Switch Amplifier

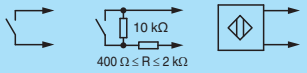
KCD2-SR-Ex1

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Relay contact output
- Line fault detection (LFD)
- Housing width 12.5 mm
- Up to SIL 2 (SC 3) acc. to IEC/EN 61508

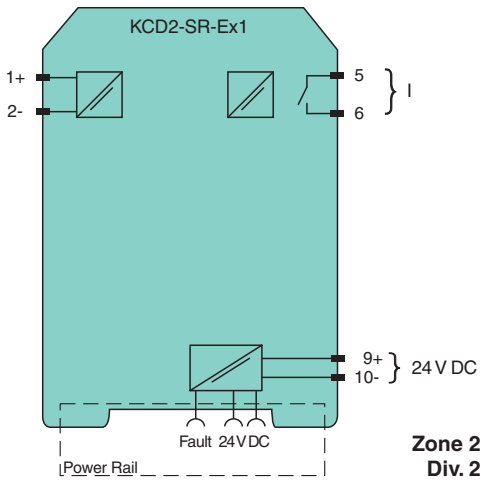
Function

This isolated barrier is used for intrinsic safety applications.
The device transfers digital signals from NAMUR sensors or dry contacts from the hazardous area to the non-hazardous area.
The proximity sensor or the mechanical contact controls the control side load for a relay contact output. The device output changes the state when the input signal changes the state.
Via switches the mode of operation can be reversed and the line fault detection can be switched off.
During a fault condition, the relay reverts to its de-energized state and the LEDs indicate the fault according to NAMUR NE 44.
If the device is operated via Power Rail, additionally a collective error message is available.
Due to its compact housing design and low heat dissipation, this device is useful for detecting positions, end stops, and switching states in space-critical applications.

Connection



Zone 0, 1, 2
Div. 1, 2



Zone 2
Div. 2

Technical Data

General specifications		
Signal type		Digital Input
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Systematic capability (SC)		SC 3
Supply		
Connection		Power Rail or terminals 9+, 10-
Rated voltage	U_r	19 ... 30 V DC
Ripple		≤ 10 %

Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 70109406_eng.pdf

Technical Data

Rated current	I_r	≤ 29 mA
Power dissipation		≤ 600 mW
Power consumption		≤ 600 mW
Input		
Connection side		field side
Connection		terminals 1+, 2-
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 ≥ 6.5 mA
Pulse/Pause ratio		min. 20 ms / min. 20 ms
Output		
Connection side		control side
Connection		terminals 5, 6
Output I		signal ; relay
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
Minimum switch current		2 mA / 24 V DC
Energized/De-energized delay		≤ 20 ms / ≤ 20 ms
Mechanical life		10^7 switching cycles
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+A1:2019+A1:2019/AC:2019
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		-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 100 g
Dimensions		12.5 x 119 x 114 mm (0.5 x 4.7 x 4.5 inch) (W x H x D) , housing type A2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU-type examination certificate		BASEEFA 06 ATEX 0092 X
Marking		⟨Ex⟩ II 3(1)G Ex ec nC [ia Ga] IIC T4 Gc , ⟨Ex⟩ II (1)D [Ex ia Da] IIIC , ⟨Ex⟩ I (M1) [Ex ia Ma] I
Input		Ex ia
Voltage	U_o	10.5 V

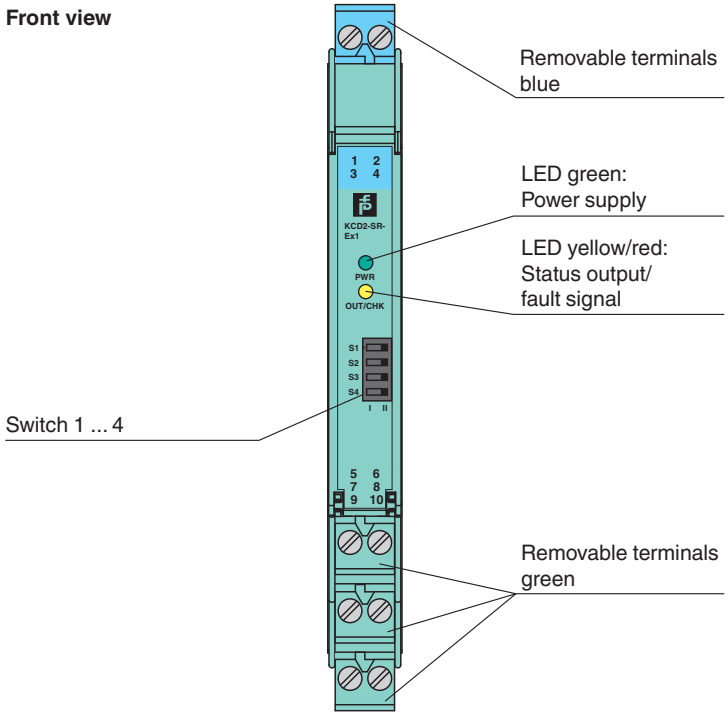
Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 70109406_eng.pdf

