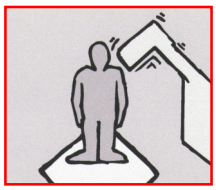
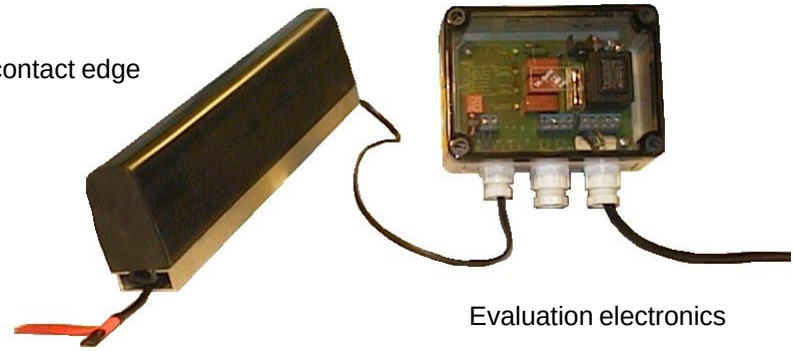
Safety switchgear are used in conjunction with safety contact elements wherever the secure protection of individuals and equipment is required. The safety switchgear presented here employ the quiescent current principle for monitoring the safety contact elements as this meets the high demands for fault recognition and safety. The safety level provided is attested to by approvals from the BG and TÜV for use up to safety category 3 in accordance with EN 954-1.To monitor the quiescent current, a monitoring resistor is mounted at the end of the signal transmitter line. If the setpoint quiescent current is flowing, the output relays are activated and the switching contacts are closed. If the switching element is activated or the safety circuit is interrupted, the relay switch contacts open. The relay switch states and the applied operating voltage are indicated by LEDs.

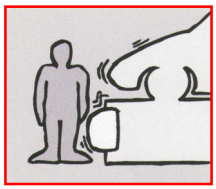


Safety contact edge



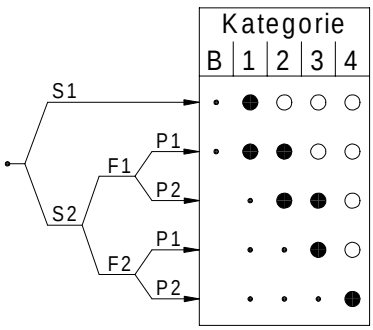
Evaluation electronics

8,2 kOhm
Monitoring resistor



Safety Considerations

The following risk chart reproduced from EN 954-1 offers instructions for selecting the safety system category. The selection of the appropriate safety combination and its safety level is the responsibility of the design or construction engineer. The instructions shown do not release the design or construction engineer from the obligation to observe all relevant standards in the design of the safety equipment.



S Degree of injury
- S1 Light (generally reversible) injuries
- S2 Severe (generally irreversible) injuries

F Frequency and/or duration of the hazard
- F1 Seldom to frequently
- F2 Frequent to continuous

P Opportunity to avoid the hazard
- P1 Possible under certain conditions
- P2 nearly impossible

Category selection

B, 1 - 4 categories for controller components relevant to safety
- ● Preferred category for reference points
- • Possible category requiring additional measures
- ○ Excessive measure in view of the hazard

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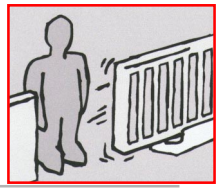
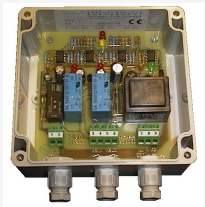


