



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



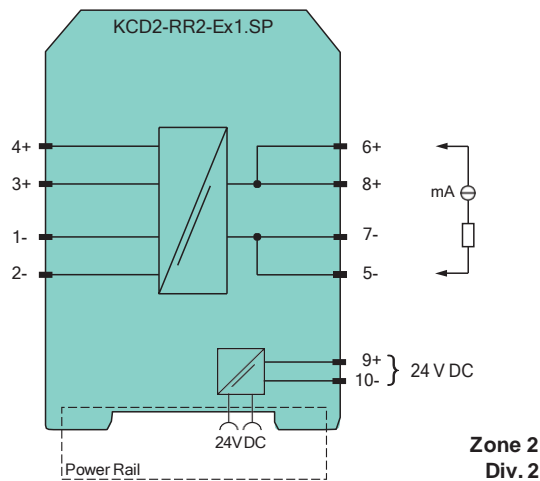
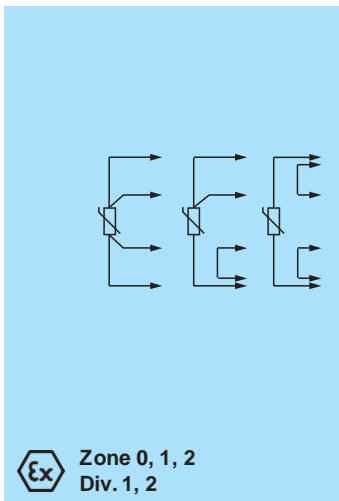
SIL 2



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

Please see:

Pepperl+Fuchs Group
www.pepperl-fuchs.com

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info@omranniroo.com

Germany: +49 621 776 2222
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Singapore: +65 6779 9091
pa-info@sg.pepperl-fuchs.com



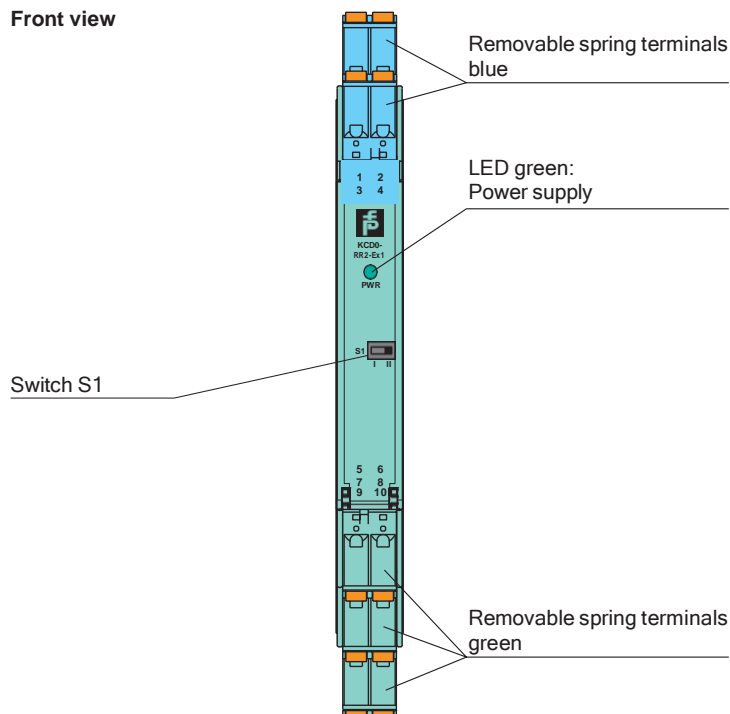
Connection side	field side	
Connection	terminals 1, 2, 3, 4	
Line fault detection	yes, at Pt100	
Lead resistance	≤ 10 % of resistance value	
Transmission range	0 ... 10 mA	
Available voltage	7 V	
Line fault detection	< 30 nA	
Output		
Connection side	control side	
Connection	terminals 5-, 7-, 6+, 8+	
Current	0 ... 10 mA	
Available voltage	0 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	1 II (1)G [Ex ia Ga] IIC 1 II (1)D [Ex ia Da] IIIC 1 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

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		1 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	
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



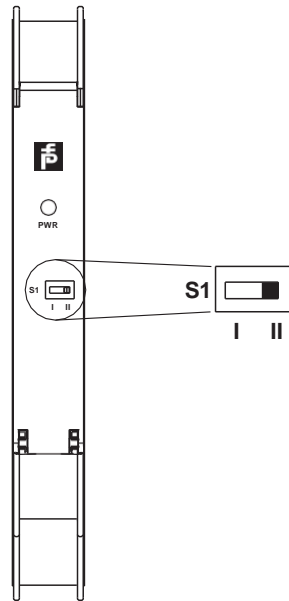
Matching System Components

	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

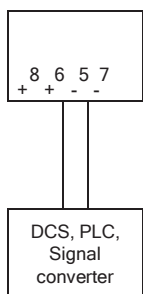
Function

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.

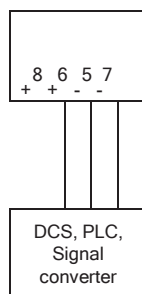
The quoted accuracy is for a 4-wire technique connection. The accuracy in 3-wire technique will depend on the matching of the line resistance.

Connection types control side (safe area)

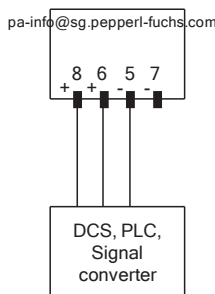
2-wire technique



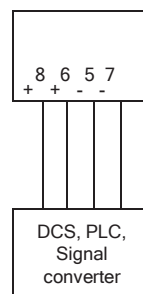
3-wire technique negative measuring line



3-wire technique positive measuring line



4-wire technique



Connection types field side (hazardous area)

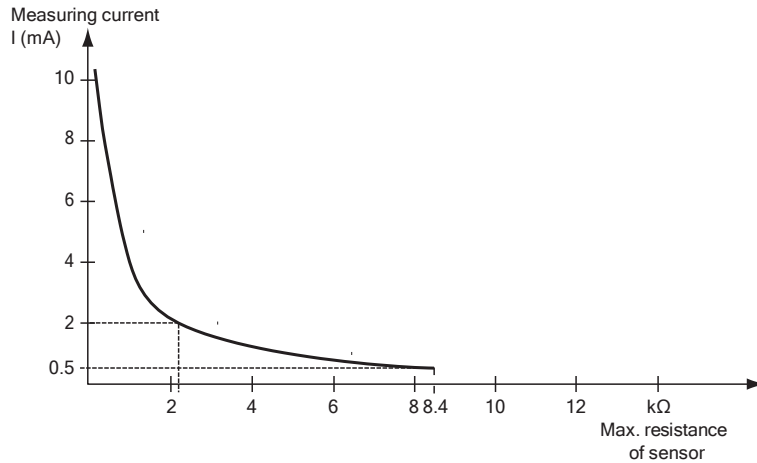
The resistance in the hazardous area can be measured with a 2-, 3- or 4-wire technique.

- 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.