

Resistance Repeater

KCD2-RR2-Ex1.SP

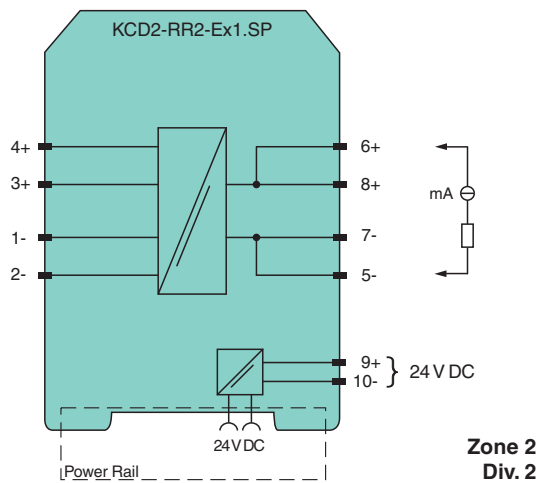
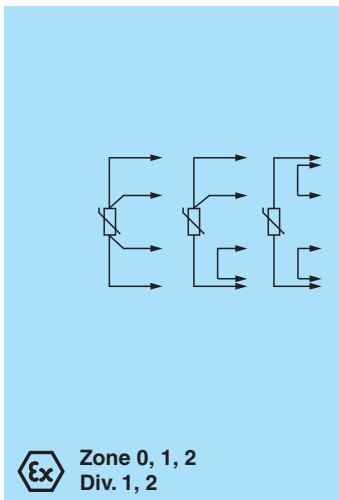
- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Resistance and RTD input (Pt100, Pt500, Pt1000)
- Resistance output
- Accuracy 0.1 %
- Line fault detection (LFD) for Pt100
- Housing width 12.5 mm
- Connection via spring terminals with push-in connection technology
- Up to SIL 2 acc. to IEC/EN 61508



Function

This isolated barrier is used for intrinsic safety applications. It transfers resistance values of RTDs or potentiometers from hazardous areas to safe areas. A 2-, 3-, or 4-wire technique is available depending on the required accuracy. The input card of the control system measures the same load as if it were connected directly to the resistance in a hazardous area.

Connection



Technical Data

General specifications	
Signal type	Analog input
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 2
Supply	
Connection	Power Rail or terminals 9+, 10-
Rated voltage	U_r 19 ... 30 V DC
Ripple	within the supply tolerance
Rated current	I_r < 28 mA
Power consumption	0.35 W (24 V and 1 mA sense current), 0.85 W (30 V and 10 mA sense current)
Input	

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Technical Data

Connection side	field side	
Connection	terminals 1, 2, 3, 4	
Line fault detection	yes, at Pt100	
Lead resistance	≤ 10 % of resistance value	
Transmission range	0 ... 10 mA	
Available voltage	7 V	
Line fault detection	< 30 nA	
Output		
Connection side	control side	
Connection	terminals 5-, 7-, 6+, 8+	
Current	0 ... 10 mA	
Available voltage	0 ... 4.2 V	
Fault signal	field voltage < 150 mV or > 4 V, depending on lead disconnected	
Reverse polarity protection	for I < 10 mA or U < 20 V	
Transfer characteristics		
Accuracy	0.1 %	
Deviation	I _m ≥ 1 mA: ±0.1 % of R _m or ± 0.1 Ω (the larger value is applicable) I _m < 1 mA: accuracy reduces in proportion to I _m . e. g. I _m = 0.1 mA: ± 1 % of R _m or 1 Ω (the larger value is applicable).	
Influence of ambient temperature	I _m ≥ 1 mA, R _m ≥ 100 Ω: 0.01 %/K in the range -20 ... +70 °C (-4 ... 158 °F) I _m < 1 mA or R _m < 100 Ω: temperature stability reduces in proportion to I _m or R _m	
Settling time	≤ 5 ms	
Rise time/fall time	≤ 2 ms (10 ... 90%)	
Galvanic isolation		
Output/power supply	functional insulation, rated insulation voltage 50 V AC	
Indicators/settings		
Display elements	LED	
Control elements	DIP switch	
Configuration	via DIP switches	
Labeling	space for labeling at the front	
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)	
Conformity		
Electromagnetic compatibility	NE 21:2017 EN IEC 61326-3-2:2018	
Degree of protection	IEC 60529:2001	
Protection against electrical shock	UL 61010-1:2012	
Ambient conditions		
Ambient temperature	-40 ... 70 °C (-40 ... 158 °F)	
Mechanical specifications		
Degree of protection	IP20	
Connection	spring terminals	
Mass	approx. 100 g	
Dimensions	12.5 x 124 x 114 mm (0.5 x 4.9 x 4.5 inch) (W x H x D), housing type A2	
Mounting	on 35 mm DIN mounting rail acc. to EN 60715:2001	
Data for application in connection with hazardous areas		
EU-type examination certificate	BASEEFA 10 ATEX 0061X	
Marking	⊕ II (1)G [Ex ia Ga] IIC ⊕ II (1)D [Ex ia Da] IIIC ⊕ I (M1) [Ex ia Ma] I	
Input	[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I	
Voltage	U _o	9.5 V
Current	I _o	39.22 mA
Power	P _o	93 mW