Switchgear Overview

			
Switchgear:	SK 21-11 SK 21-21	SK 24-31	SK 26-32
Former designation:			
Input	1 x sensing device 8,2 kΩ	1 x sensing device 8,2 kΩ	1 x sensing device 8,2 kΩ
Output	1 x redundant relay contacts / changer	1 x redundant relay contacts	1 x redundant relay contacts
Additional functions		optional auxiliary contact delayed/non-delayed nc-closer/no-closer slip-door contact	optional auxiliary contact delayed/non-delayed nc-closer/no-closer manual reset
Design:			
Housing	wall mounting with transparent cover	wall mounting with transparent cover	45 mm mounted housing for DIN standart rail
Dimensions	HxWxD = 94x94x45 mm	HxWxD = 94x130x55 mm	HxWxD = 75x45x110 mm
Power supply:			
	SK 21-11:		
Mains voltage	U_{EAC} = 230 V 50/60 Hz	U_{EAC} = 230 V 50/60 Hz	U_{EAC} = 230 V 50/60 Hz
Current consumption	I_E = 13 mA	I_{EAC} = 15 mA	I_{EAC} = 15 mA
Power consumption	P = 3 VA	P_{AC} = 3,5 VA	P_{AC} = 3,5 VA
	SK 21-21:		
Mains voltage	U_E = 12-24 V AC/DC	U_E = 12-24 V AC/DC	U_E = 12-24 V AC/DC
Current consumption	I_{EAC} = 79 mA, I_{EDC} = 71 mA	I_E = 95 mA	I_E = 110 mA
Power consumption	P_{AC} = 1,9 VA, P_{DC} = 1,7 W	P = 2,3 W	P = 2,6 W
Weight:			
Weight with housing	G = 280g	G = 334g	G = 270g
Safety class:	2* according to EN 954	2* according to EN 954	2* according to EN 954
Input contact element:			
terminal resistance	R_A = 8,2 KΩ	R_A = 8,2 KΩ	R_A = 8,2 KΩ
Input voltage	U_E = 4V ± 5%	U_E = 4V ± 2%	U_E = 4V ± 2%
Output current	approx. 1 mA	approx. 1 mA	approx. 1 mA
Switching times:			
Relay open ($U_E \rightarrow$ 0V)	T_A see data sheet	T_A see data sheet	T_A see data sheet
Relay closed (0V→U_E)	T_E ≈1 sec	T_E ≈1 sec	T_E ≈1 sec
Relays:			
Maximum switching voltage	U_{AC} = 250 V	U_{AC} = 250 V	U_{AC} = 250 V
Maximum switching current	I_{AC} = 2,5 A	I_{AC} = 2,5 A	I_{AC} = 2,5 A
Maximum switching voltage	U_{DC} = 30 V	U_{DC} = 30 V	U_{DC} = 30 V
Maximum switching current	I_{DC} = 2,5 A	I_{DC} = 2,5 A	I_{DC} = 2,5 A
Output fuse		I_{SI} = 2,5 AT	I_{SI} = 2,5 AT
Environmental conditions:			
Max. temperature range	-25°C bis +70°C	-25°C bis +70°C	-25°C bis +70°C
Diameter of connecting cables:			
single or fine wire cabless	A = 0,75 -1,5 mm²	A = 0,75 -1,5 mm²	A = 0,75 -1,5 mm²

* For licence and safety class look at the actuell certifikation

			
SK 28-32	SK 30-11 SK 30-21	SK 41-32	**Switchgear**
			Outline
2 x sensing device 8,2 kΩ 2 x redundant relay contacts	1 x sensing device 8,2 kΩ 1 x forced redundant redundant relays contact	1 x sensing device 8,2 kΩ 1 x forced redundant redundant relays contact	Input Output
optional auxiliary contact delayed/non-delayed nc-closer/no-closer	start-up testing	optional auxiliary contact manual reset	Addition function
			Design
45 mm mounted housing for DIN standart rail	wall mounting with transparent cover	22,5 mm mounted housing for DIN standart rail	Housing
HxWxD = 75x45x110 mm	HxWxD = 120x123x56 mm	HxWxD = 99x22,5x114 mm	Dimension
			Power supply
	SK 30-11:		
U_{EAC} = 230 V 50/60 Hz	U_{EAC} = 230 V AC	U_{EAC} = 230 V 50/60 Hz	Mains voltage
I_{EAC} = 13 mA	I_E = 20 mA	I_{EAC} = 25 mA	Current consumption
P_{AC} = 3 VA	P_{AC} = 4,5 VA	P_{AC} = 5,8	Power Consumption
	SK 30-21:		
U_E = 12-24 V AC/DC	U_E = 24 V AC/DC	U_E = 24 V AC/DC	Mains voltage
	I_{EAC} = 117mA, I_{EDC} = 83mA	I_E = 120 mA	Current consumption
	P_{AC} = 2,8 VA, P_{DC} = 2 W	P = 2,9 VA	Power Consumption
			Weight
G = 432g	G = 445g	G = 335g	Weight with casing
2* according to EN 954	3* according to EN 954	3* according to EN 954	**safety class**
			Input contact element
R_A = 8,2 KΩ	R_A = 8,2 KΩ	R_A = 8,2 KΩ	Input terminal resistance
U_E = 4V ± 2%	U_E = 6V ± 2%	U_E = 6V ± 2%	Input voltage
approx. 1 mA	approx. 1 mA	approx. 1 mA	Output current
			Switching times
T_A see data sheet	T_A see data sheet	T_A see data sheet	Relay open (UE → 0V)
T_E ≈1 sec	T_E ≈1 sec	T_E ≈1 sec	Relay closed (0V → UE)
			Relay's
U_{AC} = 250 V	U_{AC} = 250 V	U_{AC} = 250 V	Maximum switching voltage
I_{AC} = 2,5 A	I_{AC} = 2,5 A	I_{AC} = 4 A	Maximum switching current
U_{DC} = 30 V	U_{DC} = 30 V	U_{DC} = 30 V	Maximum switching voltage
I_{DC} = 2,5 A	I_{DC} = 2,5 A	I_{DC} = 4 A	Maximum switching current
	I_{SI} = 2,5 AT		Output Fuse
			Environmental conditions
-25°C bis +70°C	-25°C bis +70°C	-25°C bis +70°C	Max. temperature range
			Diameter of connecting cables
A = 0,75 -1,5 mm²	A = 0,75 -1,5 mm²	A = 0,75 -1,5 mm²	single or fine wire cables

