

RTD Converter KFD0-TR-Ex1

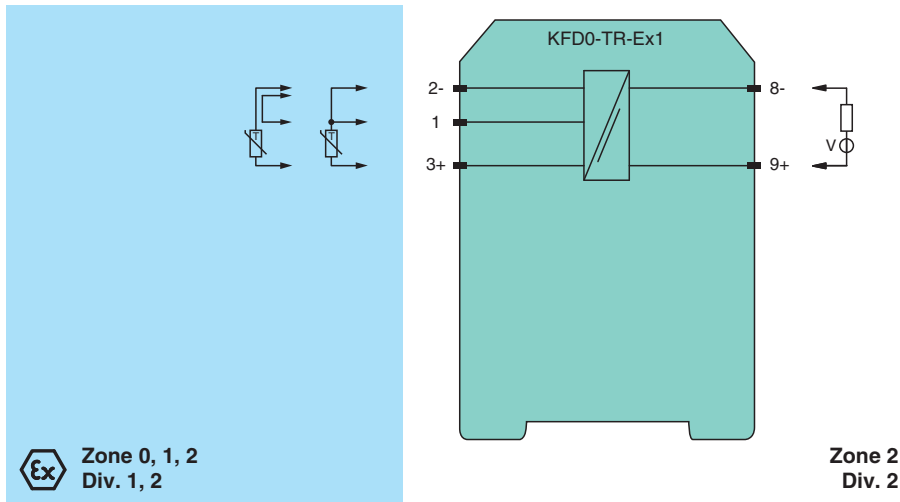
- 1-channel isolated barrier
- 24 V DC supply (loop powered)
- 2- or 3-wire Pt100 RTD input
- Output 4 mA ... 20 mA, temperature linearization selectable
- DIP switch selectable ranges
- Sensor breakage detection



Function

This isolated barrier is used for intrinsic safety applications. It is a loop-powered isolator that converts the resistance from a 3-wire RTD in the hazardous area to a 4 mA ... 20mA signal in the safe area. A selectable analog linearization ensures a temperature linear 4 mA ... 20mA output between 25 °C ... 375 °C. It also features conveniently located DIP switches, rotary switches and potentiometers to make field calibration easy.

Connection



Technical Data

| General specifications | |
|------------------------|--|
| Signal type | Analog input |
| Supply | |
| Rated voltage | U_r 12 ... 35 V DC loop powered |
| Power dissipation | 0.4 W |
| Input | |
| Connection side | field side |
| Connection | terminals 1, 2-, 3+ suitable for Pt100, 2- and 3-wire connection |
| Lead resistance | max. 100 Ω per line |
| Measuring current | approx. 1 mA |
| Output | |
| Connection side | control side |

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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

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Technical Data

| | | |
|--|-------|---|
| Connection | | terminals 9+, 8- |
| Load | | (U -12 V) / 0.02 A |
| Current output | | 4 ... 20 mA , limited to ≤ 35 mA |
| Fault signal | | upscaling ≥ 22 mA (limited to 35 mA) |
| Transfer characteristics | | |
| Measurement range | f_n | span without linearization 25 ... 800 °C (77 ... 1472 °F)/with linearization 25 ... 375 °C (77 ... 707 °F), both adjustable zero point without linearization -200 ... 400 °C (-328 ... 752 °F)/with linearization -30 ... 375 °C (-22 ... 707 °F), both adjustable |
| Deviation | | |
| After calibration | | 0.1 % of full-scale value incl. linearity and hysteresis |
| Influence of ambient temperature | | span and zero point 0.015 % / K or ± 10 mΩ / K |
| Influence of supply voltage | | 6.5 ppm/V |
| Rise time | | 250 ms |
| Galvanic isolation | | |
| Input/Output | | available |
| Indicators/settings | | |
| Control elements | | DIP switch rotary switch |
| Configuration | | via DIP switches via rotary switch |
| Labeling | | space for labeling at the front |
| Directive conformity | | |
| Electromagnetic compatibility | | |
| Directive 2014/30/EU | | EN 61326-1:2013 (industrial locations) |
| Conformity | | |
| Insulation coordination | | EN 50178 |
| Galvanic isolation | | EN 50178 |
| Degree of protection | | IEC 60529 |
| Ambient conditions | | |
| Ambient temperature | | -20 ... 60 °C (-4 ... 140 °F) |
| Mechanical specifications | | |
| Degree of protection | | IP20 |
| Connection | | screw terminals |
| Mass | | approx. 150 g |
| Dimensions | | 20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch) (W x H x D) , housing type B2 |
| Mounting | | on 35 mm DIN mounting rail acc. to EN 60715:2001 |
| Data for application in connection with hazardous areas | | |
| EU-type examination certificate | | ZELM 00 ATEX 0036 |
| Marking | | ⊕ II (1)GD [EEx ia] IIC |
| Voltage | U_o | 16.1 V |
| Current | I_o | 33 mA |
| Power | P_o | 131 mW |
| Certificate | | TÜV 01 ATEX 1777 X |
| Marking | | ⊕ II 3G Ex nA II T4 |
| Galvanic isolation | | |
| Input/Output | | 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 |
| International approvals | | |
| CSA approval | | 1029981 |
| Control drawing | | 116-0132 |
| IECEx approval | | |
| IECEx certificate | | IECEx TUN 06.0004 |
| IECEx marking | | [Zone 0] [Ex ia] IIC |

