



KSR Electrode Relay
KSR Water Detector Relay
KSR Rod and Floor Electrodes

1004-2



KSR Electrode Relay Type ER230 and ER24



General description KSR Electrode relays type ER230 and ER24 operate on the conductive measurement principle and can be used in conjunction with KSR Rod electrodes to monitor and control liquid levels of electrically conductive media such as water, caustic solutions or acids. They have a protected low voltage control circuit to VDE 0100 part 410.

The electrode relays provide an AC measuring voltage to the electrodes and react to the small alternating current at the electrode tip, generated upon contact with the conductive medium. The controllers are voltage and temperature stabilised and guarantee a defined switch behaviour. A holding contact allows the units to be used as min-max controllers. As conductivity can vary from liquid to liquid, the response sensitivity of the relay units is adjustable.

Via the relay outputs, the switch signals can be forwarded to other evaluating circuits or instruments.

Power supply/output, power supply/input and input/output are galvanically isolated to DIN 106, rated insulation voltage of 253V_{eff}.

Open circuit current principle

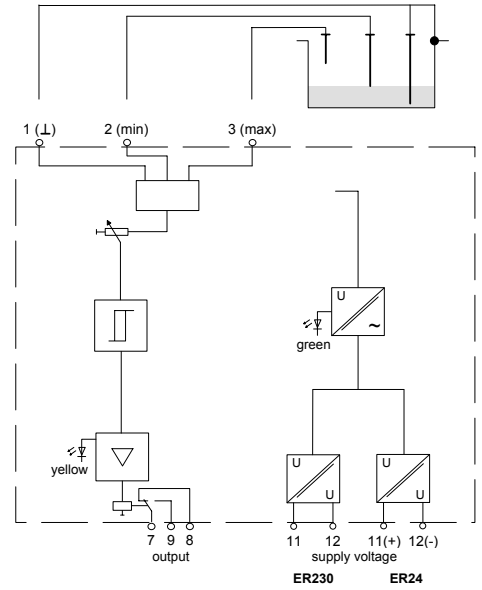
In the open circuit current principle the relay energises when the liquid reaches the electrode.

Closed circuit current principle

In the closed circuit current principle the relay energises immediately on power up. It de-energises, when the liquid reaches the electrode.

Technical features

- ◆ protected low voltage control circuit to VDE 0100 part 410
- ◆ Min-Max-Control
- ◆ open circuit current / closed circuit current – user selectable



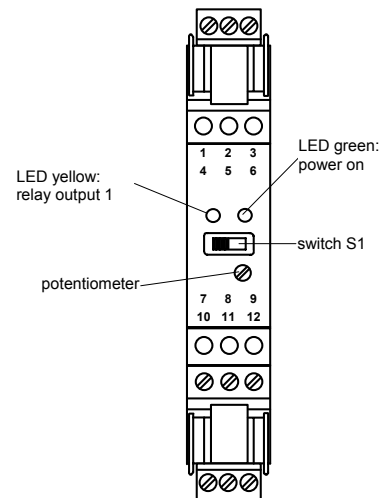
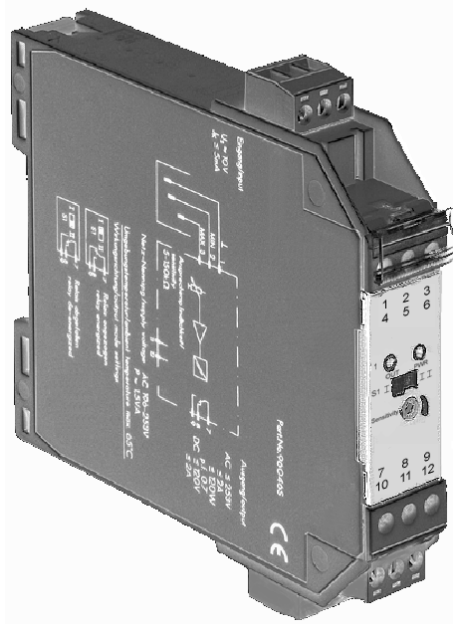
Selection of operating mode output relay

detail front panel	input	output				
	<table border="1"> <tr> <td>1</td> <td>3</td> </tr> <tr> <td>1 - Signal</td> <td></td> </tr> </table>	1	3	1 - Signal		relay energised
1	3					
1 - Signal						
	<table border="1"> <tr> <td>1</td> <td>3</td> </tr> <tr> <td>0 - Signal</td> <td></td> </tr> </table>	1	3	0 - Signal		relay de-energised
1	3					
0 - Signal						

detail front panel	input	output				
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1	3					
1 - Signal						

