

KP-1...72S
Series



Normally open fire-resisting duct damper with mechanical drive mechanism

Application

The fire dampers are intended for automatic closing of process openings and air duct penetrations in intermediate floors, walls and partitions, as well as closing of openings in supply and exhaust ducts of smoke ventilation systems.

KP-1...PKP
KP-1...PVP
KP-1...PSP
Series



Normally open fire-resisting duct damper with electric drive mechanism

The dampers of this particular design are not suitable for installation in air ducts and ducts of premises with rated explosion and fire safety category A and B and in flammable and explosive mixture intakes.

The KP-1 fire-resisting duct dampers are capable of resisting fire for at least 60 minutes (EI 60) at the temperature of 600 °C.

Design

The KP-1 series dampers are made in the general-purpose industrial version with a minimized variety of hardware components using low-alloy galvanized steel. The damper flap is made of fire-resistant material. The duct installation design results in two mounting flanges on the casing for integration into a ventilation ducts (air ducting) and external configuration of the drive mechanism for easier maintenance. The KP-1 series dampers are characterised by a simplified design and the absence of a hot and cold zone baffle. Depending on the design variant KP-1 series dampers are equipped with:

▶ **Mechanical actuating unit with a thermal fuse and a return spring.**

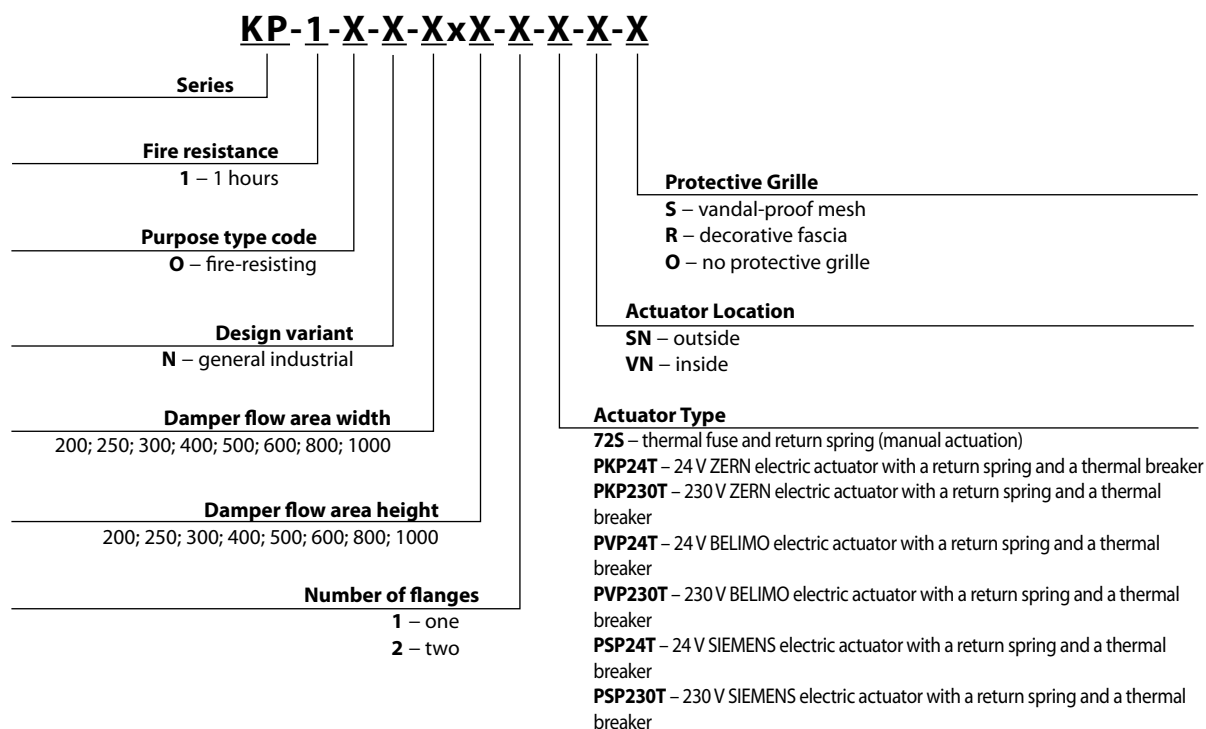
The damper is set to the operating position upon the thermal fuse breakdown resulting from a temperature increase.

