

RTD Converter KFD0-TR-Ex1

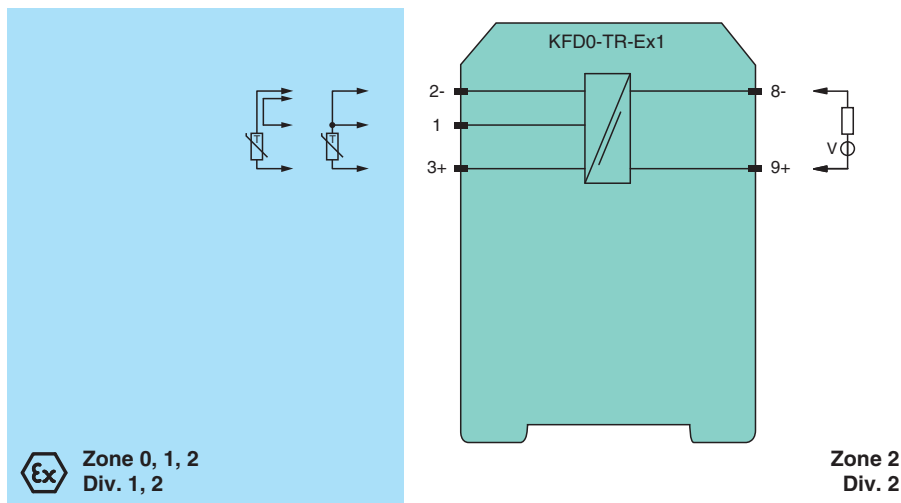
- 1-channel isolated barrier
- 24 V DC supply (loop powered)
- 2- or 3-wire Pt100 RTD input
- Output 4 mA ... 20 mA, temperature linearization selectable
- DIP switch selectable ranges
- Sensor breakage detection



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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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

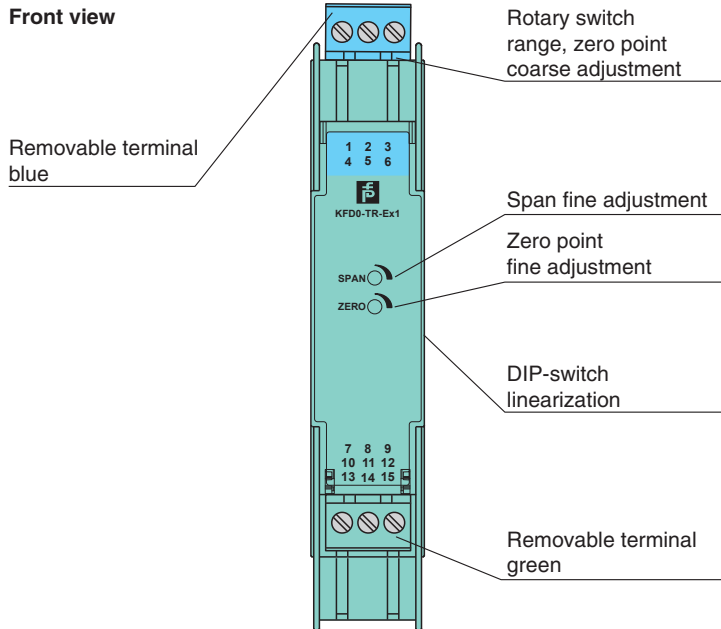
Technical Data

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
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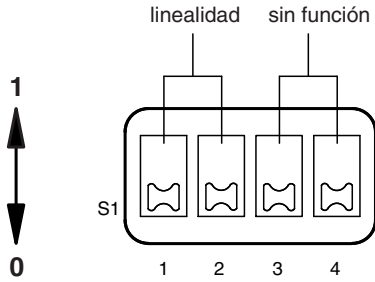
Accessories

	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

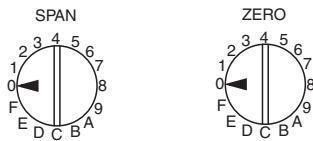
DIP switches function



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