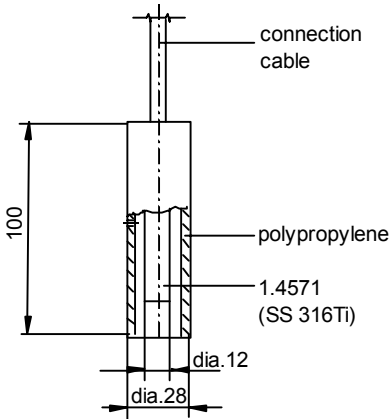
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Dimensions
 B 20 mm
 H 105 mm
 T 115 mm

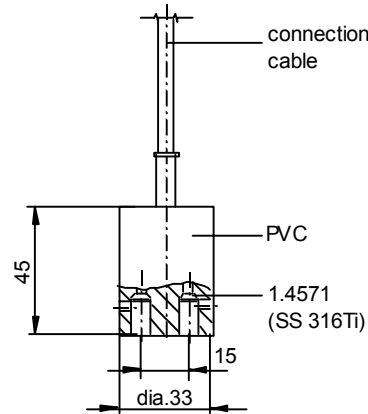


		ER230	ER24	Technical data
Supply				
supply voltage	terminals 11(+), 12(-)	230V AC, 48Hz ... 62Hz	24V DC	
power consumption		≤ 0.8W		
Input/control circuit		terminals 1, 2 and 3	1 (mass/ground) ; 2 (min.) ; 3 (max.)	
response sensitivity		5 kOhm ... 150 kOhm adjustable		
max. voltage		10V AC (approx.. 1 Hz)		
max. current		5mA		
min- /max- control		terminals 1, 2 and 3		
on- / off- control		terminals 1 and 3		
Output		terminals 7, 8 and 9	1 relay output (changeover contact) volt-free	
contact rating AC		250V / 2A / cosφ > 0,7		
contact rating DC		40V / 2A / resistance load		
delay time: energising / de-energising		approx. 1s / approx. 1s		
switch S1		I open circuit current II closed circuit current		
Transfer characteristics				
switching frequency		≤ 10Hz		
Galvanic isolation				
power supply / output		galvanic isolation		
power supply / input		to DIN 106		
input / output		rated insulation voltage 253V _{eff}		
Environmental conditions				
operating temperature		-25°C ... +65°C		
type of protection		IP 20		
Mechanical data				
design		modular terminal housing in Makrolon, flammability class UL94: V - 0		
mounting		snap/clip onto standard 35mm rail or screw mounted via 2 screws		
connection terminals		self-opening instrument terminals max. 2.5mm ²		
weight		approx. 110g		

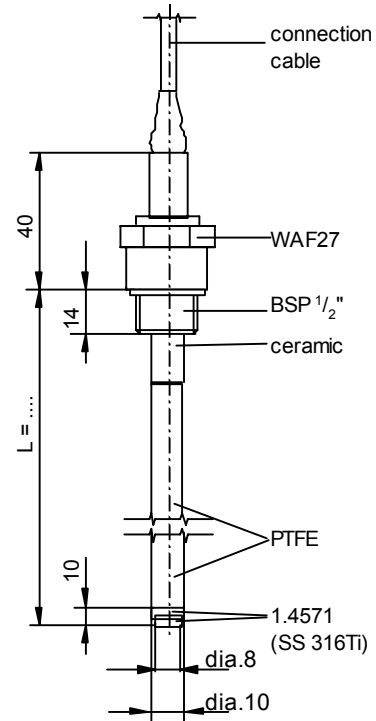
KSR Suspension Electrode
Type: **HV - L 100 - 3**
atm., 80 °C



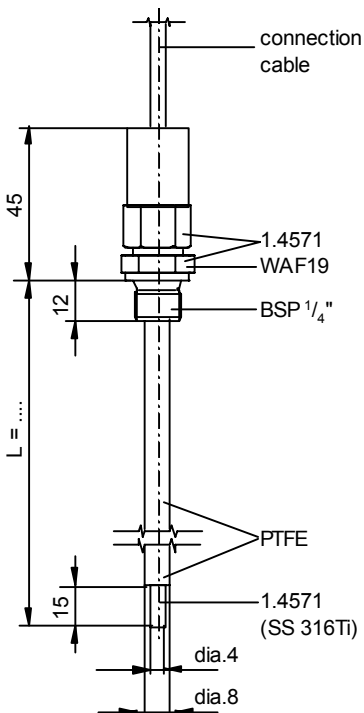
KSR Suspension Electrode
Type: **HV 2 - L 45 - 2**
atm., 80 °C



