

Switch Amplifier

KFD2-SR2-Ex2.W

SIL 2

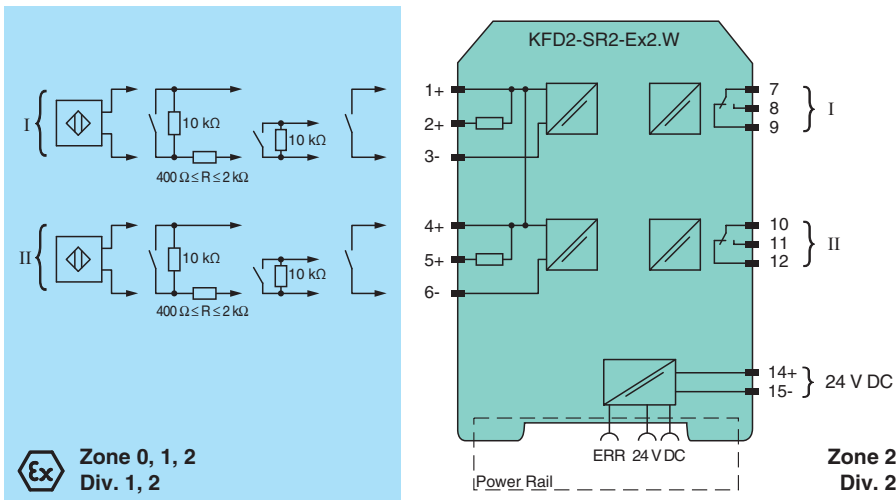
- 2-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Relay contact output
- Line fault detection (LFD)
- Reversible mode of operation
- Up to SIL 2 acc. to IEC 61508/IEC 61511



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 normal output state can be reversed using switches S1 and S2. 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



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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	≤ 50 mA

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

Technical Data

Power dissipation	≤ 1 W
Power consumption	≤ 1 W
Input	
Connection side	field side
Connection	terminals 1+, 2+, 3-; 4+, 5+, 6-
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	output I: terminals 7, 8, 9 ; output II: terminals 10, 11, 12
Output I, II	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}
Output/Output	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

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 Pepperl+Fuchs Group
 www.pepperl-fuchs.com

 USA: +1 330 486 0002
 pa-info@us.pepperl-fuchs.com

 Germany: +49 621 776 2222
 pa-info@de.pepperl-fuchs.com

 Singapore: +65 6779 9091
 pa-info@sg.pepperl-fuchs.com

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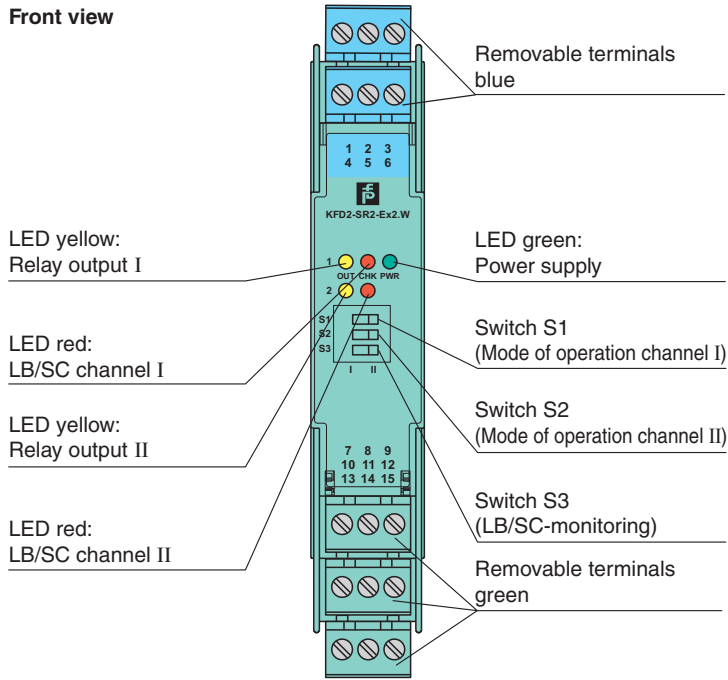
Technical Data

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

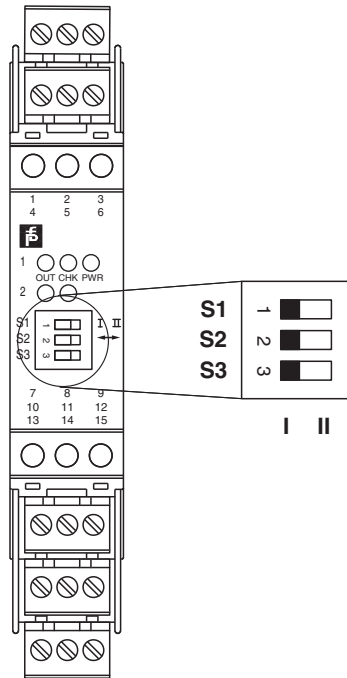
Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0002
pa-info@us.pepperl-fuchs.com

Germany: +49 621 776 2222
pa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
pa-info@sg.pepperl-fuchs.com

Configuration



Switch position

S	Function		Position
1	Mode of operation output I (relay) energized	with high input current	I
		with low input current	II
2	Mode of operation output II (relay) energized	with high input current	I
		with low input current	II
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

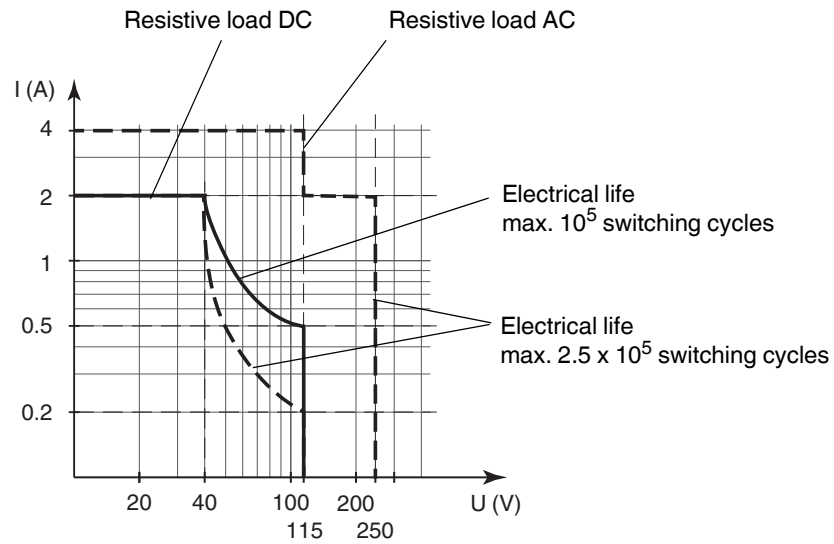
Factory setting: switch 1, 2 and 3 in position I

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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