

# Switch Amplifier

## KFA5-SR2-Ex1.W

- 1-channel isolated barrier
- 115 V AC supply
- Dry contact or NAMUR inputs
- Relay contact output
- Line fault detection (LFD)
- Reversible mode of operation
- Up to SIL 2 acc. to IEC 61508/IEC 61511



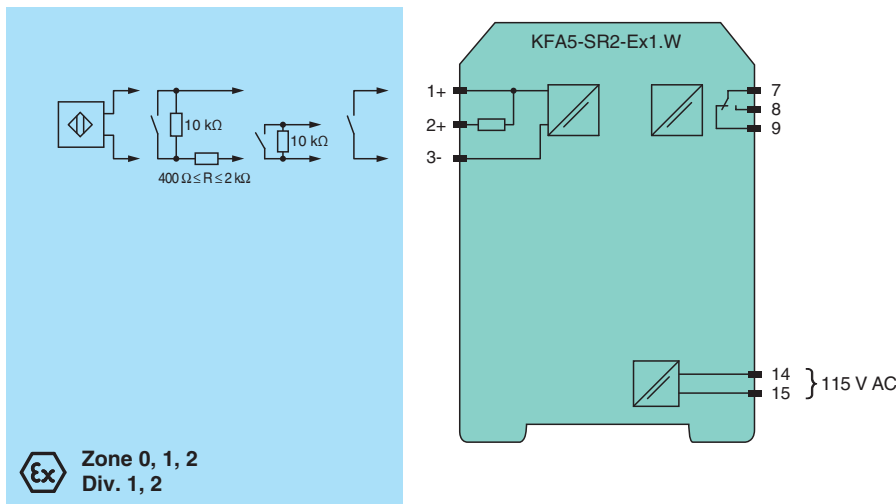
**SIL 2**



### Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area. The proximity sensor or switch controls a form C changeover relay contact for the safe area load. The barrier output changes state when the input signal changes state. The normal output state can be reversed using switch S1. Switch S3 is used to enable or disable line fault detection of the field circuit. During an error condition, relays revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

### Connection



### Technical Data

|   |   |
|---|---|
| <b>General specifications</b>               |   |
| Signal type                                 | Digital Input                           |
| <b>Functional safety related parameters</b> |   |
| Safety Integrity Level (SIL)                | SIL 2                                   |
| <b>Supply</b>                               |   |
| Connection                                  | terminals 14, 15                        |
| Rated voltage                               | $U_r$ 103.5 ... 126 V AC , 45 ... 65 Hz |
| Power consumption                           | 1 W                                     |
| <b>Input</b>                                |   |
| Connection side                             | field side                              |

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## Technical Data

|  |                |  |
|--|----------------|--|
| Connection   |                | terminals 1+, 2+, 3-   |
| 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 $I \leq 0.1$ mA , short-circuit $I > 6$ mA  |
| Pulse/Pause ratio  |                | min. 20 ms / min. 20 ms  |
| <b>Output</b>  |                |  |
| Connection side  |                | control side   |
| Connection   |                | terminals 7, 8, 9  |
| Output   |                | signal, relay  |
| Contact loading  |                | 253 V AC/2 A/cos $\phi > 0.7$ ; 126.5 V AC/4 A/cos $\phi > 0.7$ ; 40 V DC/2 A resistive load     |
| Energized/De-energized delay                                   |                | approx. 20 ms / approx. 20 ms  |
| Mechanical life  |                | $10^7$ switching cycles  |
| <b>Transfer characteristics</b>                                |                |  |
| Switching frequency  |                | < 10 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> |
| <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  |
| <b>Conformity</b>  |                |  |
| Electromagnetic compatibility                                  |                | NE 21:2006   |
| Degree of protection   |                | IEC 60529:2001   |
| Input  |                | EN 60947-5-6:2000  |
| <b>Ambient conditions</b>                                      |                |  |
| Ambient temperature  |                | -20 ... 60 °C (-4 ... 140 °F)  |
| <b>Mechanical specifications</b>                               |                |  |
| Degree of protection   |                | IP20   |
| Connection   |                | screw terminals  |
| Mass   |                | approx. 150 g  |
| Dimensions   |                | 20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch) (W x H x D) , housing type B2                           |
| 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                                |                | PTB 00 ATEX 2081   |
| 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 <sub>o</sub> | 10.6 V   |
| Current  | I <sub>o</sub> | 19.1 mA  |
| Power  | P <sub>o</sub> | 51 mW (linear characteristic)  |
| Supply   |                |  |
| Maximum safe voltage   | U <sub>m</sub> | 126.5 V AC (Attention! U <sub>m</sub> is no rated voltage.)                                      |
| Output   |                |  |
| Contact loading  |                | 253 V AC/2 A/cos $\phi > 0.7$ ; 126.5 V AC/4 A/cos $\phi > 0.7$ ; 40 V DC/2 A resistive load     |