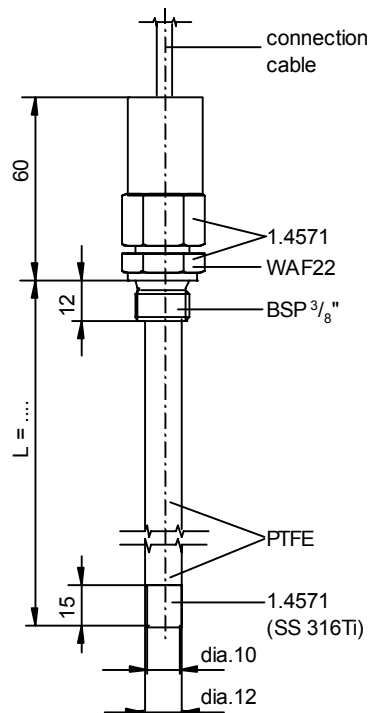
KSR Rod Electrode
Type: **EKR 1/2 - L..... - 3 Sil**
6 bar, 100 °C



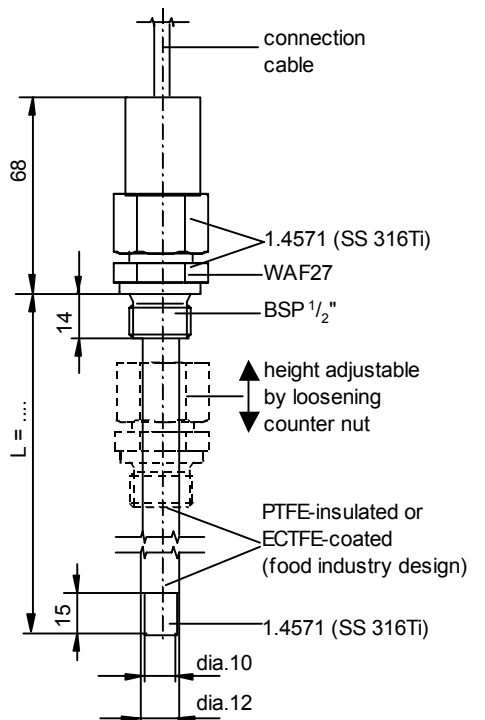
KSR Rod Electrode
Type: **EVR 1/4 - L..... - 3 Sil**
atm., 100 °C



KSR Rod Electrode
Type: **EVR 3/8 - L..... - 3 Sil**
atm., 100 °C

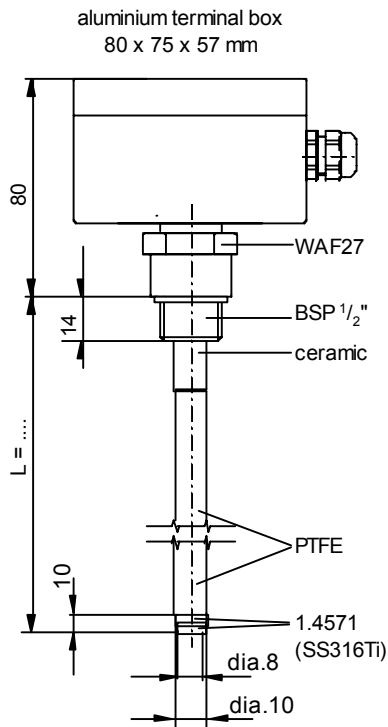


KSR Rod Electrode
Type: **EVR 1/2 - L..... - 3 Sil - adj.**
atm., 100 °C
Type: **EVR 1/2 - L..... - ECTFE - 3 Sil - adj.**
atm., 200 °C

