

Damper Actuators

Spring Return TF ... 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 *	~75 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				
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.

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 TF.. actuators

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Subject to technical changes.

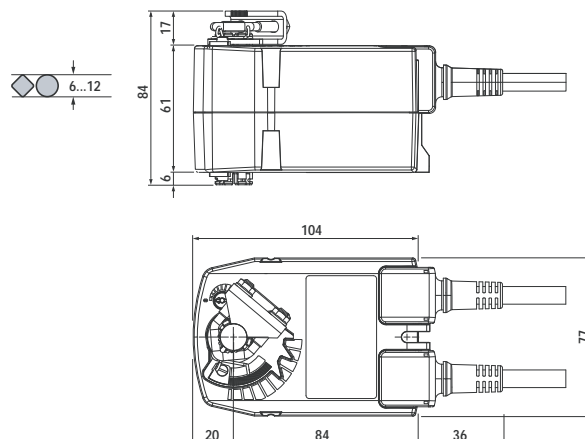


- For operation of air control dampers that perform safety function
- Torque 2 Nm
- Nominal voltage AC/DC 24 V
- 1 wire control
- Integrated auxiliary switch(TF24-S)

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	2.5 W @ running / 1.5 W @ holding	
	Wire/transformer sizing	5 VA	
	Auxiliary switch TF24-S	1 x SPDT, 1 mA ... 3 (0.5) A, AC 250 V <input type="checkbox"/> 0 ... 100% adjustable	
Functional data	Connection cable - Motor - Auxiliary switch TF24-S	Cable 1 m, 2 x 0.75 mm ² Cable 1 m, 3 x 0.75 mm ²	
	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% ↯ adjustable by mechanical stops	
	Running time - Motor - Spring return	<75 s <25 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	IP42
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)	
Dimensions / weight	Maintenance	Maintenance free	
	Dimensions (L x W x H)	140 x 77 x 84 mm	
	Shaft length	Clamp up Min. 84 mm Clamp down Min. 20 mm	
	Shaft diameter	6 ... 12 mm	
	Weight	600 g	

Dimensions [mm]



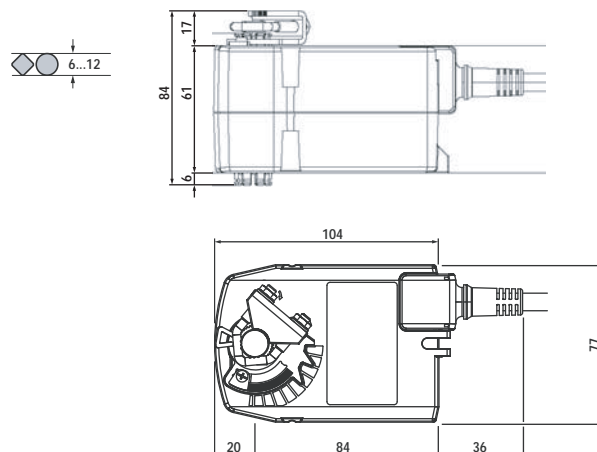
- For operation of air control dampers that perform safety function
- Torque 2 Nm
- Nominal voltage AC 24 V
- Control: 3-point



Technical data

Electrical data	Nominal voltage	AC 24 V 50/60 Hz
	Power supply range	AC 19.2 ... 28.8 V
	Power consumption	2.5 W @ running / 1 W @ holding
	Wire/transformer sizing	4 VA
	Connection cable	Cable 1 m, 4 x 0.75 mm ²
Functional data	Torque - Motor	2 Nm @ nominal voltage
	- Spring return	2 Nm
	Direction of rotation - Motor	Selectable by 0/1 Switch
	- Spring return	Selectable by mounting L/R
	Angle of rotation	Max. 95° 37...100% ↯ adjustable by mechanical stops
	Running time - Motor	40 ~ 75 s (0 ~ 2 Nm)
	- Spring return	<25 s @ -20... 50°C/max. 60 s @ -30°C
Working conditions	Sound power level	Motor max. 35 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	IP42
	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)
Dimensions / weight	Maintenance	Maintenance free
	Dimensions (L x W x H)	140 x 77 x 84 mm
	Shaft length	Clamp up Min. 84 mm
	Clamp down	Min. 20 mm
	Shaft diameter	⌀ I 6 ... 12 mm
Weight	600 g	

