

Thermocouple Converter KFD0-TT-Ex1

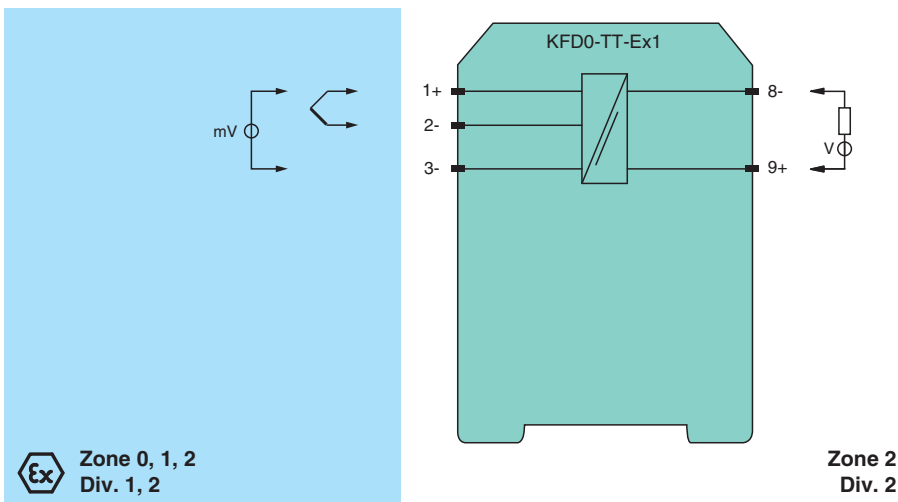
- 1-channel isolated barrier
- 24 V DC supply (loop powered)
- Thermocouple input
- Output 4 mA ... 20 mA
- Internal cold junction compensation
- Sensor breakage detection
- DIP switch selectable ranges



Function

This isolated barrier is used for intrinsic safety applications. It is a loop-powered isolator that converts thermocouple inputs in the hazardous area to a 4 mA ... 20mA signal in the safe area. The internal cold junction compensation can be bypassed by using terminals 1 and 3. The output current is linear to input voltage, not proportional to temperature. Zero, span, and burnout detection are field-configurable.

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- thermocouple E, J, K, N, R, S or T, cold junction referenced to 0 °C (32 °F)		
Lead resistance	max. 100 Ω per line		
Current	lead monitoring ON: ≤ 15 nA; OFF: ≤ 1 nA		
Output			

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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 side	control side	
Connection	terminals 9+, 8-	
Load	(U -12 V) / 0.02 A	
Current output	4 ... 20 mA , limited to ≤ 35 mA	
Fault signal	downscaling ≤ 3 mA , upscaling ≥ 22 mA	
Transfer characteristics		
Measurement range	f_n	span 4 ... 100 mV, zero point -12 ... 60 mV , both adjustable
Deviation		
After calibration	0.1 % of full-scale value ± 1 K for the cold junction	
Temperature effect	temperature deviation 0.015 % of the span/K or 1.5 μV/K cold junction ± 2 K (calibrated at $T_{amb} = 20\text{ °C}$ (68 °F))	
Influence of supply voltage	6.5 ppm/V	
Characteristic curve	the output voltage is linearly proportionate to the input voltage (not to temperature)	
Rise time	250 ms	
Galvanic isolation		
Input/Output	safe isolation according to EN 50178, rated insulation voltage 253 V _{eff}	
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) , 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 0035	
Marking	⊕ II (1)GD [Ex ia] IIC	
Voltage	U_o	16.1 V
Current	I_o	0.8 mA
Power	P_o	3.2 mW
Output		
Maximum safe voltage	U_m	60 V (Attention! The rated voltage can be lower.)
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 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-15:2010	
International approvals		
CSA approval		
Control drawing	116-0132	

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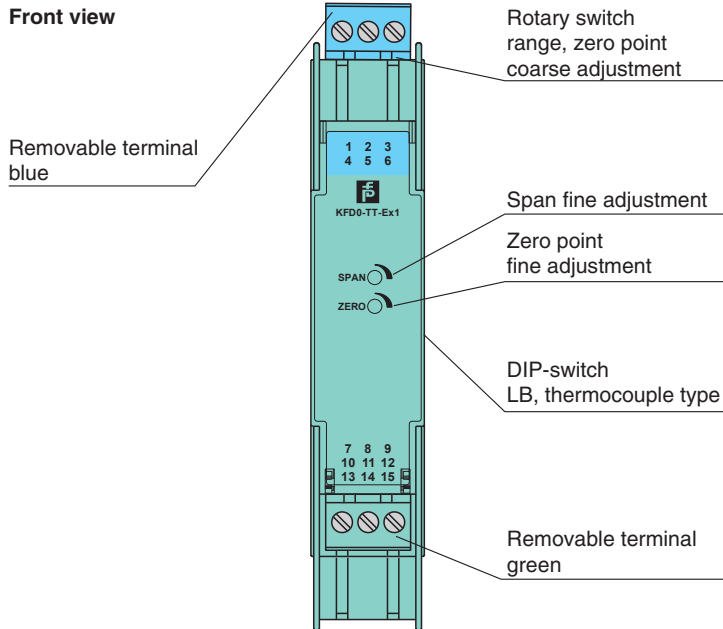
Technical Data

