

Universal Temperature Converter KFD2-UT2-Ex2

SIL 2

- 2-channel isolated barrier
- 24 V DC supply (Power Rail)
- Thermocouple, RTD, potentiometer or voltage input
- Usable as signal splitter (1 input and 2 outputs)
- Current output 0/4 mA ... 20 mA
- Sink or source mode
- Configurable by PACTware
- Line fault (LFD) and sensor burnout detection
- Up to SIL 2 acc. to IEC 61508/IEC 61511

Current output 0/4 mA ... 20 mA



Function

This isolated barrier is used for intrinsic safety applications. The device converts the signal of a resistance thermometer, thermocouple, or potentiometer to a proportional output current. The device can also be configured as a signal splitter. The removable terminal block K-CJC-** is available as an accessory for internal cold junction compensation of thermocouples. A fault is signalized by LEDs acc. to NAMUR NE44 and a separate collective error message output. The device is easily configured by the use of the PACTware configuration software. For additional information, refer to the manual and www.pepperl-fuchs.com.

Technical Data

General specifications		
Signal type		Analog input
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Supply		
Connection		terminals 14+, 15- or power feed module/Power Rail
Rated voltage	U _r	20 ... 30 V DC
Ripple		within the supply tolerance
Power dissipation/power consumption		≤ 1.53 W / 1.53 W
Interface		
Programming interface		programming socket
Input		
Connection side		field side
Connection		terminals 1, 2, 3; 4, 5, 6
RTD		type Pt10, Pt50, Pt100, Pt500, Pt1000 (EN 60751: 1995) type Pt10GOST, Pt50GOST, Pt100GOST, Pt500GOST, Pt1000GOST (6651-94) type Cu10, Cu50, Cu100 (P50353-92) type Ni100 (DIN 43760)
Measuring current		approx. 200 µA with RTD
Types of measuring		2-, 3-wire connection
Lead resistance		max. 50 Ω per line
Measurement loop monitoring		sensor breakage, sensor short-circuit
Thermocouples		type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985) type TXK, TXKH, TXA (P8.585-2001)
Cold junction compensation		external and internal
Measurement loop monitoring		sensor breakage

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

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Technical Data

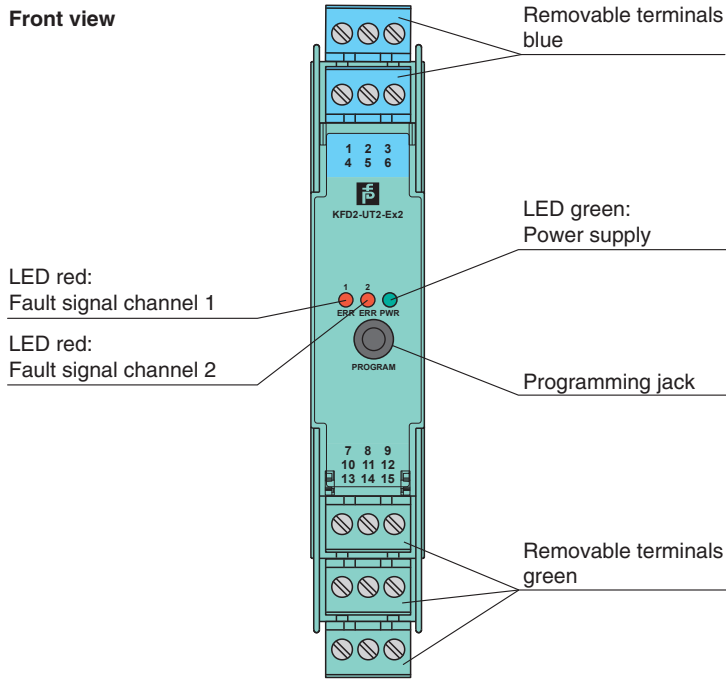
Potentiometer	0 ... 20 k Ω (2-wire connection), 0.8 ... 20 k Ω (3-wire connection)
Voltage	selectable within the range -100 ... 100 mV
Input resistance	$\geq 1 \text{ M}\Omega$ (-100 ... 100 mV)
Output	
Connection side	control side
Connection	output I: terminal 7: source (-), sink (+), terminal 8: source (+), terminal 9: sink (-) output II: terminal 10: source (-), sink (+), terminal 11: source (+), terminal 12: sink (-)
Output I, II	Analog current output
Current range	0 ... 20 mA or 4 ... 20 mA
Fault signal	downscale 0 or 2 mA, upscale 21.5 mA (acc. NAMUR NE43)
Source	load 0 ... 550 Ω open-circuit voltage $\leq 18 \text{ V}$
Sink	Voltage across terminals 5 ... 30 V. If the current is supplied from a source $> 16.5 \text{ V}$, series resistance of $\geq (V - 16.5)/0.0215 \Omega$ is needed, where V is the source voltage. The maximum value of the resistance is $(V - 5)/0.0215 \Omega$.
Transfer characteristics	
Deviation	
After calibration	Pt100: $\pm (0.06 \text{ \% of measurement value in K} + 0.1 \text{ \% of span} + 0.1 \text{ K (4-wire connection)})$ thermocouple: $\pm (0.05 \text{ \% of measurement value in } ^\circ\text{C} + 0.1 \text{ \% of span} + 1 \text{ K (1.2 K for types R and S)})$ this includes $\pm 0.8 \text{ K}$ error of the cold junction compensation mV: $\pm (50 \mu\text{V} + 0.1 \text{ \% of span})$ potentiometer: $\pm (0.05 \text{ \% of full scale} + 0.1 \text{ \% of span, (excludes errors due to lead resistance)})$
Influence of ambient temperature	deviation of CJC included: Pt100: $\pm (0.0015 \text{ \% of measurement value in K} + 0.006 \text{ \% of span})/\text{K } \Delta T_{\text{amb}}^{*)}$ thermocouple: $\pm (0.02 \text{ K} + 0.005 \text{ \% of measurement value in } ^\circ\text{C} + 0.006 \text{ \% of span})/\text{K } \Delta T_{\text{amb}}^{*)}$ mV: $\pm (0.01 \text{ \% of measurement value} + 0.006 \text{ \% of span})/\text{K } \Delta T_{\text{amb}}^{*)}$ potentiometer: $\pm 0.006 \text{ \% of span}/\text{K } \Delta T_{\text{amb}}^{*)}$ $^{*)} \Delta T_{\text{amb}}$ = ambient temperature change referenced to 23 $^\circ\text{C}$ (296 K)
Influence of supply voltage	$< 0.01 \text{ \% of span}$
Influence of load	$\leq 0.001 \text{ \% of output value per } 100 \Omega$
Reaction time	worst case value (sensor breakage and/or sensor short circuit detection enabled) mV: 1.2 s, thermocouples with CJC: 1.4 s, thermocouples with fixed ref. temp: 1.4 s, 3- or 4-wire RTD: 1.1 s, 2-wire RTD: 920 ms, Potentiometer: 3-wire connection 2.8 s, 2-wire connection 2.25 s
Galvanic isolation	
Output/supply, programming input	functional insulation, rated insulation voltage 50 V AC There is no electrical isolation between the programming input and the supply. The programming cable provides galvanic isolation so that ground loops are avoided.
Indicators/settings	
Display elements	LEDs
Configuration	via PACTware
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 21:2006
Degree of protection	IEC 60529:2001
Protection against electrical shock	UL 61010-1:2004
Ambient conditions	
Ambient temperature	-20 ... 60 $^\circ\text{C}$ (-4 ... 140 $^\circ\text{F}$)
Mechanical specifications	
Degree of protection	IP20
Connection	screw terminals
Mass	approx. 130 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

