

## Switch Amplifier KCD2-SR-Ex1.LB

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Usable as signal splitter (1 input and 2 outputs)
- Relay contact output
- Fault relay contact output
- Line fault detection (LFD)
- Housing width 12.5 mm
- 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 digital signals from NAMUR sensors or dry contacts from the hazardous area to the non-hazardous area.

The proximity sensor or the mechanical contact controls the control side load for a relay contact output. The device output changes the state when the input signal changes the state.

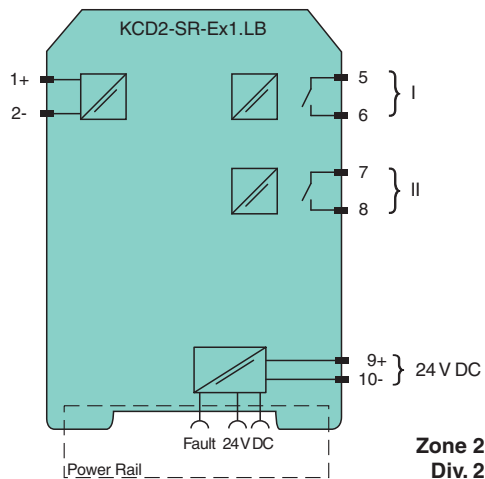
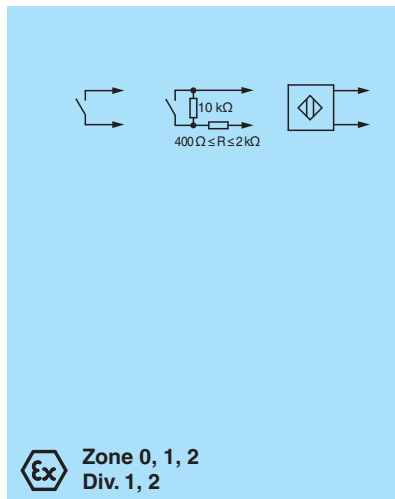
Via switches the mode of operation can be reversed and the line fault detection can be switched off.

During a fault condition, the relay reverts to its de-energized state and the LEDs indicate the fault according to NAMUR NE 44.

If the device is operated via Power Rail, additionally a collective error message is available.

Due to its compact housing design and low heat dissipation, this device is useful for detecting positions, end stops, and switching states in space-critical applications.

### Connection



### Technical Data

| General specifications               |                |                                 |
|--------------------------------------|----------------|---------------------------------|
| Signal type                          |                | Digital Input                   |
| Functional safety related parameters |                |                                 |
| Safety Integrity Level (SIL)         |                | SIL 2                           |
| Systematic capability (SC)           |                | SC 3                            |
| Supply                               |                |                                 |
| Connection                           |                | Power Rail or terminals 9+, 10- |
| Rated voltage                        | U <sub>r</sub> | 19 ... 30 V DC                  |
| Ripple                               |                | ≤ 10 %                          |

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

Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0002  
pa-info@us.pepperl-fuchs.com

Germany: +49 621 776 2222  
pa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091  
pa-info@sg.pepperl-fuchs.com

