



Switch Amplifier

KFD2-SH-Ex1.T.OP

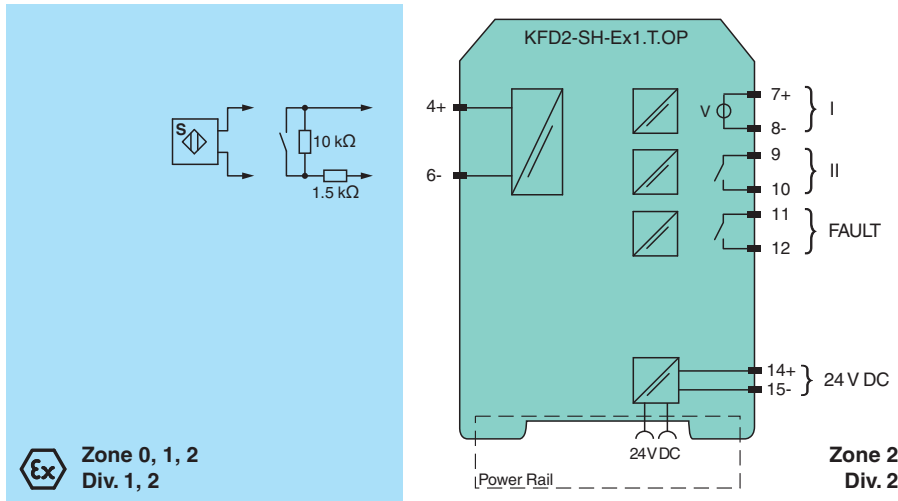
- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Input for approved dry contacts or SN/S1N sensors
- Active voltage output
- Relay contact output
- Fault indication output
- Line fault detection (LFD)
- Up to SIL 3 acc. to IEC/EN 61508
- Up to PL d acc. to EN/ISO 13849



Function

This isolated barrier is used for intrinsic safety applications. The device transfers digital signals (SN/S1N proximity sensors or approved dry contacts) from a hazardous area to a safe area. The input controls one active voltage output and one relay contact output with a NO contact. Unlike an SN/S1N series proximity sensor, a mechanical contact requires a 10 kΩ resistor to be placed across the contact in addition to a 1.5 kΩ resistor in series. Lead breakage (LB) and short circuit (SC) conditions of the control circuit are continuously monitored. During an fault condition, the fault indication output and the outputs I and II de-energize. For safety applications up to SIL3, output I must be used. For safety applications up to SIL2, output I and output II can be used.

Connection



Technical Data

| General specifications | |
|--------------------------------------|----------------------------------|
| Signal type | Digital Input |
| Functional safety related parameters | |
| Safety Integrity Level (SIL) | SIL 3 |
| Systematic capability (SC) | SC 3 |
| Performance level (PL) | PL d |
| Supply | |
| Connection | Power Rail or terminals 14+, 15- |
| Rated voltage | U_r 20 ... 30 V DC |
| Ripple | ≤ 10 % |

