

# Solenoid Driver

## KFD2-RCI-Ex1

**SIL 3**

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Output 20.4 mA at 13.5 V DC
- 19 V DC ... 30 V DC input
- Line fault detection (LFD)
- Conformal coating
- Up to SIL 3 acc. to IEC 61508

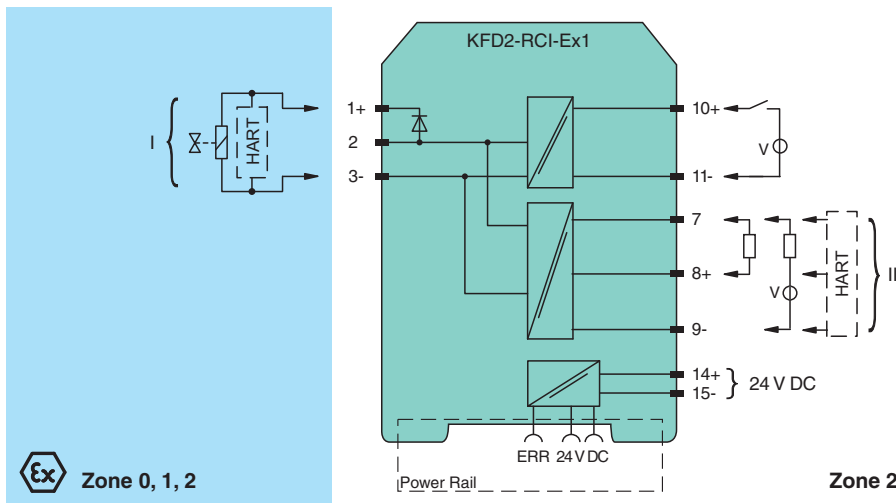
Lead monitoring



### Function

This isolated barrier is used for intrinsic safety applications. The device can be used in shut down applications with HART positioners. Via the logic input the positioner is energized or de-energized (shut down). Independent of the status, a second input enables HART communication with the positioner. With this the asset management system can request for example diagnostic information or can initiate a partial stroke test. The HART communication also works with deenergized positioner. A unique collective error messaging feature is available when used with the Power Rail system.

### Connection



### Technical Data

General specifications	
Signal type	Digital Output
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 3
Supply	
Connection	Power Rail or terminals 14+, 15-
Rated voltage	$U_r$ 19 ... 30 V DC
Rated current	$I_r$ < 35 mA
Power consumption	< 0.8 W
Input	
Connection side	control side

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

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## Technical Data

Connection		terminals 10+, 11-
Input current		40 mA at 19 ... 30 V DC
Signal level		1-signal: 19 ... 30 V DC 0-signal: 0 ... 5 V DC
Power consumption		< 1.2 W
Operating mode		loop powered
<b>Output</b>		
Connection side		field side/control side
Output I		
Connection		terminals 1+, 3- (terminals 1+, 2 for test loop)
Current	$I_e$	max. 20.4 mA
Voltage	$U_e$	min. 13.5 V
Current		1-signal: 20.4 mA 0-signal: 4.2 mA
Voltage		1-signal: > 13.5 V
Load		max. 650 $\Omega$
Response time		< 40 ms input to output
Line fault detection		short circuit voltage < 1 V , open circuit voltage > 16 V
Output II		
Connection		terminal 7: source (-) or sink (+), terminal 8: source (+), terminal 9: sink (-)
Current		11 mA (source or sink mode)
Voltage		9 ... 30 V sink mode from external supply
Load		max. 650 $\Omega$ , source mode , for HART $\geq$ 230 $\Omega$
Communication		pass-through of HART signal between input II and output
<b>Galvanic isolation</b>		
Input/power supply		functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Output II/power supply		functional insulation acc. to IEC 62103, rated insulation voltage 50 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
Degree of protection		IEC 60529:2001
<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		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
<b>Data for application in connection with hazardous areas</b>		
EU-Type Examination Certificate		CESI 09 ATEX 037
Marking		Ⓜ II (1)GD [Ex ia] IIC; [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]
Equipment		terminals 1+, 2 / 3-
Voltage	$U_o$	25.4 V
Current	$I_o$	93.6 mA
Power	$P_o$	595 mW (linear characteristic)
Supply		

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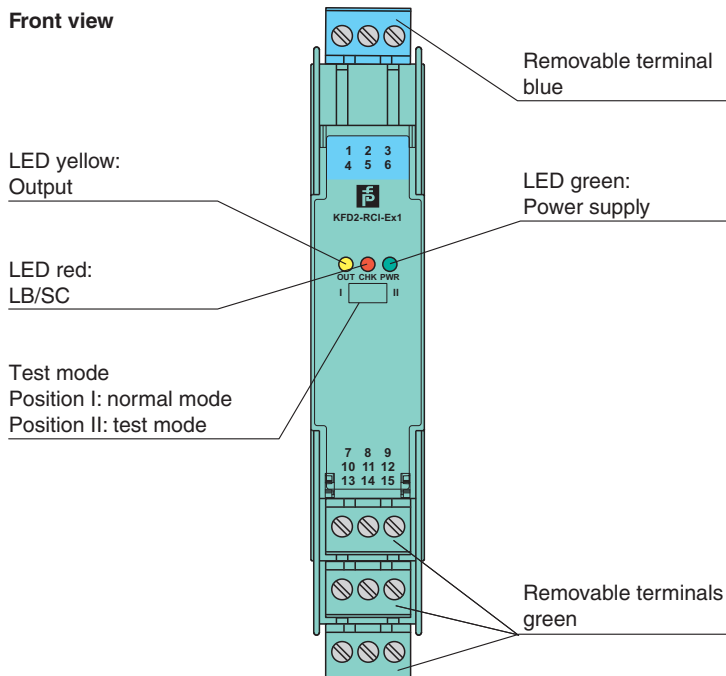
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**PEPPERL+FUCHS**

**Technical Data**

Maximum safe voltage	U <sub>m</sub>	253 V (Attention! The rated voltage can be lower.)
Input		
Maximum safe voltage	U <sub>m</sub>	253 V (Attention! The rated voltage can be lower.)
Collective error message		
Maximum safe voltage	U <sub>m</sub>	253 V (Attention! The rated voltage can be lower.)
Certificate		PF 09 CERT 1438 X
Marking		Ⓜ II 3G Ex nA IIC T4 Gc
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
<b>International approvals</b>		
CSA approval		
Control drawing		116-0335
IECEX approval		
IECEX certificate		IECEX CES 09.0008
IECEX marking		[Ex ia] IIC , [Ex iaD]
<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
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




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## Accessories

	<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
	<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

## Application

The device supplies power to safety valve controller with HART functionality.

It is controlled by means of a logic circuit. Voltage signals in a range of 19 V DC ... 30 V DC are accepted as 1-signal. The 0-signal must be within a range of 0 V DC ... 5 V DC. The current consumption of the logic input is about 40 mA.

At full load, 13.5 V at 20.4 mA is available for the hazardous area load.

Line fault detection of the field circuit is indicated by a red LED. The error signal switches on if the field voltage is > 16 V for lead breakage (LB) or < 1 V for short circuit (SC).

This device provides the HART pass-through for maintenance and diagnostic of the solenoid valve. The HART communication is available both in ON condition and in OFF condition of the solenoid.