

# Universal Temperature Converter KCD2-UT2-Ex1

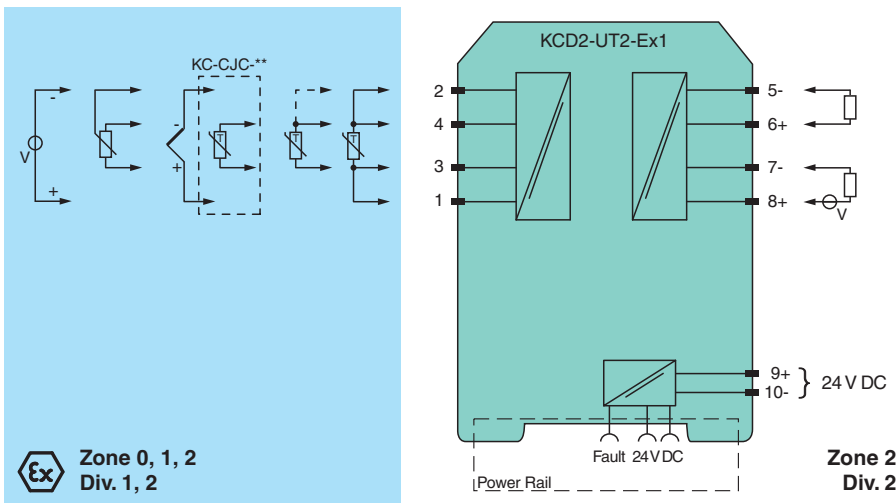
- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Thermocouple, RTD, potentiometer or voltage input
- Current output 0/4 mA ... 20 mA
- Sink or source mode
- Configurable by PACTware
- Line fault (LFD) and sensor burnout detection
- Up to SIL 2 acc. to IEC/EN 61508 / IEC/EN 61511



## Function

This isolated barrier is used for intrinsic safety applications. The device converts RTD input signals or thermocouple input signals in the hazardous area to 0/4 mA ... 20mA signals in the safe area. The removable terminal block KC-CJC-\*\* is available for thermocouples when internal cold junction compensation is desired. A fault is indicated by an LED and by user-configured fault indication outputs. If the device is operated via Power Rail, additionally a collective error message is available. 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](http://www.pepperl-fuchs.com).

## Connection



## Technical Data

<b>General specifications</b>	
Signal type	Analog input
<b>Functional safety related parameters</b>	
Safety Integrity Level (SIL)	SIL 2
<b>Supply</b>	
Connection	terminals 9+, 10- or power feed module/Power Rail
Rated voltage	$U_r$ 19 ... 30 V DC
Ripple	within the supply tolerance
Power dissipation	≤ 0.98 W
Power consumption	max. 0.98 W

Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 225696\_eng.pdf

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

Pepperl+Fuchs Group  
[www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

USA: +1 330 486 0002  
[pa-info@us.pepperl-fuchs.com](mailto:pa-info@us.pepperl-fuchs.com)

Germany: +49 621 776 2222  
[pa-info@de.pepperl-fuchs.com](mailto:pa-info@de.pepperl-fuchs.com)

Singapore: +65 6779 9091  
[pa-info@sg.pepperl-fuchs.com](mailto:pa-info@sg.pepperl-fuchs.com)

**PEPPERL+FUCHS**

**Technical Data**

<b>Interface</b>	
Programming interface	programming socket
<b>Input</b>	
Connection side	field side
Connection	terminals 1, 2, 3, 4
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-, 4-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
Potentiometer	0 ... 20 kΩ (2-wire connection), 0.8 ... 20 kΩ (3-wire connection)
Voltage	selectable within the range -100 ... 100 mV
Input resistance	≥ 1 MΩ (-100 ... 100 mV)
<b>Output</b>	
Connection side	control side
Connection	terminal 5: source (-), terminal 6: source (+), terminal 7: sink(-), terminal 8: sink (+)
Output	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 ≤ 18 V
Sink	Voltage across terminals 5 ... 30 V. If the current is supplied from a source > 16.5 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 $(V - 5)/0.0215 \Omega$ .
<b>Transfer characteristics</b>	
Deviation	
After calibration	Pt100: $\pm (0.06 \%$ of measurement value in K + 0.1 % of span + 0.1 K (4-wire connection)) thermocouple: $\pm (0.05 \%$ of measurement value in °C + 0.1 % of span + 1.5 K (1.7 K for types R and S)) , includes $\pm 1.3$ K fault of the cold junction compensation (CJC) mV: $\pm (50 \mu\text{V} + 0.1 \%$ of span) potentiometer: $\pm (0.05 \%$ of full scale + 0.1 % of span, (excludes faults due to lead resistance))
Influence of ambient temperature	Pt100: $\pm (0.0015 \%$ of measurement value in K + 0.006 % of span)/K $\Delta T_{\text{amb}}^1$ thermocouple: $\pm (0.02 \text{ K} + 0.005 \%$ of measurement value in °C + 0.006 % of span)/K $\Delta T_{\text{amb}}^1$ , influence of cold junction compensation (CJC) included mV: $\pm (0.01 \%$ of measurement value + 0.006 % of span)/K $\Delta T_{\text{amb}}^1$ potentiometer: $\pm 0.006 \%$ of span/K $\Delta T_{\text{amb}}^1$ <sup>1</sup> $\Delta T_{\text{amb}}$ = ambient temperature change referenced to 23 °C (296 K)
Influence of supply voltage	< 0.01 % of span
Influence of load	≤ 0.001 % of output value per 100 Ω
Reaction time	worst case value (sensor breakage and/or sensor short circuit detection enabled) mV: 1 s, thermocouples with CJC: 1.1 s, thermocouples with fixed reference temperature: 1.1 s, 3- or 4-wire RTD: 920 ms, 2-wire RTD: 800 ms, Potentiometer: 2.05 s
<b>Galvanic isolation</b>	
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.
<b>Indicators/settings</b>	
Display elements	LEDs
Configuration	via PACTware
Labeling	space for labeling at the front
<b>Directive conformity</b>	

Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 225696\_eng.pdf

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

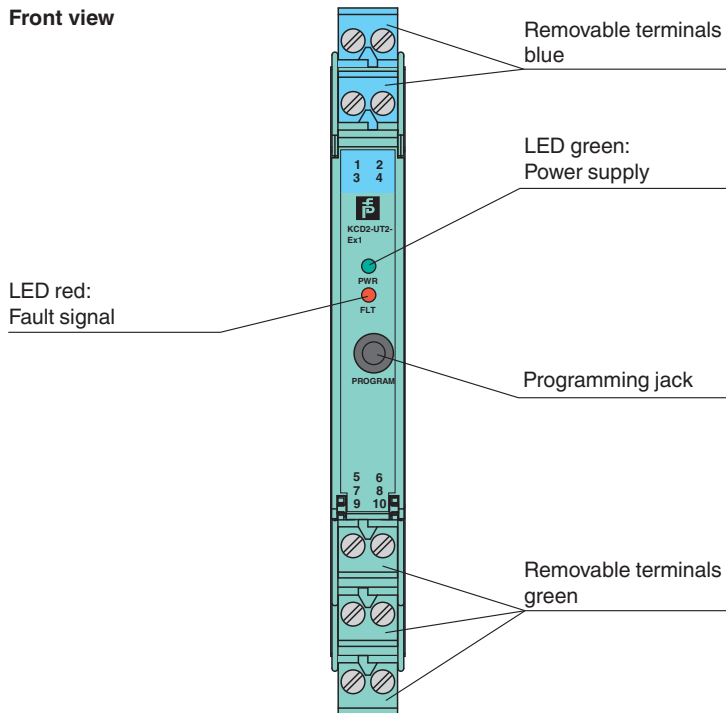
**Technical Data**

Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
<b>Conformity</b>		
Electromagnetic compatibility		NE 21:2012 EN 61326-3-2:2008
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 61010-1:2004
<b>Ambient conditions</b>		
Ambient temperature		-20 ... 70 °C (-4 ... 158 °F)
<b>Mechanical specifications</b>		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 100 g
Dimensions		12.5 x 119 x 114 mm (0.5 x 4.7 x 4.5 inch) (W x H x D) , housing type A2
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		BASEEFA 13 ATEX 0102 X
Marking		Ⓜ II (1)G [Ex ia Ga] IIC , Ⓜ II (1)D [Ex ia Da] IIIC , Ⓜ I (M1) [Ex ia Ma] I
Input		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
Inputs		terminals 1, 2, 3, 4
Voltage $U_o$		9 V
Current $I_o$		13.1 mA
Power $P_o$		30 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		
Marking		Ⓜ II 3G Ex nA IIC T4 Gc
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 IEC 60079-0:2018+AC:2020 , EN 60079-11:2012 , EN 60079-15:2010
<b>International approvals</b>		
UL approval		
Control drawing		116-0379 (cULus)
IECEX approval		
IECEX certificate		IECEX BAS 13.0057X
IECEX marking		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
<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> .










Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 225696\_eng.pdf

## Assembly

Front view



## Matching System Components






	<b>DTM Interface Technology</b>	Device type manager (DTM) for interface technology
	<b>PACTware 5.0</b>	FDT Framework
	<b>K-ADP-USB</b>	Programming adapter with USB interface
	<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
	<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
---	---------------	--------------------

Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 225696\_eng.pdf

**Accessories**

	<b>K-500R0%1</b>	Measuring resistor
	<b>KC-CJC-1BU</b>	Resistance thermometer for cold junction compensation for KC modules
	<b>KC-ST-5GN</b>	Terminal block for KC modules, 2-pin screw terminal, green
	<b>KC-ST-5BU</b>	Terminal block for KC modules, 2-pin screw terminal, blue
	<b>KF-CP</b>	Red coding pins, packaging unit: 20 x 6

Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 225696\_eng.pdf

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

Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0002  
pa-info@us.pepperl-fuchs.com

Germany: +49 621 776 2222  
pa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091  
pa-info@sg.pepperl-fuchs.com