Solenoid Driver

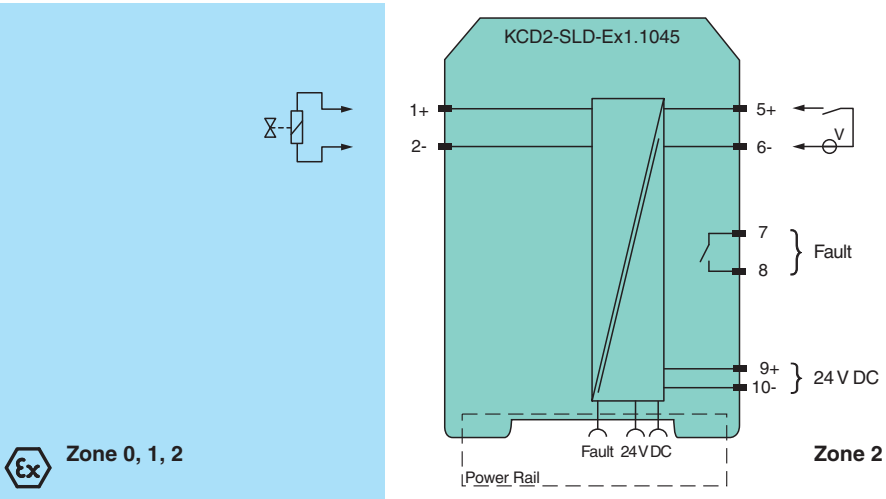
KCD2-SLD-Ex1.1045

- 1-channel isolated barrier
- 24 V DC supply (bus or loop powered)
- Output 45 mA at 10 V DC
- Line fault transparency (LFT)
- Test pulse immunity
- Housing width 12.5 mm
- Up to SIL 3 acc. to IEC/EN 61508

Function

This isolated barrier is used for intrinsic safety applications.
It supplies power to solenoids, LEDs and audible alarms located in a hazardous area.
The device is controlled with a loop powered signal or a bus powered logic signal.
The device is immune to the test pulses of various control systems.
The device simulates a minimum load at the input. The minimum load can be activated and de-activated.
The line fault transparency function can display a line fault in the field by a change in impedance at the switching input of the solenoid driver.
A line fault is indicated by a red LED and output via the fault indication output or a switch contact.

Connection



Technical Data

General specifications		
Signal type		Digital Output
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 3
Systematic capability (SC)		SC 3
Supply		
Connection		terminals 5+, 6- loop powered Power Rail or terminals 9+, 10- bus powered
Rated voltage	U_r	19 ... 30 V DC loop powered
Input current		75 mA at 24 V, 220 Ω load

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Technical Data

Power dissipation		1.4 W at 24 V, 220 Ω load
Input		
Connection side		control side
Connection		terminals 5+, 6-
Test pulse length		max. 2 ms from DO card
Signal level		loop powered 1-signal: 19 ... 30 V DC 0-signal: 0 ... 5 V DC bus powered 1-signal: 15 ... 30 V DC (current limited to 5 mA) 0-signal: 0 ... 5 V DC
Rated current	I_r	0-signal: typ. 1.6 mA at 1.5 V DC; typ. 8 mA at 3 V DC (maximum leakage current DO card) 1-signal: ≥ 36 mA (minimum load current DO card)
Inrush current		< 200 mA , 10 ms loop powered
Output		
Connection side		field side
Connection		terminals 1+, 2-
Internal resistor	R_i	285 Ω
Current	I_e	typ. 45 mA
Voltage	U_e	typ. 10 V
Current limit	I_{max}	45 mA
Open loop voltage	U_s	typ. 24.6 V
Load		nominal 0.05 ... 18 kΩ , valid range for line fault detection (LFD)
Output II		fault signal
Connection		terminals 7, 8 , non-intrinsically safe
Contact loading		30 V DC/ 0.5 A resistive load
Mechanical life		10^5 switching cycles
Energized/De-energized delay		≤ 20 ms / ≤ 20 ms
Line fault detection		
Test current		max. 350 µA , calculated by $I_{LFD} = 4.7\ V / (15\ k\Omega + R_{Load})$
Galvanic isolation		
Output/other circuits		basic insulation according to IEC/EN 61010-1, rated insulation voltage 300 V_{eff}
Output II/power supply		basic insulation according to IEC/EN 61010-1, rated insulation voltage 32 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)
Conformity		
Electromagnetic compatibility		NE 21:2012 , EN 61326-3-2:2008 For further information see system description.
Degree of protection		IEC 60529:2013
Protection against electrical shock		EN 61010-1:2010
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F) Observe the temperature range limited by derating, see section derating.
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 150 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