Emergency Damper Actuation: The flap remains in the protective position (damper unaffected by fire) and is fixed by a thermal fuse (the return spring is cocked upon setting the damper to the protective position). Upon emergency actuation (damper directly affected by fire) the thermal fuse breaks down and the return spring sets the flap to the operating condition.

▶ **Electric actuator with a built-in return spring and a back-up thermal breaker.**

Setting the damper to operating position (direct fire contact): remotely, via electric actuator. The damper

Designation key:



can be set to the operating or protective position either remotely via the control panel or manually using the manual cocking handle which is always included in the standard delivery set of the electric actuator.

In case of the remote control panel failure, the back-up thermal breaker interrupts the power supply to

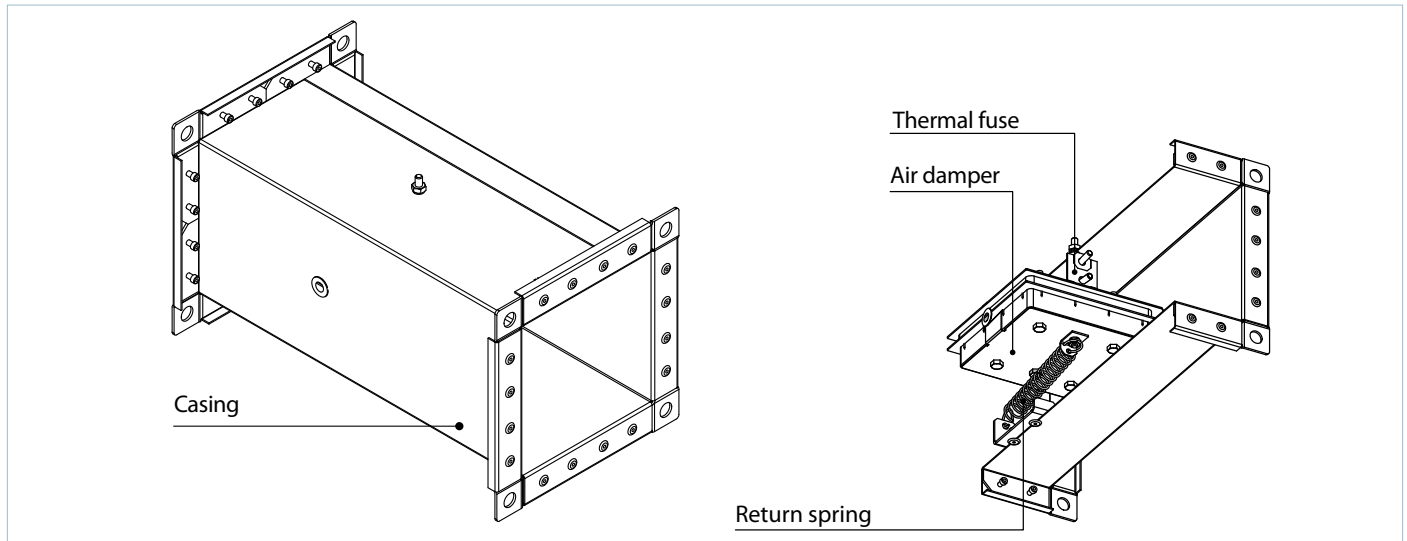
the electric actuator and the return spring sets the damper to the operating position. Emergency damper actuation: the damper flap is set to the protective position automatically (damper unaffected by fire).

The electric actuator remains energized at all times.

