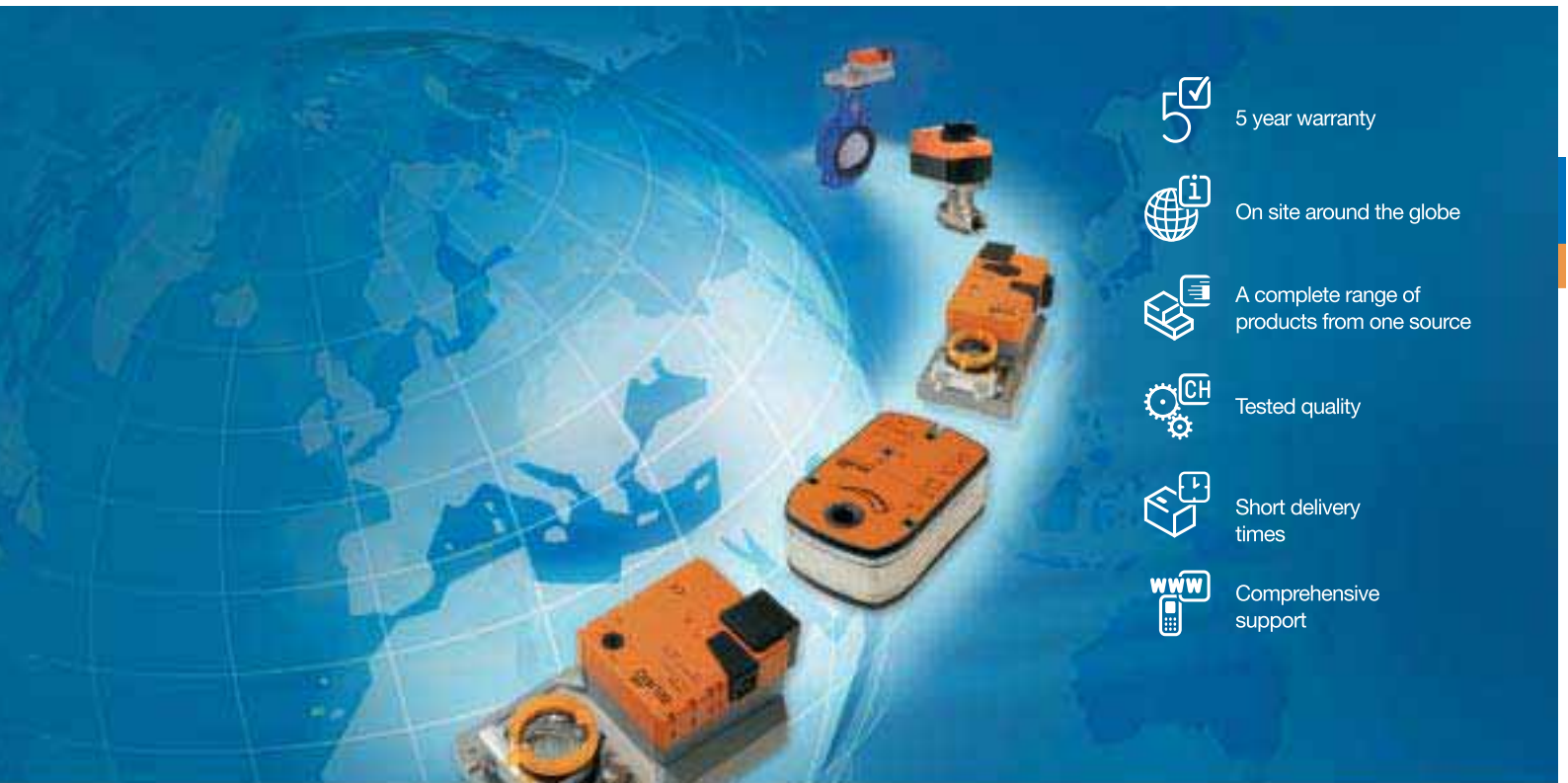
1) For...-SR

2) For...24-SR

		Actuators							
		LMU	NMU	SMU	GMU	TF	LF	NF	AF/AFR
	<b>IND-AF2</b> Pointer With circlip							•	- / •
	<b>AV6-20</b> Shaft extension Length approx. 170mm For damper spindles Ø 6...20mm Extension Ø 10mm	•				•	•		
	<b>AV8-25</b> Shaft extension Length approx. 250 For damper spindles Ø 8...25mm Extension Ø 20mm		•	•					• / •
	<b>K6-1</b> Spindle clamp for LF.. For damper spindles Ø 16...20 mm						•		
	<b>KG10A</b> Ball joint Suitable for damper crank arms KH8 For round steel rod with Ø 10 mm Zinc-plated steel		•	•	•	•	•		• / •
	<b>KG6</b> Ball joint Suitable for damper crank arm KH6 For round steel rod with Ø 8 mm Zinc-plated steel								• / -
	<b>KG8</b> Ball joint Suitable for damper crank arm KH8 For round steel rod with Ø 8 mm Zinc-plated steel		•	•		•	•		• / •
	<b>KH6</b> Universal crank arm Zinc-plated steel, for damper spindles Ø 10...18 mm or square 10...14 mm, Slot width 6.2 mm						•		•
	<b>KH8</b> Universal crank arm Zinc-plated steel, for damper spindles Ø 10...18 mm or square 10...14 mm, Slot width 8.2 mm		•	•		•	•		• / -
	<b>KH10</b> Universal crank arm Galvanized steel, for damper spindles Clamp range Ø 14...25 mm Slot width 8.2 mm				•				
	<b>KH-AF</b> Universal crank arm Zinc-plated steel, for damper spindles Ø 10...20 mm or square 10...16 mm, Slot width 8.2 mm							•	- / •
	<b>ZG-AF</b> Damper linkage kit For flat and side mounting								- / •
	<b>KH-LF</b> Damper crank arm For damper spindles Ø 8...16 mm						•		
	<b>KH-LF1</b> Damper crank arm For damper spindles Ø 16...20 mm						•		

		Actuators							
		LMU	NMU	SMU	GMU	TF	LF	NF	AF/AFR
<b>K-NA</b>	Reversible spindle clamp Damper spindle Ø 8...20 mm		•						
									
<b>K-SA</b>	Reversible spindle clamp Damper spindle Ø 10...20 mm			•					
									
<b>K-ENSA</b>	Spindle clamp Damper spindle Ø 10...26.7 mm			•					
									
<b>AH-GMA</b>	Actuator arm				•				
									
<b>AH-25</b>	Actuator arm		•						
									
<b>AH-20</b>	Actuator arm			•					
									
<b>ZG-GMA</b>	Mounting kit For flat and side mounting				•				
									
<b>ZG-NMA</b>	Mounting kit For flat and side mounting		•						
									
<b>ZG-SMA</b>	Mounting kit For flat and side mounting			•					
									
<b>ZDB-AF</b>	Angle of rotation limiter								• / -
									
<b>ZDB-TF</b>	Angle of rotation limiter					•			
									

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