

# Switch Amplifier KFD2-SOT3-Ex2.IO-Y1

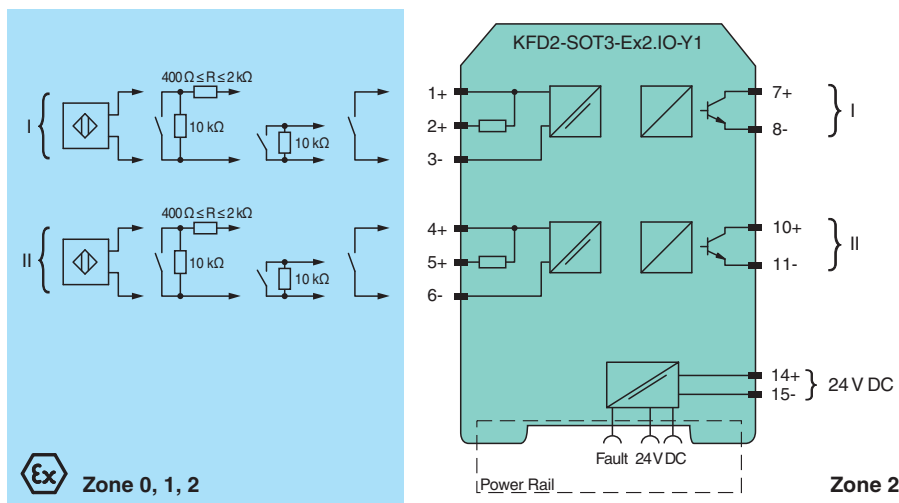
- 2-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Isolated passive transistor output, TTL level
- Line fault detection (LFD)
- Reversible mode of operation
- Up to SIL 2 acc. to IEC/EN 61508



## 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. Each input controls a passive transistor output. The outputs are galvanically isolated from each other. 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

### Supply

Connection Power Rail or terminals 14+, 15-

Rated voltage  $U_r$  19 ... 30 V DC

Ripple  $\leq 10\%$

Rated current  $I_r$  30 ... 20 mA

Power dissipation  $\leq 1.1$  W including maximum power dissipation in the output

## Technical Data

|                                                                |       |                                                                                                                                     |
|----------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Input</b>                                                   |       |                                                                                                                                     |
| Connection side                                                |       | field side                                                                                                                          |
| Connection                                                     |       | terminals 1+, 2+, 3-; 4+, 5+, 6-                                                                                                    |
| Rated values                                                   |       | acc. to EN 60947-5-6 (NAMUR), see manual for electrical data                                                                        |
| 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 7, 8 ; output II: terminals 10, 11                                                                              |
| Rated voltage                                                  | $U_r$ | 30 V DC                                                                                                                             |
| Rated current                                                  | $I_r$ | 2 mA , short-circuit protected                                                                                                      |
| Response time                                                  |       | $\leq 200$ $\mu$ s                                                                                                                  |
| Signal level                                                   |       | 1-signal: switching voltage - 0.85 V max. at 2 mA switching current<br>0-signal: switched off (off-state current $\leq 10$ $\mu$ A) |
| Output I                                                       |       | signal ; Transistor , TTL compatible                                                                                                |
| Output II                                                      |       | signal ; Transistor , TTL compatible                                                                                                |
| Collective error message                                       |       | Power Rail                                                                                                                          |
| <b>Transfer characteristics</b>                                |       |                                                                                                                                     |
| Switching frequency                                            |       | $\leq 5$ kHz                                                                                                                        |
| <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                                            |       | basic insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>                                         |
| Output/Output                                                  |       | basic insulation according to IEC/EN 61010-1, rated insulation voltage 60 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 21:2012 , EN 61326-3-2:2008                                                                                                      |
| 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                                |       | EXA 16 ATEX 0016 X                                                                                                                  |
| Marking                                                        |       | ⊕ II 3(1)G Ex nA [ia Ga] IIC T4 Gc<br>⊕ II (1)D [Ex ia Da] IIIC<br>⊕ I (M1) [Ex ia Ma] I                                            |
| Input                                                          |       | Ex ia                                                                                                                               |
| Voltage                                                        | $U_o$ | 10.5 V                                                                                                                              |
| Current                                                        | $I_o$ | 17.1 mA                                                                                                                             |