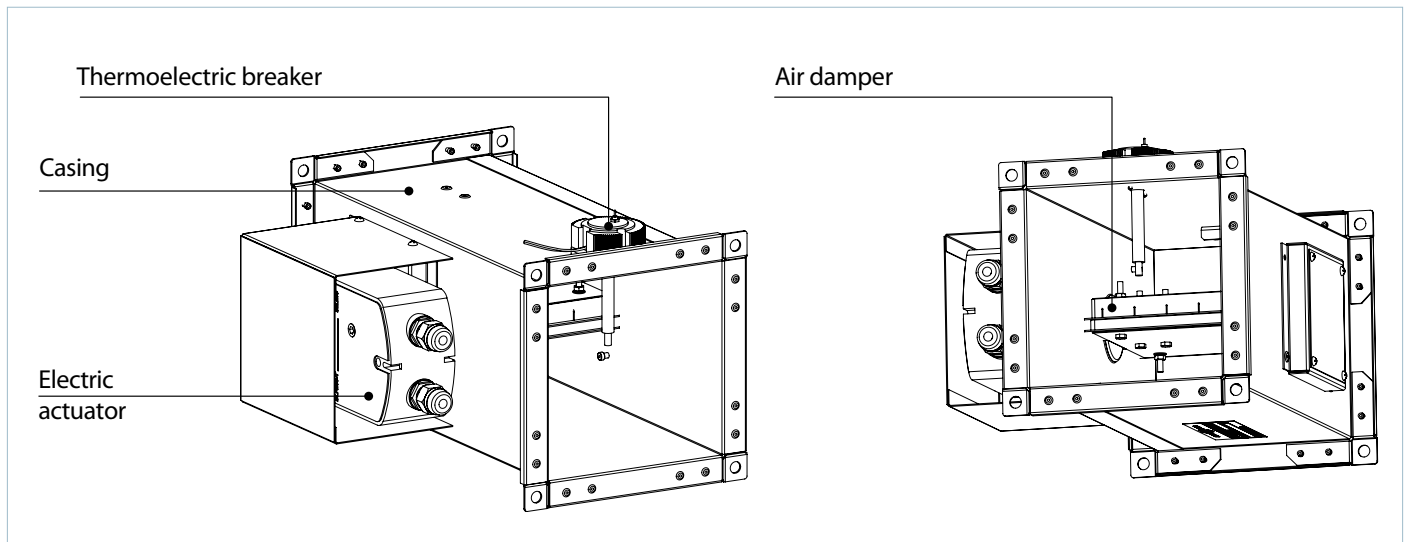
In case of an emergency actuation (direct fire contact):

The electric actuator equipped with a return spring is de-energized and the damper flap is set to the operating position by means of the spring energy. In case of a power failure not related to fire and its subsequent restoration at the actuator with a return spring, the damper flap returns to protective position.

■ KP-1...72S fire safety damper with a mechanical actuating unit with a thermal fuse and a return spring



■ KP-1...PKP/KP-1...PVP/KP-1...PSP fire safety damper with a Belimo electric actuator and a thermoelectric breaker



FIRE-RESISTING DAMPER

Installation

The damper must be installed into the building envelope structure in accordance with the applicable standards and regulations. The seal fire resistance must be at least equal to that of the building envelope.

The dampers can be installed in any position in vertical and horizontal ducts of fire-protection structures.

The ducts for damper installation must be made in such a way so as to prevent the transfer of loads caused by the fire-protection structures to the damper casing.

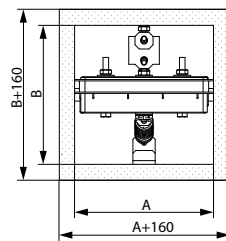
The adjoining air duct must be suspended in such a way so as to prevent the transfer of air duct load to the damper flange.

The minimum free space for accessing the control parts must be at least 350 mm. Make sure to arrange an inspection hole. While carrying out the installation consider size K. When two or more dampers are installed into the same fire-protection separation structure, the distance between the two adjacent dampers must be at least 200 mm.

The damper must be installed in such a way so that the damper flap (in its closed position) is located in the fire-protection separation structure. If such installation is not possible, the damper casing part between the fire-protection separation structure and the damper flap must be insulated with a suitable material pursuant

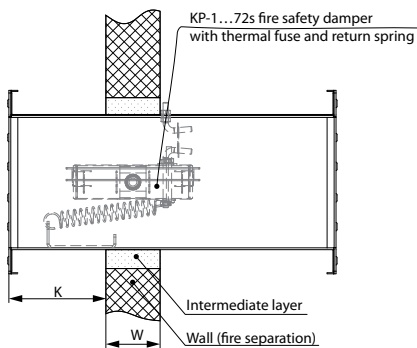
to the applicable standards. The damper control mechanism must be protected against damage and contamination. The damper casing must not deform any deformation during embedding. After the installation the flap must not catch against the damper casing while opening or closing. The fire safety damper can be integrated into a tight wall structure – e.g. made of conventional concrete work of minimum width $W = 100$ mm or into a plasterboard wall of the necessary fire resistance class or into a tight ceiling structure – e.g. made of conventional concrete of minimum width $W = 150$ mm. Do not use any foaming substances for sealing the damper in the separation structure.

