



# Conductive Switch Amplifier

## KFD2-ER-Ex1.W.LB

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Level sensing input
- Adjustable range 1 k $\Omega$  ... 150 k $\Omega$
- Relay contact output
- Fault relay contact output
- Adjustable time delay up to 10 s
- Minimum/maximum control
- Line fault detection (LFD)



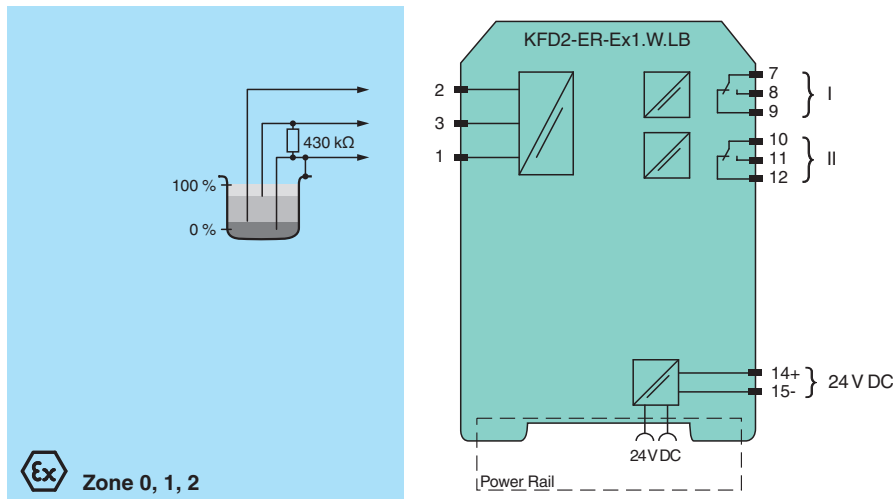
### Function

This isolated barrier is used for intrinsic safety applications. It provides the AC measuring voltage for the level sensing electrodes. Once the measured medium reaches the electrodes, the unit reacts by energizing a form C changeover relay contact. The module is voltage and temperature stabilized and guarantees a defined switching characteristic. It can be used for on/off control or minimum/maximum control. A signal delay feature is available and is adjustable between 0.5 s and 10 s. This module can also monitor the field circuit for lead breakage (LB). LB is indicated by a red LED. If LB monitoring is selected, output II serves as the fault signal output; otherwise, it will follow the function of output I.

### Application

The device is equipped with lead breakage detection (current free relay in event of failure). For this purpose, the enclosed 430 k $\Omega$  resistance must be switched between the maximum and reference electrode. This function can be deactivated by DIP switches.

### Connection



### Technical Data

| General specifications |                |                                  |  |
|------------------------|----------------|----------------------------------|--|
| Signal type            |                | Digital Input                    |  |
| Supply                 |                |                                  |  |
| Connection             |                | Power Rail or terminals 14+, 15- |  |
| Rated voltage          | U <sub>r</sub> | 20 ... 30 V DC                   |  |
| Rated current          | I <sub>r</sub> | 30 ... 40 mA                     |  |
| Input                  |                |                                  |  |

