

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 61508
- Up to PL d acc. to EN/ISO 13849



SIL 3

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).

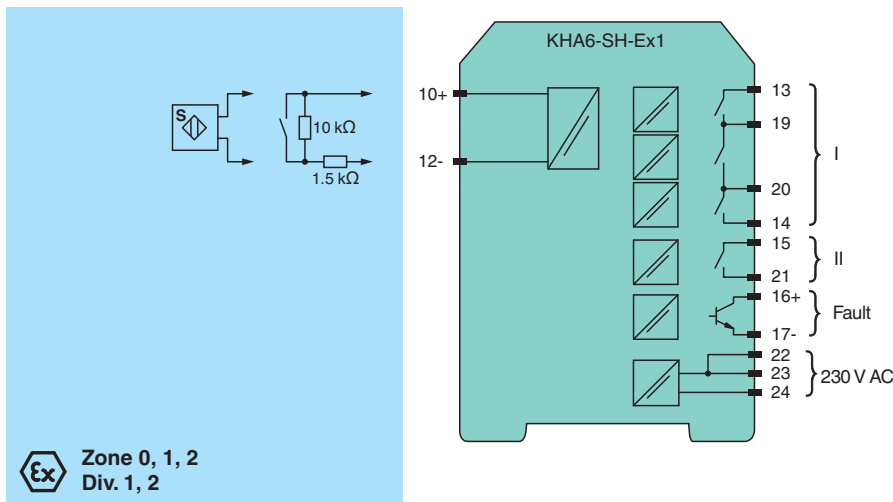
Unlike an SN/S1N series proximity sensor, a mechanical contact requires a 10 kΩ resistor to be placed across the contact in addition to a 1.5 kΩ resistor in series.

Lead breakage (LB) and short circuit (SC) conditions of the control circuit are continuously monitored.

During an 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.

Connection



Technical Data

General specifications

Signal type Digital Input

Functional safety related parameters

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 ± 5 mA

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

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Technical Data

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	≤ 50 Ω, in hazardous area cable capacitances and inductivities are to be taken into account
Switching point	
Relay de-energized	I < 2.1 mA and I > 5.9 mA
Relay energized	2.8 mA < I < 5.3 mA
Response delay	≤ 1 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 φ ≥ 0.7; 24 V DC/1 A resistive load
Mechanical life	50 x 10 ⁶ switching cycles
Output II	relay , signal
Contact loading	253 V AC/1 A/cos φ ≥ 0.7; 24 V DC/1 A resistive load
Mechanical life	50 x 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 ≤ 10 μA)
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)
Machinery Directive	
Directive 2006/42/EC	EN/ISO 13849-1:2015
Conformity	
Electromagnetic compatibility	NE 21:2011
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) , housing type E
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	Ⓢ II (1)GD [EEx ia] IIC [circuit(s) in zone 0/1/2]
Input	EEx ia IIC
Voltage	U _o 9.56 V
Current	I _o 16.8 mA
Power	P _o 41 mW (linear characteristic)

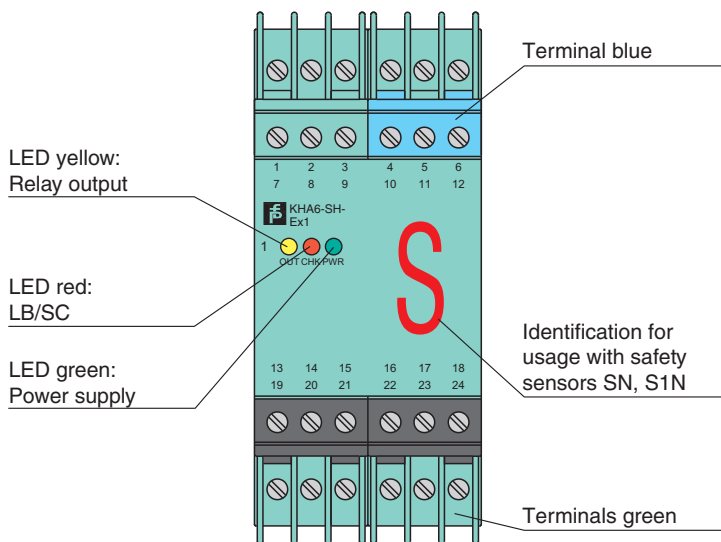
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Technical Data


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 $\phi \geq 0.7$; 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 60079-0:2012+A11:2013 , 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

	K-DUCT-BU	Profile rail, wiring comb field side, blue
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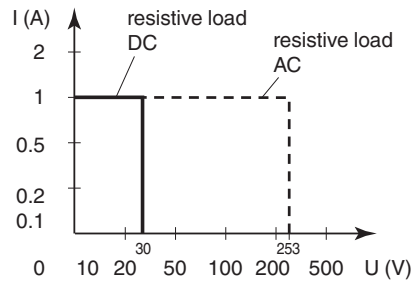
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Application

The input (terminals 10, 12) may generally be operated only with **potentially free** (passive) switches.
 Single channel operations up to SIL3 **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 output III error message delivers a "1"-signal when the control circuit experiences lead breakage (LB) or a short circuit (LK).
 The device (housing type E) has integrated terminals.

Characteristic Curve

Maximal switching power of the output



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