

Features

- 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
- Up to SIL2 acc. to IEC 61508

Function

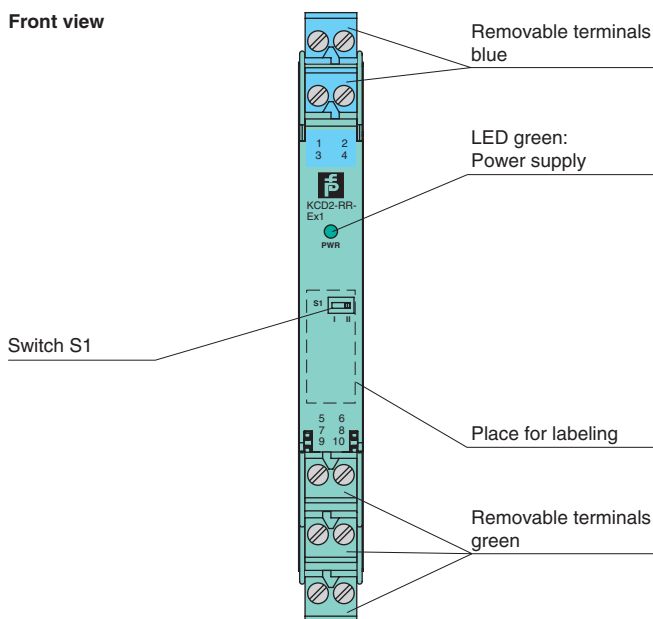
This isolated barrier is used for intrinsic safety applications. It transfers resistance values of RTDs or potentiometers from hazardous areas to safe areas.

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.

Assembly

Front view

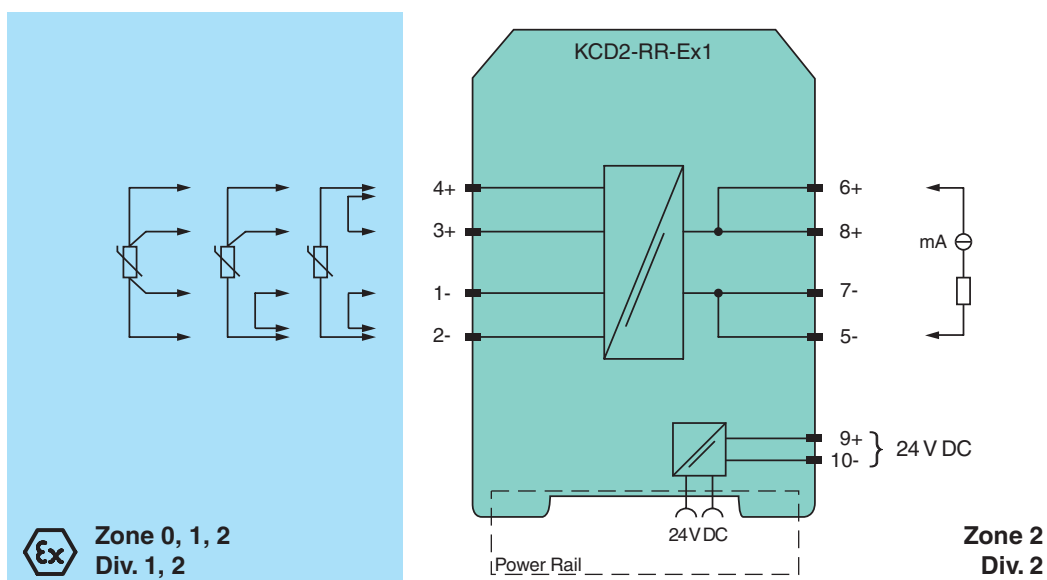





CE



SIL2

Connection



General specifications		
Signal type		Analog input
Supply		
Connection		Power Rail or terminals 9+, 10-
Rated voltage		19 ... 30 V DC
Ripple		within the supply tolerance
Rated current		< 20 mA
Power consumption		0.35 W (24 V and 1 mA sense current)
Input		
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		9 V
Line fault detection		8 nA
Output		
Connection		terminals 5-, 7-, 6+, 8+
Current		0 ... 10 mA
Available voltage		0 ... 4.2 V
Fault signal		< 10 Ω or > 400 Ω, depending on lead disconnected (measuring current ≤ 1mA)
Transfer characteristics		
Deviation		4-wire 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). 3-wire I _m ≥ 1 mA: (±0.1 % - 0.1 Ω Offset) or ± 0.2 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 % - 0.1 Ω Offset) or ± 1.1 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 ... +60 °C (253 ... 333 K) I _m < 1 mA or R _m < 100 Ω: temperature stability reduces in proportion to I _m or R _m
Rise time		signal response time ≤ 2 ms (10 ... 90 %) response to application of I _m : R _m > 50 Ω and I _m < 5mA: < 5ms response to application of I _m : R _m > 30 Ω and I _m < 5mA: < 10ms response to application of I _m : R _m > 18 Ω and I _m < 5mA: < 20ms
Electrical isolation		
Input/Output		reinforced insulation acc. to EN 50178, rated insulation voltage 300 V _{eff}
Input/power supply		reinforced insulation acc. to EN 50178, rated insulation voltage 300 V _{eff}
Output/power supply		functional insulation, rated insulation voltage 50 V AC
Directive conformity		
Electromagnetic compatibility		
Directive 2004/108/EC		EN 61326-1:2013
Conformity		
Electromagnetic compatibility		NE 21:2011
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 61010-1
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Mass		approx. 100 g
Dimensions		12.5 x 114 x 124 mm (0.5 x 4.5 x 4.9 in) , housing type A2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with Ex-areas		
EC-Type Examination Certificate		BASEEFA 10 ATEX 0061 , for additional certificates see www.pepperl-fuchs.com
Group, category, type of protection		 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	12.4 V
Current	I _o	17.4 mA
Power	P _o	54 mW
Supply		
Maximum safe voltage	U _m	253 V (Attention! The rated voltage can be lower.)
Output		
Maximum safe voltage	U _m	253 V (Attention! The rated voltage can be lower.)

