

# Potentiometer Converter

## KFD2-PT2-Ex1-4

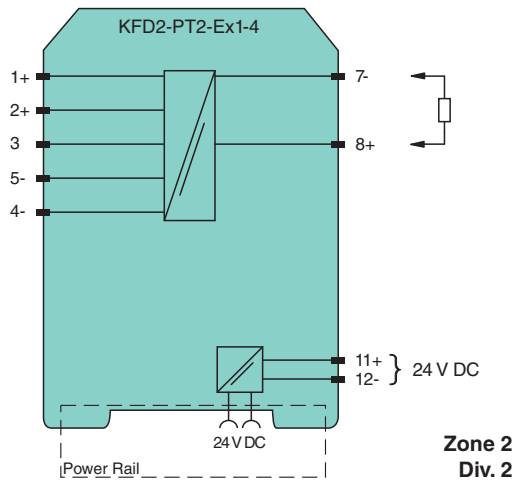
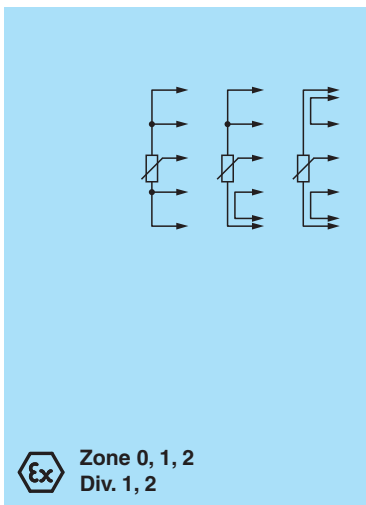
- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Potentiometer input
- Current output 0 mA ... 20 mA
- Lead resistance compensation adjustment
- Accuracy 0.05 %
- Up to SIL 2 acc. to IEC/EN 61508



### Function

This isolated barrier is used for intrinsic safety applications. It provides the source voltage to a potentiometer and transfers its wiper position from hazardous areas to safe areas. It then converts the signal to a 0 mA ... 20mA current output. The unit can be used in a 3-, 4-, or 5-wire configuration depending on the required measurement accuracy. Terminals 2 and 5 are used as the sense line for the potentiometer lead resistance compensation in a 5-wire configuration. The barrier's potentiometer can be used to compensate for lead resistance up to 5 % of the hazardous area potentiometer value.

