



# Solenoid Driver

## KFD2-SLD-Ex1.13100

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Logic input
- Output 100 mA at 13 V DC
- Alternating outputs for the operation of solenoids with 2 coils
- High output power for IIB gas group
- Line fault transparency (LFT)
- Test pulse immunity
- Up to SIL 3 acc. to IEC/EN 61508



### Function

This isolated barrier is used for intrinsic safety applications. The device supplies power to solenoids, LEDs and audible alarms located in the explosion-hazardous area. The device has 2 alternating outputs, in order to be able to operate a valve with 2 coils. If both inputs are energized, then only output 1 is energized. The device is immune to the test pulses of various control systems. 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 fault is signaled by LEDs and a separate collective error message output.

### Application

#### Device function with 2 alternating outputs

The device has 2 alternating outputs, in order to be able to operate a valve with 2 coils. The table shows the behavior of input to output in relationship with the alternating outputs.

Input 1	Input 2	Active output
High signal	Low signal	Output 1
Low signal	High signal	Output 2
High signal	High signal	Output 1
Low signal	Low signal	No output

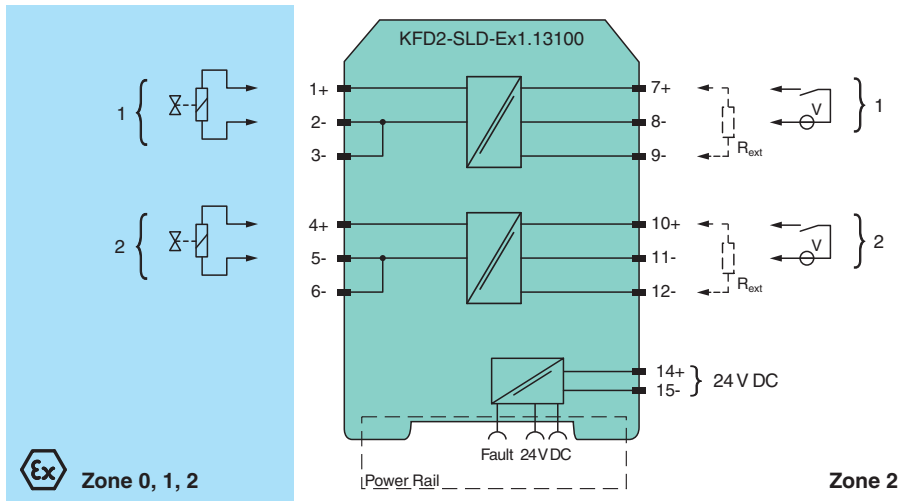
#### Input current setting

For DO cards that require a minimum load, the input current can be adapted via an external resistor. The device has an auxiliary terminal at each input for connecting the external resistor.

For example

The minimum load of the DO card is 20 mA. Subtract the input current of the isolator from the minimum load of the DO card. This results in  $20 \text{ mA} - 6 \text{ mA} = 14 \text{ mA}$ . In this case, create a bypass with 14 mA. With an output voltage of the DO card of 24 V, this results in  $1714 \Omega$ . The suitable external resistor  $R_{ext}$  is 1.5 k $\Omega$ /1 W.