Installation recommendations for KP-1...72S dampers with a thermal fuse and a return spring:

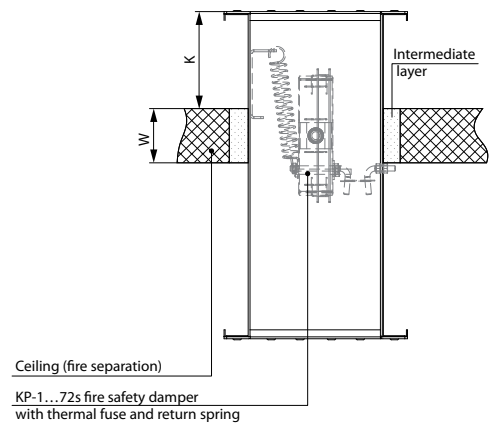


For sizes A and B please refer to the dimension table

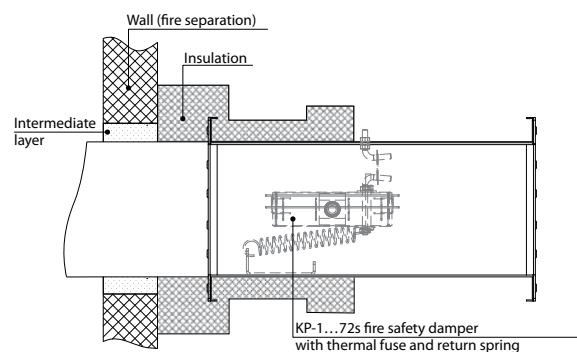
– in vertical building structures



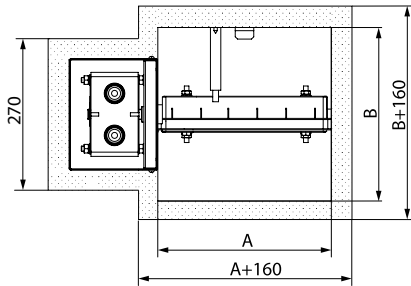
– in horizontal building structures



– duct modification with an air duct

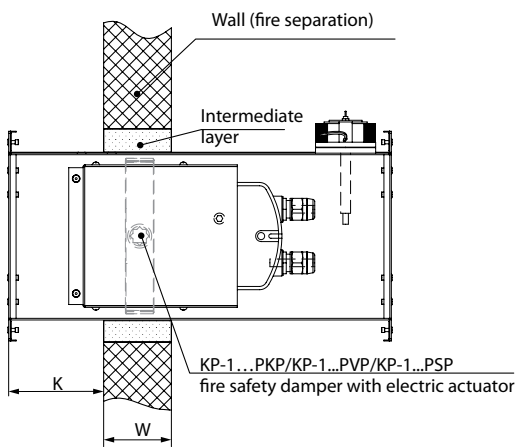


■ Installation recommendations for KP-1...PKP/KP-1...PVP/KP-1...PSP fire safety dampers with electric actuator and thermoelectric breaker

