Voltage Repeater
KCD2-VR4-Ex1.SP

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Voltage input -20 V ... +5 V
- Vibration sensor inputs
- Voltage/current field supply
- Voltage output -20 V ... +5 V
- Housing width 12.5 mm
- Connection via spring terminals with push-in connection technology
- Up to SIL 2 (SC 3) acc. to IEC/EN 61508

SIL 2

Function

This isolated barrier is used for intrinsic safety applications.
The device transfers the voltage signal from the following sensors to the non explosion-hazardous area:

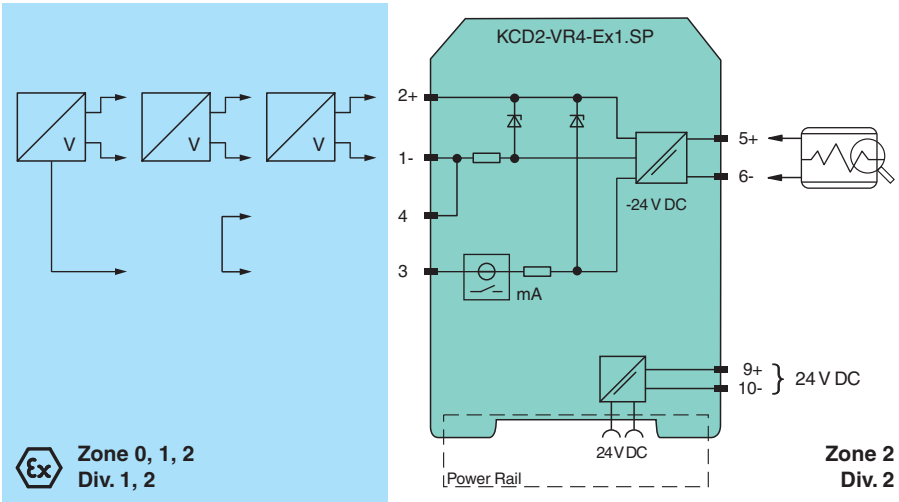
- Vibration sensors
- Displacement probes
- Accelerometers
- Magnetic pick-up sensors
- Seismic sensors

The device is designed to provide the power supply to the sensors. Depending on configuration the device provides:

- a current of 3.6 mA, 5.3 mA, or 8.9 mA for 2-wire sensors
- a voltage of 18 V at 20 mA for 3-wire sensors

The output towards measuring system supports energizing currents up to 10 mA.
The yellow LED indicates when an output signal is biased between -8 V and -13.5 V DC. This indicates the proper mechanical alignment of displacement probes.

Connection



Technical Data

General specifications		
Signal type		Analog input
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Systematic capability (SC)		SC 3

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Technical Data

Supply		
Connection		Power Rail or terminals 9+, 10-
Rated voltage	U_r	19 ... 30 V DC
Ripple		within the supply tolerance
Power dissipation		≤ 0.9 W
Power consumption		≤ 1.2 W
Input		
Connection side		field side
Connection		terminals 2 (common), 3 (sensor supply -), 1 and 4 (signal -)
Sensor supply		sensor supply depending on DIP switches configuration and external jumper: voltage: -18 V at 20 mA (short circuit limited at approx. 23 mA) current: 3.6 mA or 5.3 mA or 8.9 mA (±10 %) at -10 V reduced sensor supply option (-2.5 V compared to standard setting)
Input resistance		10 kΩ terminals 2 (common), 1 and 4
Transmission range		-20 ... 5 V
Output		
Connection side		control side
Connection		terminals 5+, 6- (monitoring) limited electrical values: max. 30V, max. 5A
Voltage		-20 ... 5 V
Load		≥ 9 kΩ (3-wire sensor), ≥ 2 kΩ (2-wire sensor)
Output resistance		max. 5 Ω
Transfer characteristics		
Cut-off frequency		20 kHz (-1 dB)
Deviation		at 20 °C transfer error (with 10 kΩ load) < 20 mV, provided that the alternating component of the input voltage is not excessive, e. g. - square waves (0 ... 20 kHz): 5 V_{pp} - sine waves (0 ... 20 kHz): the full span of 20 V_{pp} (= 100 g peak acceleration at 100 mV/g) is acceptable.
Influence of ambient temperature		(< 100 ppm of span)/K at any point within the span
Time delay relative to input		5 µs
Ripple		in 200 kHz bandwidth < 20 mV_{rms} in 20 kHz bandwidth < 3 mV_{rms}
Galvanic isolation		
Input/Output		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V_{eff}
Input/power supply		basic insulation according to IEC/EN 61010-1, rated insulation voltage 300 V_{eff}
Output/power supply		basic insulation according to IEC/EN 61010-1, rated insulation voltage 300 V_{eff}
Indicators/settings		
Display elements		LEDs
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 60529:2013
Protection against electrical shock		UL 61010-1:2023
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