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Statement of conformity	BASEEFA 10 ATEX 0062X , observe statement of conformity
Group, category, type of protection, temperature class	Ⓔ II 3G Ex nA II T4 Gc [device in zone 2]
Electrical isolation	
Input/Output	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity	
Directive 94/9/EC	EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010
International approvals	
FM approval	
Control drawing	116-0129 (cFMus)
UL approval	
Control drawing	116-0332 (cULus)
IECEX approval	IECEX BAS 10.0024 IECEX BAS 10.0025X
Approved for	[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
General information	
Supplementary information	EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com .
Accessories	
Designation	optional accessories: insertion bridge EBP 2- 5

Additional information

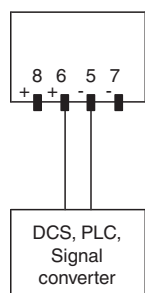
Function

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.

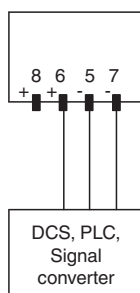
The quoted accuracy is for a 4-wire technique connection. The accuracy in 3-wire technique will depend on the matching of the line resistance.

Connection types control side (safe area)

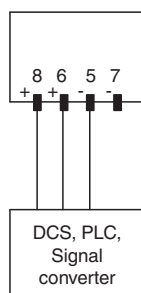
2-wire technique



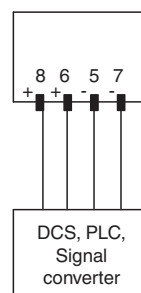
3-wire technique
negative
measuring line



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.

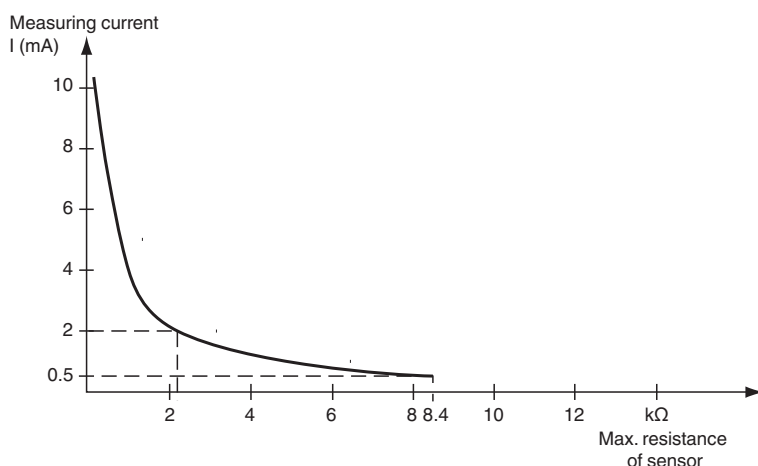
Measurement range

The resistance repeater can convey a maximum of 10 mA and a maximum of 7 V. The maximum connectable resistance value can be calculated with the following equations

- Resistance value = $4.2 \text{ V} / \text{measuring current}$
- Resistance value = $9 \text{ V} / \text{measuring current} - 758 \Omega$

Use the smaller of these two resistance values as maximum allowed load.

The measuring current is determined by control.



An example of the maximum transferable resistance value:

- 8.4 kΩ at 0.5 mA measuring current
- 2.1 kΩ at 2 mA measuring current

Line Fault Detection (LFD)

The output will indicate less than 10 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 1 mA i.e. out of range for Pt100.

Accessories**Power feed module KFD2-EB2**

The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to 150 individual devices depending on the power consumption of the devices. Collective error messages received from the Power Rail activate a galvanically-isolated mechanical contact.

Power Rail UPR-03

The Power Rail UPR-03 is a complete unit consisting of the electrical insert and an aluminium profile rail 35 mm x 15 mm. To make electrical contact, the devices are simply engaged.

Profile Rail K-DUCT with Power Rail

The profile rail K-DUCT is an aluminum profile rail with Power Rail insert and two integral cable ducts for system and field cables. Due to this assembly no additional cable guides are necessary.



Power Rail and Profile Rail must not be fed via the device terminals of the individual devices!