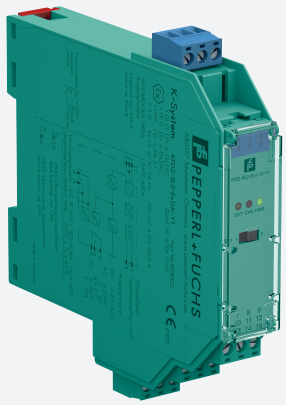


Solenoid Driver

KFD2-SL2-Ex1.LK-Y1

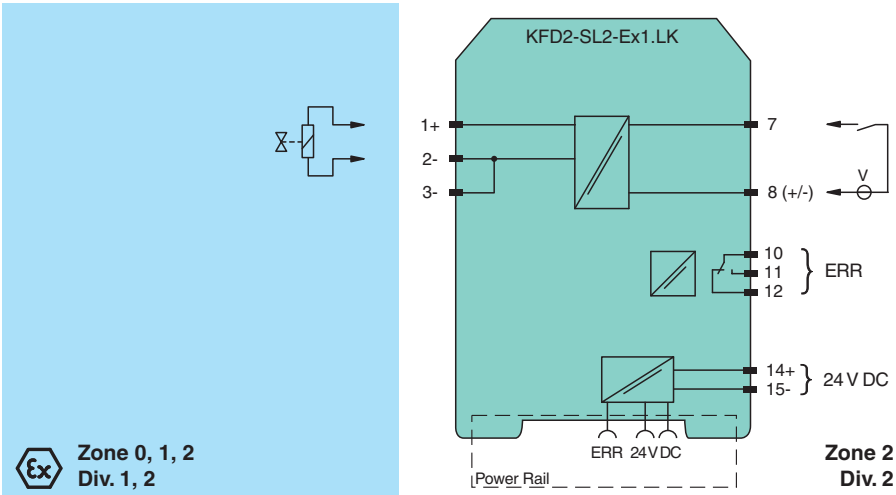
SIL 2

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Increased input load
- Output 45 mA at 11.2 V DC
- Logic input, non-polarized
- Fault indication output
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC 61508

Function

This isolated barrier is used for intrinsic safety applications.
The device supplies power to solenoids, LEDs and audible alarms located in a hazardous area.
It is controlled via a logic signal. The input has two defined states: 1-Signal = 16 V DC ... 30 V DC, 0-Signal = 0 V DC ... 5 V DC. The current consumption of the input is about 3 mA.
At full load, 11.2 V at 45 mA is available for the hazardous area application.
If the field impedance is > 10 kΩ for lead breakage or < 50 Ω for short circuits a line fault is detected.
During an error condition, the fault indication output de-energizes.
A fault is signalized by LEDs and a separate collective error message output.

Connection



Technical Data

General specifications		
Signal type		Digital Output
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Supply		
Connection		Power Rail or terminals 14+, 15-
Rated voltage	U_r	19 ... 30 V DC
Power dissipation		max. 1.5 W
Power consumption		max. 2 W at 45 mA output current

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Technical Data

Input		
Connection side		control side
Connection		terminals 7, 8
Input current		1-signal: 3.5 mA over the entire range 0-signal: 1.5 mA at 5 V DC
Signal level		1-signal: 16 ... 30 V DC 0-signal: 0 ... 5 V DC
Output		
Connection side		field side
Output I		
Connection		terminals 1+, 2- or 3-
Internal resistor	R_i	270 Ω
Current	I_e	max. 45 mA
Voltage	U_e	min. 11.2 V
Open loop voltage	U_s	min. 23.5 V
Output signal		These values are valid for the rated operating voltage 19 ... 30 V DC.
Energized/De-energized delay		≤ 20 ms / ≤ 20 ms
Line fault detection		signal at short-circuit R_B < 50 Ω, lead breakage R_B > 10 kΩ ; test current < 650 µA
Output II		fault signal
Connection		terminals 10, 11, 12 , non-intrinsically safe
Contact loading		253 V AC/2 A/cos ϕ > 0.7; 40 V DC/2 A resistive load
Mechanical life		2 x 10^7 switching cycles
Energized/De-energized delay		≤ 20 ms / ≤ 20 ms
Galvanic isolation		
Input/power supply		basic insulation according to IEC/EN 61010-1, rated insulation voltage 50 V_{eff}
Output I, II against eachother		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V_{eff}
Output II/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
Conformity		
Electromagnetic compatibility		NE 21:2007
Degree of protection		IEC 60529:2001
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 150 g
Dimensions		20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch) , housing type B2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU-Type Examination Certificate		ZELM 99 ATEX 0015
Marking		⟨Ex⟩ II (1)G [Ex ia Ga] IIC ⟨Ex⟩ II (1)D [Ex ia Da] IIIC ⟨Ex⟩ I (M1) [Ex ia Ma] I
Output I		Ex ia

