

Switch Amplifier

KFD2-SR2-Ex1.W

SIL 2

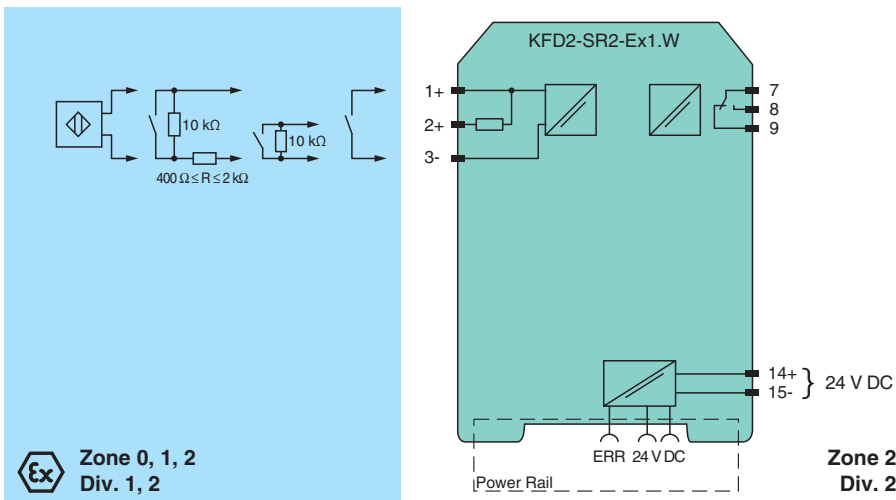
- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Relay contact output
- Line fault detection (LFD)
- Reversible mode of operation
- Up to SIL 2 acc. to IEC 61508/IEC 61511



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.

Connection



Technical Data

General specifications	
Signal type	Digital Input
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 2
Supply	
Connection	Power Rail or terminals 14+, 15-
Rated voltage	U_r 19 ... 30 V DC
Ripple	≤ 10 %
Rated current	I_r ≤ 35 mA

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Technical Data

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
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

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Technical Data

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		
Voltage	U _o	10.5 V
Current	I _o	13 mA
Power	P _o	34 mW (linear characteristic)
Certificate		TÜV 99 ATEX 1493 X
Marking		Ⓜ II 3G Ex ec nC IIC T4 Gc
Output		
Contact loading		50 V AC/4 A/cos φ > 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		
Control drawing		E106378
Control drawing		116-0473 (cULus)
Contact loading		250 V AC/2 A/cos φ > 0.75; 126.5 V AC/4 A/cos φ > 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 .

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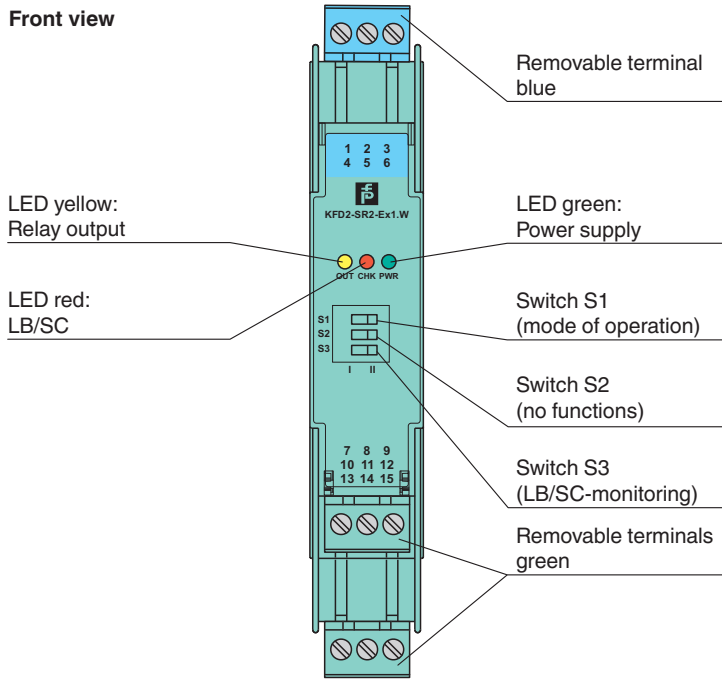
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Assembly

Front view



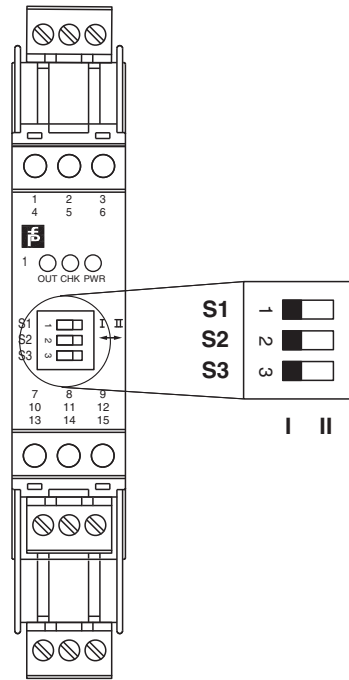
Accessories

	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

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Configuration



Switch position

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

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

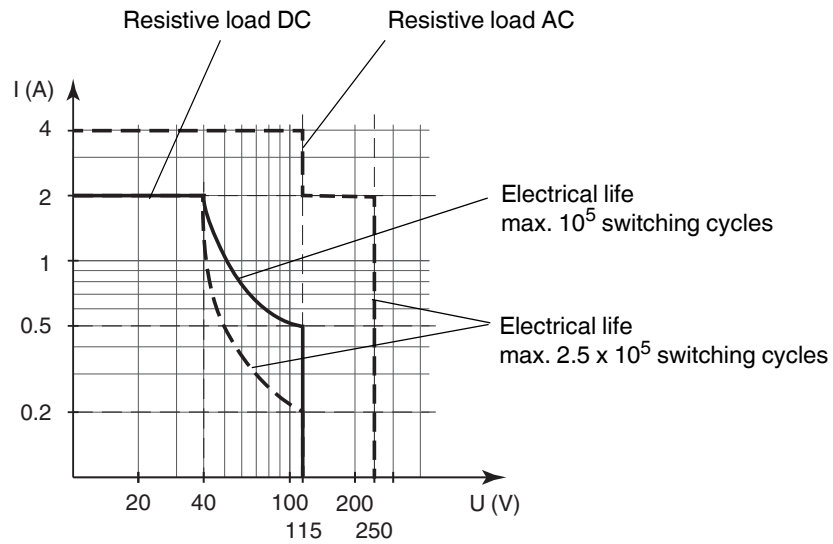
Factory setting: switch 1, 2 and 3 in position I

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.

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