

# Switch Amplifier KCD2-SON-Ex1

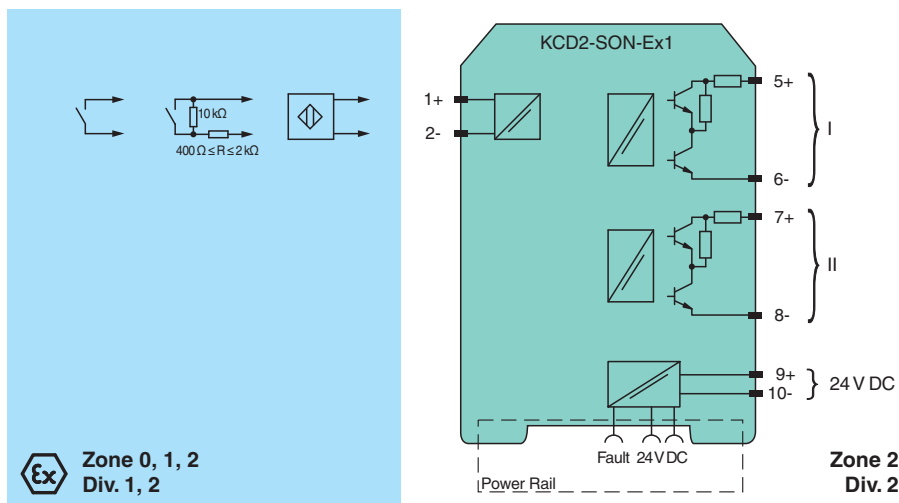
- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR input
- 2 passive transistor outputs (resistive acc. to EN 60947-5-6)
- Line fault transparency (LFT)
- Housing width 12.5 mm
- Up to SIL 2 (SC 3) acc. to IEC/EN 61508



## Function

This isolated barrier is used for intrinsic safety applications. The device transfers digital signals (NAMUR sensors or dry contacts) from a hazardous area to a safe area. The input controls two passive transistor outputs with a resistive output characteristic (acc. to EN60947-5-6). The outputs have three defined states: 1-Signal = 1.8 k $\Omega$ , 0-Signal = 14 k $\Omega$  and fault > 100 k $\Omega$ . This output characteristic offers line fault transparency on the signal lines. Via switches the mode of operation can be reversed and the line fault detection can be switched off. A fault is signaled by LEDs acc. to NAMUR NE44 and a separate collective error message output.

## 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                        | $U_r$ | 19 ... 30 V DC                  |
| Ripple                               |       | ≤ 10 %                          |
| Rated current                        | $I_r$ | 18 ... 14 mA                    |