* For licence and safety class look at the actuall certifikation

ISK Inductive Cable Transmission System

General Information

The ISK cable transmission system solves the problem of connecting a movable signal transmitter and a stationary evaluation without mechanical stress. Here, communications between the movable signal transmitters and the evaluation electronics are based on inductivity. To achieve this, the monitoring electronics induces a frequency on a coil core connected to a closed conductor loop.
The second coil core to which the movable signal transmitters are connected receives this frequency and, in case of a wire break or the activation of a signal transmitter, sends a corresponding message to the evaluation electronics.

ISK in a see-through housing

Function

ISK safety switchgear is designed to be used in a wide variety of environments and under varying technical conditions. Up to four safety contact edge circuits can be connected to each ISK system. For the safety contact edge (SKL) on the portal wing, two channels are available (SKL opening movement, and SKL closing movement), while two channels are also available for the safety contact edge on the guidepost. The movable safety contact edges on the portal are monitored by the cable transmission system. This monitoring is contact-free and results in no wear. The fixed safety contact edges are connected directly to the switchgear. The switchgear continuously monitors these four safety contact edges circuits for activation or interruption (wire break). In case of a fault, one of the two stop commands (stop in the opening direction or stop in closing direction) is issued to the affected safety contact edge circuit. In order to permit quiescent current monitoring of the entire system, a terminal resistor is integrated into the final edge in the safety contact edge circuit. If the setpoint quiescent current is flowing, the output relays are activated and the switching contacts are closed. If the switching element is activated or the safety circuit is interrupted, the relay switching contacts open. To increase security, both output channels are equipped with two switching stages whose output relay contacts are switched in series. The switch states of the relays and the applied operating voltage are indicated by LEDs.

ISK in a surface-mounted housing with 11-pin connector socket

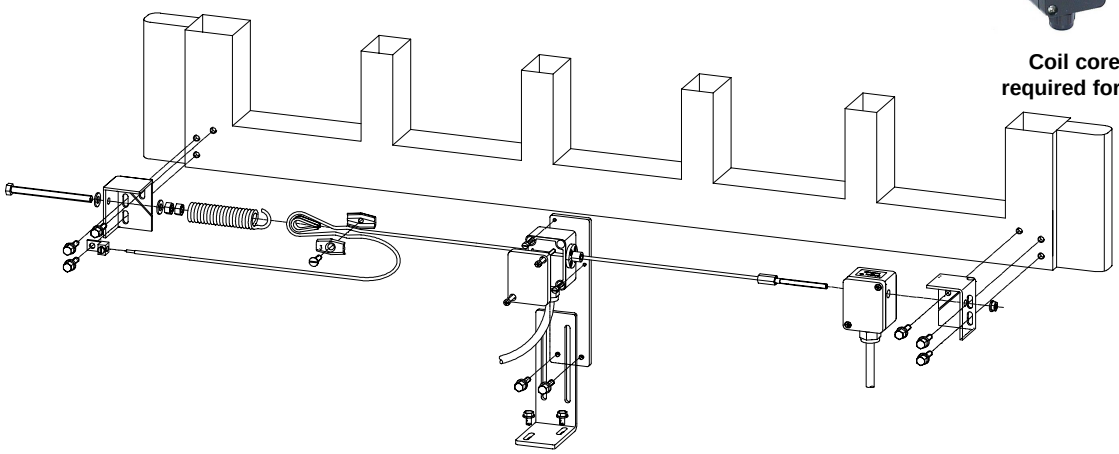
ISK connector PCB

The switchgear has been designed in accordance with the latest EN portal standards and meets all their requirements.

IISK in a snap-on rail housing

Please refer to the technical specification sheets of the ISK series of switchgear for further technical information.

Coil cores, one pair required for each system



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