Features

- 2-channel isolated barrier
- 24 V DC supply (Power Rail)
- Current output up to 700 Ω load
- HART I/P and valve positioner
- Line fault detection (LFD)
- Accuracy 0.05 %
- Terminal blocks with test sockets
- Up to SIL 2 acc. to IEC 61508

Function

This isolated barrier is used for intrinsic safety applications. It drives SMART I/P converters, electrical valves, and positioners in hazardous areas.

Digital signals are superimposed on the analog values at the field or control side and are transferred bi-directionally.

Current transferred across the DC/DC converter is repeated at terminals 1, 2 and 4, 5.

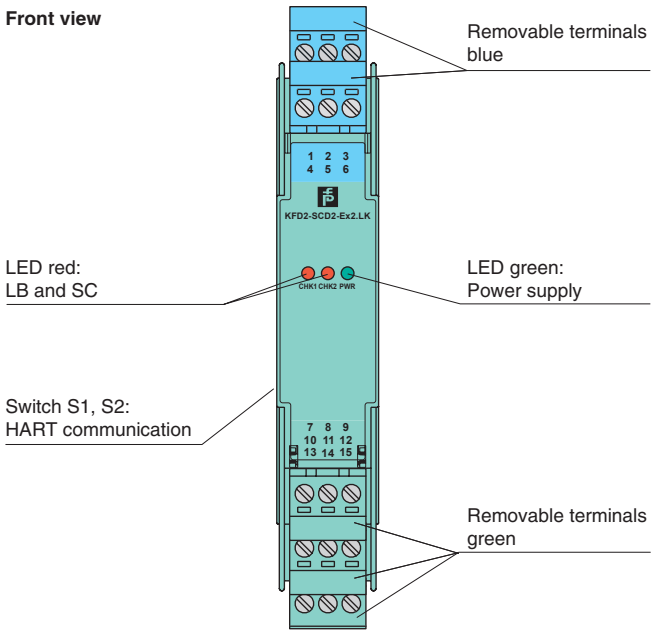
An open and shorted field circuit presents a high input impedance to the control side to allow line fault detection by control system.

If the loop resistance for the digital communication is too low, an internal resistor of 250 Ω between terminals 8, 9 and 11, 12 is available, which may be used as the HART communication resistor.

Sockets for the connection of a HART communicator are integrated into the terminals of the device.

A unique collective error messaging feature is available when used with the Power Rail system.

