

Switch Amplifier KFD2-SR2-Ex1.W

PL d

SIL 2

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Relay contact output
- Line fault detection (LFD)
- Reversible mode of operation
- Up to SIL 2 acc. to IEC 61508/IEC 61511
- Up to SIL 2 acc. to IEC/EN 62061
- Up to PL d acc. to EN/ISO 13849



Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area. The proximity sensor or switch controls a change-over relay contact for the load in the non-explosion hazardous area. The output changes state when the input signal changes state. The normal output state can be reversed using switch S1. Switch S3 is used to enable or disable line fault detection of the field circuit. During an error condition, the relays revert to their de-energized state and the LEDs indicate the fault according to NAMUR NE44. A unique collective error messaging feature is available when used with the Power Rail system.

Technical Data

General specifications

Signal type	Digital Input
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Functional safety related parameters

Safety Integrity Level (SIL)	SIL 2
SIL Claim Level	SIL 2 , see functional safety manual
Performance level (PL)	PL d , see functional safety manual

Supply

Connection	Power Rail or terminals 14+, 15-
Rated voltage	U _r 19 ... 30 V DC
Ripple	≤ 10 %
Rated current	I _r ≤ 35 mA
Power dissipation	≤ 0.7 W
Power consumption	≤ 0.7 W

Input

Connection side	field side
Connection	terminals 1+, 2+, 3-
Rated values	acc. to EN 60947-5-6 (NAMUR)
Open circuit voltage/short-circuit current	approx. 8 V DC / approx. 8 mA
Switching point/switching hysteresis	1.2 ... 2.1 mA / approx. 0.2 mA
Line fault detection	breakage I ≤ 0.1 mA , short-circuit I > 6 mA
Pulse/Pause ratio	min. 20 ms / min. 20 ms

Output

Connection side	control side
Connection	terminals 7, 8, 9
Output	signal ; relay
Contact loading	250 V AC/2 A/cos φ > 0.75; 126.5 V AC/4 A/cos φ > 0.75; 40 V DC/2 A resistive load

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

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PEPPERL+FUCHS

Technical Data

Minimum switch current		2 mA / 24 V DC
Energized/De-energized delay		approx. 20 ms / approx. 20 ms
Mechanical life		10 ⁷ switching cycles
Collective error message		Power Rail
Transfer characteristics		
Switching frequency		< 10 Hz
Galvanic isolation		
Input/Output		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Input/power supply		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Output/power supply		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Indicators/settings		
Display elements		LEDs
Control elements		DIP-switch
Configuration		via DIP switches
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
Conformity		
Electromagnetic compatibility		NE 21:2017 , EN 61326-3-1:2017 , EN IEC 61326-3-2:2018
Degree of protection		IEC 60529:1989+A1:1999+A2:2013
Functional safety		IEC/EN 61508:2010
Input		EN 60947-5-6:2000
Ambient conditions		
Ambient temperature		-20 ... 70 °C (-4 ... 158 °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) , 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 2080
Marking		⊕ II (1)G [Ex ia Ga] IIC ⊕ II (1)D [Ex ia Da] IIIC ⊕ I (M1) [Ex ia Ma] I
Input		Ex ia
Voltage	U _o	10.5 V
Current	I _o	13 mA
Power	P _o	34 mW (linear characteristic)
Supply		
Maximum safe voltage	U _m	253 V AC / 125 V DC (Attention! U _m is no rated voltage.)
Output		
Maximum safe voltage	U _m	253 V AC (Attention! The rated voltage can be lower.)
Fault indication output		
Maximum safe voltage	U _m	40 V DC (Attention! U _m is no rated voltage.)
Certificate		PF 08 CERT 0803
Marking		⊕ II (3)G [Ex ic Gc] IIC
Input		Ex ic
Voltage	U _o	10.5 V
Current	I _o	13 mA
Power	P _o	34 mW (linear characteristic)

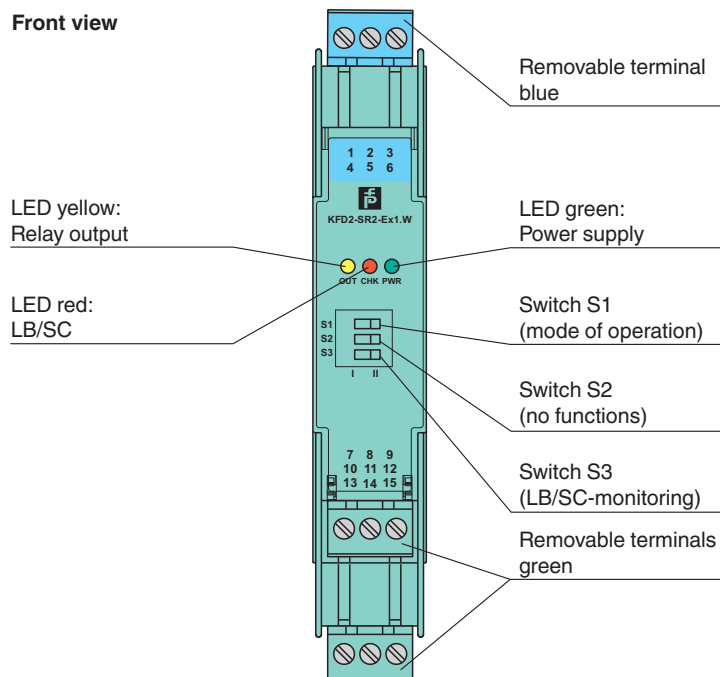
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Technical Data

