



Switch Amplifier KCD2-SON-Ex1.R1

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR input
- 2 passive transistor outputs (resistive)
- Application-specific outputs
- Line fault transparency (LFT)
- Usable as signal splitter (1 input and 2 outputs)
- Housing width 12.5 mm
- Up to SIL 2 (SC 3) acc. to IEC/EN 61508



SIL 2



Function

This isolated barrier is used for intrinsic safety applications.
The device transfers digital signals (NAMUR sensors or dry contacts) from a hazardous area to a safe area.
The input controls two passive transistor outputs with a resistive output characteristic.
The outputs have three defined states: 1-Signal = 6.5 V voltage drop, 0-Signal = 33 k Ω and 6.5 V voltage drop and fault > 100 k Ω .
This output characteristic offers line fault transparency on the signal lines.
Via switches the mode of operation can be reversed and the line fault detection can be switched off.
A fault is signaled by LEDs acc. to NAMUR NE44 and a separate collective error message output.

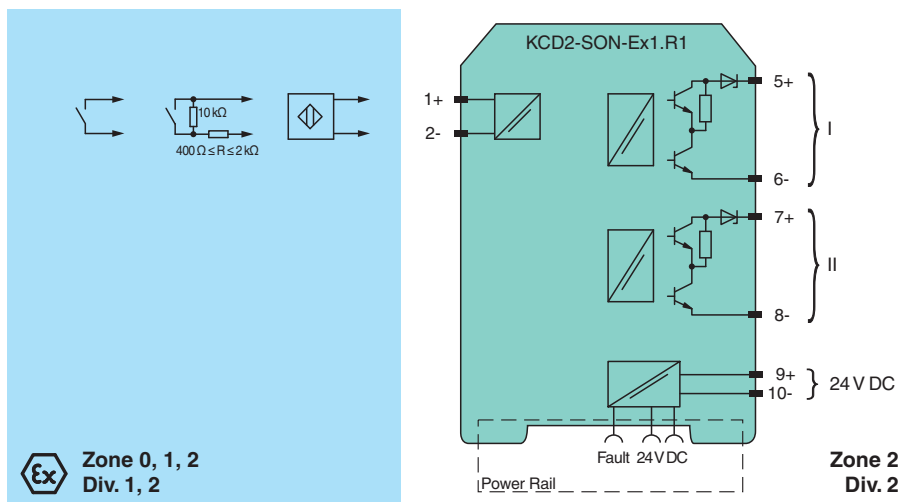
Application

This device is compatible to the control:

- Yokogawa ProSafe DI card SDV144

Compatibility check to other ESD/DCS systems on request.

Connection



Technical Data

General specifications	
Signal type	Digital Input
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 2
Systematic capability (SC)	SC 3
Supply	

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

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Technical Data

Connection		Power Rail or terminals 9+, 10-
Rated voltage	U_r	19 ... 30 V DC
Ripple		$\leq 10 \%$
Rated current	I_r	18 ... 14 mA
Power dissipation		$\leq 500 \text{ mW}$
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. 10 V DC / approx. 8 mA
Switching point/switching hysteresis		1.2 ... 2.1 mA / approx. 0.2 mA
Line fault detection		breakage $I \leq 0.1 \text{ mA}$, short-circuit $I \geq 6.5 \text{ mA}$
Pulse/Pause ratio		min. 100 μs / min. 100 μs
Output		
Connection side		control side
Connection		output I: terminals 5, 6 ; output II: terminals 7, 8
Rated voltage	U_r	19 ... 30 V DC with external resistance $> 2 \text{ k}\Omega$, e. g. 16-channel ProSafe DI card SDV144 from Yokogawa
Response time		$\leq 200 \mu\text{s}$
Output I, II		signal or fault message, passive transistor output (resistive) 0-signal: $33 \text{ k}\Omega \pm 5 \%$ + voltage drop $6.5 \text{ V} \pm 0.5 \text{ V}$ 1-signal: voltage drop $6.5 \text{ V} \pm 0.5 \text{ V}$ fault: $> 100 \text{ k}\Omega$
Collective error message		Power Rail
Transfer characteristics		
Switching frequency		$\leq 5 \text{ kHz}$
Galvanic isolation		
Input/Output		reinforced insulation acc. to EN 50178, rated insulation voltage $300 \text{ V}_{\text{eff}}$
Input/power supply		reinforced insulation acc. to EN 50178, rated insulation voltage $300 \text{ V}_{\text{eff}}$
Output/power supply		basic insulation according to EN 50178, rated insulation voltage $50 \text{ V}_{\text{eff}}$
Output/Output		basic insulation according to EN 50178, rated insulation voltage $50 \text{ V}_{\text{eff}}$
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)
Conformity		
Electromagnetic compatibility		NE 21:2011 , EN 61326-3-2:2008
Degree of protection		IEC 60529:2001
Protection against electrical shock		IEC 61010-1:2010
Input		EN 60947-5-6:2000
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions
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		