General information

Supplementary information

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

Assembly



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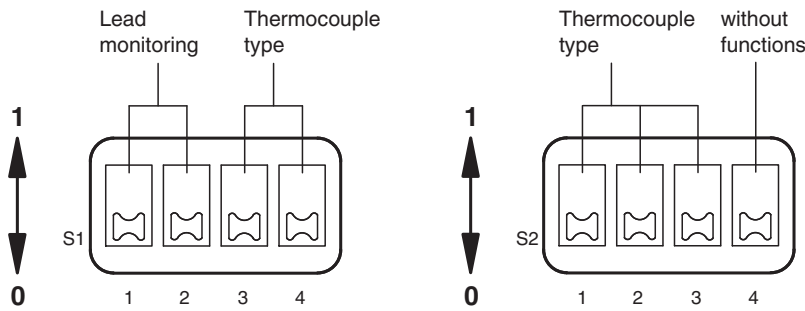
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Configuration

DIP switches function

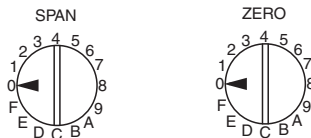


Switch	Position	Function
S1.1/S1.2	1/0	LB UP-upscaled
S1.1/S1.2	0/1	LB DOWN-downscaled
S1.3	1	Thermocouple type E
S1.4	1	Thermocouple type J
S2.1	1	Thermocouple type K, T
S2.2	1	Thermocouple type N
S2.3	1	Thermocouple type R, S

* other combinations not allowed/defined

Note: A new adjustment is necessary in the case of modified configuration (e. g. LB from upscaled to downscaled).

Rotary switches function



Please consider that the values of the Zero-table are only valid for the span range Pos. 0 and that both tables contain typical values, which can be used as an adjustment help.

Switch SPAN coarse adjustment	Span (mV)	Switch ZERO coarse adjustment	Zero point (mV) for max. span (potentiometer right-hand stop)	Zero point (mV) for min. span (potentiometer left-hand stop)
0	100.0 ... 53.0	0	-12.0 ... -8.0	-13.6 ... -8.5
1	55.0 ... 30.0	1	-8.3 ... -3.7	-9.0 ... -4.0
2	32.0 ... 20.0	2	-4.0 ... 1.0	-4.3 ... 1.1
3	22.0 ... 5.0	3	0.5 ... 5.6	0.5 ... 6.1
4	17.0 ... 12.0	4	4.6 ... 10.2	5.2 ... 11.2
5	14.0 ... 11.0	5	9.3 ... 14.9	10.2 ... 16.2
6	13.0 ... 9.0	6	13.9 ... 19.5	15.2 ... 21.1
7	11.0 ... 8.0	7	18.3 ... 23.9	20.1 ... 25.6
8	10.0 ... 7.0	8	23.0 ... 28.6	24.7 ... 31.0
9	9.0 ... 6.0	9	27.6 ... 33.1	30.0 ... 36.0
A	8.0 ... 5.5	A	32.1 ... 37.6	35.0 ... 40.5
B	7.5 ... 5.0	B	36.6 ... 42.1	39.4 ... 46.0
C	7.0 ... 4.5	C	41.1 ... 46.6	45.1 ... 51.0
D	6.5 ... 4.2	D	45.5 ... 51.0	50.1 ... 56.0
E	6.2 ... 4.1	E	50.0 ... 55.5	55.0 ... 61.0
F	6.1 ... 4.0	F	54.4 ... 60.0	60.0 ... 62.0

Recommendation for adjustment:

1. Span determination (in mV).
2. "Span coarse adjustment" in accordance with the table.
3. Minimum value adjustment (in mV or °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 mV or °C) at the input.
7. "Span fine adjustment" to exactly 20 mA.
8. If necessary repeat fine adjustment for 4 mA and 20 mA.

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