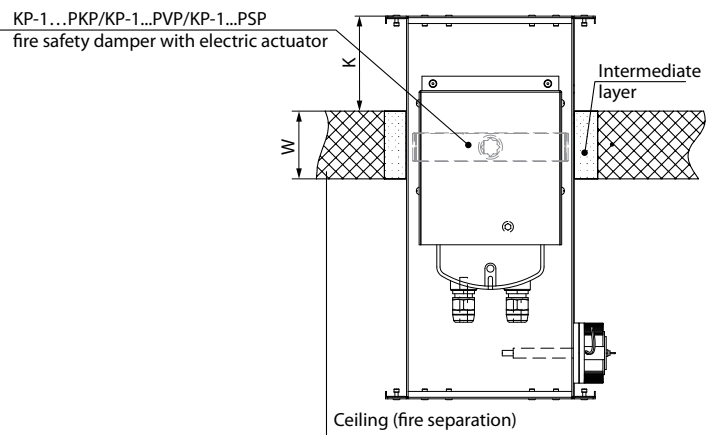


For sizes A and B please refer to the dimension table

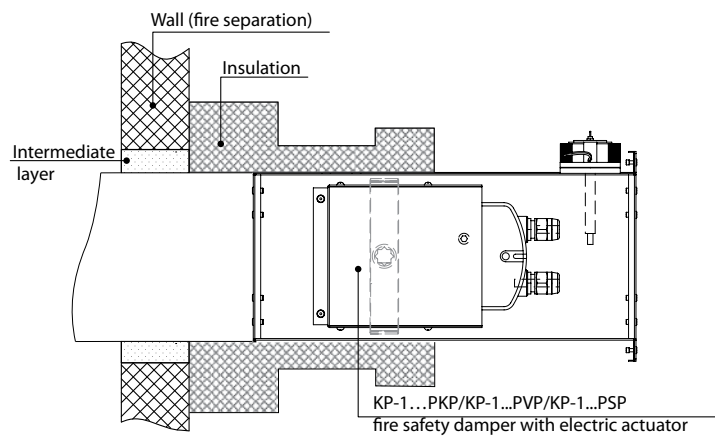
- in vertical building structures



- in horizontal building structures

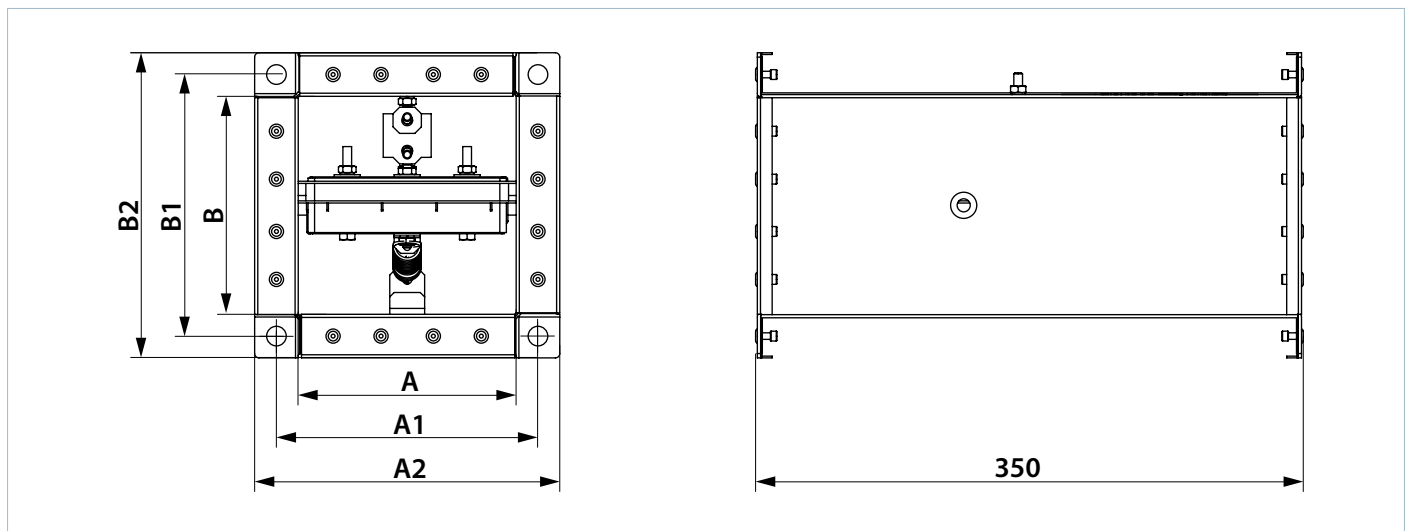


- duct modification with an air duct



Overall and connecting dimensions of KP-1...725 dampers with a mechanical actuator:

Duct cross-section	Dimensions [mm]						Weight [kg]
	A	A1	A2	B	B1	B2	
KP-1-0-N-200x200-2-72S-SN-0	200	220	240	200	220	240	3.5
KP-1-0-N-250x200-2-72S-SN-0	250	270	290	200	220	240	4
KP-1-0-N-250x250-2-72S-SN-0	250	270	290	250	270	290	4.5
KP-1-0-N-300x200-2-72S-SN-0	300	320	340	200	220	240	4.5
KP-1-0-N-300x250-2-72S-SN-0	300	320	340	250	270	290	5.1
KP-1-0-N-300x300-2-72S-SN-0	300	320	340	300	320	340	5.8
KP-1-0-N-400x250-2-72S-SN-0	400	420	440	250	270	290	6.3
KP-1-0-N-400x300-2-72S-SN-0	400	420	440	300	320	340	7.1
KP-1-0-N-400x400-2-72S-SN-0	400	420	440	400	420	440	8.7
KP-1-0-N-500x300-2-72S-SN-0	500	520	540	300	320	340	8.5
KP-1-0-N-500x400-2-72S-SN-0	500	520	540	400	420	440	10.3
KP-1-0-N-500x500-2-72S-SN-0	500	520	540	500	520	540	12
KP-1-0-N-600x400-2-72S-SN-0	600	620	640	400	420	440	11.9
KP-1-0-N-600x500-2-72S-SN-0	600	620	640	500	520	540	13.8
KP-1-0-N-600x600-2-72S-SN-0	600	620	640	600	620	640	16.1