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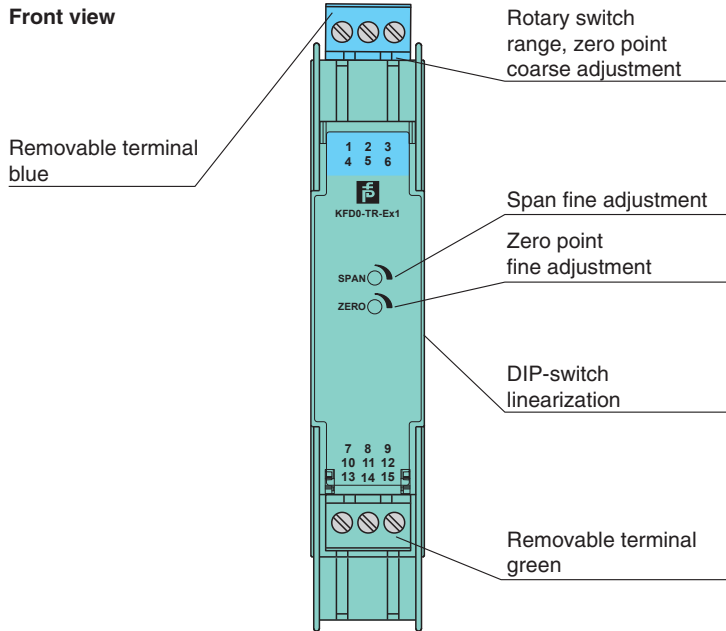
 Singapore: +65 6779 9091
pa-info@sg.pepperl-fuchs.com

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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

| | | |
|---|------------------|--|
|  | K-DUCT-BU | Profile rail, wiring comb field side, blue |
|---|------------------|--|

Accessories

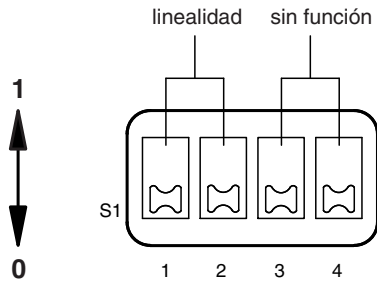
| | | |
|---|------------------|--|
|  | KF-ST-5GN | Terminal block for KF modules, 3-pin screw terminal, green |
|  | KF-ST-5BU | Terminal block for KF modules, 3-pin screw terminal, blue |
|  | KF-CP | Red coding pins, packaging unit: 20 x 6 |

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Configuration

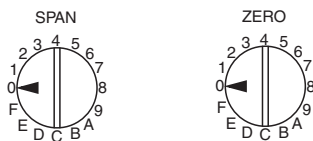
DIP switches function



| Switch | Position | Function |
|--------|----------|-----------------------------|
| S1.1 | 1 | Pt100 with linearisation |
| S1.2 | 0 | (-30 °C ... 375 °C) |
| S1.1 | 0 | Pt100 without linearisation |
| S1.2 | 1 | (-200 °C ... 800 °C) |

Other combinations of S1.1 and S1.2 are not allowed.