## Connection



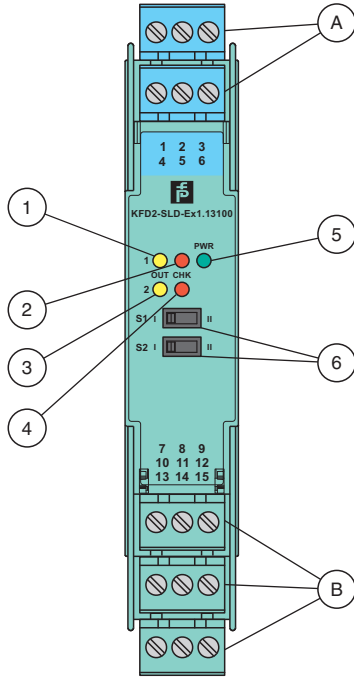
## Technical Data

General specifications		
Signal type		Digital Output
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 3
Systematic capability (SC)		SC 3
Supply		
Connection		Power Rail or terminals 14+, 15-
Rated voltage	$U_r$	19 ... 30 V DC loop powered
Input current		115 mA at 24 V , 130 $\Omega$ load
Power dissipation		1.5 W at 24 V , 130 $\Omega$ load
Input		
Connection side		control side
Connection		input 1: terminals 7+, 8- , optional $R_{ext}$ between terminals 7 and 9 input 2: terminals 10+, 11- , optional $R_{ext}$ between terminals 10 and 12
Test pulse length		max. 2 ms from DO card
Input current		approx. 6 mA at 24 V DC If necessary, the current value can be increased by resistor $R_{ext}$ .
Signal level		1-signal: 15 ... 30 V DC 0-signal: 0 ... 5 V DC
Output		
Connection side		field side
Connection		output 1: terminals 1+, 2-, 3 output 2: terminals 4+, 5-, 6-
Internal resistor	$R_i$	approx. 64 $\Omega$
Current	$I_e$	typ. 100 mA
Voltage	$U_e$	$\geq 13$ V
Current limit	$I_{max}$	105 mA
Open loop voltage	$U_s$	typ. 19.2 V
Load		nominal 0.08 ... 1 k $\Omega$
Switching frequency	$f$	max. 2 Hz
Energized/De-energized delay		30 ms / 30 ms
Galvanic isolation		
Input/power supply		basic insulation according to IEC/EN 61010-1, rated insulation voltage 60 V <sub>eff</sub>
Input/input		basic insulation according to IEC/EN 61010-1, rated insulation voltage 60 V <sub>eff</sub>
Output/Output		basic insulation according to IEC/EN 61010-1, rated insulation voltage 60 V <sub>eff</sub>
Output/other circuits		basic insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Indicators/settings		

## Technical Data

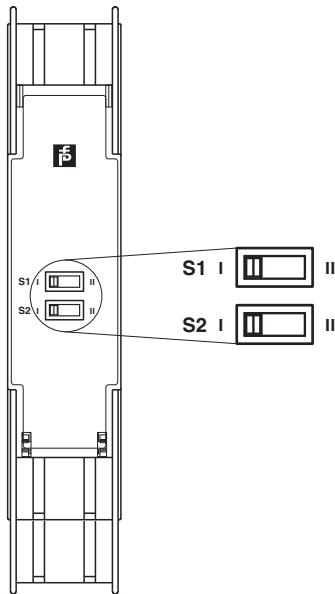
Display elements	LEDs	
Control elements	DIP switch	
Configuration	via DIP switches	
Labeling	space for labeling at the front	
<b>Directive conformity</b>		
Electromagnetic compatibility		
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)	
<b>Conformity</b>		
Electromagnetic compatibility	NE 21:2011 For further information see system description.	
Degree of protection	IEC 60529:2001	
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. 200 g	
Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch) (W x H x D) , housing type B2	
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 0076X	
Marking	Ⓜ II 3(1)G Ex ec [ia IIB Ga] IIC T4 Gc Ⓜ II (1)D [Ex ia Da] IIIC Ⓜ I (M1) [Ex ia Ma] I	
Voltage	U <sub>o</sub>	22.2 V
Current	I <sub>o</sub>	360 mA
Power	P <sub>o</sub>	1990 mW
Supply		
Maximum safe voltage	U <sub>m</sub>	60 V (Attention! The rated voltage can be lower.)
Input		
Maximum safe voltage	U <sub>m</sub>	60 V (Attention! The rated voltage can be lower.)
Galvanic isolation		
Output/Output	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 60 V	
Output/other circuits	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+AC:2020 , EN 60079-7:2015+A1:2018 , EN 60079-11:2012	
<b>International approvals</b>		
IECEX approval		
IECEX certificate	IECEX EXA 17.0019X	
IECEX marking	Ex ec [ia IIB Ga] IIC T4 Gc [Ex ia Da] IIIC [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> .	

**Assembly**



1	LED yellow: Status output 1
2	LED red: LB/SC output 1
3	LED yellow: Status output 2
4	LED red: LB/SC output 2
5	LED green: power supply
6	Switches S1, S2
A	Removable terminals, blue
B	Removable terminals, green

**Configuration**



**Switch Settings**

Switch	Function	Position
S1	Line fault detection (LB/SC)	enabled
		disabled
S1	Line fault transparency (LFT)	enabled
		disabled

Release date: 2025-02-22 Date of issue: 2025-02-22 Filename: 243753\_eng.pdf

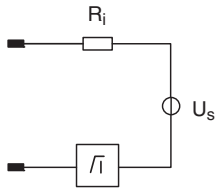
Factory setting: line fault detection enabled, line fault transparency enabled

Release date: 2025-02-22 Date of issue: 2025-02-22 Filename: 243753\_eng.pdf

# Characteristic Curve

## Output characteristics

Output circuit diagram



Output characteristic