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

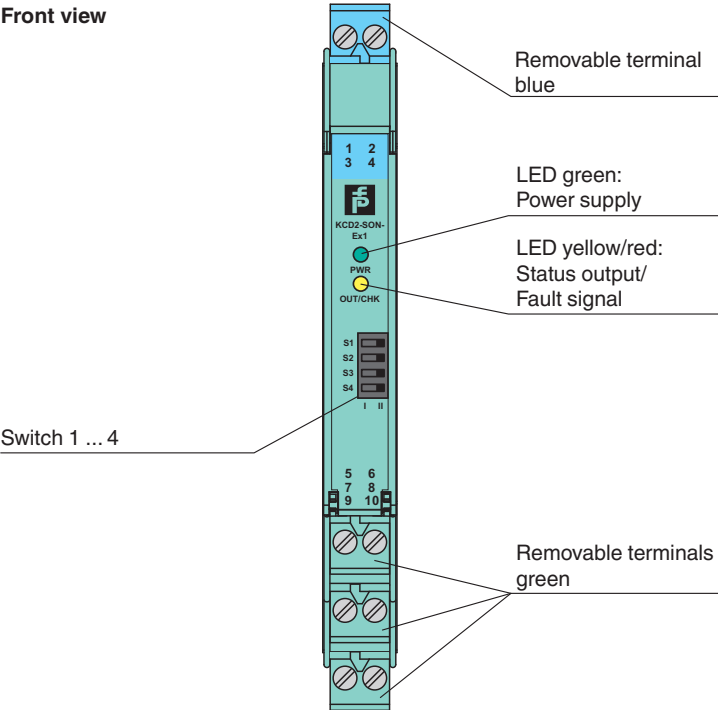
|                                                                |       |                                                                                                                                                                                           |
|----------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power dissipation                                              |       | ≤ 500 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. 10 V DC / approx. 8 mA                                                                                                                                                            |
| Switching point/switching hysteresis                           |       | 1.2 ... 2.1 mA / approx. 0.2 mA                                                                                                                                                           |
| Line fault detection                                           |       | breakage $I \leq 0.1$ mA , short-circuit $I \geq 6.5$ mA                                                                                                                                  |
| Pulse/Pause ratio                                              |       | min. 100 $\mu$ s / min. 100 $\mu$ s                                                                                                                                                       |
| <b>Output</b>                                                  |       |                                                                                                                                                                                           |
| Connection side                                                |       | control side                                                                                                                                                                              |
| Connection                                                     |       | output I: terminals 5, 6 ; output II: terminals 7, 8                                                                                                                                      |
| Rated voltage                                                  | $U_r$ | typ. 8 V max. 20 V DC                                                                                                                                                                     |
| Response time                                                  |       | ≤ 200 $\mu$ s                                                                                                                                                                             |
| Output I, II                                                   |       | signal or fault message, passive transistor output (resistive)<br>0-signal: $14 \text{ k}\Omega \pm 10 \%$<br>1-signal: $1.8 \text{ k}\Omega \pm 10 \%$<br>fault: $> 100 \text{ k}\Omega$ |
| Collective error message                                       |       | Power Rail                                                                                                                                                                                |
| <b>Transfer characteristics</b>                                |       |                                                                                                                                                                                           |
| Switching frequency                                            |       | ≤ 5 kHz                                                                                                                                                                                   |
| <b>Galvanic isolation</b>                                      |       |                                                                                                                                                                                           |
| Input/Output                                                   |       | reinforced insulation acc. to EN 50178, rated insulation voltage 300 V <sub>eff</sub>                                                                                                     |
| Input/power supply                                             |       | reinforced insulation acc. to EN 50178, rated insulation voltage 300 V <sub>eff</sub>                                                                                                     |
| Output/power supply                                            |       | basic insulation according to EN 50178, rated insulation voltage 50 V <sub>eff</sub>                                                                                                      |
| Output/Output                                                  |       | basic insulation according to EN 50178, rated insulation voltage 50 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)                                                                                                                                                    |
| <b>Conformity</b>                                              |       |                                                                                                                                                                                           |
| Electromagnetic compatibility                                  |       | NE 21:2011 , EN 61326-3-2:2008                                                                                                                                                            |
| Degree of protection                                           |       | IEC 60529:2001                                                                                                                                                                            |
| Protection against electrical shock                            |       | IEC 61010-1:2010                                                                                                                                                                          |
| Input                                                          |       | EN 60947-5-6:2000                                                                                                                                                                         |
| <b>Ambient conditions</b>                                      |       |                                                                                                                                                                                           |
| Ambient temperature                                            |       | -20 ... 60 °C (-4 ... 140 °F)<br>extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions                                               |
| <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 13 ATEX 0080                                                                                                                                                                      |
| Marking                                                        |       | ⊕ II (1)G [Ex ia Ga] IIC<br>⊕ II (1)D [Ex ia Da] IIIC<br>⊕ I (M1) [Ex ia Ma] I                                                                                                            |
| Input                                                          |       | Ex ia                                                                                                                                                                                     |
| Voltage                                                        | $U_o$ | 10.5 V                                                                                                                                                                                    |

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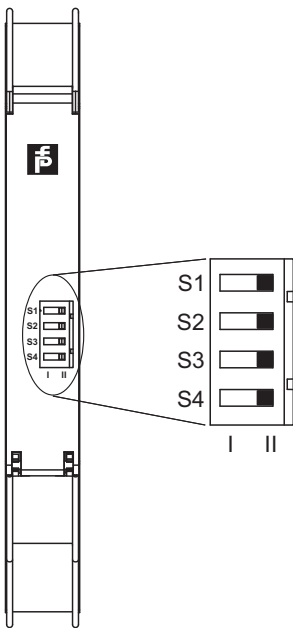
Technical Data

