



# Temperature Converter with Trip Values

## KFD2-GUT-1.D

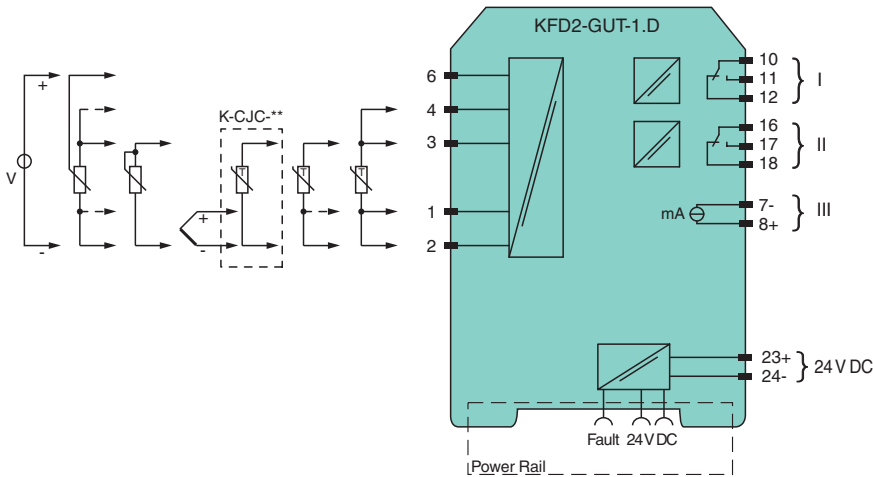
- 1-channel signal conditioner
- 24 V DC supply (Power Rail)
- Thermocouple, RTD, potentiometer or voltage input
- Redundant TC input
- Current output 0/4 mA ... 20 mA
- 2 relay contact outputs
- Configurable by PACTware or keypad
- Line fault (LFD) and sensor burnout detection
- Up to SIL 2 acc. to IEC 61508/IEC 61511

# CE SIL2

### Function

This signal conditioner provides the galvanic isolation between field circuits and control circuits. The device converts the signal of a resistance thermometer, thermocouple, potentiometer, or voltage source to a proportional output current. It also provides a relay trip value. The removable terminal block K-CJC-\*\* is available as an accessory for internal cold junction compensation of thermocouples. A fault is signaled 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](http://www.pepperl-fuchs.com).

### Connection



### Technical Data

#### General specifications

Signal type Analog input

#### Functional safety related parameters

Safety Integrity Level (SIL) SIL 2

#### Supply

Connection terminals 23+, 24- or power feed module/Power Rail

Rated voltage  $U_r$  20 ... 30 V DC

Rated current  $I_r$  approx. 100 mA

Power dissipation/power consumption  $\leq 2 \text{ W} / 2.2 \text{ W}$

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## Technical Data

<b>Interface</b>	
Programming interface	programming socket
<b>Input</b>	
Connection side	field side
Connection	terminals 1, 2, 3, 4, 6
RTD	Pt100, Pt500, Pt1000, Ni100, Ni1000
Measuring current	approx. 400 $\mu$ A
Types of measuring	2-, 3-, 4-wire technology
Lead resistance	max. 50 $\Omega$
Measurement loop monitoring	sensor breakage, sensor short-circuit
Thermocouples	type B, E, J, K, L, N, R, S, T (IEC 584-1: 1995)
Cold junction compensation	external and internal
Measurement loop monitoring	sensor breakage
Potentiometer	0.8 ... 20 k $\Omega$
Types of measuring	2-, 3-, 5-wire technology
Voltage	0 ... 10 V, 2 ... 10 V, 0 ... 1 V, -100 ... 100 mV
Open loop voltage	max. 5 V with resistance measuring sensor
Input resistance	$\geq$ 250 k $\Omega$ (0 ... 10 V) min. 1 M $\Omega$ (0 ... 1 V, -100 ... 100 mV)
<b>Output</b>	
Connection side	control side
Connection	output I: terminals 10, 11, 12 output II: terminals 16, 17, 18 output III: terminals 8+, 7-
Output I, II	relay
Contact loading	250 V AC / 2 A / $\cos \phi \geq 0.7$ ; 40 DC / 2 A
Mechanical life	5 x 10 <sup>7</sup> switching cycles
Energized/De-energized delay	approx. 20 ms / approx. 20 ms
Output III	Analog current output
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	max. 24 V DC
Load	max. 650 $\Omega$
Fault signal	downscale I $\leq$ 3.6 mA, upscale I $\geq$ 21 mA (acc. NAMUR NE43)
Collective error message	Power Rail
<b>Transfer characteristics</b>	
Deviation	
Temperature effect	Input: 0.005 %/K (50 ppm) of span ; current output: 0.005 %/K (50 ppm) of span
RTD	max. 0.2 % of span
Thermocouples	max. 10 $\mu$ V deviation of CJC: $\pm$ 0.8 K
Voltage	0.1 % of span
Potentiometer	0.1 % of span when $<$ 5 k $\Omega$ 0.5 % of span when $>$ 5 k $\Omega$
Current output	max. 20 $\mu$ A
Sampling rate	approx. 700 ms
<b>Galvanic isolation</b>	
Input/Other circuits	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Output I, II against each other	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Output I, II/other circuits	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Output III/power supply and collective error	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Interface/power supply	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
<b>Indicators/settings</b>	
Display elements	LEDs, display
Control elements	Control panel

