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KSR Contact Protection Relays



KSR Contact Protection Relay Type KR230-Ex and KR24-Ex



General Description

The contact protection relays KR230-Ex and KR24-Ex transmit binary signals out of the hazardous area.

The input circuits are suitable for sensors according to NAMUR DIN EN 60947-5-6 or mechanical contacts.

Inputs are safely separated from outputs and supply voltage according to DIN EN 50020.

Outputs, and supply voltage are galvanically isolated from each other in accordance with DIN EN 50178 for a nominal isolation voltage of 253 V AC.

Wire break monitoring

The output is switched off if the current in the control circuit falls below 0.1 mA (response level for wire break monitoring).

Technical Details

- dual channel
- 1 output relay per channel, volt-free
- switching status indication via yellow LED
- reversible operation mode
- wire break monitoring via red LED
- control circuit EEx ia IIC

Input Circuit

Option 1

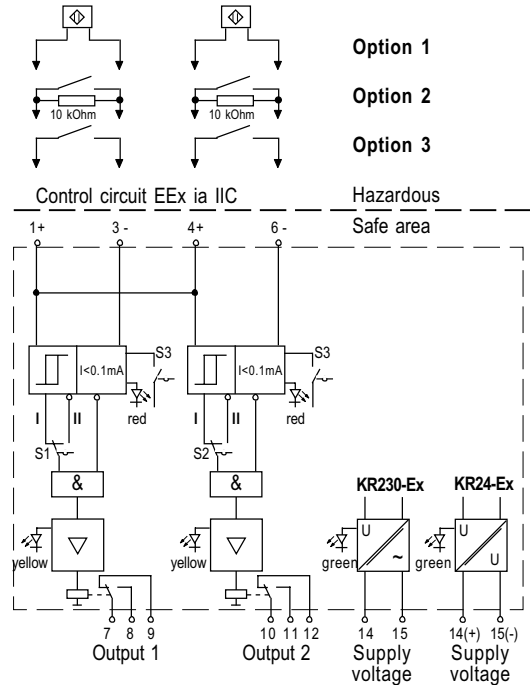
Sensor connected with wire break monitoring
DIP switch 3 in pos. "I" (OFF)

Option 2

Mechanical contact connected with wire break monitoring
DIP switch 3 in pos. "I" (OFF)

Option 3

Mechanical contact connected without wire break monitoring
DIP switch 3 in pos. "II" (ON)



Selection of operating mode

Detail front panel	Input	Output
	1 - Signal	Relay energised
	0 - Signal	Relay de-energised
	0 - Signal	Relay energised
	1 - Signal	Relay de-energised

Front panel controls

LEDs

- | | | | |
|---|-------|----------|---------------------------------|
| 1 | ① ② ③ | 1 yellow | Relay output channel 1 |
| 2 | √ ⑤ | 2 red | Wire break monitoring channel 1 |
| | | 3 green | Supply voltage |
| | | 4 yellow | Relay output channel 2 |
| | | 5 red | Wire break monitoring channel 2 |

Switch

- | | | |
|----|--|--------------------------|
| S1 | | Operating mode channel 1 |
| S2 | | Operating mode channel 2 |
| S3 | | Wire break monitoring |

Dimensions





- W 20 mm
H 105 mm
D 115 mm



KSR Contact Protection Relay

Type KR230-Ex and KR24-Ex



	 KR230-Ex	 KR24-Ex	Technical Data
Power supply			
Supply voltage terminal 14 (+), 15 (-)	207 ... 253 V AC, 45 ... 65 Hz	20 V ... 30 V DC	
Power consumption	≤ 1.3 W	≤ 1.3 W	
Max. safe voltage	253 V AC	125 V DC, 253 V AC	
Ripple		≤ 10%	
Current consumption		≤ 50 mA	
Input	terminal 1+, 3-, 4+, 6-	intrinsically safe, acc.to DIN EN 60947-5-6 (NAMUR)	
Open-circuit voltage U_{AO}		approx. 8 V DC	
Short-circuit current I_{AK}		approx. 8 mA	
Switch point I_s within range		1.2 mA ... 2.1 mA	
Switching hysteresis I_H		approx. 0.2 mA	
Input pulse length		⊕ 20 ms	
Input pulse interval		⊕ 20 ms	
Wire break monitoring		Break $I \leq 0.1$ mA, Short-circuit $I > 6$ mA	
Maximum ratings acc. to certificate of conformity			
Approval number	PTB 02 ATEX 2073	PTB 02 ATEX 2072	
Ignition protection class, category	 II (1) G D EEx ia IIC	 II (1) G D EEx ia IIC	
Max. voltage U_o	10.6 V	10.5 V	
Max. current I_o	19.1 mA	13 mA	
Max. power P_o	51 mW	34 mW	
Permissible circuit values			
Ignition protection class, category	EEx ia and EEx ib	EEx ia and EEx ib	
Explosion group	IIA IIB IIC	IIA IIB IIC	
Max. external capacitance	72 μ F 16.2 μ F 2.32 μ F	75 μ F 16.8 μ F 2.41 μ F	
Max. external inductance	780 mH 390 mH 97 mH	1000 mH 840 mH 210 mH	
Output	terminal 7, 8, 9, 10, 11, 12	not intrinsically safe, 1 changeover relay (SPDT) volt-free	
Contact rating AC		253 V / 2 A / $\cos \varphi > 0.7$	
Contact rating DC		40 V / 2 A / resistance load	
Mechanical service life		10^7 switching cycles	
Energise delay		approx. 20 ms	
De-energise delay		approx. 20 ms	
Transfer characteristics			
Switching frequency		≤ 10 Hz	
Galvanic separation			
Input - Output / Input - Supply		safe galvanic isolation to EN 50020, 375 V_{PP}	
Output - Supply		safe isolation to IEC 61140, nominal isolation voltage 253 V_{eff}	
Output - Output		basic isolation to DIN EN 50178, nominal isolation voltage 253 V_{eff}	
Environmental conditions			
Operating temperature		-20°C ... +60°C	
Protection class		IP 20	
Mechanical data			
Design		Modular terminal housing in Makrolon flammability class to UL94: V - 0	
Mounting		clipping onto 35 mm standard rail or by screws	
Connections		self-opening instrument terminals max. 2.5 mm ²	
Weight		approx. 150 g	