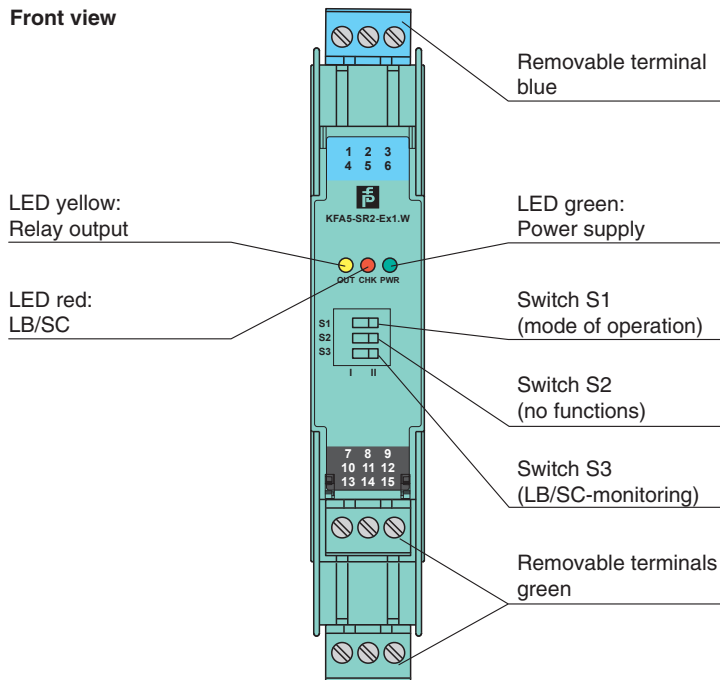
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**Technical Data**


|                                |                |   |
|--------------------------------|----------------|---|
| Maximum safe voltage           | U <sub>m</sub> | 253 V AC (Attention! The rated voltage can be lower.)   |
| 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+AC:2020 , EN 60079-11:2012  |
| <b>International approvals</b> |                |   |
| FM approval                    |                |   |
| Control drawing                |                | 116-0035  |
| UL approval                    |                |   |
| Control drawing                |                | 116-0145  |
| CSA approval                   |                |   |
| Control drawing                |                | 116-0047  |
| IECEX approval                 |                |   |
| IECEX certificate              |                | IECEX PTB 11.0031   |
| IECEX marking                  |                | [Ex ia Ga] IIC<br>[Ex ia Da] IIIC<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>K-DUCT-BU</b> | Profile rail, wiring comb field side, blue |
|---|------------------|--|

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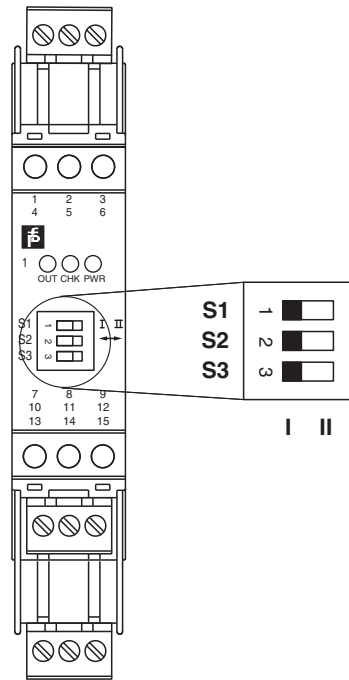
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## Accessories

|   |                  |  |
|---|------------------|--|
|  | <b>F-NR3-Ex1</b> | NAMUR Resistor Network                                     |
|  | <b>KF-ST-5GN</b> | Terminal block for KF modules, 3-pin screw terminal, green |
|  | <b>KF-ST-5BU</b> | Terminal block for KF modules, 3-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 (relay) energized | with high input current | I        |
|   |  | with low input current  | II       |
| 2 | No function                                |                         |          |
| 3 | Line fault detection                       | ON                      | I        |
|   |  | OFF                     | II       |

**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         |

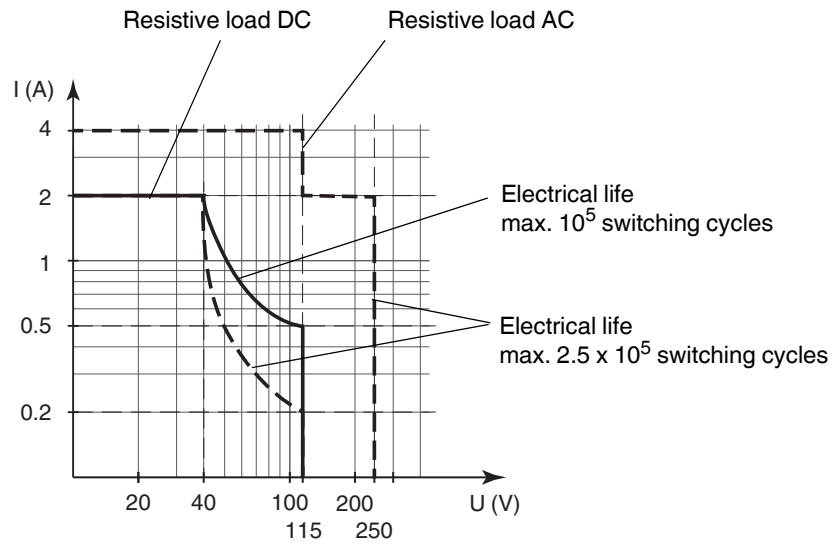
Factory setting: switch 1, 2 and 3 in position I

**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.

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