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Technical Data

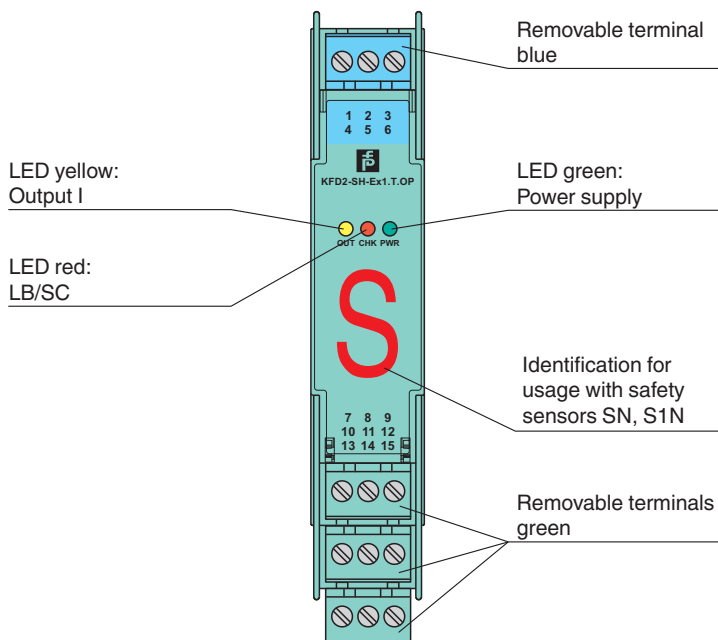
| | | |
|--|-------|--|
| Rated current | I_r | ≤ 100 mA |
| Power dissipation | | 1.5 W |
| Power consumption | | max. 1.7 W |
| Input | | |
| Connection side | | field side |
| Connection | | terminals 4+, 6- |
| Open circuit voltage/short-circuit current | | approx. 8.4 V DC / approx. 11.7 mA |
| Lead resistance | | max. 50 Ω , cable capacitances and inductances must be observed in hazardous areas |
| Switching point | | |
| Relay de-energized | | $I < 2.1$ mA and $I > 5.9$ mA , output switched off |
| Relay energized | | 2.8 mA $< I < 5.3$ mA , output switched on |
| Response delay | | ≤ 1 ms |
| Output | | |
| Connection side | | control side |
| Connection | | output I: terminals 7+, 8- ; output II: terminals 9, 10 ; output III: terminals 11, 12 |
| Output I | | active voltage output, short-circuit proof 0-signal: 0 V 1-signal: 19 V DC at 15 mA ... 31 V DC at no-load fault: 0 V |
| Output II | | relay |
| Contact loading | | 48 V AC/DC 250 mA |
| Mechanical life | | $\leq 20 \times 10^6$ switching cycles |
| Output III | | relay , fault signal |
| Contact loading | | 48 V AC/DC 250 mA |
| Mechanical life | | $\leq 20 \times 10^6$ switching cycles |
| Transfer characteristics | | |
| Switching frequency | | |
| Output I | | ≤ 50 Hz |
| Output II | | ≤ 5 Hz |
| Output III | | ≤ 5 Hz |
| Indicators/settings | | |
| Display elements | | LEDs |
| Labeling | | space for labeling at the front |
| Directive conformity | | |
| Electromagnetic compatibility | | |
| Directive 2014/30/EU | | EN 61326-1:2013 (industrial locations) |
| Machinery Directive | | |
| Directive 2006/42/EC | | EN/ISO 13849-1:2015 |
| Conformity | | |
| Electromagnetic compatibility | | NE 21:2017 , EN 61326-3-2:2008 |
| Degree of protection | | IEC 60529:2001 |
| Safety | | IEC/EN 61508:2010 |
| Ambient conditions | | |
| Ambient temperature | | -20 ... 60 °C (-4 ... 140 °F) |
| Mechanical specifications | | |
| 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 |
| Data for application in connection with hazardous areas | | |
| EU-type examination certificate | | PTB 00 ATEX 2041 |

Technical Data

| | | |
|--------------------------------|---|---|
| Marking | Ⓜ II (1)G [Ex ia Ga] IIC , Ⓜ II (1)D [Ex ia Da] IIIC | |
| Input | | Ex ia |
| Voltage | U_o | 9.56 V |
| Current | I_o | 16.8 mA |
| Power | P_o | 41 mW (linear characteristic) |
| Supply | | |
| Maximum safe voltage | U_m | 40 V AC/DC (Attention! The rated voltage can be lower.) |
| Output | | |
| Contact loading | | 48 V AC/DC 250 mA |
| Maximum safe voltage | U_m | 60 V AC/DC (Attention! The rated voltage can be lower.) |
| Certificate | TÜV 99 ATEX 1493 X | |
| Marking | Ⓜ II 3G Ex ec nC 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+AC:2020 , EN 60079-7:2015+A1:2018 , EN 60079-11:2012 , EN IEC 60079-15:2019 | |
| International approvals | | |
| IECEX approval | | |
| IECEX certificate | IECEX PTB 21.0010 IECEX TUN 19.0013X | |
| IECEX marking | [Ex ia Ga] IIC [Ex ia Da] IIIC Ex ec nC IIC T4 Gc | |
| General information | | |
| Supplementary information | Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com . | |

Assembly

Front view

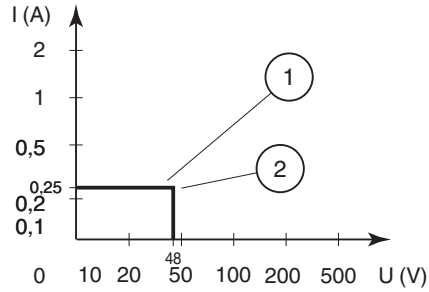


Characteristic Curve

Maximum switching power of the output contacts

The maximum number of switching cycles is depending on the electrical load and may be higher if reduced currents and voltages are applied.

For devices that are not used in applications with functional safety, 50 % more switching cycles are assumed.



- 1 Resistive load AC/DC
- 2 Electrical life max. 2×10^5 switching cycles