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KSR Contact Protection Relay Type KR230 and KR24



General Description

KSR contact protection relays type KR230 and KR24 use a control circuit with a protective low voltage acc. to VDE 0100 part 410 and transmit binary signals from a switching element e.g. magnetic float switches (catalogue 1003) and magnetic switches (catalogue 1008 and catalogue 1015).

The AC control circuit is voltage and temperature compensated and thus guarantees a stable switching behaviour. A 2-point control can be set up using the built-in latching contact.

The built-in relays can be used to trigger contactors or other circuitry without the danger of damaging the switching elements (reed contacts) by current peaks.

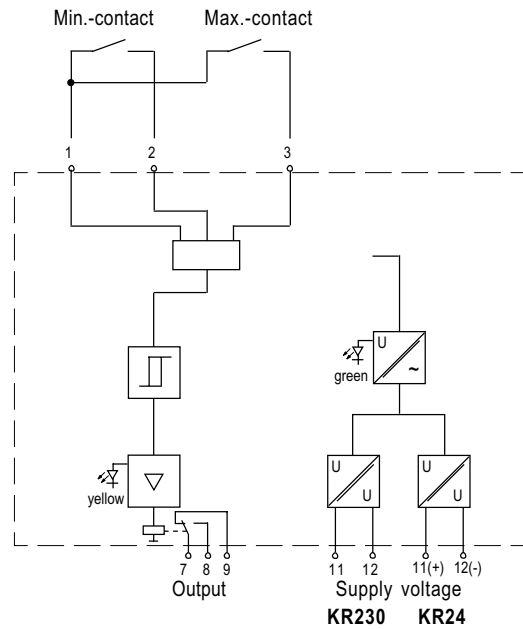
Inputs, outputs and supply voltage are galvanically isolated from each other in accordance with DIN EN 50178 for a nominal isolation voltage of 253 V AC.

High Alarm

The output relay is energised when the switch point is reached.

Low Alarm

The output relay is energised immediately when the supply voltage is connected. It is de-energised when the switch point is reached.



Technical Details

- control circuit acc. to VDE 0100 part 410
- 2-point control possible
- High / Low Alarm selectable

Selection of operating mode

Detail front panel	Input	Output
	1 - Signal Terminal 1 Terminal 3	Relay energised
	0 - Signal Terminal 1 Terminal 3	Relay de-energised
	0 - Signal Terminal 1 Terminal 3	Relay energised
	1 - Signal Terminal 1 Terminal 3	Relay de-energised

Front panel controls

LED's	
1	1 yellow Relay output
2	2 green Supply voltage
Switch S1	

Dimensions
W 20 mm
H 105 mm
D 115 mm



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KSR Contact Protection Relay

Type KR230 and KR24



		KR230	KR24	Technical Data
Power supply				
Supply voltage	terminal 11(+), 12(-)	230 V AC, 48 Hz ... 62 Hz	24 V DC	
Power consumption		≤ 0.8 W	≤ 0.8 W	
Input / Current circuit		terminal 1, 2 and 3	1 common, 2 min-contact, 3 max-contact	
Max. voltage		10 V AC (approx. 1 Hz)		
Max. current		5 mA		
Min - Max - Control		terminal 1, 2 and 3		
On - Off - Control		terminal 1 and 3		
Output		terminal 7, 8 and 9	1 relay output (SPDT) volt free	
Contact rating AC		250 V / 2 A / $\cos \varphi > 0.7$		
Contact rating DC		40 V / 2 A / resistance load		
Energise delay		approx. 1 s		
De-energise delay		approx. 1 s		
Switch S1		I open circuit current		
		II closed circuit current		
Transfer characteristics				
Switching frequency		≤ 10 Hz		
Galvanic separation				
Supply - Output		safe galvanic isolation		
Supply - Input		acc. to DIN 106		
Input - Output		nominal isolation voltage 253 V _{eff}		
Environmental conditions				
Operating temperature		-25°C ... +65°C		
Protection class		IP 20		
Mechanical data				
Design		Modular terminal housing in Makrolon		
		flammability class to UL94: V - 0		
Mounting		clipping onto 35 mm standard rail or by screws		
Connections		self-opening instrument terminals max. 2.5 mm ²		
Weight		approx. 110 g		