Dimensions [mm]



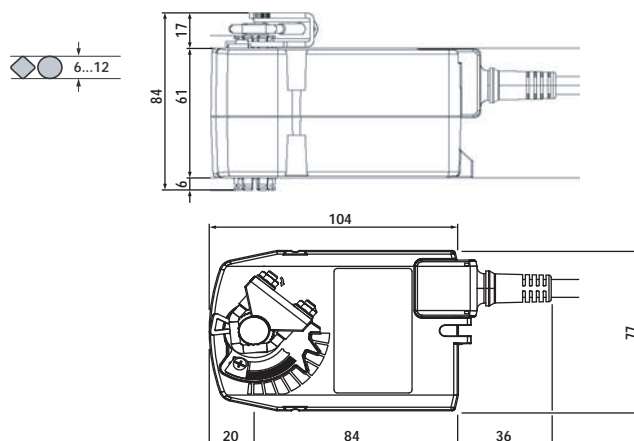


- For operation of air control dampers that perform safety function
- Torque 2 Nm
- Nominal voltage AC/DC 24 V
- Control signal DC 2(0) ... 10 V
- Position feedback DC 2 ... 10 V

Technical data

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	4 VA
Functional data	Connection cable	Cable 1 m, 4 x 0.75 mm ²
	Torque - Motor	2 Nm @ nominal voltage
	- Spring return	2 Nm
	Control signal	2(0) ... 10 VDC (input impedance 100 kΩ)
	Operating range	2 ... 10 VDC
	Measurement voltage	2 ... 10 VDC, max. 0.5 mA
	Direction of rotation	Selectable by mounting L/R
	Angle of rotation	Max. 95° 37...100% ◁ adjustable by mechanical stops
Working conditions	Running time - Motor	<150 s
	- Spring return	<25 s @ -20... 50°C/max. 60 s @ -30°C
	Sound power level	Motor max. 35 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	IP42
	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	
Dimensions / weight	Dimensions (L x W x H)	140 x 77 x 84 mm
	Shaft length	Clamp up Min. 84 mm
		Clamp down Min. 20 mm
	Shaft diameter	⌀ 6 ... 12 mm
	Weight	600 g

Dimensions [mm]



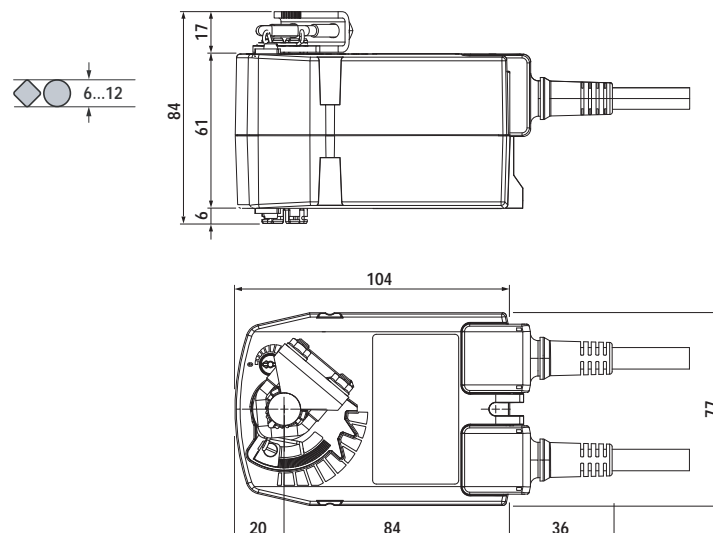
- For operation of air control dampers that perform safety function
- Torque 2 Nm
- Nominal voltage AC 100...240 V
- 1 wire control
- Integrated auxiliary switch(TF230-S)