Technical Data

Current	I_o	13 mA
Power	P_o	34 mW (linear characteristic)
Supply		
Maximum safe voltage	U_m	253 V AC (Attention! U_m is no rated voltage.)
Output		
Contact loading		Zone 2 : 50 V AC/2 A/cos ϕ > 0.75; 30 V DC/2 A resistive load
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.)
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		
UL approval		E106378
Control drawing		116-0477 (cULus)
IECEx approval		
IECEx certificate		IECEx BAS 06.0025 X
IECEx marking		Ex ec nC [ia Ga] IIC T4 Gc [Ex ia Da] IIIC [Ex ia Ma] I
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



Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 70109406_eng.pdf

Matching System Components

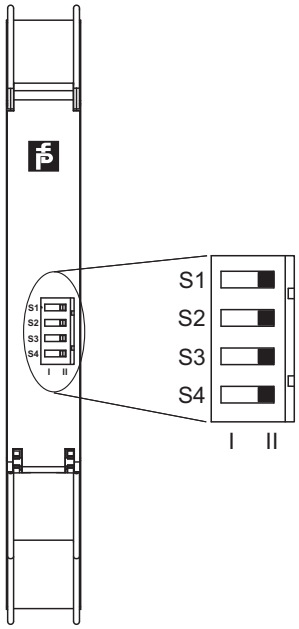
	**KFD2-EB2**	Power Feed Module
	**UPR-03**	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m
	**UPR-03-M**	Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m
	**UPR-03-S**	Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m
	**K-DUCT-BU**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

Accessories

	**F-NR3-Ex1**	NAMUR Resistor Network
	**KC-ST-5GN**	Terminal block for KC modules, 2-pin screw terminal, green
	**KC-ST-5BU**	Terminal block for KC modules, 2-pin screw terminal, blue
	**KF-CP**	Red coding pins, packaging unit: 20 x 6

Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 70109406_eng.pdf

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	no function		
3	Line fault detection	ON	I
		OFF	II
4	no function		

Operating states

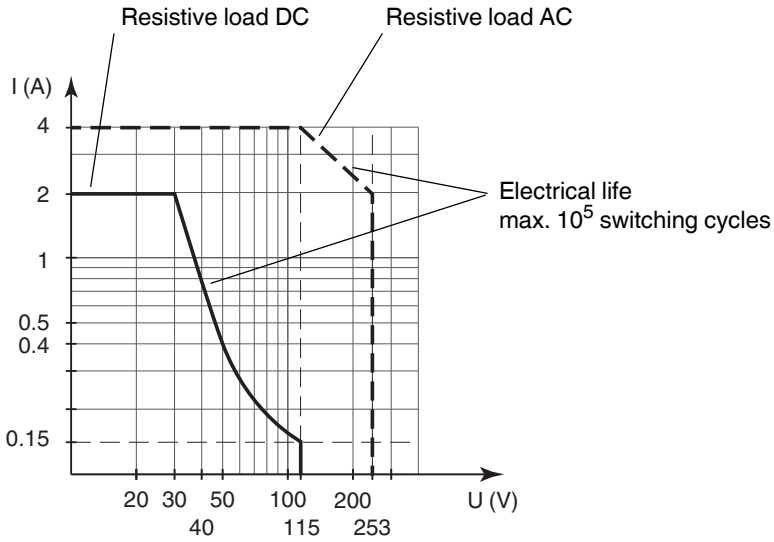
Control circuit	Input signal
Initiator high impedance/contact opened	low input current
Initiator low impedance/contact closed	high input current
Lead breakage, lead short circuit	Line fault

Factory setting: switch 1, 2, 3 and 4 in position I

Characteristic Curve

Maximum switching power of output contacts

Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 70109406_eng.pdf



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

Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 70109406_eng.pdf