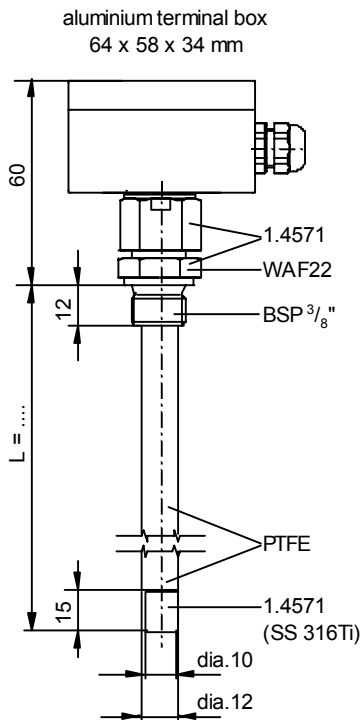


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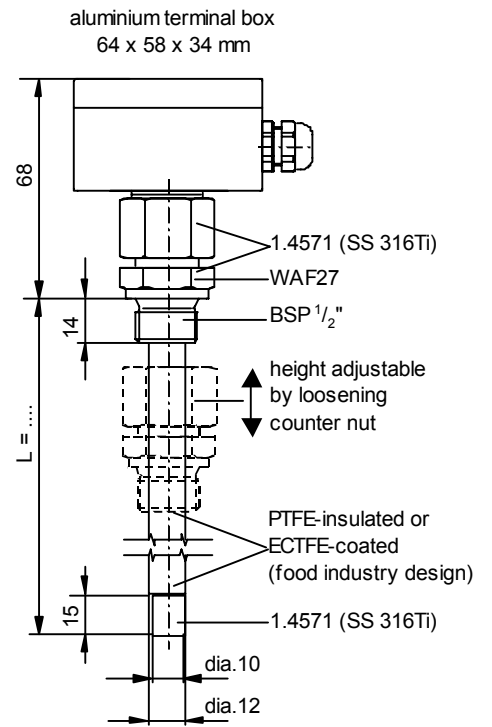
KSR Rod Electrode
Type: **AKR 1/2 - L....**
6 bar, 100 °C



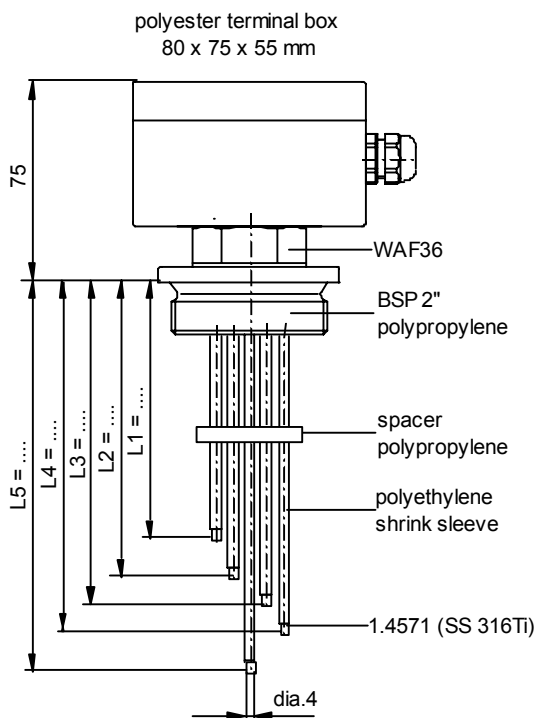
KSR Rod Electrode
Type: **AEVR 3/8 - L....**
atm., 100 °C



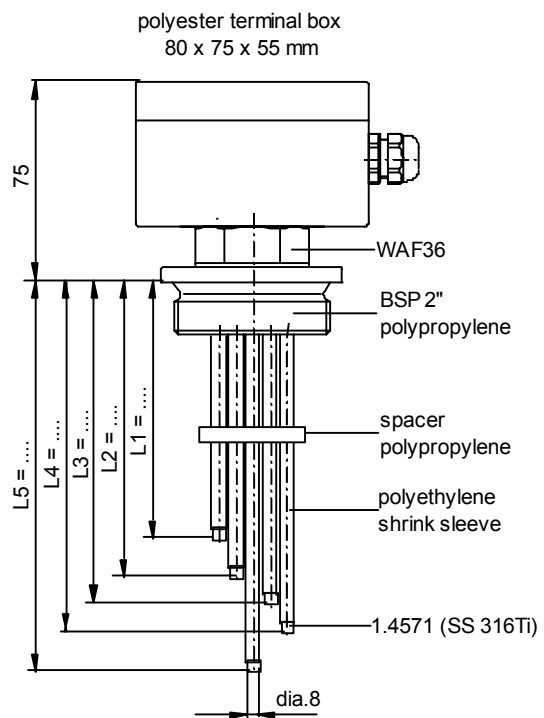
KSR Rod Electrode
Type: **AEVR 1/2 - L.... - adj.**
atm., 100 °C
Type: **AEVR 1/2 - L.... - ECTFE - adj.**
atm., 200 °C