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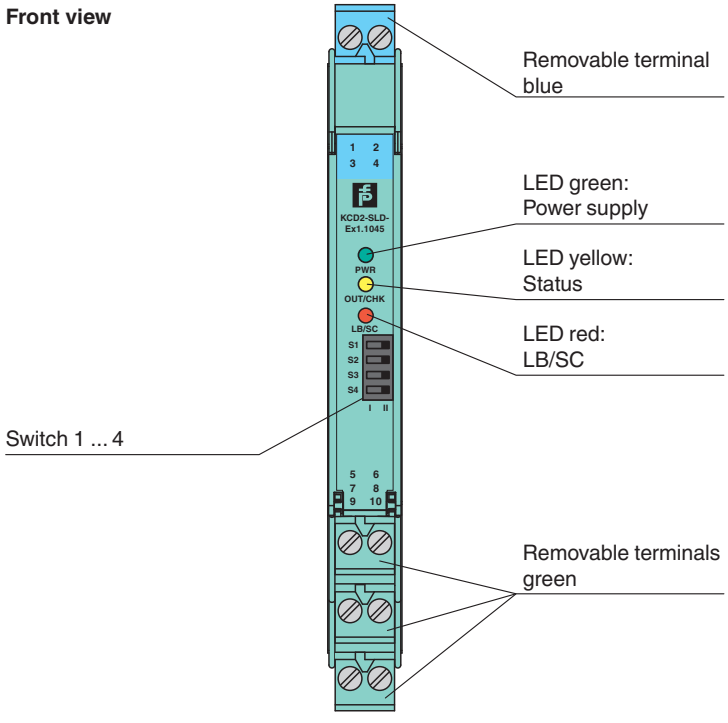
Technical Data

Data for application in connection with hazardous areas		
EU-type examination certificate		EXA 17 ATEX 0002 X
Marking		⟨Ex⟩ II 3(1)G Ex nC ec [ia Ga] IIC T4 Gc ⟨Ex⟩ II (1)D [Ex ia Da] IIIC ⟨Ex⟩ I (M1) [Ex ia Ma] I
Output I		Ex ia
Voltage	U_o	26 V
Current	I_o	93 mA
Power	P_o	605 mW
Supply		
Maximum safe voltage	U_m	60 V (Attention! The rated voltage can be lower.)
Input		
Maximum safe voltage	U_m	60 V (Attention! The rated voltage can be lower.)
Collective error message		
Maximum safe voltage	U_m	60 V (Attention! The rated voltage can be lower.)
Galvanic isolation		
Output I/other circuits		safe electrical isolation acc. to IEC/EN 60079-11, rated insulation voltage 300 V_{rms}
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-7:2015 , EN 60079-11:2012 , EN 60079-15:2010
International approvals		
UL approval		E106378
Control drawing		116-0448 (cULus)
IECEx approval		
IECEx certificate		IECEx EXA 17.0001X
IECEx marking		Ex nC ec [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



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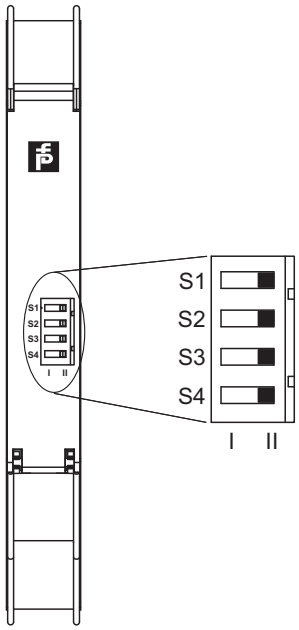
Configuration



Switch settings

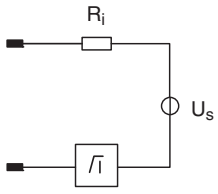
Switch	Function		Position
S1	Line fault detection	enabled	I
		disabled	II
S2	Mode of operation	loop powered	I
		bus powered with logic input	II
S3	Minimum load	enabled	I
		disabled	II
S4	No function		

Factory setting: line fault detection enabled, operating mode loop powered, minmum load enabled

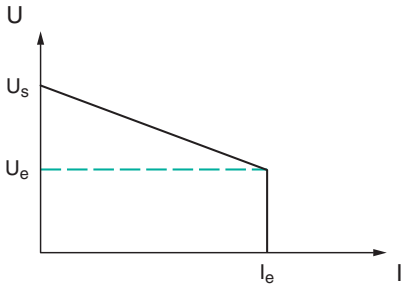
Characteristic Curve

Output characteristics

Output circuit diagram



Output characteristic



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