Technical Data

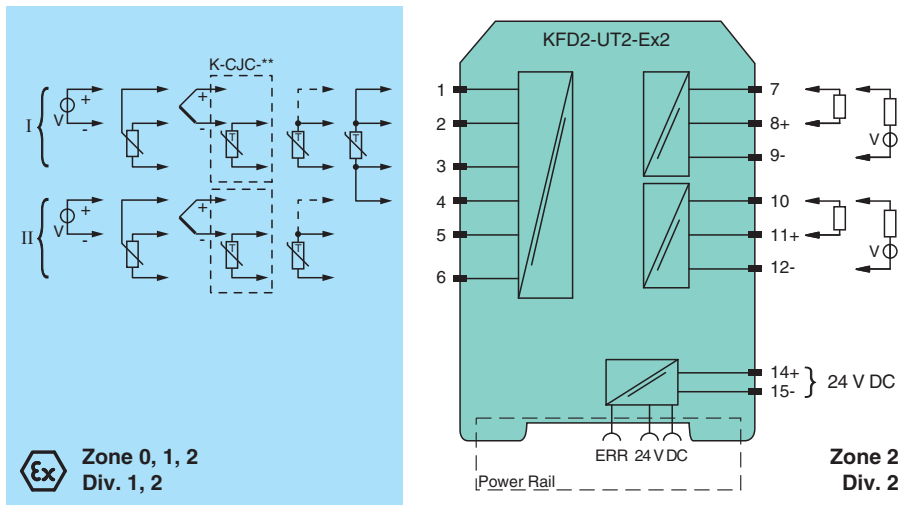
Data for application in connection with hazardous areas

EU-type examination certificate		CESI 04 ATEX 143
Marking		Ⓜ II (1)G [Ex ia Ga] IIC Ⓜ II (1)D [Ex ia Da] IIIC Ⓜ I (M1) [Ex ia Ma] I
Input		Ex ia
Inputs		terminals 1, 2, 3, 4, 5, 6 (for passive equipment)
Voltage U_o		9 V
Current I_o		22 mA
Power P_o		50 mW
Analog outputs, power supply, collective error		
Maximum safe voltage	U_m	250 V (Attention! This is not the rated voltage.)
Interface		
Maximum safe voltage	U_m	250 V (Attention! The rated voltage is lower.), RS 232
Certificate		TÜV 02 ATEX 1797 X
Marking		Ⓜ II 3G Ex nA II T4
Galvanic isolation		
Input/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 50303:2000
International approvals		
UL approval		
Control drawing		116-0410
CSA approval		
Control drawing		116-0314 (cCSAus) 116-0347
IECEx approval		
IECEx certificate		IECEx TUN 07.0003 IECEx CML 16.0126X
IECEx marking		[Ex ia Ga] IIC [Ex ia Da] IIIC [Ex ia Ma] I Ex nA IIC T4 Gc
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com .

Assembly



Connection



Accessories

	DTM Interface Technology	
	PACTware 5.X	FDT Framework
	K-ADP-USB	
	KFD2-EB2	Power Feed Module
	UPR-03	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m

Accessories

	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
	K-CJC-BU	