

# Solenoid Driver

## KCD2-SLD-Ex1.1045

**SIL 3**

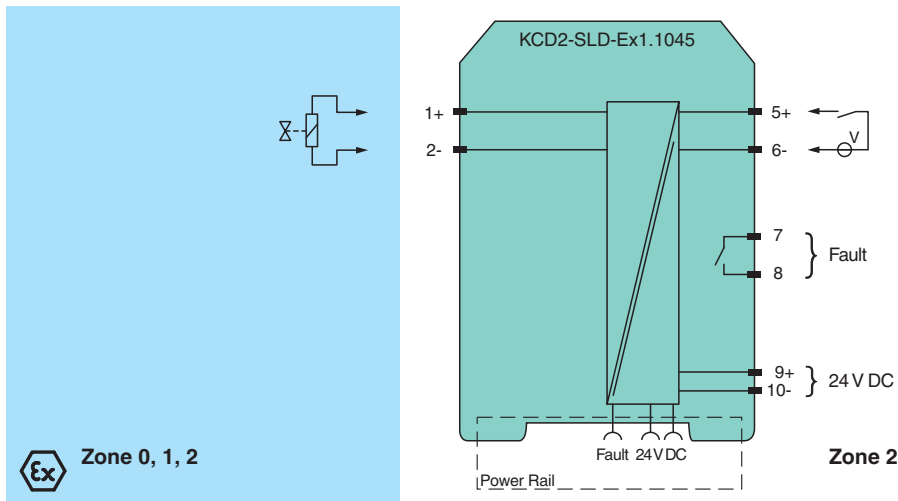
- 1-channel isolated barrier
- 24 V DC supply (bus or loop powered)
- Output 45 mA at 10 V DC
- Line fault transparency (LFT)
- Test pulse immunity
- Housing width 12.5 mm
- Up to SIL 3 acc. to IEC 61508



### 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



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

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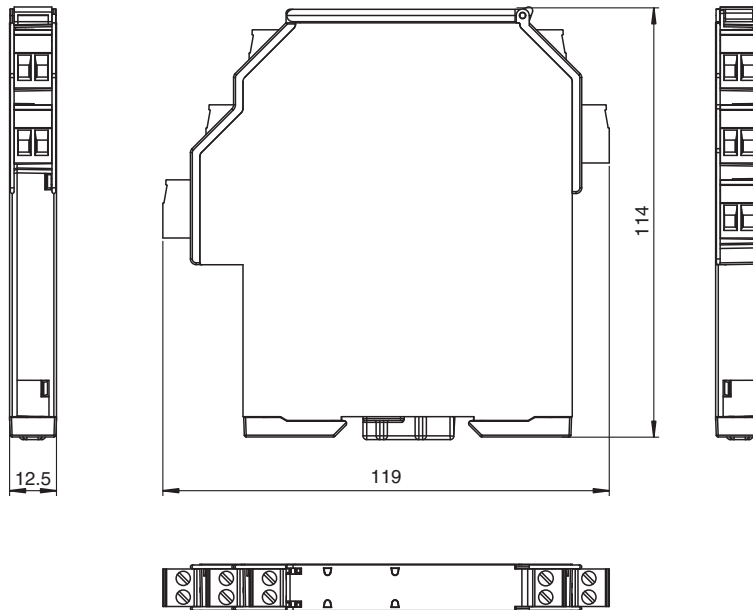
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**PF** PEPPERL+FUCHS

## Dimensions



## Technical Data

### General specifications

Signal type	Digital Output
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### Functional safety related parameters

Safety Integrity Level (SIL)	SIL 3
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### 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 $\Omega$ load
Power dissipation	1.4 W at 24 V, 220 $\Omega$ 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 at 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: $\geq$ 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 $\Omega$
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