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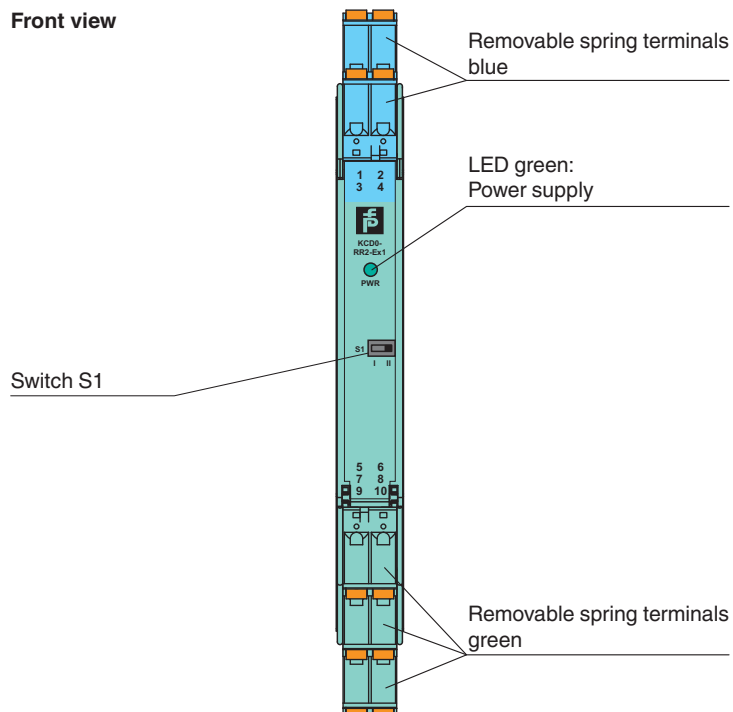
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Technical Data

Supply			
Maximum safe voltage	U_m	250 V (Attention! The rated voltage can be lower.)	
Output			
Maximum safe voltage	U_m	250 V (Attention! The rated voltage can be lower.)	
Certificate			
		BASEEFA 10 ATEX 0062X	
Marking			
		Ⓜ II 3G Ex ec IIC T4 Gc	
Galvanic isolation			
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11:2007, voltage peak value 375 V	
Input/power supply		safe electrical isolation acc. to IEC/EN 60079-11:2007, voltage peak value 375 V	
Directive conformity			
Directive 2014/34/EU		EN IEC 60079-0:2018 , EN 60079-7:2015+A1:2018 , EN 60079-11:2012	
International approvals			
FM approval			
FM certificate		FM 19 CA 0039 X , FM 19 US 0067 X	
Control drawing		116-0457 (cFMus)	
UL approval			
Control drawing		E106378	
Control drawing		116-0332 (cULus)	
IECEX approval			
IECEX certificate		IECEX BAS 10.0024X IECEX BAS 10.0025X	
IECEX marking		[Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I Ex ec IIC T4 Gc	
General information			
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com .	

Assembly

Front view



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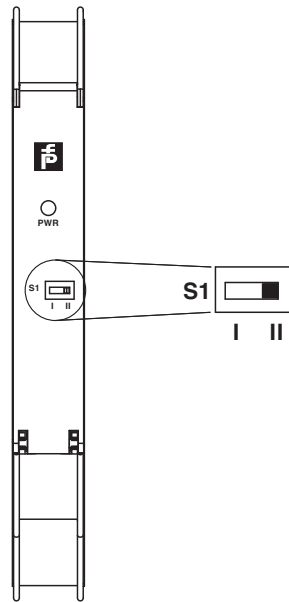
Matching System Components

	KFD2-EB2	Power Feed Module
	UPR-03	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m
	UPR-03-M	Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m
	UPR-03-S	Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m
	K-DUCT-BU	Profile rail, wiring comb field side, blue
	K-DUCT-BU-UPR-03	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side, blue