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Technical Data

Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU-type examination certificate		UL 24 ATEX 3300 X
Marking		⟨Ex⟩ II 3(1)G Ex ec [ia Ga] IIC T4 Gc ⟨Ex⟩ II (1)D [Ex ia Da] IIIC ⟨Ex⟩ I (M1) [Ex ia Ma] I
Input		Ex ia Ga, Ex ia Da Refer to certificate for alternative parameters.
Supply		
Maximum safe voltage	U_m	250 V (Attention! The rated voltage can be lower.)
Equipment		
Connection		terminals 1, 2
Voltage	U_i	30 V
Voltage	U_o	1.1 V
Current	I_o	0.12 mA
Power	P_o	0.031 mW
Equipment		
Connection		terminals 1 ... 4
Voltage	U_o	26.3 V
Current	I_o	32.4 mA
Power	P_o	596 mW (angular characteristic curve)
Output		
Maximum safe voltage	U_m	250 V (Attention! The rated voltage is lower.)
Galvanic isolation		
Input/Output		safe galvanic isolation acc. to IEC 60079-11, voltage peak value 375 V
Input/power supply		safe galvanic isolation acc. to IEC 60079-11, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 , IEC 60079-11:2023 , EN IEC 60079-7:2015+A1:2018
International approvals		
IECEx approval		
IECEx certificate		IECEx ULD 24.0028X
IECEx marking		Ex ec [ia Ga] IIC T4 Gc [Ex ia Da] IIIC [Ex ia Ma] I
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com.

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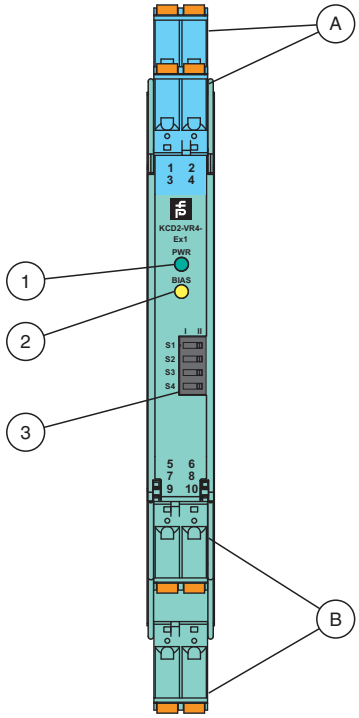
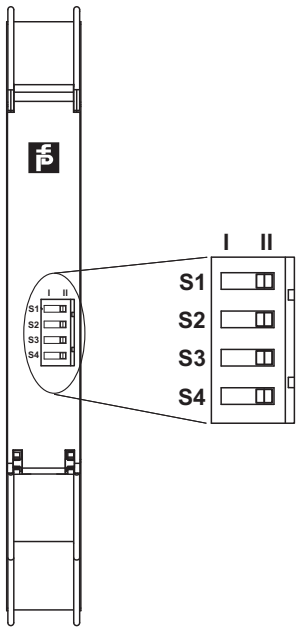
Assembly



1	LED green: Power supply
2	LED yellow: BIAS
3	Switches S1 to S4
A	Removable terminals, blue
B	Removable terminals, green

Configuration



Switch Settings

Mode of operation	S1	S2	S3	S4
2-wire sensor at 3.6 mA (J)	II	II	*	II
2-wire sensor at 5.3 mA (J)	I	II	*	II
2-wire sensor at 8.9 mA (J)	II	I	*	II
3-wire sensor with voltage supply	I	I	*	I

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Mode of operation	S1	S2	S3	S4
Standard sensor supply option	*	*	I	*
Reduced sensor supply option	*	*	II	*
2-wire sensor without supply	*			

* = any combination
(J) = jumper between terminals 3 and 4

Factory setting: 2-wire sensor at 3.6 mA excitation current, standard supply, jumper between terminals 3 and 4

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