

# Solenoid Driver

## KFD2-SL2-Ex2

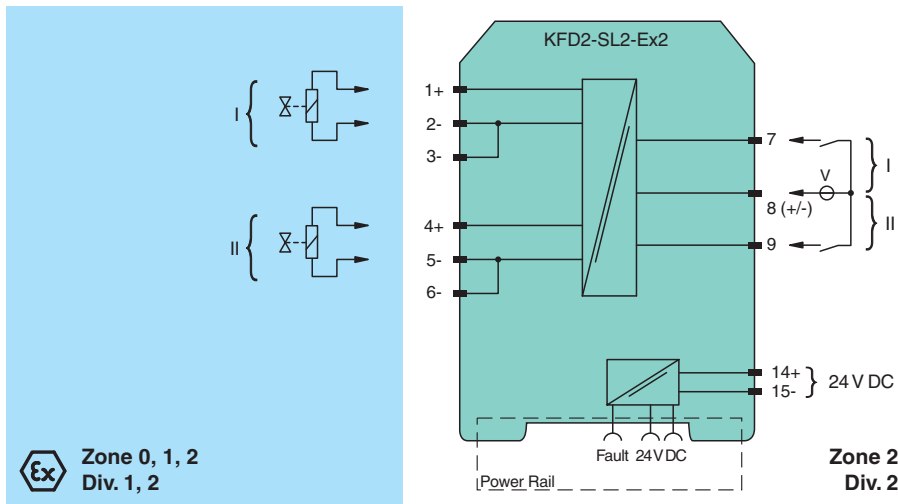
- 2-channel isolated barrier
- 24 V DC supply (Power Rail)
- Output 45 mA at 11.7 V DC
- Logic input, non-polarized
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC/EN 61508



### Function

This isolated barrier is used for intrinsic safety applications. The device supplies power to solenoids, LEDs and audible alarms located in a hazardous area. It is controlled via logic signals. The inputs have two defined states: 1-Signal = 16 V DC ... 30 V DC, 0-Signal = 0 V DC ... 5 V DC. The current consumption of the input is about 3 mA. At full load, 11.7 V at 45 mA is available for the hazardous area application. If the field impedance is > 10 kΩ for lead breakage or < 50 Ω for short circuits a line fault is detected. A fault is signaled by LEDs and a separate collective error message output.

### Connection



### Technical Data

| General specifications               |                                    |
|--------------------------------------|------------------------------------|
| Signal type                          | Digital Output                     |
| Functional safety related parameters |                                    |
| Safety Integrity Level (SIL)         | SIL 2                              |
| Supply                               |                                    |
| Connection                           | Power Rail or terminals 14+, 15-   |
| Rated voltage                        | $U_r$ 20 ... 30 V DC               |
| Power consumption                    | max. 3.3 W at 45 mA output current |
| Input                                |                                    |
| Connection side                      | control side                       |

Release date: 2021-09-13 Date of issue: 2021-09-13 Filename: 184258\_eng.pdf

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

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## Technical Data

|  |       |  |
|--|-------|--|
| Connection   |       | terminals 7, 8, 9  |
| Input current  |       | approx. 3 mA at 24 V DC  |
| Signal level   |       | 1-signal: 16 ... 30 V DC<br>0-signal: 0 ... 5 V DC   |
| <b>Output</b>  |       |  |
| Connection side  |       | field side   |
| Connection   |       | channel 1: terminals 1+, 2-, 3<br>channel 2: terminals 4+, 5-, 6-                                |
| Internal resistor  | $R_i$ | 272 $\Omega$   |
| Current  | $I_e$ | $\leq 45$ mA   |
| Voltage  | $U_e$ | $\geq 11.7$ V  |
| Open loop voltage  | $U_s$ | min. 24 V  |
| Output signal  |       | These values are valid for the rated operating voltages from 20 ... 30 V DC.                     |
| Energized/De-energized delay                                   |       | $\leq 20$ ms / $\leq 20$ ms  |
| Line fault detection   |       |  |
| Short-circuit  |       | $< 50$ $\Omega$  |
| Open-circuit   |       | $> 10$ k $\Omega$  |
| Test current   |       | $< 650$ $\mu$ A  |
| <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> |
| Power supply/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)   |
| <b>Conformity</b>  |       |  |
| Electromagnetic compatibility                                  |       | NE 21:2006   |
| Degree of protection   |       | IEC 60529:2001   |
| Protection against electrical shock                            |       | EN 61010-1:2010  |
| <b>Ambient conditions</b>                                      |       |  |
| Ambient temperature  |       | -20 ... 50 °C (-4 ... 122 °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) , 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                                |       | ZELM 00 ATEX 0024  |
| Marking  |       | Ⓜ II (1)G [Ex ia Ga] IIC<br>Ⓜ II (1)D [Ex ia Da] IIIC<br>Ⓜ I (M1) [Ex ia Ma] I                   |
| Output   |       | Ex ia  |
| Voltage  | $U_o$ | 28 V   |
| Current  | $I_o$ | 110 mA   |
| Power  | $P_o$ | 770 mW (linear characteristic)   |
| <b>Supply</b>  |       |  |
| Maximum safe voltage   | $U_m$ | 40 V (Attention! The rated voltage can be lower.)  |
| Input  |       |  |