Technical data

Electrical data	Nominal voltage	AC 100 ... 240 V 50/60 Hz
	Nominal voltage 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 x SPDT, 1 mA ... 3 (0.5) A, AC 250 V <input type="checkbox"/> 0 ... 100% adjustable
Functional data	Connection cable - Motor	Cable 1 m, 2 x 0.75 mm ²
	- Auxiliary switch TF230-S	Cable 1 m, 3 x 0.75 mm ²
	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	<75 s
	- Spring return	<25 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
Working conditions	Service life	> 60,000 full cycles
	Protection class	II (all insulated)
	Degree of protection	IP42
	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 range	-30 ... +50°C
	Non-operation temperature	-40 ... +80°C
	Humidity test	95% RH, non condensing (EN 60730-1)
	Maintenance	Maintenance free
Dimensions / weight	Dimensions (L x W x H)	140 x 77 x 84 mm
	Shaft length	Clamp up Min. 84 mm
	Clamp down	Min. 20 mm
	Shaft diameter	⌀ 6 ...12 mm
	Weight	600 g

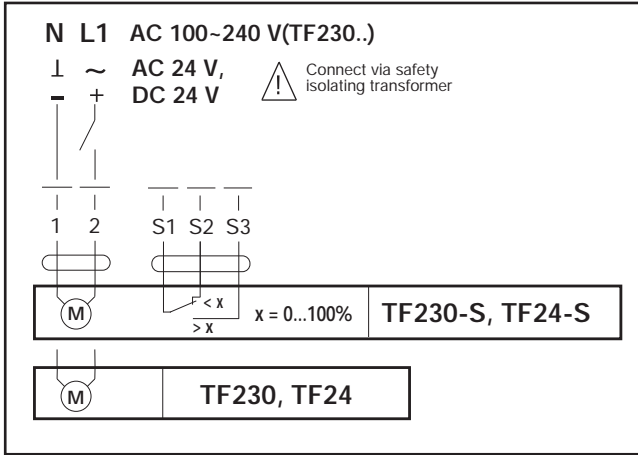
Dimensions [mm]



Wiring diagram: TF..

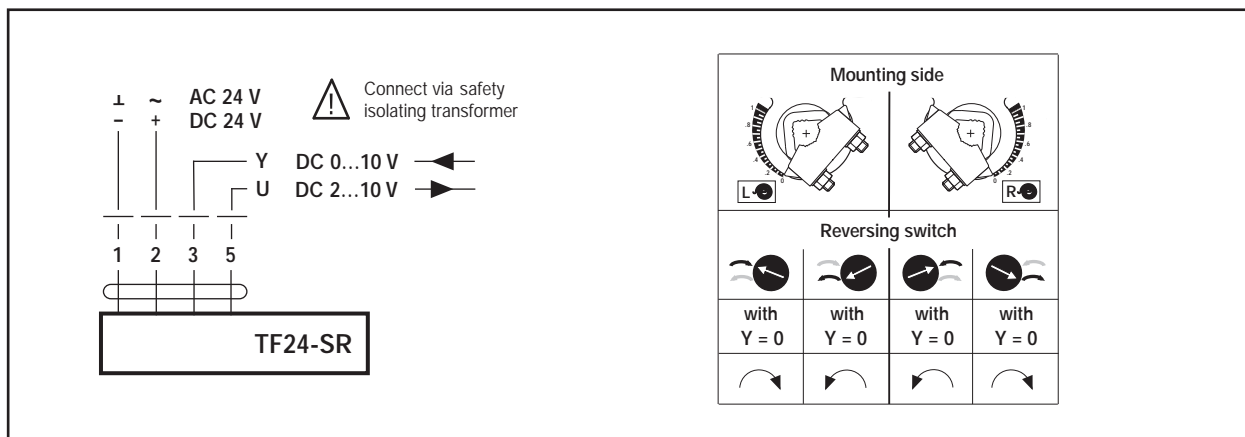
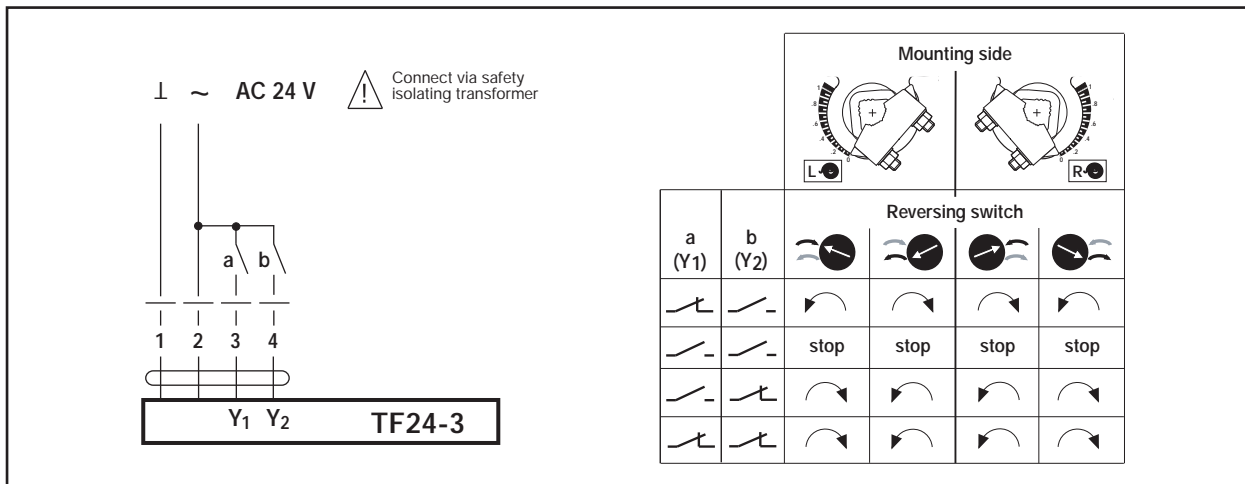
Notes:

- 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.



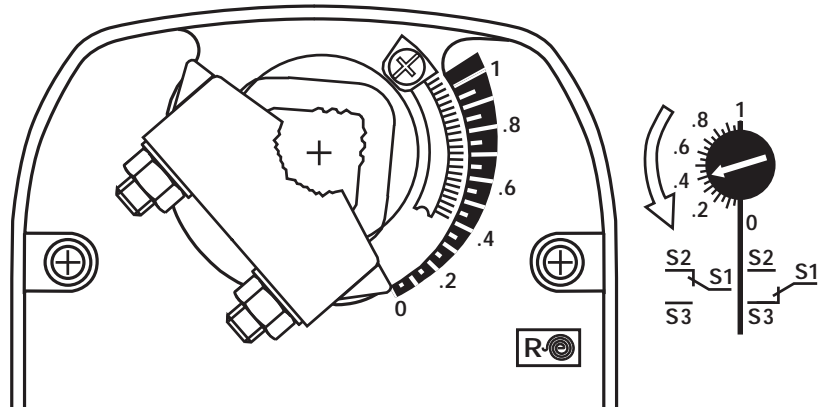
Auxiliary switch adjustment for Spring Return actuators

LF..-S (Mounting side R)

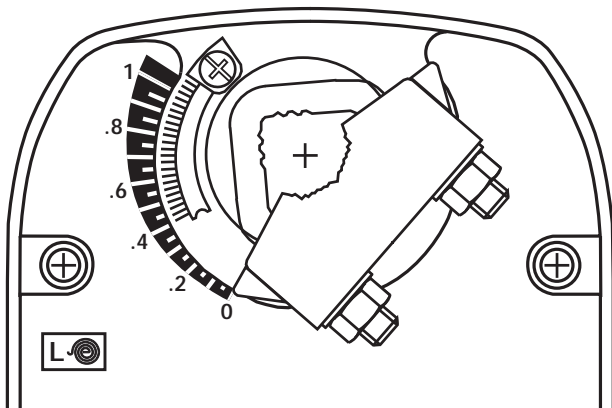
Starting point: Actuator in safe position

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

Innovation, Quality and Consultancy: A partnership for motorizing HVAC actuators



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