Accessories

	KC-STP-5GN	Terminal block for KC modules, 2-pin screw terminal, with test sockets, green
	KC-STP-5BU	Terminal block for KC modules, 2-pin screw terminal, with test sockets, blue
	EBP 2- 5	Insertion bridge for connectors, 2-pin, fully insulated
	KF-CP	Red coding pins, packaging unit: 20 x 6

Configuration



Switch position

Switch	Input	Position
S1	2-wire technique	II
	3-wire technique	I
	4-wire technique	II

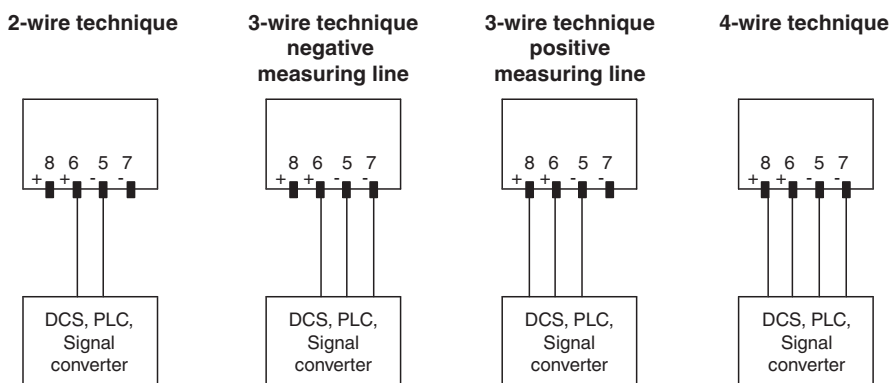
Factory settings: switch 1, in position I
 Refer to the next section for connection information.

Additional Information

Function

When a signal converter, a DCS or PLC is connected to terminals 5, 6, 7, and 8 (control side), the measuring current is transferred to terminals 2 and 4 (field side). The resulting voltage at terminals 1, and 3 is transferred to terminals 5, 6, 7, and 8. In the case of fast multiplex input cards, transmission problems might be experienced in connection with low resistance values and/or high sensor currents. For data see rise time. The quoted accuracy is for a 4-wire technique connection. The accuracy in 3-wire technique will depend on the matching of the line resistance.

Connection types control side (safe area)



Connection types field side (hazardous area)

The resistance in the hazardous area can be measured with a 2-, 3- or 4-wire technique.

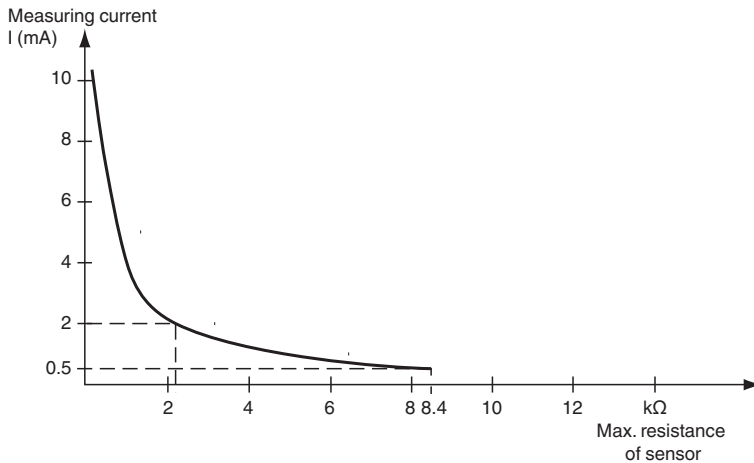
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- 2-wire technique:
Link terminals 1 and 2 and terminals 3 and 4. Connect the resistance to terminal 4 and terminal 2. Switch S1 in the position II.
- 3-wire technique:
Link terminals 1 and 2. Connect the resistance to terminals 3 and 4 and terminal 2. Switch S1 in the position I.
- 4-wire technique
Connect the resistance to terminals 3 and 4 and terminals 1 and 2. Switch S1 in the position II.

Measurement range

The resistance repeater can convey a maximum of 10 mA and a maximum of 4.2 V. The maximum connectable resistance value can be calculated with the following equation: resistance value = 4.2 V / measuring current

The measuring current is determined by control.



An example of the maximum transferable resistance value:

- 4.2 kΩ at 1 mA measuring current
- 420 Ω at 10 mA measuring current

Line Fault Detection (LFD)

The output will indicate less than 15 Ω or greater than 400 Ω for a lead breakage at terminals 1, 2, 3 or 4 for measuring current of less than or equal to 10 mA i. e. out of range for Pt100.