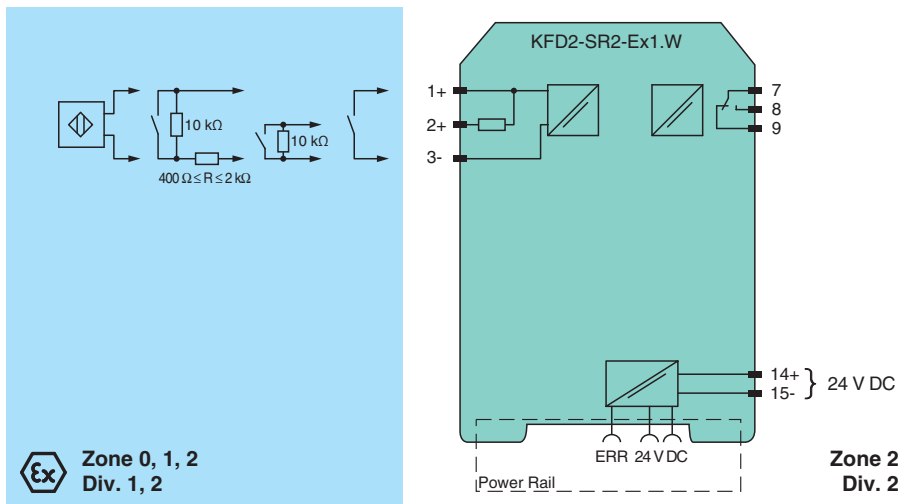
Certificate	TÜV 99 ATEX 1493 X
Marking	Ⓔ II 3G Ex ec nC IIC T4 Gc
Output	
Contact loading	50 V AC/4 A/cos $\phi > 0.7$; 40 V DC/2 A resistive load
Galvanic isolation	
Input/Output	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity	
Directive 2014/34/EU	EN IEC 60079-0:2018 , EN 60079-7:2015+A1:2018 , EN 60079-11:2012 , EN IEC 60079-15:2019
International approvals	
FM approval	
FM certificate	FM19US0207X
Control drawing	116-0035
UL approval	E106378
Control drawing	116-0473 (cULus)
Contact loading	250 V AC/2 A/cos $\phi > 0.75$; 126.5 V AC/4 A/cos $\phi > 0.75$; 30 V DC/2 A resistive load
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
IECEX approval	
IECEX certificate	IECEX PTB 11.0034 , IECEX TUN 19.0013X
IECEX marking	[Ex ia Ga] IIC [Ex ia Da] IIIC [Ex ia Ma] I 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



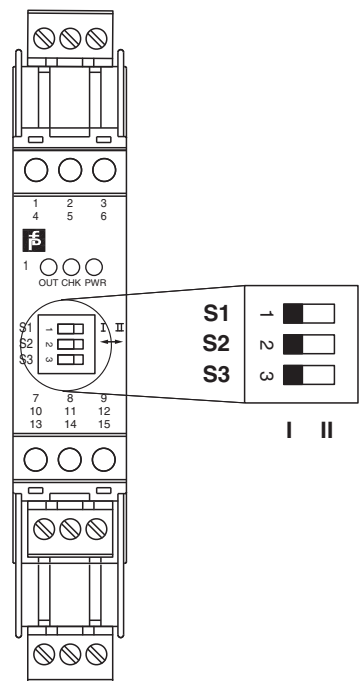
Connection



Accessories

	KFD2-EB2	Power Feed Module
	UPR-03	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m
	UPR-03-M	Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m
	UPR-03-S	Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m
	K-DUCT-BU	
	K-DUCT-BU-UPR-03	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side blue

Configuration



Switch position

S	Function	Position
1	Mode of operation output (relay) energized	with high input current
		with low input current
2	No function	
3	Line fault detection	ON
		OFF

Operating states

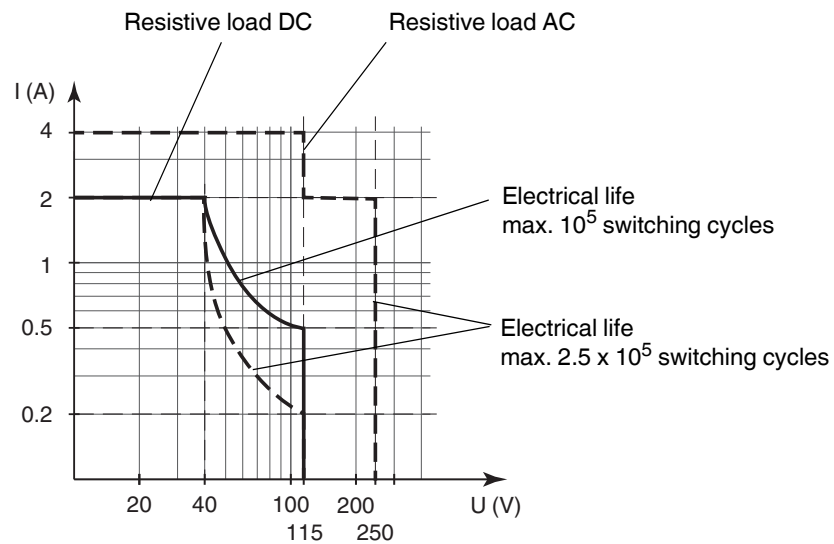
Control circuit	Input signal
Initiator high impedance/contact opened	low input current
Initiator low impedance/contact closed	high input current
Lead breakage, lead short circuit	Line fault

Factory setting: switch 1, 2 and 3 in position I

Characteristic Curve

Maximum switching power of output contacts

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