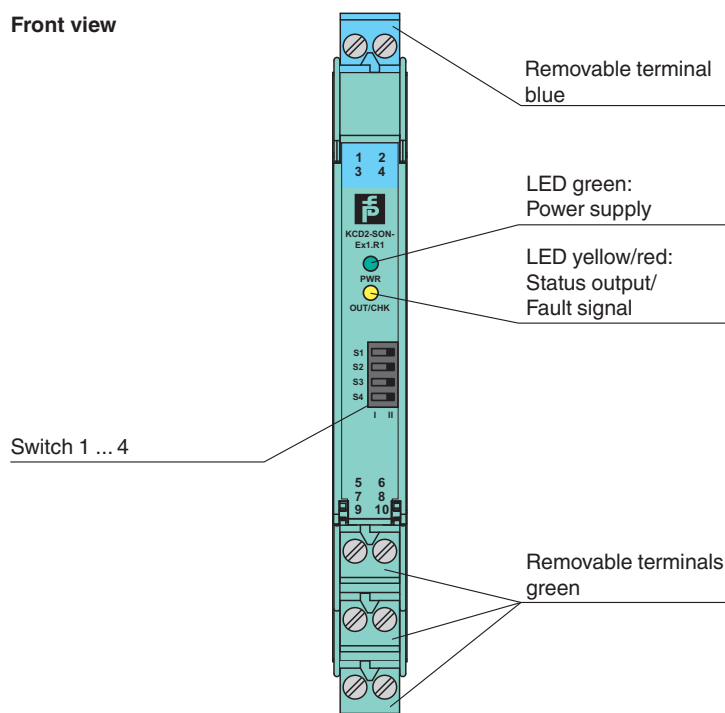
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Technical Data

EU-type examination certificate		BASEEFA 13 ATEX 0080	
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	17.1 mA	
Power	P _o	45 mW (linear characteristic)	
Supply			
Maximum safe voltage	U _m	253 V AC (Attention! U _m is no rated voltage.)	
Output			
Maximum safe voltage	U _m	253 V AC (Attention! The rated voltage can be lower.)	
Certificate		CML 19 ATEX 4410 X	
Marking		Ⓢ II 3G Ex ec IIC T4 Gc	
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	
International approvals			
UL approval			
Control drawing		116-0374 (cULus)	
IECEx approval			
IECEx certificate		IECEx BAS 13.0046 IECEx CML 19.0147X	
IECEx marking		[Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I Ex ec 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



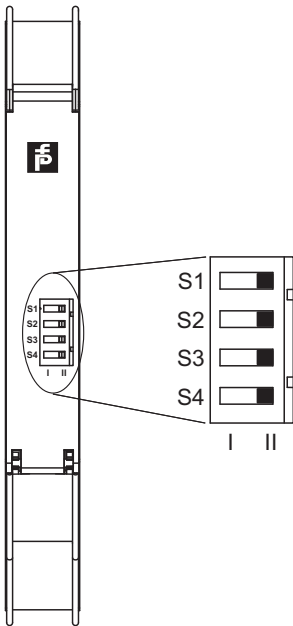
Matching System Components

	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

Configuration



Switch settings

S	Function		Position
1	Mode of operation output I, II (active)	with high input current	I
		with low input current	II
2	no function		
3	Line fault detection of the input	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

Switching points

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