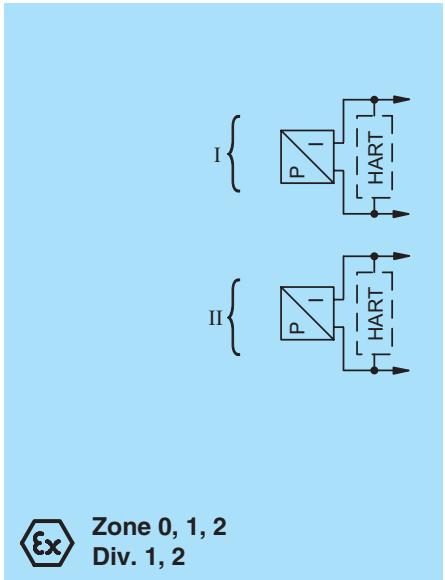
Assembly

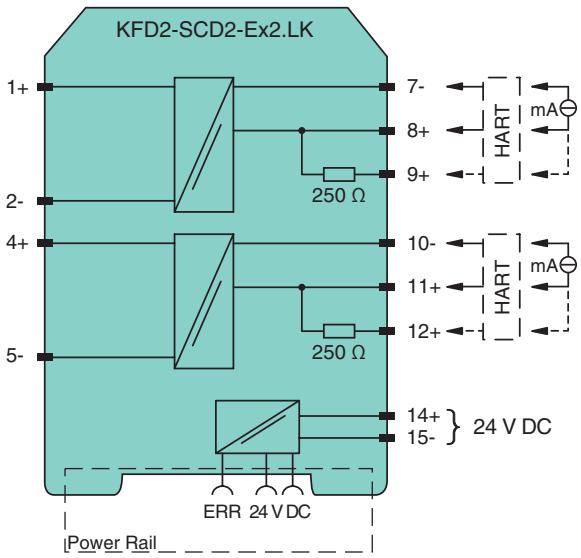


SIL 2

HART COMMUNICATION PROTOCOL

Connection





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General specifications		
Signal type		Analog output
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Supply		
Connection		Power Rail or terminals 14+, 15-
Rated voltage	U_r	20 ... 35 V DC
Ripple		within the supply tolerance
Power dissipation		1.4 W at 20 mA into 10 V (equivalent to 500 Ω) load
Power consumption		1.8 W at 20 mA
Input		
Connection side		control side
Connection		terminals 7-, 8+, (9+); 10-, 11+, (12+)
Voltage drop		approx. 4 V or internal resistance 200 Ω at 20 mA
Input resistance		> 100 kΩ, when wiring resistance in the field > 16 V (equivalent to 800 Ω at 20 mA)
Current		4 ... 20 mA limited to approx. 25 mA
Output		
Connection side		field side
Connection		terminals 1+, 2-; 4+, 5-
Current		4 ... 20 mA
Load		100 ... 700 Ω
Voltage		≥ 14 V at 20 mA
Transfer characteristics		
Accuracy		0.05 %
Deviation		
After calibration		at 20 °C (68 °F): ≤ 10 µA incl. non-linearity, calibration, hysteresis, supply and load changes
Influence of ambient temperature		≤ 1 µA/K
Rise time		< 100 µs , 10 ... 90 % step change
Galvanic isolation		
Input/power supply		functional insulation, rated insulation voltage 50 V AC
Input/input		functional insulation, rated insulation voltage 50 V AC
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 21:2011
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 61010-1:2004
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 124 x 115 mm (0.8 x 4.9 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		BAS 00 ATEX 7240
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		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
Voltage	U_o	25.2 V
Current	I_o	93 mA
Power	P_o	585 mW
Supply		
Maximum safe voltage	U_m	250 V_{rms} (Attention! The rated voltage can be lower.)
Input		
Maximum safe voltage	U_m	250 V_{rms} (Attention! The rated voltage can be lower.)
Certificate		TÜV 99 ATEX 1499 X
Marking		⟨Ex⟩ II 3G Ex nA II T4 [device in zone 2]

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Galvanic isolation	
Input/Output	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Output/power supply	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
International approvals	
UL approval	
Control drawing	116-0173 (cULus)
IECEx approval	IECEx BAS 04.0014
Approved for	[Zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] 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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Additional information

Lead monitoring, input characteristics

During lead breakage (> 16 V) in the field the input resistance is > 100 kΩ, the field current is < 1 mA and the red LED is flashing.

During short circuit (< 50 Ω) in the field the input resistance is approx. 20 kΩ, the input current and the field current are approx. 1 mA and the red LED is flashing.

The voltage drop at the current input (terminals 7-, 8+ and 10-, 11+) is lower than 4 V. Thus, it corresponds to an input resistance of 200 Ω at 20 mA. The AC input impedance corresponds to the load impedance of the unit.

Adjustment SMART function

When using positioners, which do not meet the HART standard, set the switches to the 1 position (without SMART function) (see adjustment table).

Switch		Position	Function
Channel 1	Channel 2		
S1.1 S1.2	S2.1 S2.2	0 0	SMART
All other switch settings			non SMART

If you are using field devices with high input impedance and a control system with low output impedance, check wheather HART transparency is working correctly.

If necessary, deactivate HART transparency via the DIP switches. If the impedances are combined as described above, you can for example use the device KCD2-SCD-Ex1 alternatively.

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