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## Technical Data

|                                                                |       |                                                                                                  |
|----------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------|
| Rated current                                                  | $I_r$ | $\leq 37 \text{ mA}$                                                                             |
| Power dissipation                                              |       | $\leq 750 \text{ mW}$                                                                            |
| Power consumption                                              |       | $\leq 750 \text{ mW}$                                                                            |
| <b>Input</b>                                                   |       |                                                                                                  |
| Connection side                                                |       | field side                                                                                       |
| Connection                                                     |       | terminals 1+, 2-                                                                                 |
| Rated values                                                   |       | acc. to EN 60947-5-6 (NAMUR)                                                                     |
| Open circuit voltage/short-circuit current                     |       | approx. 8 V DC / approx. 8 mA                                                                    |
| Switching point/switching hysteresis                           |       | 1.2 ... 2.1 mA / approx. 0.2 mA                                                                  |
| Line fault detection                                           |       | breakage $I \leq 0.1 \text{ mA}$ , short-circuit $I \geq 6.5 \text{ mA}$                         |
| Pulse/Pause ratio                                              |       | min. 20 ms / min. 20 ms                                                                          |
| <b>Output</b>                                                  |       |                                                                                                  |
| Connection side                                                |       | control side                                                                                     |
| Connection                                                     |       | output I: terminals 5, 6 ; output II: terminals 7, 8                                             |
| Output I                                                       |       | signal ; relay                                                                                   |
| Output II                                                      |       | signal or fault message ; relay                                                                  |
| Contact loading                                                |       | 250 V AC/2 A/cos $\phi > 0.75$ ; 126.5 V AC/4 A/cos $\phi > 0.75$ ; 30 V DC/2 A resistive load   |
| Minimum switch current                                         |       | 2 mA / 24 V DC                                                                                   |
| Energized/De-energized delay                                   |       | $\leq 20 \text{ ms}$ / $\leq 20 \text{ ms}$                                                      |
| Mechanical life                                                |       | $10^7$ switching cycles                                                                          |
| <b>Transfer characteristics</b>                                |       |                                                                                                  |
| Switching frequency                                            |       | $\leq 10 \text{ Hz}$                                                                             |
| <b>Galvanic isolation</b>                                      |       |                                                                                                  |
| Input/Output                                                   |       | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> |
| Input/power supply                                             |       | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> |
| Output/power supply                                            |       | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> |
| Output/Output                                                  |       | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub> |
| <b>Indicators/settings</b>                                     |       |                                                                                                  |
| Display elements                                               |       | LEDs                                                                                             |
| Control elements                                               |       | DIP switch                                                                                       |
| Configuration                                                  |       | via DIP switches                                                                                 |
| Labeling                                                       |       | space for labeling at the front                                                                  |
| <b>Directive conformity</b>                                    |       |                                                                                                  |
| Electromagnetic compatibility                                  |       |                                                                                                  |
| Directive 2014/30/EU                                           |       | EN 61326-1:2013 (industrial locations)                                                           |
| Low voltage                                                    |       |                                                                                                  |
| Directive 2014/35/EU                                           |       | EN 61010-1:2010+A1:2019+A1:2019/AC:2019                                                          |
| <b>Conformity</b>                                              |       |                                                                                                  |
| Electromagnetic compatibility                                  |       | NE 21:2017 , EN 61326-3-1:2017 , EN IEC 61326-3-2:2018                                           |
| Degree of protection                                           |       | IEC 60529:1989+A1:1999+A2:2013                                                                   |
| Functional safety                                              |       | IEC/EN 61508:2010                                                                                |
| Input                                                          |       | EN 60947-5-6:2000                                                                                |
| <b>Ambient conditions</b>                                      |       |                                                                                                  |
| Ambient temperature                                            |       | -40 ... 70 °C (-40 ... 158 °F)                                                                   |
| <b>Mechanical specifications</b>                               |       |                                                                                                  |
| Degree of protection                                           |       | IP20                                                                                             |
| Connection                                                     |       | screw terminals                                                                                  |
| Mass                                                           |       | approx. 100 g                                                                                    |
| Dimensions                                                     |       | 12.5 x 119 x 114 mm (0.5 x 4.7 x 4.5 inch) (W x H x D) , housing type A2                         |
| Mounting                                                       |       | on 35 mm DIN mounting rail acc. to EN 60715:2001                                                 |
| <b>Data for application in connection with hazardous areas</b> |       |                                                                                                  |
| EU-type examination certificate                                |       | BASEEFA 06 ATEX 0092 X                                                                           |
| Marking                                                        |       | Ⓔ II 3(1)G Ex ec nC [ia Ga] IIC T4 Gc , Ⓔ II (1)D [Ex ia Da] IIIC , Ⓔ I (M1) [Ex ia Ma] I        |

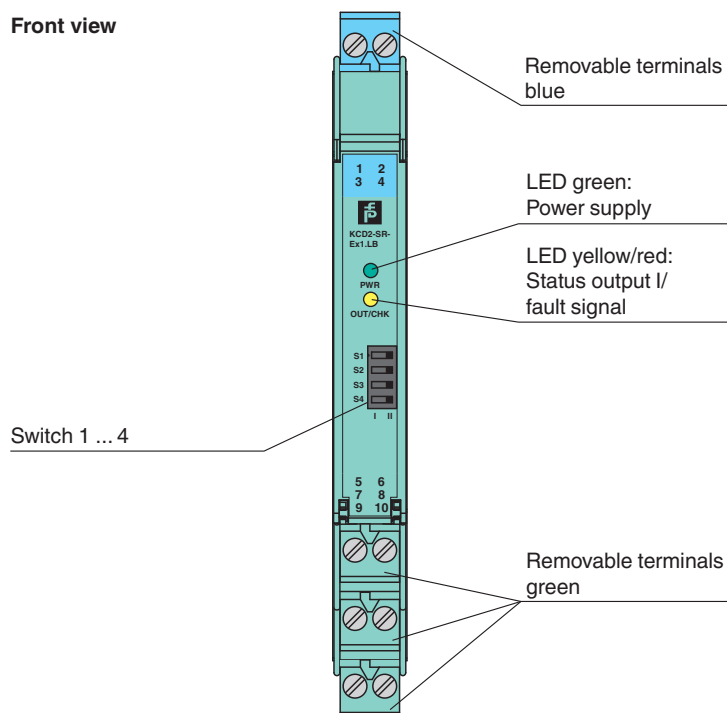
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## Technical Data