KSR Rod Electrode (max. length 1000 mm)
Type: **ALP2-V5-L1.../L2.../L3.../L4.../L5...**
atm., 80 °C



KSR Rod Electrode (length > 1000 mm)
Type: **APP2-V5-L1.../L2.../L3.../L4.../L5...**
atm., 80 °C



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KSR Water Detector Relay Type WW230 and WW24



General Description

KSR-Water detector relays Type WW230 and WW24 operate on the conductive measurement principle. In conjunction with KSR-floor electrodes they can be used to monitor water ingress into rooms and areas caused by burst pipes or leaking vessels etc.

The water detector relays provide an AC measuring voltage for the electrode circuit. Any number of floor electrodes can be connected to this to serve as detection points. As soon as electrically conductive liquids such as water, chemicals, alkaline or acidic solutions bridge one of the 2-pole floor electrodes, a small alternating current flows.

The controllers are voltage and temperature stabilised and guarantee a defined switch behaviour. The signal delay is adjustable from between 0.5 s and 10 s and refers to the on/off switching of the output relays.

The device is equipped with wire break (LB) monitoring (current free relay in event of failure). For this purpose an end-electrode (Type AFE) with built-in 430 kOhm resistor must be used. This function can be de-activated via a DIP switch. When utilising the LB (wire break) monitoring the second relay output serves as a fault signal output. When LB (wire break) monitoring is de-activated the second relay output follows the first relay output.

Open circuit current principle

In the open circuit current principle the relay energises when the liquid bridges the 2-pole floor electrode.

Closed circuit current principle

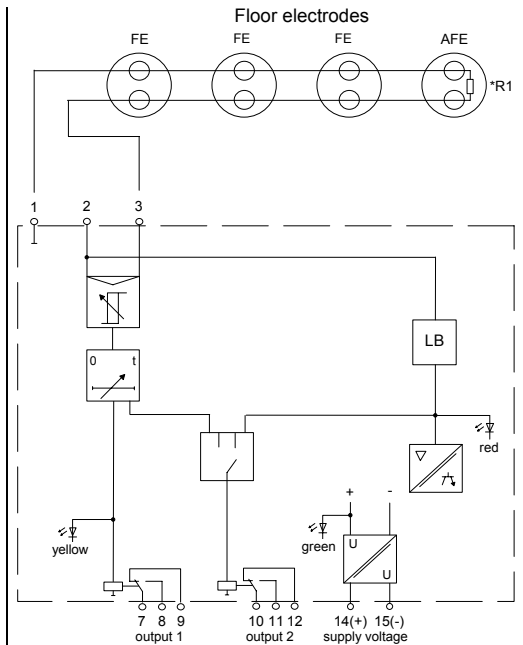
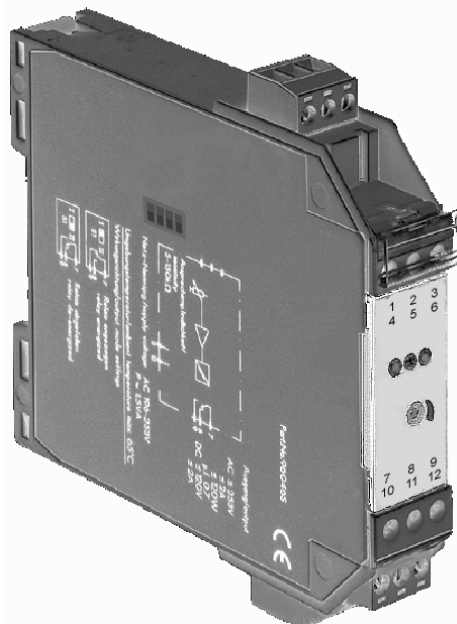
In the closed circuit current principle the relay energises immediately on power-up. It de-energises, when the 2-pole floor electrode is bridged by the liquid.