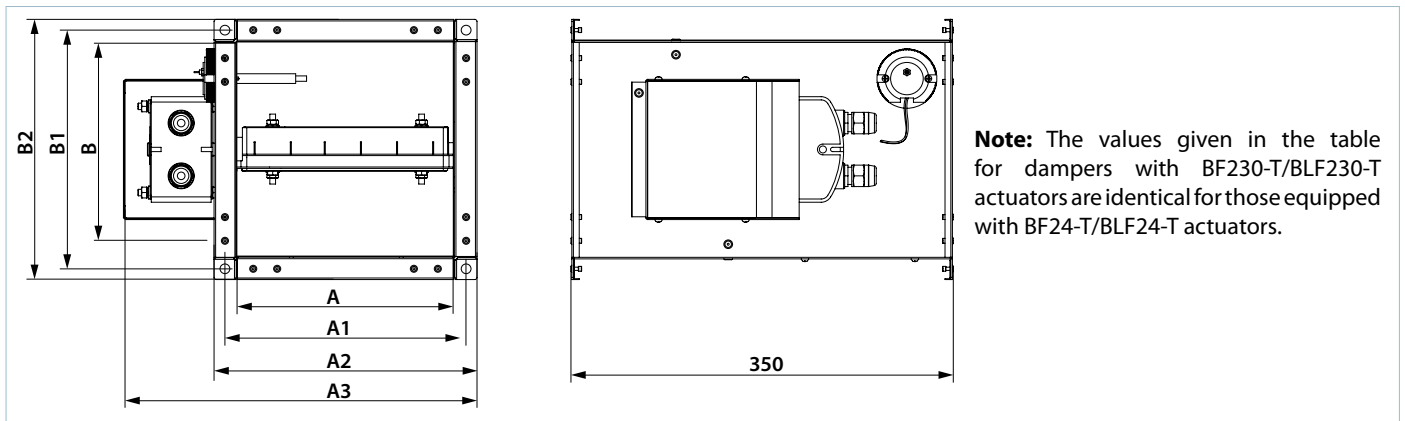
Flow area of fire-resisting duct damper with mechanical actuator [m²]

A/B	200	250	300	400	500	600
200	0.032					
250	0.04	0.053				
300	0.048	0.063	0.078			
400	0.064	0.084	0.104	0.144		
500	0.08	0.105	0.13	0.18	0.23	
600	0.096	0.126	0.156	0.216	0.276	0.336

Dampers with dimensions not included in the table can be produced on request.
Limit damper size: 600x600.

■ Overall and connecting dimensions of KP-1...PKP/KP-1...PSP dampers with electric actuators:

Duct cross-section	Dimensions [mm]							Weight [kg]
	A	A1	A2	A3	B	B1	B2	
KP-1-0-N-200x200-2-...-SN-0	200	220	240	325	200	220	240	6.2
KP-1-0-N-250x200-2-...-SN-0	250	270	290	375	200	220	240	6.8
KP-1-0-N-250x250-2-...-SN-0	250	270	290	375	250	270	290	7.3
KP-1-0-N-300x200-2-...-SN-0	300	320	340	425	200	220	240	7.3
KP-1-0-N-300x250-2-...-SN-0	300	320	340	425	250	270	290	7.9
KP-1-0-N-300x300-2-...-SN-0	300	320	340	425	300	320	340	8.5
KP-1-0-N-400x250-2-...-SN-0	400	420	440	525	250	270	290	9.1
KP-1-0-N-400x300-2-...-SN-0	400	420	440	525	300	320	340	9.8
KP-1-0-N-400x400-2-...-SN-0	400	420	440	525	400	420	440	11.3
KP-1-0-N-500x300-2-...-SN-0	500	520	540	625	300	320	340	10.7
KP-1-0-N-500x400-2-...-SN-0	500	520	540	625	400	420	440	12.9
KP-1-0-N-500x500-2-...-SN-0	500	530	560	635	500	530	560	16.6
KP-1-0-N-600x400-2-...-SN-0	600	620	640	725	400	420	440	14.5
KP-1-0-N-600x500-2-...-SN-0	600	630	660	735	500	530	560	18.4
KP-1-0-N-600x600-2-...-SN-0	600	630	660	735	600	630	660	20.6
KP-1-0-N-800x500-2-...-SN-0	800	830	860	935	500	530	560	22.3
KP-1-0-N-800x600-2-...-SN-0	800	830	860	935	600	630	660	24.8
KP-1-0-N-800x800-2-...-SN-0	800	830	860	935	800	830	860	30.1
KP-1-0-N-1000x600-2-...-SN-0	1000	1030	1060	1135	600	630	660	29
KP-1-0-N-1000x800-2-...-SN-0	1000	1030	1060	1135	800	830	860	35.4
KP-1-0-N-1000x1000-2-...-SN-0	1000	1030	1060	1135	1000	1030	1060	41.7



