



Temperature Converter with Trip Values

KFD2-GUT-Ex1.D

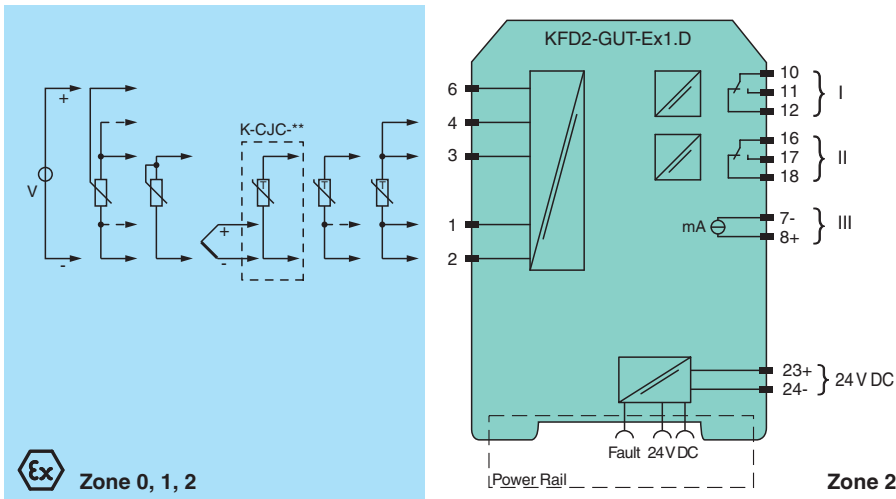
- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Thermocouple, RTD, potentiometer or voltage input
- Redundant TC input
- Current output 0/4 mA ... 20 mA
- 2 relay contact outputs
- Configurable by PACTware or keypad
- Line fault (LFD) and sensor burnout detection
- Up to SIL 2 acc. to IEC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



Function

This isolated barrier is used for intrinsic safety applications. 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.

Connection



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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 | $\leq 2 \text{ W} / 2.2 \text{ W}$ |

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

Technical Data

| | |
|--|---|
| Interface | |
| Programming interface | programming socket |
| Input | |
| Connection side | field side |
| Connection | terminals 1, 2, 3, 4, 6 |
| RTD | Pt100, Pt500, Pt1000, Ni100, Ni1000 |
| Types of measuring | 2-, 3-, 4-wire technology |
| Lead resistance | max. 50 Ω |
| 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 Ω |
| Types of measuring | 2-, 3-, 5-wire technology |
| Voltage | 0 ... 10 V, 2 ... 10 V, 0 ... 1 V, -100 ... 100 mV |
| Input resistance | ≥ 250 k Ω (0 ... 10 V) min. 1 M Ω (0 ... 1 V, -100 ... 100 mV) |
| Measuring current | approx. 400 μ A with resistance measuring sensor |
| Output | |
| 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 ⁷ 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 Ω |
| Fault signal | downscale I ≤ 3.6 mA, upscale I ≥ 21 mA (acc. NAMUR NE43) |
| Collective error message | Power Rail |
| Transfer characteristics | |
| 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 μ V deviation of CJC: ± 0.8 K |
| Voltage | 0.1 % of span |
| Potentiometer | 0.1 % of span when < 5 k Ω 0.5 % of span when > 5 k Ω |
| Current output | max. 20 μ A |
| Sampling rate | approx. 700 ms |
| Galvanic isolation | |
| Input/Other circuits | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} |
| Output I, II against each other | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} |
| Output I, II/other circuits | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} |
| Output III/power supply and collective error | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} |
| Interface/power supply | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} |
| Indicators/settings | |
| Display elements | LEDs , display |
| Control elements | Control panel |
| Configuration | via operating buttons via PACTware |