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## Technical Data

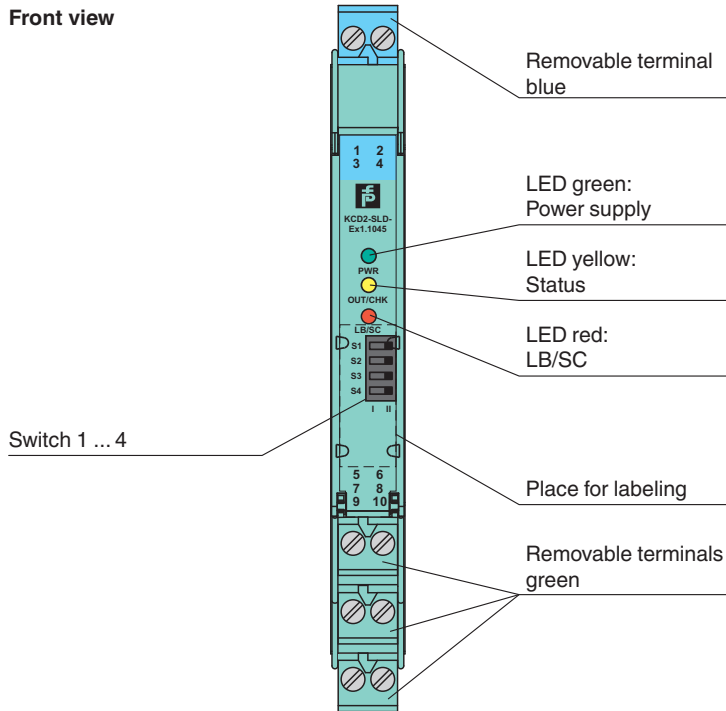
Load		nominal 0.05 ... 18 k $\Omega$
Output II		fault signal
Connection		terminals 7, 8, non-intrinsically safe
Contact loading		30 V DC/ 0.5 A resistive load
Mechanical life		10 <sup>5</sup> switching cycles
Energized/De-energized delay		$\leq 20$ ms / $\leq 20$ ms
Line fault detection		signal at short-circuit $R_B < 25 \Omega$ , lead breakage $R_B > 50 \text{ k}\Omega$ ; test current $< 500 \mu\text{A}$
<b>Galvanic isolation</b>		
Output/other circuits		basic insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Output II/power supply		basic insulation according to IEC/EN 61010-1, rated insulation voltage 32 V <sub>eff</sub>
<b>Indicators/settings</b>		
Display elements		LEDs
Control elements		DIP-switch
Configuration		via DIP switches
Labeling		space for labeling at the front
<b>Directive conformity</b>		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
<b>Conformity</b>		
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
<b>Ambient conditions</b>		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
<b>Mechanical specifications</b>		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 150 g
Dimensions		12.5 x 114 x 119 mm (0.5 x 4.5 x 4.7 inch), housing type A2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
<b>Data for application in connection with hazardous areas</b>		
EU-Type Examination Certificate		EXA 17 ATEX 0002 X
Marking		Ⓜ II 3(1)G Ex nC ec [ia Ga] IIC T4 Gc Ⓜ II (1)D [Ex ia Da] IIC Ⓜ I (M1) [Ex ia Ma] I
Output I		Ex ia
Voltage	U <sub>o</sub>	26 V
Current	I <sub>o</sub>	93 mA
Power	P <sub>o</sub>	605 mW
<b>Supply</b>		
Maximum safe voltage	U <sub>m</sub>	60 V (Attention! The rated voltage can be lower.)
<b>Input</b>		
Maximum safe voltage	U <sub>m</sub>	60 V (Attention! The rated voltage can be lower.)
<b>Collective error message</b>		
Maximum safe voltage	U <sub>m</sub>	60 V (Attention! The rated voltage can be lower.)
<b>Galvanic isolation</b>		
Output I/other circuits		safe electrical isolation acc. to IEC/EN 60079-11, rated insulation voltage 300 V <sub>rms</sub>
<b>Directive conformity</b>		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013, EN 60079-7:2015, EN 60079-11:2012, EN 60079-15:2010
<b>International approvals</b>		
UL approval		E106378
Control drawing		116-0448 (cULus)

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**Technical Data**

IECEX approval	
IECEX certificate	IECEX EXA 17.0001X
IECEX marking	Ex nC ec [ia Ga] IIC T4 Gc [Ex ia Da] IIC [Ex ia Ma] I
<b>General information</b>	
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .
<b>Accessories</b>	
Optional accessories	- power feed module KFD2-EB2(.R4A.B)(.SP) - universal power rail UPR-03(-M)(-S) - profile rail K-DUCT-BU(-UPR-03)

**Assembly**






**Accessories**

	<b>KFD2-EB2</b>	Power Feed Module
	<b>KFD2-EB2.R4A.B</b>	Power feed module, redundant supply
	<b>KFD2-EB2.R4A.B.SP</b>	Power feed module with spring terminals, redundant supply
	<b>KFD2-EB2.SP</b>	Power feed module with spring terminals
	<b>UPR-03</b>	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m
	<b>UPR-03-M</b>	Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m

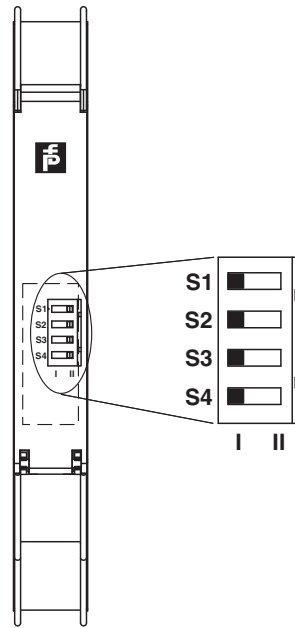
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## Accessories

	<b>UPR-03-S</b>	Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m
	<b>K-DUCT-BU</b>	
	<b>K-DUCT-BU-UPR-03</b>	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side blue

**Configuration**



**Switch settings**

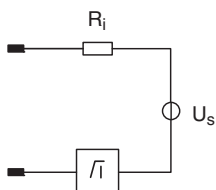
Switch	Function		Position
S1	Line fault detection	enabled	I
		disabled	II
S2	Mode of operation	loop powered	I
		bus powered with logic input	II
S3	Minimum load	enabled	I
		disabled	II
S4	No function		

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

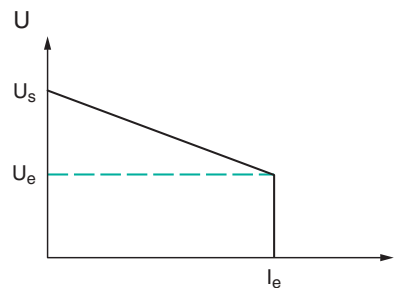
**Characteristic Curve**

**Output characteristics**

**Output circuit diagram**



**Output characteristic**



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