### Connection



### Technical Data

#### General specifications

Signal type Analog input

#### Functional safety related parameters

Safety Integrity Level (SIL) SIL 2

#### Supply

Connection Power Rail or terminals 11+, 12-

Rated voltage  $U_r$  20 ... 35 V DC

Ripple within the supply tolerance

Power dissipation 1 W

Power consumption 1.3 W

#### Input

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

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**Technical Data**

<b>Connection side</b>		field side	
Connection		terminals 4-, 5-, 3+, 2+, 1+	
<b>Potentiometer</b>			
Types of measuring		3-, 4-, 5-wire technology	
Nominal resistance		800 Ω to 100 kΩ	
Supply voltage		approx. 4.7 V	
Lead resistance		5 % of the potentiometer resistance (adjustable)	
<b>Output</b>			
<b>Connection side</b>		control side	
Connection		terminals 7-, 8+	
Current output		0 ... 20 mA, load ≤1 kΩ	
<b>Transfer characteristics</b>			
Accuracy		0.05 %	
Deviation			
Linearity		≤ ± 10 μA	
Influence of ambient temperature		≤ 1 μA/K	
Rise time		10 to 90 % ≤ 8 ms; 10 to 90 % within 1 % of span ≤ 25 ms	
<b>Galvanic isolation</b>			
Output/power supply		functional insulation, rated insulation voltage 50 V AC	
<b>Indicators/settings</b>			
Control elements		potentiometer	
Configuration		via potentiometer	
<b>Directive conformity</b>			
<b>Electromagnetic compatibility</b>			
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)	
<b>Conformity</b>			
<b>Electromagnetic compatibility</b>		NE 21:2006	
<b>Degree of protection</b>		IEC 60529:2001	
<b>Protection against electrical shock</b>		UL 61010-1	
<b>Ambient conditions</b>			
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)	
<b>Mechanical specifications</b>			
<b>Degree of protection</b>		IP20	
<b>Connection</b>		screw terminals	
<b>Mass</b>		approx. 120 g	
<b>Dimensions</b>		20 x 107 x 115 mm (0.8 x 4.2 x 4.5 inch) (W x H x D) , housing type B1	
<b>Mounting</b>		on 35 mm DIN mounting rail acc. to EN 60715:2001	
<b>Data for application in connection with hazardous areas</b>			
<b>EU-type examination certificate</b>		BAS 00 ATEX 7171	
Marking		Ⓢ II (1)G [Ex ia Ga] IIC , Ⓢ II (1)D [Ex ia Da] IIIC , Ⓢ I (M1) [Ex ia Ma] I (-20 °C ≤ T <sub>amb</sub> ≤ 60 °C)	
Voltage	U <sub>o</sub>	10.4 V DC	
Current	I <sub>o</sub>	31.4 mA	
Power	P <sub>o</sub>	82 mW	
<b>Supply</b>			
Maximum safe voltage	U <sub>m</sub>	250 V (Attention! The rated voltage can be lower.)	
<b>Output</b>			
Maximum safe voltage	U <sub>m</sub>	250 V (Attention! The rated voltage can be lower.)	
<b>Certificate</b>			
<b>Marking</b>		Ⓢ II 3G Ex nA II T4	
<b>Galvanic isolation</b>			
<b>Input/Output</b>		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V	
<b>Input/power supply</b>		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V	

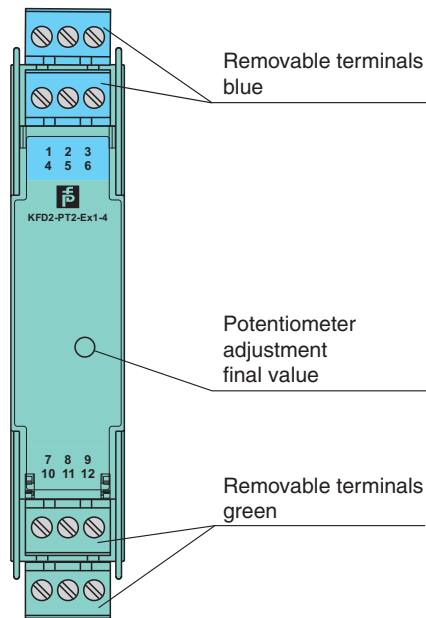
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**Technical Data**

<b>Directive conformity</b>		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 , EN 60079-11:2012 , EN 60079-15:2010
<b>International approvals</b>		
FM approval		
Control drawing		116-0129
UL approval		
Control drawing		116-0173 (cULus)
IECEX approval		
IECEX certificate		IECEX BAS 10.0060 IECEX BAS 10.0061X
IECEX marking		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I Ex ec IIC T4 Gc
<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**

Front view





**Matching System Components**

	<b>KFD2-EB2</b>	Power Feed Module
	<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






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### Matching System Components

	<b>K-DUCT-BU</b>	Profile rail, wiring comb field side, blue
	<b>K-DUCT-BU-UPR-03</b>	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side, blue

### Accessories

	<b>K-250R</b>	Measuring resistor
	<b>K-500R0%1</b>	Measuring resistor
	<b>KF-ST-5GN</b>	Terminal block for KF modules, 3-pin screw terminal, green
	<b>KF-ST-5BU</b>	Terminal block for KF modules, 3-pin screw terminal, blue
	<b>KF-CP</b>	Red coding pins, packaging unit: 20 x 6

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## Application

Jumpers must be used on terminals 1, 2 and 4, 5 in 3-wire configurations. A jumper must be used between terminals 4 and 5 in 4-wire connections. In the 5-wire mode of operation, the potentiometer voltage is measured at terminals 2 and 5 and automatically readjusted.

The front side potentiometer can be used to compensate for lead resistances up to 5 % of the potentiometer value. During adjustment, the potentiometer is set to 100 % of its value and the output signal is adjusted to 100 % of the required value. This adjustment can be repeated setting the potentiometer to 0 %.