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Technical Data

| | | |
|--|----------------|---|
| Labeling | | space for labeling at the front |
| Directive conformity | | |
| Electromagnetic compatibility | | |
| Directive 2014/30/EU | | EN 61326-1:2013 (industrial locations) |
| Low voltage | | |
| Directive 2014/35/EU | | EN 61010-1:2010 |
| Conformity | | |
| Electromagnetic compatibility | | NE 21:2007 |
| Degree of protection | | IEC 60529:2001 |
| Ambient conditions | | |
| Ambient temperature | | -20 ... 60 °C (-4 ... 140 °F) |
| Mechanical specifications | | |
| 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 |
| Data for application in connection with hazardous areas | | |
| EU-type examination certificate | | TÜV 03 ATEX 2140 |
| Marking | | ⊕ II (1)G [Ex ia] IIC , ⊕ II (1)D [Ex iaD] |
| Input | | Ex ia IIC, Ex iaD |
| Supply | | |
| Maximum safe voltage | U _m | 40 V DC (Attention! The rated voltage can be lower.) |
| Input | | terminals 2, 6 (for active equipment) |
| Voltage | U _o | 13.1 V |
| Current | I _o | 8 mA |
| Power | P _o | 67 mW |
| Voltage | U _i | 29 V |
| Current | I _i | 11 mA |
| Power | P _i | 200 mW |
| Inputs | | terminals 1, 2, 3, 4, 6 (for passive equipment) |
| Voltage U _o | | 13.1 V |
| Current I _o | | 21 mA |
| Power P _o | | 67 mW |
| Output | | |
| Contact loading | | 253 V AC/2 A/cos φ > 0.7; 40 V DC/2 A resistive load (TÜV 03 ATEX 2140) |
| Analog output | | |
| Maximum safe voltage | U _m | 40 V (Attention! The rated voltage can be lower.) |
| Interface | | |
| Maximum safe voltage | U _m | 40 V (Attention! The rated voltage can be lower.) , RS 232 |
| Certificate | | |
| Marking | | ⊕ II 3G Ex nA nC IIC T4 Gc |
| Output I, II | | |
| Contact loading | | 50 V AC/2 A/cos φ > 0.7; 40 V DC/1 A resistive load |
| 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 |
| International approvals | | |
| IECEx approval | | |
| IECEx certificate | | IECEx TUN 09.0019 |
| IECEx marking | | [Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I |

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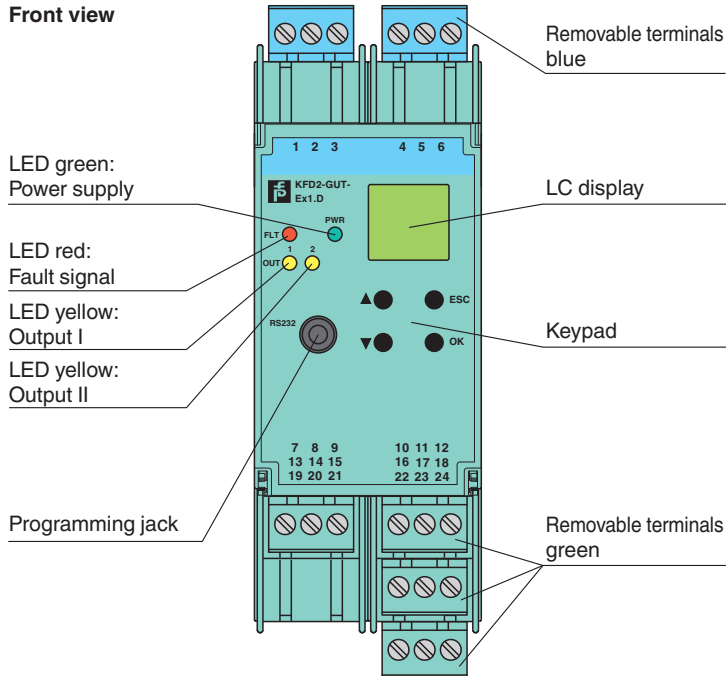
Technical Data

General information










Supplementary information

Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com.

Assembly









Matching System Components

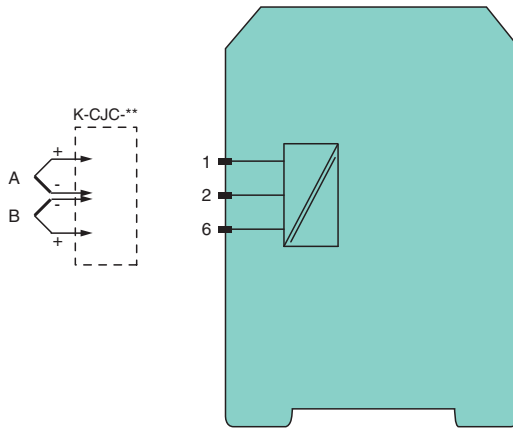
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|---|---------------------------------|--|
|  | DTM Interface Technology | Device type manager (DTM) for interface technology |
|  | PACTware 5.X | FDT Framework |
|  | K-ADP-USB | Programming adapter with USB interface |
|  | KFD2-EB2 | Power Feed Module |
|  | UPR-03 | Universal Power Rail with end caps and cover, 3 conductors, length: 2 m |
|  | 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 | Profile rail, wiring comb field side, blue |
|  | K-DUCT-BU-UPR-03 | Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side, blue |

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Accessories

| | | |
|---|------------------|---|
|  | K-250R | Measuring resistor |
|  | K-500R0%1 | Measuring resistor |
|  | K-CJC-BU | Terminal block for cold junction compensation, 3-pin screw terminal, blue |
|  | KF-ST-5GN | Terminal block for KF modules, 3-pin screw terminal, green |
|  | KF-ST-5BU | Terminal block for KF modules, 3-pin screw terminal, blue |
|  | KF-CP | 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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