Rotary switches function



Please consider that both tables contain typical values, which can be used as an adjustment help.

| Adjustment range with linearisation | | | | | |
|-------------------------------------|-------------|-------------|-------------|-------------|-------------|
| Switch SPAN (°C) coarse adjustment | D | 6 | 2 | 1 | 0 |
| | 20 ... 60 | 35 ... 100 | 75 ... 220 | 120 ... 340 | 260 ... 375 |
| Switch ZERO (°C) coarse adjustment | | | | | |
| 0 | - | - | - | - | - |
| 1 | - | - | - | - | - |
| 2 | - | - | - | - | - |
| 3 | - | - | - | - | - |
| 4 | - | - | - | - | - |
| 5 | -19 ... 50 | -22 ... 45 | -30 ... 29 | -30 ... 13 | - |
| 6 | 35 ... 103 | 30 ... 97 | 16 ... 78 | 2 ... 61 | -30 ... 0 |
| 7 | 87 ... 155 | 82 ... 148 | 65 ... 127 | 48 ... 107 | -10 ... 38 |
| 8 | 142 ... 207 | 134 ... 200 | 115 ... 177 | 96 ... 154 | 28 ... 76 |
| 9 | 192 ... 257 | 185 ... 249 | 162 ... 223 | 141 ... 198 | 65 ... 111 |
| A | 245 ... 306 | 234 ... 297 | 209 ... 269 | 185 ... 242 | - |
| B | 290 ... 355 | 282 ... 344 | 254 ... 315 | - | - |
| C | 338 ... 375 | 329 ... 375 | - | - | - |
| D | - | - | - | - | - |
| E | - | - | - | - | - |
| F | - | - | - | - | - |

| Adjustment range without linearisation | | | | | |
|--|---------------|---------------|---------------|---------------|---------------|
| Switch SPAN (°C) coarse adjustment | D | 6 | 2 | 1 | 0 |
| | 25 ... 60 | 40 ... 100 | 90 ... 230 | 140 ... 360 | 320 ... 800 |
| Switch ZERO (°C) coarse adjustment | | | | | |
| 0 | - | - | - | - | - |
| 1 | -200 ... -171 | -200 ... -172 | -200 ... -176 | -200 ... -179 | - |
| 2 | -183 ... -112 | -184 ... -115 | -188 ... -122 | -191 ... -129 | -200 ... -153 |
| 3 | -126 ... -54 | -127 ... -54 | -134 ... -67 | -140 ... -77 | -163 ... -111 |
| 4 | -68 ... -6 | -71 ... 1 | -80 ... -12 | -90 ... -24 | -122 ... -70 |
| 5 | -9 ... 65 | -14 ... 59 | -26 ... 42 | -38 ... 27 | -80 ... -29 |
| 6 | 48 ... 123 | 43 ... 116 | 28 ... 97 | 14 ... 78 | -40 ... 12 |
| 7 | 107 ... 182 | 101 ... 175 | 82 ... 151 | 65 ... 130 | 1 ... 53 |
| 8 | 168 ... 243 | 160 ... 234 | 138 ... 208 | 117 ... 183 | 43 ... 95 |
| 9 | 226 ... 302 | 217 ... 292 | 192 ... 262 | 168 ... 234 | 82 ... 135 |
| A | 284 ... 361 | 274 ... 350 | 246 ... 317 | 219 ... 285 | 122 ... 174 |
| B | 343 ... 400 | 331 ... 400 | 300 ... 372 | 270 ... 337 | 162 ... 215 |
| C | - | - | 353 ... 400 | 320 ... 388 | 201 ... 254 |
| D | - | - | - | 37 ... 400 | 241 ... 293 |
| E | - | - | - | - | 279 ... 333 |
| F | - | - | - | - | 318 ... 372 |

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Recommendation for adjustment:

1. Span determination.
2. "Span coarse adjustment" in accordance with the table (for mode of operation "without linearisation" considering the approx. measurement range start).
3. Minimum value adjustment (in °C) at the input.
4. "Zero point coarse adjustment" to approach to 4 mA.
5. "Zero point fine adjustment" to exactly 4 mA.
6. Maximum value adjustment (in °C) at the input.
7. "Span fine adjustment" to exactly 20 mA.
8. If necessary repeat fine adjustment for 4 mA and 20 mA