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

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## Technical Data

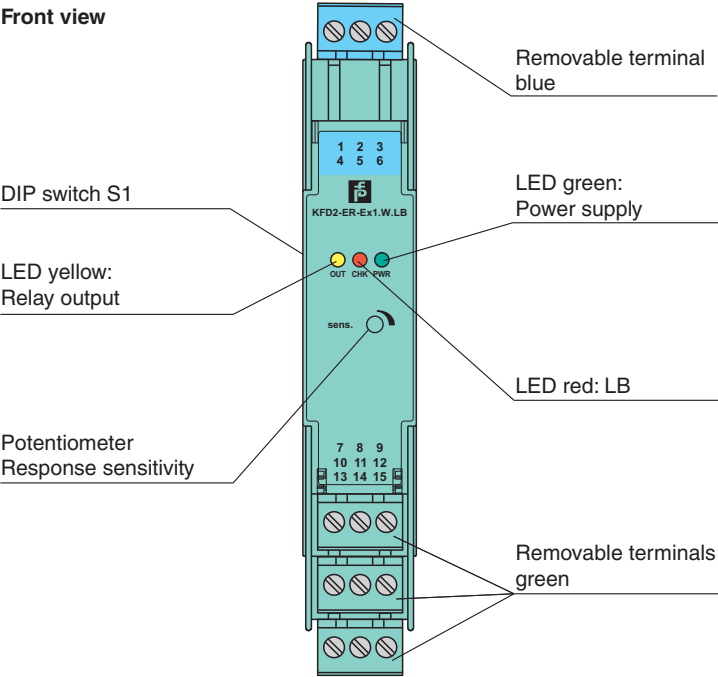
|  |                |  |
|--|----------------|--|
| Connection side  | field side     |  |
| Connection   |                | terminals 1 (mass), 2 (min), 3 (max)   |
| Control input  |                | min./max. control system: terminals 1, 2, 3<br>on/off control system: terminals 1, 3             |
| Response sensitivity   |                | 1 ... 150 kΩ , adjustable via potentiometer  |
| <b>Output</b>  |                |  |
| Connection side  |                | control side   |
| Connection   |                | terminals 7, 8, 9; 10, 11, 12  |
| Switching power  |                | max. 192 W , 2000 VA   |
| Output   |                | signal ; relay   |
| Contact loading  |                | 253 V AC/2 A/cos φ > 0.7; 40 V DC/2 A resistive load   |
| Time constant for signal damping                               |                | 0.5 s, 2 s, 5 s, 10 s  |
| <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<br>potentiometer  |
| Configuration  |                | via DIP switches<br>via potentiometer  |
| 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   |
| <b>Ambient conditions</b>                                      |                |  |
| Ambient temperature  |                | -20 ... 60 °C (-4 ... 140 °F)  |
| <b>Mechanical specifications</b>                               |                |  |
| Degree of protection   |                | IP20   |
| Connection   |                | screw terminals , max. 2.5 mm <sup>2</sup>   |
| 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                                |                | DMT 00 ATEX E 033  |
| Marking  |                | Ⓔ II (1)G [EEx ia] IIC [circuit(s) in zone 0/1/2]  |
| Input  |                | [EEx ia] IIC   |
| Voltage  | U <sub>o</sub> | 10 V   |
| Current  | I <sub>o</sub> | 2.5 mA   |
| Power  | P <sub>o</sub> | 6 mW   |
| Supply   |                |  |
| Maximum safe voltage   | U <sub>m</sub> | 40 V DC (Attention! U <sub>m</sub> is no rated voltage.)   |
| Output   |                |  |
| Contact loading  |                | 253 V AC/2 A/cos φ > 0.7; 40 V DC/2 A resistive load   |
| 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   |                |  |

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Technical Data

|                            |   |
|----------------------------|---|
| Directive 2014/34/EU       | EN 60079-0:2012+A11:2013, EN 60079-11:2012  |
| <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



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>KF-ST-5GN</b> | Terminal block for KF modules, 3-pin screw terminal, green |
|--|------------------|--|

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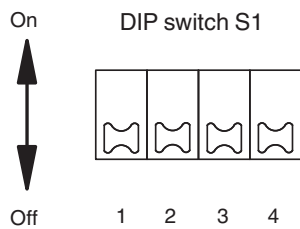
Accessories

|   |                  |   |
|---|------------------|---|
|  | <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                   |

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Configuration

DIP switch function on side of device



| Switches | Position | Function               |
|----------|----------|------------------------|
| 1        | Off      | open circuit current   |
|          | On       | closed circuit current |
| 2        | Off      | LB deactivated         |
|          | On       | LB activated           |

| Switch 3 | Switch 4 | Time constant for signal damping |
|----------|----------|----------------------------------|
| Off      | Off      | 0.5 s                            |
| Off      | On       | 2 s                              |
| On       | Off      | 5 s                              |
| On       | On       | 10 s                             |

- Open circuit current principle: In open circuit current principle the relay becomes active when the limit is reached.
- Closed circuit current principle: In closed circuit current principle, the relay is activated when power is applied. The relay is deactivated when the limit is reached.

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