|                                |       |                                                                                                                                                                                                 |
|--------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input                          |       | Ex ia                                                                                                                                                                                           |
| Voltage                        | $U_o$ | 10.5 V                                                                                                                                                                                          |
| Current                        | $I_o$ | 13 mA                                                                                                                                                                                           |
| Power                          | $P_o$ | 34 mW (linear characteristic)                                                                                                                                                                   |
| Supply                         |       |                                                                                                                                                                                                 |
| Maximum safe voltage           | $U_m$ | 253 V AC (Attention! $U_m$ is no rated voltage.)                                                                                                                                                |
| Output                         |       |                                                                                                                                                                                                 |
| Contact loading                |       | Zone 2 : 50 V AC/2 A/cos $\phi > 0.75$ ; 30 V DC/2 A resistive load                                                                                                                             |
| Maximum safe voltage           | $U_m$ | 253 V AC (Attention! The rated voltage can be lower.)                                                                                                                                           |
| Fault indication output        |       |                                                                                                                                                                                                 |
| Maximum safe voltage           | $U_m$ | 40 V DC (Attention! $U_m$ is no rated voltage.)                                                                                                                                                 |
| Galvanic 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 2014/34/EU           |       | EN IEC 60079-0:2018 , EN 60079-7:2015+A1:2018 , EN 60079-11:2012 , EN IEC 60079-15:2019                                                                                                         |
| <b>International approvals</b> |       |                                                                                                                                                                                                 |
| UL approval                    |       | E106378                                                                                                                                                                                         |
| Control drawing                |       | 116-0477 (cULus)                                                                                                                                                                                |
| IECEx approval                 |       |                                                                                                                                                                                                 |
| IECEx certificate              |       | IECEx BAS 06.0025 X                                                                                                                                                                             |
| IECEx marking                  |       | Ex ec nC [ia Ga] IIC T4 Gc<br>[Ex ia Da] IIC<br>[Ex ia Ma] I                                                                                                                                    |
| <b>General information</b>     |       |                                                                                                                                                                                                 |
| Supplementary information      |       | Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> . |

## Assembly

### Front view



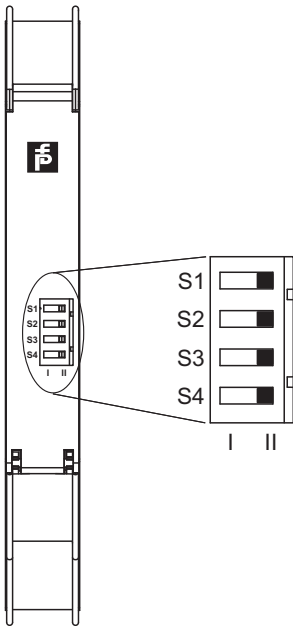
## Matching System Components

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

## Accessories

|                                                                                     |                  |                                                            |
|-------------------------------------------------------------------------------------|------------------|------------------------------------------------------------|
|    | <b>F-NR3-Ex1</b> | NAMUR Resistor Network                                     |
|   | <b>KC-ST-5GN</b> | Terminal block for KC modules, 2-pin screw terminal, green |
|  | <b>KC-ST-5BU</b> | Terminal block for KC modules, 2-pin screw terminal, blue  |
|  | <b>KF-CP</b>     | Red coding pins, packaging unit: 20 x 6                    |

Configuration



Switch position

| S | Function                                     | Position                                        |
|---|----------------------------------------------|-------------------------------------------------|
| 1 | Mode of operation output I (relay) energized | with high input current                         |
|   |                                              | with low input current                          |
| 2 | Assignment output II (relay)                 | Switching state like relay I                    |
|   |                                              | Fault indication output (de-energized if fault) |
| 3 | Line fault detection                         | ON                                              |
|   |                                              | OFF                                             |
| 4 | no function                                  |                                                 |

Operating states

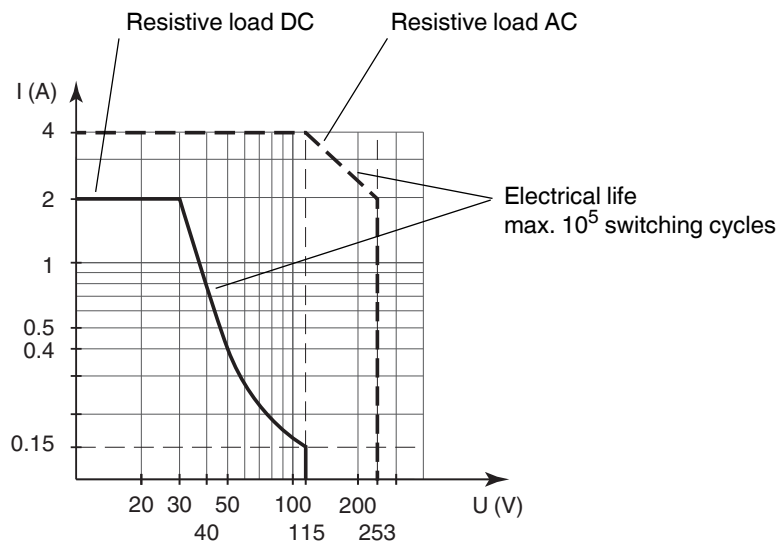
| Control circuit                         | Input signal       |
|-----------------------------------------|--------------------|
| Initiator high impedance/contact opened | low input current  |
| Initiator low impedance/contact closed  | high input current |
| Lead breakage, lead short circuit       | Line fault         |

Factory setting: switch 1, 2, 3 and 4 in position I

Characteristic Curve

Maximum switching power of output contacts

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The maximum number of switching cycles is depending on the electrical load and may be higher when reduced currents and voltages are applied.