Technical features

- ◆ Wire break monitoring (LB)
- ◆ open circuit current / closed circuit current – user selectable

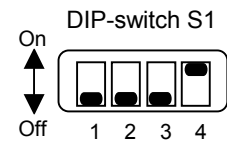
Dimensions

B 20 mm
H 105 mm
T 115 mm

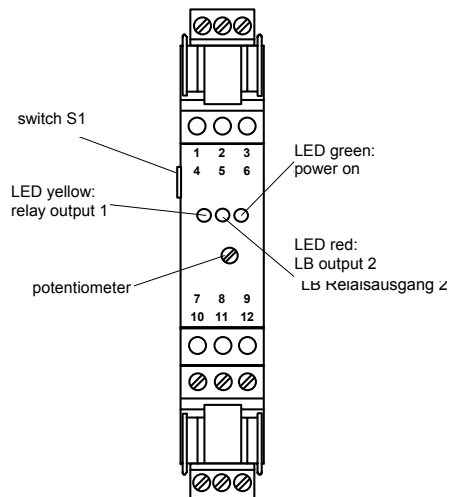


* resistor R1 = 430 kOhm required with activated wire break monitoring

Selection



DIP Switch S1	Position	Function
DIP Switch 1	Off	Closed circuit current
	On	Open circuit current
DIP Switch 2	Off	LB deactivated
	On	LB activated
DIP Switch 3	DIP Switch 4	Energised and de-energised delay
		0.5 s
Off	On	2 s
On	Off	5 s
On	On	10 s

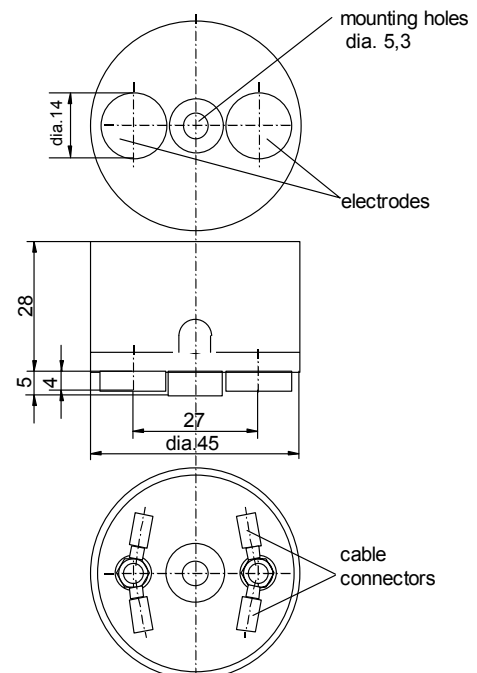


		WW230	WW24	Technical data
Supply				
supply voltage	terminals 14(+), 15(-)	230V AC, 48Hz ... 62Hz	20V DC ... 30V DC	
power consumption		$\leq 1.2W$		
Input/control circuit	terminals 1 and 3			
response sensitivity		1 kOhm ... 150 kOhm adjustable		
max. voltage		10V		
max. current		2.5mA		
max. power		6mW		
max. inductance L_o		100mH		
max. capacitance C_o		3 μ F		
max. L/R-relation		5mH/ Ω		
Output	terminals 7, 8, 9 ; 10, 11, 12	1 relay output (changeover contact) per output terminal set, volt-free		
contact rating AC		253V / 2A / $\cos\phi > 0,7$		
contact rating DC		40V / 2A / resistance load		
delay time: energising / de-energising (DIP-Switch 3 & 4)		0.5s , 2s , 5s , 10s		
open circuit / closed circuit current (DIP-Switch 1)		„On“ open circuit current „Off“ closed circuit current		
wire break (LB) monitoring (DIP-Switch 2)		„On“ LB activated „Off“ LB de-activated		
Transfer characteristics				
switching frequency		$\leq 10Hz$		
Galvanic isolation				
power supply / output		galvanic isolation		
power supply / input		to DIN 106		
input / output		rated insulation voltage 253V _{eff}		
Environmental conditions				
operating temperature		-25°C ... +65°C		
type of protection		IP 20		
Mechanical data				
design		modular terminal housing in Makrolon,		
		flammability class UL94: V - 0		
mounting		snap/clip onto standard 35mm rail		
		or screw mounted via 2 screws		
connection terminals		self-opening instrument terminals max. 2.5mm ²		
weight		approx. 110g		

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KSR-Floor Electrodes

Type coding	FE - grey housing AFE - red housing with built-in resistor 430 kOhm
housing material	PVC
electrode material	stainless steel 1.4571 (SS 316Ti)
distance electrode to floor	1 mm
max. permissible ambient temperature	-40°C ... + 60°C





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