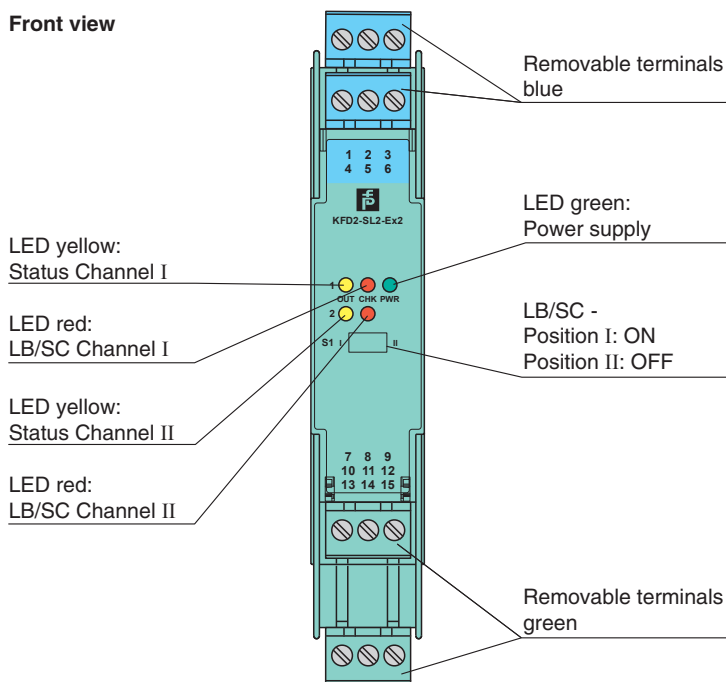
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**Technical Data**



|                                |                |   |
|--------------------------------|----------------|---|
| Maximum safe voltage           | U <sub>m</sub> | 60 V (Attention! The rated voltage can be lower.)   |
| Collective error message       |                |   |
| Maximum safe voltage           | U <sub>m</sub> | 40 V (Attention! The rated voltage can be lower.)   |
| Certificate                    |                | TÜV 02 ATEX 1820 X  |
| Marking                        |                | Ⓔ II 3G Ex nA IIC T4 Gc   |
| Galvanic isolation             |                |   |
| Input/Output                   |                | safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V   |
| Output/power supply            |                | safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V   |
| Directive conformity           |                |   |
| Directive 2014/34/EU           |                | EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-15:2010 , EN 60079-26:2007 , EN 50303:2000   |
| <b>International approvals</b> |                |   |
| CSA approval                   |                |   |
| Control drawing                |                | 116-0304  |
| IECEx approval                 |                |   |
| IECEx certificate              |                | IECEx TUN 04.0001   |
| IECEx marking                  |                | [Ex ia Ga] IIC, [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 |

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## Matching System Components

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

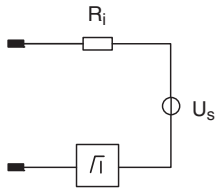
## Accessories

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

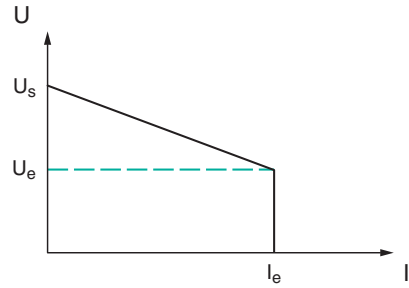
# Characteristic Curve

## Output characteristics

Output circuit diagram



Output characteristic



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