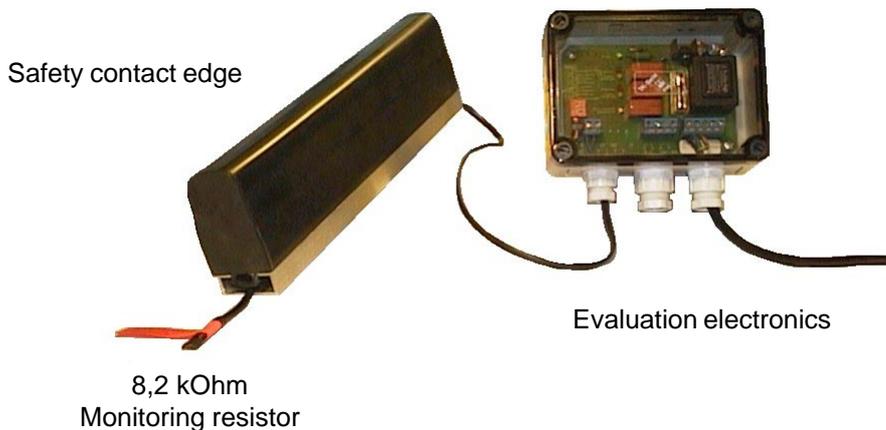
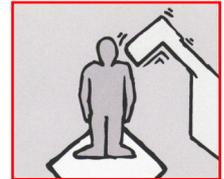


Safety switchgear are used in conjunction with safety contact elements wherever the secure protection of individuals and equipment is required. The safety switchgear presented here employ the quiescent current principle for monitoring the safety contact elements as this meets the high demands for fault 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

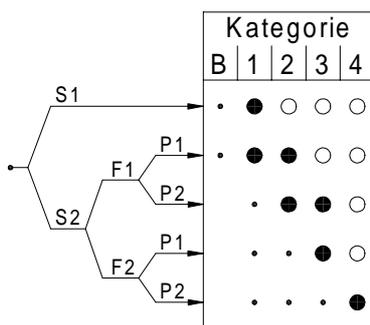
Evaluation electronics

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





Switchgear:	SK 21-11 SK 21-21	SK 24-31	SK 26-32
Former designation: Input Output Additional functions	1 x sensing device 8,2 kΩ 1 x redundant relay contacts / changer	1 x sensing device 8,2 kΩ 1 x redundant relay contacts optional auxiliary contact delayed/non-delayed nc-closer/no-closer slip-door contact	1 x sensing device 8,2 kΩ 1 x redundant relay contacts optional auxiliary contact delayed/non-delayed nc-closer/no-closer manual reset
Design: Housing Dimensions	wall mounting with transparent cover HxWxD = 94x94x45 mm	wall mounting with transparent cover HxWxD = 94x130x55 mm	45 mm mounted housing for DIN standart rail HxWxD = 75x45x110 mm
Power supply: Mains voltage Current consumption Power consumption	SK 21-11: $U_{EAC} = 230\text{ V } 50/60\text{ Hz}$ $I_E = 13\text{ mA}$ $P = 3\text{ VA}$	$U_{EAC} = 230\text{ V } 50/60\text{ Hz}$ $I_{EAC} = 15\text{ mA}$ $P_{AC} = 3,5\text{ VA}$	$U_{EAC} = 230\text{ V } 50/60\text{ Hz}$ $I_{EAC} = 15\text{ mA}$ $P_{AC} = 3,5\text{ VA}$
Mains voltage Current consumption Power consumption	SK 21-21: $U_E = 12-24\text{ V AC/DC}$ $I_{EAC} = 79\text{ mA}, I_{EDC} = 71\text{ mA}$ $P_{AC} = 1,9\text{ VA}, P_{DC} = 1,7\text{ W}$	$U_E = 12-24\text{ V AC/DC}$ $I_E = 95\text{ mA}$ $P = 2,3\text{ W}$	$U_E = 12-24\text{ V AC/DC}$ $I_E = 110\text{ mA}$ $P = 2,6\text{ W}$
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 Input voltage Output current	$R_A = 8,2\text{ K}\Omega$ $U_E = 4\text{ V} \pm 5\%$ approx. 1 mA	$R_A = 8,2\text{ K}\Omega$ $U_E = 4\text{ V} \pm 2\%$ approx. 1 mA	$R_A = 8,2\text{ K}\Omega$ $U_E = 4\text{ V} \pm 2\%$ approx. 1 mA
Switching times: Relay open ($U_E \rightarrow 0\text{V}$) Relay closed ($0\text{V} \rightarrow U_E$)	T_A see data sheet $T_E \approx 1\text{ sec}$	T_A see data sheet $T_E \approx 1\text{ sec}$	T_A see data sheet $T_E \approx 1\text{ sec}$
Relays: Maximum switching voltage Maximum switching current Maximum switching voltage Maximum switching current Output fuse	$U_{AC} = 250\text{ V}$ $I_{AC} = 2,5\text{ A}$ $U_{DC} = 30\text{ V}$ $I_{DC} = 2,5\text{ A}$	$U_{AC} = 250\text{ V}$ $I_{AC} = 2,5\text{ A}$ $U_{DC} = 30\text{ V}$ $I_{DC} = 2,5\text{ A}$ $I_{SI} = 2,5\text{ AT}$	$U_{AC} = 250\text{ V}$ $I_{AC} = 2,5\text{ A}$ $U_{DC} = 30\text{ V}$ $I_{DC} = 2,5\text{ A}$ $I_{SI} = 2,5\text{ AT}$
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 mm ²	A = 0,75 -1,5 mm ²	A = 0,75 -1,5 mm ²

* For licence and safety class look at the actuall certification



SK 28-32



SK 30-11
SK 30-21



SK 41-32

Switchgear

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

* For licence and safety class look at the actual certification

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.

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.

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

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



ISK in a see-through housing



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



ISK connector PCB



ISK in a snap-on rail housing



Coil cores, one pair required for each system