|                           |                                                                                                                                                                                                 |                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Current                   | I <sub>o</sub>                                                                                                                                                                                  | 17.1 mA                                                                     |
| Power                     | P <sub>o</sub>                                                                                                                                                                                  | 45 mW (linear characteristic)                                               |
| Supply                    |                                                                                                                                                                                                 |                                                                             |
| Maximum safe voltage      | U <sub>m</sub>                                                                                                                                                                                  | 253 V AC (Attention! U <sub>m</sub> is no rated voltage.)                   |
| Output                    |                                                                                                                                                                                                 |                                                                             |
| Maximum safe voltage      | U <sub>m</sub>                                                                                                                                                                                  | 253 V AC (Attention! The rated voltage can be lower.)                       |
| Certificate               | CML 19 ATEX 4410 X                                                                                                                                                                              |                                                                             |
| Marking                   |                                                                                                                                                                                                 | Ⓜ II 3G Ex ec IIC T4 Gc                                                     |
| 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                                                                                                                                |                                                                             |
| International approvals   |                                                                                                                                                                                                 |                                                                             |
| UL approval               |                                                                                                                                                                                                 |                                                                             |
| Control drawing           |                                                                                                                                                                                                 | 116-0374 (cULus)                                                            |
| IECEX approval            |                                                                                                                                                                                                 |                                                                             |
| IECEX certificate         |                                                                                                                                                                                                 | IECEX BAS 13.0046<br>IECEX CML 19.0147X                                     |
| IECEX marking             | [Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I<br>Ex ec IIC T4 Gc                                                                                                                              |                                                                             |
| General information       |                                                                                                                                                                                                 |                                                                             |
| 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



Configuration



Switch settings

| S | Function                                |                         | Position |
|---|-----------------------------------------|-------------------------|----------|
| 1 | Mode of operation output I, II (active) | with high input current | I        |
|   |                                         | with low input current  | II       |
| 2 | no function                             |                         |          |
| 3 | Line fault detection of the input       | ON                      | I        |
|   |                                         | OFF                     | II       |
| 4 | no function                             |                         |          |

Operating states

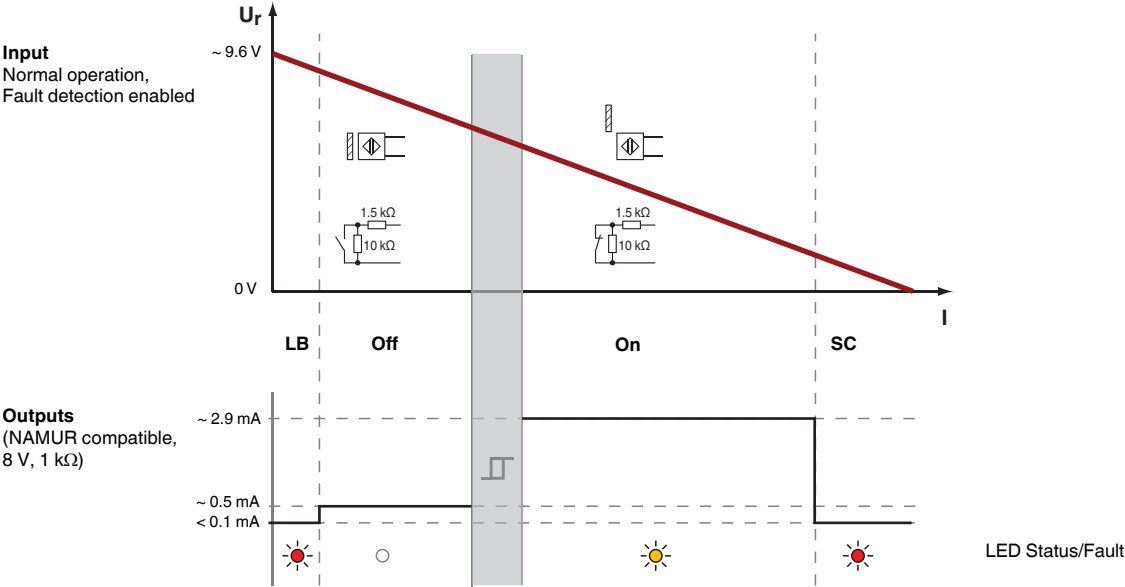
| Control circuit                         | Input signal       |
|-----------------------------------------|--------------------|
| Initiator high impedance/contact opened | low input current  |
| Initiator low impedance/contact closed  | high input current |
| Lead breakage, lead short circuit     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

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

Characteristic Curve

Switching points

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