Flow area of the duct fire-resistant damper with an electric actuator installed outside the damper [m²]

S2/S1	200	250	300	400	500	600	800	1000
200	0.032							
250	0.04	0.053						
300	0.048	0.063	0.078					
400	0.064	0.084	0.104	0.144				
500	0.08	0.105	0.13	0.18	0.23			
600	0.096	0.126	0.156	0.216	0.276	0.336		
800	0.128	0.168	0.208	0.288	0.368	0.448	0.608	
1000	0.16	0.21	0.26	0.36	0.46	0.56	0.76	0.96

Dampers with dimensions not included in the table can be produced on request.
Limit damper size: 1000x1000.

■ **Main technical specifications of Belimo electric actuators with a return spring and a thermal breaker**

Technical data	Basic models		Models with increased torque		Models with the highest torque	
Rated operation voltage	AC/DC 24 V	AC 230 V	AC/DC 24 V	AC 230 V	AC/DC 24 V	AC 230 V
Permissible operating voltage tolerance	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V
AC mains frequency	50/60 Hz					
Power consumption at rest [W]	0.8	1.1	1.4	2.1	2	3
Power consumption in operation [W]	2.5	3.5	4	5	7	8.5
Maximum design capacity [VA]	4	6.5	6	10	10	11
Motor torque [Nm]	4		9		18	
Spring torque [Nm]	3		7		12	
SEC class	III	II	III	II	III	II
Ingress protection rating	IP54					
Auxiliary switches	2 pcs., single-pole, reversible 1 mA...3 (0.5) A, AC 250 V				2 pcs., single-pole, reversible, 1 mA...6(3)A, AC 250 V	
Electric motor connection cable	1 m, 2 x 0.75 mm ² (halogen-free)					
Auxiliary switch connection cable	1 m, 6 x 0.75 mm ² (halogen-free)					
Running time spring	20 seconds at -10...+55 °C < 60 seconds at -30...-10 °C				16 seconds at +20 °C	
Running time motor	< 60 s/90°				< 120 s/90°	
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C					
Service life	Min. 60 000 emergency positions					
Technical maintenance	Not required					