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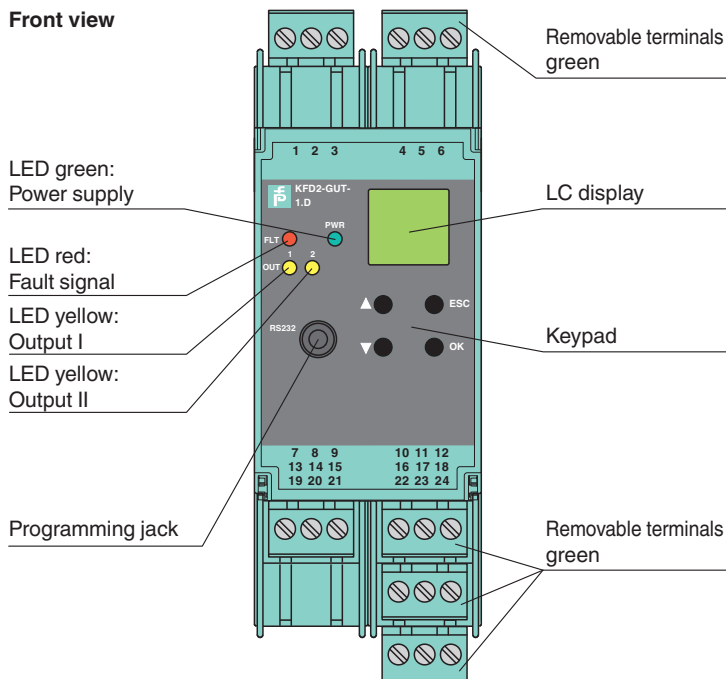
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**Technical Data**

Configuration	via operating buttons via PACTware
Labeling	space for labeling at the front
<b>Directive conformity</b>	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)
Low voltage	
Directive 2014/35/EU	EN 61010-1:2010
<b>Conformity</b>	
Electromagnetic compatibility	NE 21:2007
Degree of protection	IEC 60529:2001
<b>Ambient conditions</b>	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
<b>Mechanical specifications</b>	
Degree of protection	IP20
Connection	screw terminals
Mass	300 g
Dimensions	40 x 119 x 115 mm (1.6 x 4.7 x 4.5 inch) (W x H x D) , housing type C2
Mounting	on 35 mm DIN mounting rail acc. to EN 60715:2001
<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**










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**Matching System Components**






	<b>DTM Interface Technology</b>	Device type manager (DTM) for interface technology
	<b>PACTware 5.X</b>	FDT Framework

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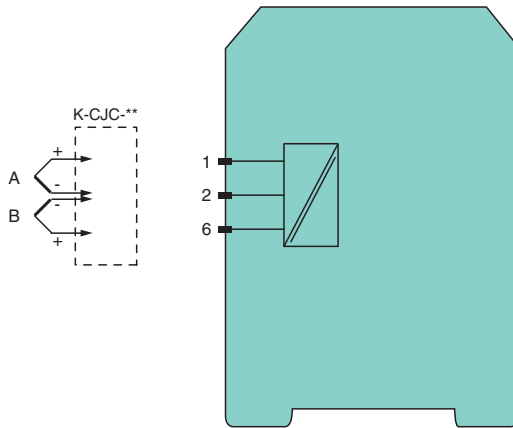
## Matching System Components

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

## Accessories

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

**Application**



**Redundant thermocouple**

For higher availability it is possible to connect a second redundant thermocouple (B) of the same type to the temperature converter. The cold junction temperature is taken from the connected terminal block.

If the deviation of the both thermocouples (A and B) exceed the selected tolerance, an error will occur. If a lead breakage of one thermocouple (e. g. A) has been detected, an error message occurs and the value of the second thermocouple (B) will be taken for further calculation.

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