

# Potentiometer Converter

## KFD2-PT2-Ex1

**SIL 2**

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Potentiometer input
- Voltage output 0 V ... 10 V
- Lead resistance compensation adjustment
- Accuracy 0.05 %
- Up to SIL 2 acc. to IEC 61508



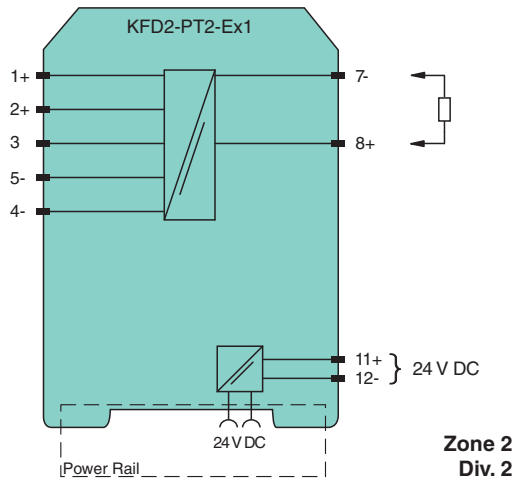
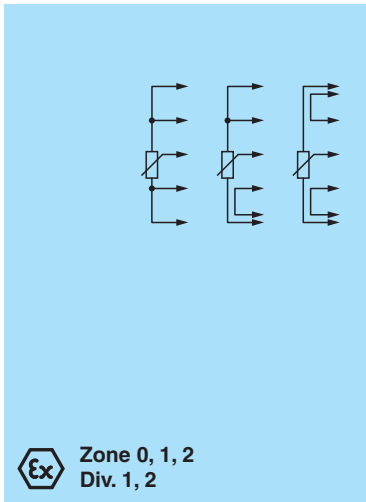
### Function

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 V ... 10 V voltage output (consistent with 0 mA ... 20mA current output, see for example KFD2-PT2-Ex1-4).

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 0.5 W

Power consumption 0.6 W

Release date: 2020-09-23 Date of issue: 2020-09-23 Filename: 072018\_eng.pdf

## Technical Data

Input		
Connection side		field side
Connection		terminals 4-, 5-, 3+, 2+, 1+
Potentiometer		
Types of measuring		3-, 4-, 5-wire technology
Nominal resistance		800 $\Omega$ to 100 k $\Omega$
Supply voltage		approx. 4.7 V
Lead resistance		5 % of the potentiometer resistance (adjustable)
Output		
Connection side		control side
Connection		terminals 7-, 8+
Voltage output		0 ... 10 V
Output resistance		max. 30 $\Omega$
Transfer characteristics		
Accuracy		0.05 %
Deviation		
Linearity		$\leq \pm 5$ mV
Influence of ambient temperature		$\leq 0.5$ mV/K
Rise time		10 to 90 % $\leq 8$ ms; 10 to 90 % within 1 % of span $\leq 25$ ms
Galvanic isolation		
Output/power supply		functional insulation, rated insulation voltage 50 V AC
Indicators/settings		
Control elements		potentiometer
Configuration		via potentiometer
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
Conformity		
Electromagnetic compatibility		NE 21:2006
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 61010-1
Ambient conditions		
Ambient temperature		-20 ... 60 $^{\circ}$ C (-4 ... 140 $^{\circ}$ F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 120 g
Dimensions		20 x 107 x 115 mm (0.8 x 4.2 x 4.5 inch) , housing type B1
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 7171
Marking		Ⓔ II (1)G [Ex ia Ga] IIC , Ⓔ II (1)D [Ex ia Da] IIIC , Ⓔ I (M1) [Ex ia Ma] I (-20 $^{\circ}$ C $\leq$ T <sub>amb</sub> $\leq$ 60 $^{\circ}$ C)
Voltage	U <sub>o</sub>	10.4 V
Current	I <sub>o</sub>	31.4 mA
Power	P <sub>o</sub>	82 mW
Supply		
Maximum safe voltage	U <sub>m</sub>	250 V (Attention! The rated voltage can be lower.)
Output		
Maximum safe voltage	U <sub>m</sub>	250 V (Attention! The rated voltage can be lower.)
Certificate		
Marking		TÜV 02 ATEX 1797 X
Galvanic isolation		Ⓔ II 3G Ex nA II T4

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

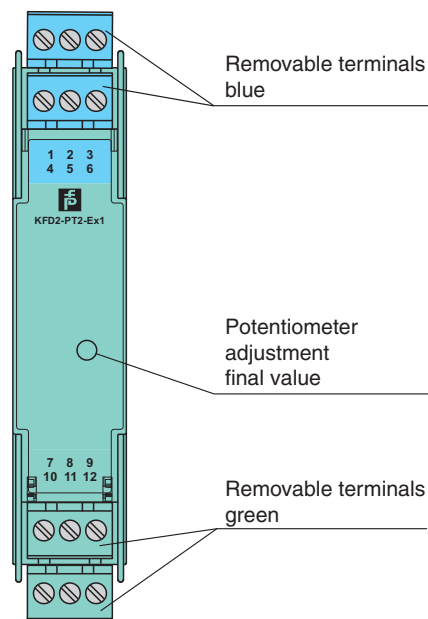
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 PEPPERL+FUCHS

## Technical Data



Input/Output	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/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
<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> .
<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

Front view










## Accessories

	<b>KFD2-EB2</b>	Power Feed Module
	<b>KFD2-EB2.R4A.B</b>	Power feed module, redundant supply

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**Accessories**

	<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

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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 %.