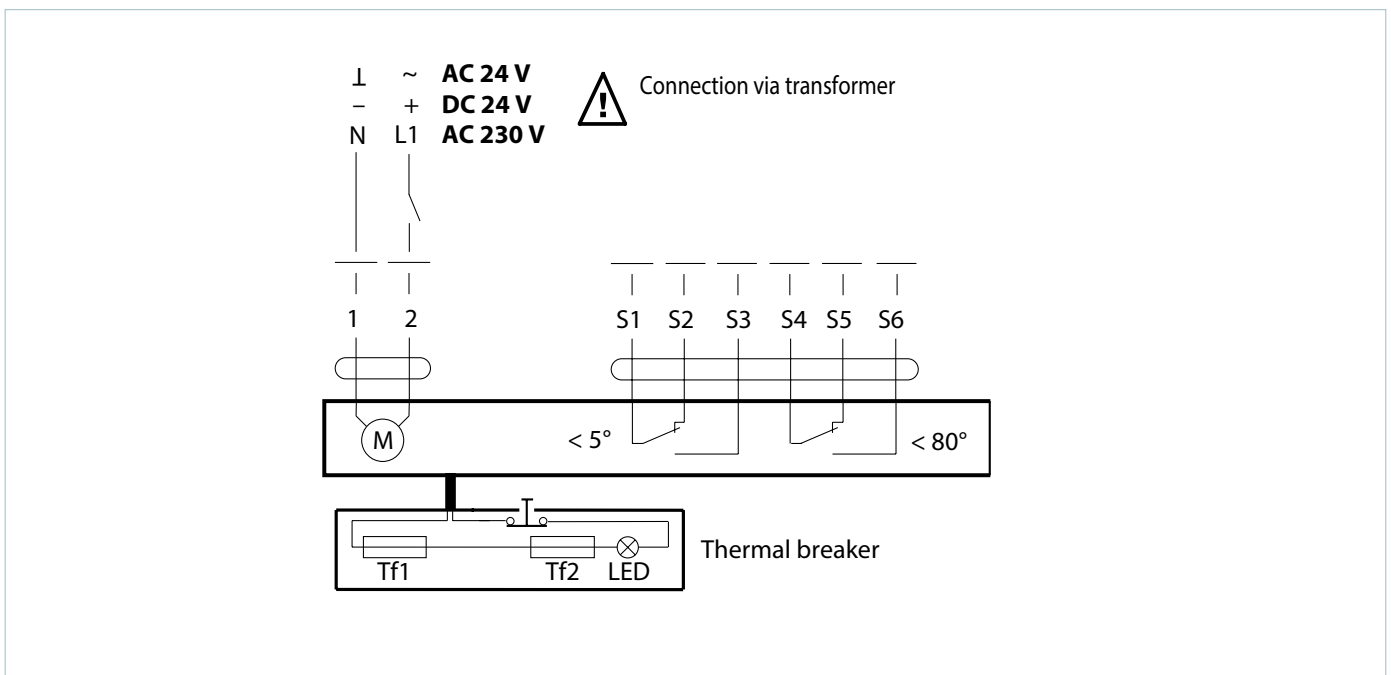
■ Main technical specifications of Zern electric actuators with a return spring and a thermal breaker

Technical data	Basic models		Models with increased torque	
Rated operation voltage	AC/DC 24 V	AC 100-240 V	AC/DC 24 V	AC 100-240 V
Permissible operating voltage tolerance	AC/DC 19.2...28.8 V	AC 85...265 V	AC/DC 19.2...28.8 V	AC 85...265 V
AC mains frequency	50/60 Hz			
Power consumption at rest [W]	3			
Power consumption in operation [W]	5			
Motor torque [Nm]	5		8	
Spring torque [Nm]				
SEC class	III	II	III	II
Ingress protection rating	IP54			
Auxiliary switches	2 pcs., single-pole, reversible, 1 mA...3(0.5)A, AC 220 V			
Electric motor connection cable	1 m, 2 x 0.5 mm ² (halogen-free)			
Auxiliary switch connection cable	1 m, 6 x 0.5 mm ² (halogen-free)			
Running time spring	<20 seconds < 60 seconds at -30...-10 °C		<25 seconds < 60 seconds at -30...-10 °C	
Running time motor	< 70 s/95°		< 100 s/95°	
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C			

■ Main technical specifications of Siemens electric actuators with a return spring and a thermal breaker

Technical data	Basic models		Models with increased torque		Models with the highest torque	
	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V
Rated operation voltage	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V
Permissible operating voltage tolerance	AC/DC ±20 %	AC ±15 %	AC/DC ±20 %	AC ±15 %	AC/DC ±20 %	AC ±15 %
AC mains frequency	50/60 Hz					
Power consumption at rest [W]	2	3.5	2	3.5	3	4
Power consumption in operation [W]	3.5	4.5	3.5	4.5	5	6
Maximum design capacity [VA]	5	7	5	7	7	8
Motor torque [Nm]	4		9		18	
Spring torque [Nm]	4		7		18	
SEC class	III	II	III	II	III	II
Ingress protection rating	IP54					
Auxiliary switches	2 pcs., single-pole, reversible, 6(2)A, AC 24...250 V					
Electric motor connection cable	0.9 m, 2 x 0.75 mm ² (halogen-free)					
Auxiliary switch connection cable	0.9 m, 6 x 0.75 mm ² (halogen-free)					
Running time spring	15 seconds < 60 seconds at -30...-10 °C					
Running time motor	90 s/90°					
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C					
Service life	10 000 emergency positions					
Technical maintenance	Not required					

■ Electrical connection of the basic models of Belimo and Zern electric actuators, as well as Belimo and Zern models with increased torque



■ Electrical connection of Belimo electric actuators with the highest torque, as well as Siemens electric actuators

