



Switch Amplifier

KHA6-SH-Ex1

- 1-channel isolated barrier
- 115/230 V AC supply
- Input for approved dry contacts or SN/S1N sensors
- 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

CE  **SIL3 PL d**

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 1 relay contact output with 3 NO contacts (1 output is in series to the both output relays for the safety function), 1 relay contact output with 1 NO contact, and 1 passive transistor output (fault indication output).

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 a fault condition, the fault indication output energizes and outputs I and II de-energize.

For safety applications up to SIL 3, output I must be used. For safety applications up to SIL 2, output I and output II can be used.

Application

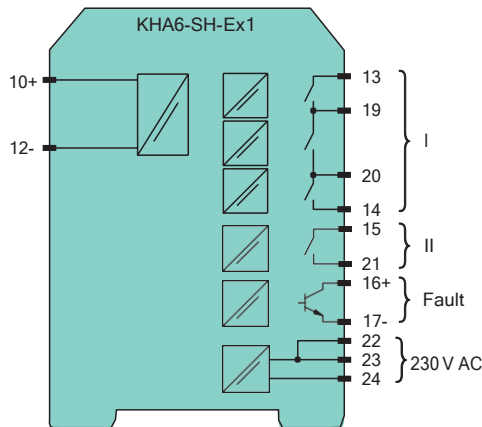
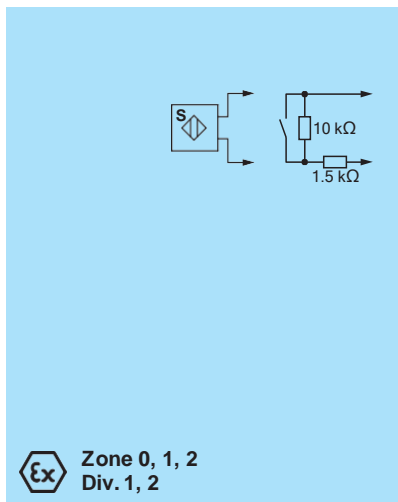
The input (terminals 10, 12) may generally be operated only with **potentially** free (passive) switches.

Single channel operations up to SIL 3 **must** occur via terminals 13 and 14. The center tap of the contacts (terminals 19, 20) can **also** be used if an operation is to occur a redundant branch.

If the device is used for safety operations the information in the test documents should be observed. The **fault message** output III delivers an 1-signal when the control circuit experiences lead breakage (LB) or a short circuit (LK).

The device (housing type E) has integrated terminals.

Connection



Technical Data

General specifications

Signal type Digital Input

Functional safety related parameters

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

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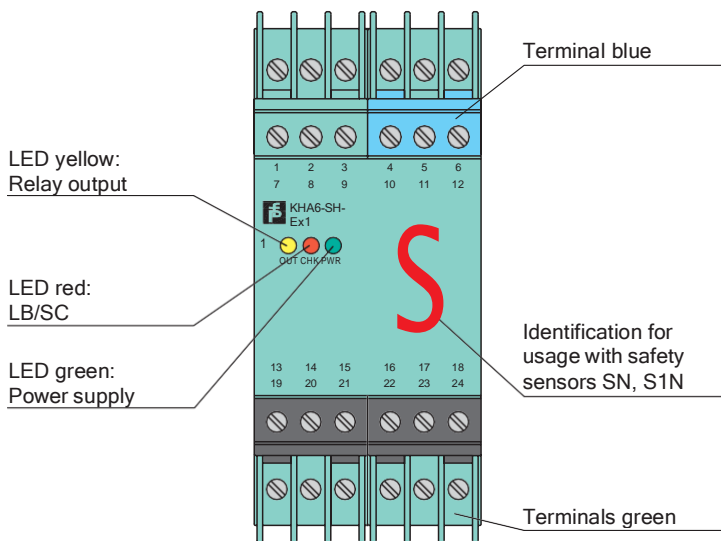
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|--|-------|---|
| Safety Integrity Level (SIL) | | SIL 3 |
| Performance level (PL) | | PL d |
| Supply | | |
| Connection | | terminals 22, 23, 24 |
| Rated voltage | U_r | 85 ... 253 V AC , 45 ... 65 Hz |
| Rated current | I_r | 30 mA \pm 5 mA |
| Power dissipation | | 2.2 W |
| Power consumption | | max. 2.3 W |
| Input | | |
| Connection side | | field side |
| Connection | | terminals 10+, 12- |
| Open circuit voltage/short-circuit current | | approx. 8.4 V DC / approx. 11.7 mA |
| Lead resistance | | $\leq 50 \Omega$, in hazardous area cable capacitances and inductivities are to be taken into account |
| Switching point | | |
| Relay de-energized | | $I < 2.1 \text{ mA}$ and $I > 5.9 \text{ mA}$ |
| Relay energized | | $2.8 \text{ mA} < I < 5.3 \text{ mA}$ |
| Response delay | | $\leq 1 \text{ ms}$ |
| Output | | |
| Connection side | | control side |
| Connection | | output I: terminals 13, 14 ; output II: terminals 15, 21 ; output III: terminals 16+, 17- |
| Output I | | relay , signal |
| Contact loading | | 253 V AC/1 A/cos $\varphi \geq 0.7$; 24 V DC/1 A resistive load |
| Mechanical life | | 50×10^6 switching cycles |
| Output II | | relay , signal |
| Contact loading | | 253 V AC/1 A/cos $\varphi \geq 0.7$; 24 V DC/1 A resistive load |
| Mechanical life | | 50×10^6 switching cycles |
| Output III | | electronic output, passive , fault signal |
| Rated voltage | | 10 ... 30 V DC |
| Signal level | | 1-signal: (L+) -2.5 V (7 mA, short-circuit proof) / 0-signal: blocked output (Leakage current $\leq 10 \mu\text{A}$) |
| Transfer characteristics | | |
| Switching frequency | | 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) |
| Low voltage | | |
| Directive 2014/35/EU | | EN 61010-1:2010+A1:2019+A1:2019/AC:2019 |
| Machinery Directive | | |
| Directive 2006/42/EC | | EN/ISO 13849-1:2015 |
| Conformity | | |
| Electromagnetic compatibility | | NE 21:2017 , EN 61326-3-1:2017 |
| 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. 280 g |
| Dimensions | | 40 x 93 x 115 mm (1.6 x 3.7 x 4.5 inch) (W x H x D) , housing type E |

Technical Data


| | | |
|--|---|--|
| 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 2043 | |
| Marking | 1 II (1)G [Ex ia Ga] IIC 1 II (1)D [Ex ia Da] IIIC 1 I (M1) [Ex ia Ma] I | |
| 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 | 253 V AC/DC (Attention! The rated voltage can be lower.) |
| Output | | |
| Contact loading | 253 V AC/1 A/cos φ ≥ 0.7; 24 V DC/1 A resistive load | |
| Maximum safe voltage | U _m | output I/output II: 253 V AC/DC (Attention! U _m is no rated voltage.) |
| 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 | |
| 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



Matching System Components

| | | | |
|--------------------|---|------------------|--|
| Pepperl+Fuchs Iran |  | K-DUCT-BU | Profile rail, wiring comb field side, blue |
| | | | |

Accessories

| | | |
|---|------------------|--|
|  | KF-ST-5GN | Terminal block for KF modules, 3-pin screw terminal, green |
|  | KF-ST-5BU | Terminal block for KF modules, 3-pin screw terminal, blue |
|  | KF-CP | Red coding pins, packaging unit: 20 x 6 |

Characteristic Curve

Maximal switching power of the output