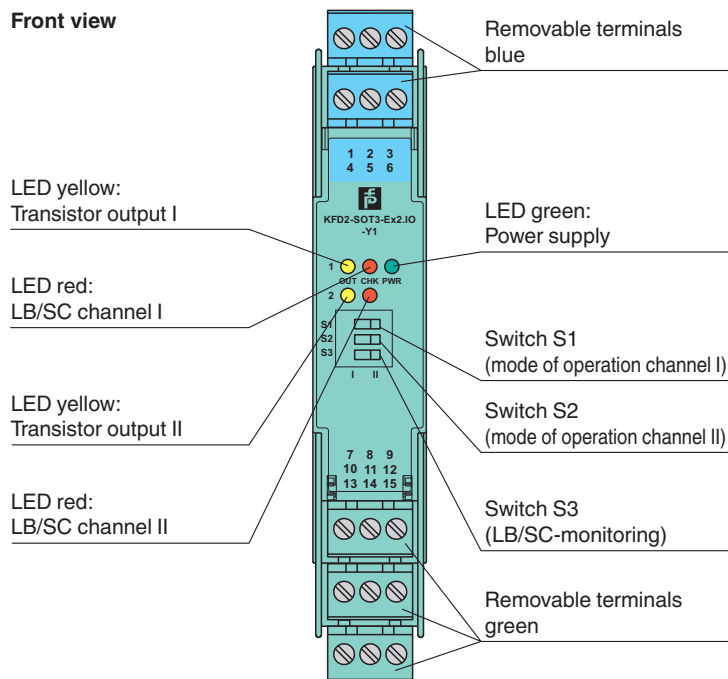
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## Technical Data

|                                |                |                                                                                                                                                                                                 |
|--------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.)                                                                                                                                           |
| 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 , EN 60079-15:2010                                                                                                                               |
| <b>International approvals</b> |                |                                                                                                                                                                                                 |
| UL approval                    |                | E106378                                                                                                                                                                                         |
| Control drawing                |                | 116-0424 (cULus)                                                                                                                                                                                |
| IECEx approval                 |                |                                                                                                                                                                                                 |
| IECEx certificate              |                | IECEx EXA 16.0009X                                                                                                                                                                              |
| IECEx marking                  |                | Ex nA [ia Ga] IIC T4 Gc , [Ex ia Da] IIIC , [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 |

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

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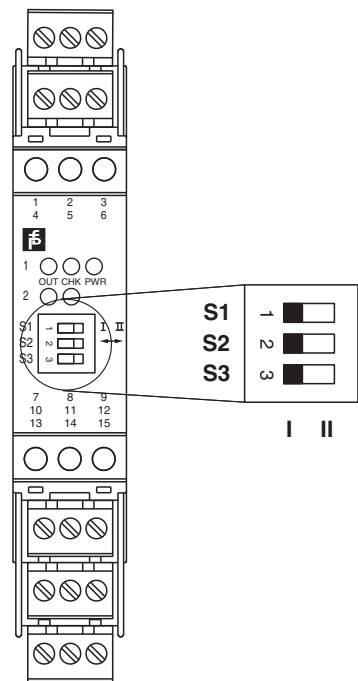
## Matching System Components

|                                                                                   |                         |                                                                                |
|-----------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------|
|  | <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>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 I active  | with high input current | I        |
|   |                                    | with low input current  | II       |
| 2 | Mode of operation output II active | with high input current | I        |
|   |                                    | with low input current  | II       |
| 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

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