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Technical Data

Voltage	U_o	28 V
Current	I_o	110 mA
Power	P_o	770 mW (linear characteristic)
Supply		
Maximum safe voltage	U_m	40 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	40 V (Attention! The rated voltage can be lower.)
Certificate		TÜV 02 ATEX 1820 X
Marking		Ⓔx II 3G Ex nA nC IIC T4 Gc
Output II		
Contact loading		50 V AC/2 A/cos ϕ > 0.7; 40 V DC/2 A resistive load
Galvanic isolation		
Output I/other circuits		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-15:2010 , EN 60079-26:2007 , EN 50303:2000
International approvals		
CSA approval		
Control drawing		116-0362
IECEx approval		
IECEx certificate		IECEx ZLM 14.0001
IECEx marking		[Ex ia Ga] IIC, [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.
Accessories		
Optional accessories		- power feed module KFD2-EB2(.R4A.B)(.SP) - universal power rail UPR-03(-M)(-S) - profile rail K-DUCT-BU(-UPR-03)

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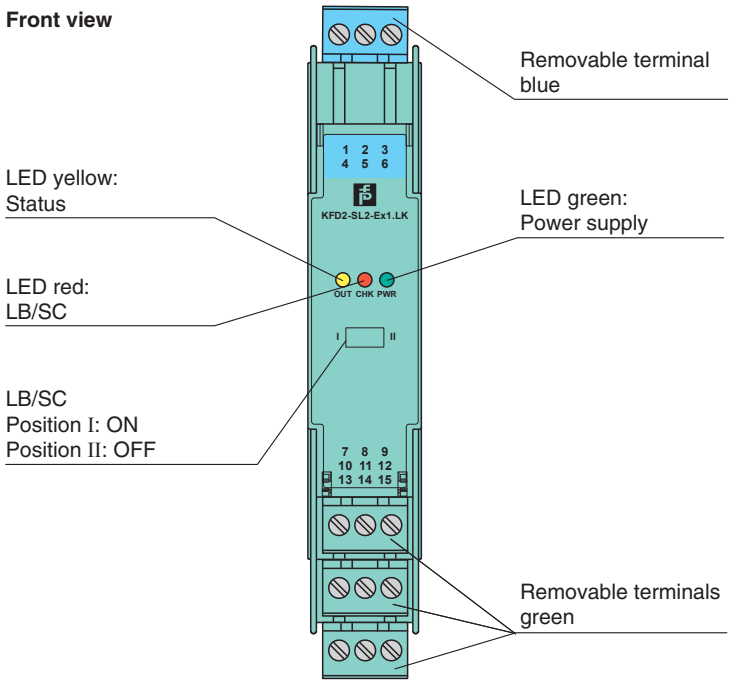
Assembly

Front view



Accessories

	**KFD2-EB2**	Power Feed Module
	**KFD2-EB2.R4A.B**	Power feed module, redundant supply
	**KFD2-EB2.R4A.B.SP**	Power feed module with spring terminals, redundant supply
	**KFD2-EB2.SP**	Power feed module with spring terminals
	**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**	
	**K-DUCT-BU-UPR-03**	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side blue

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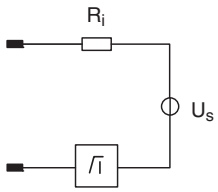
Application

e. g. Yokogawa ProSafe DO card SDV541, SDV531 with deactivated test pulse and deactivated line fault detection

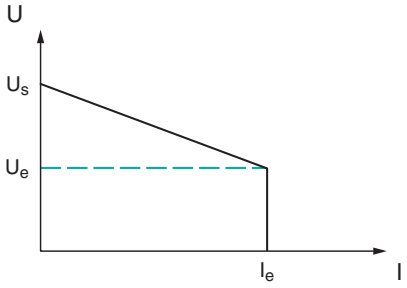
Characteristic Curve

Output characteristics

Output circuit diagram



Output characteristic



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