Features

- 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

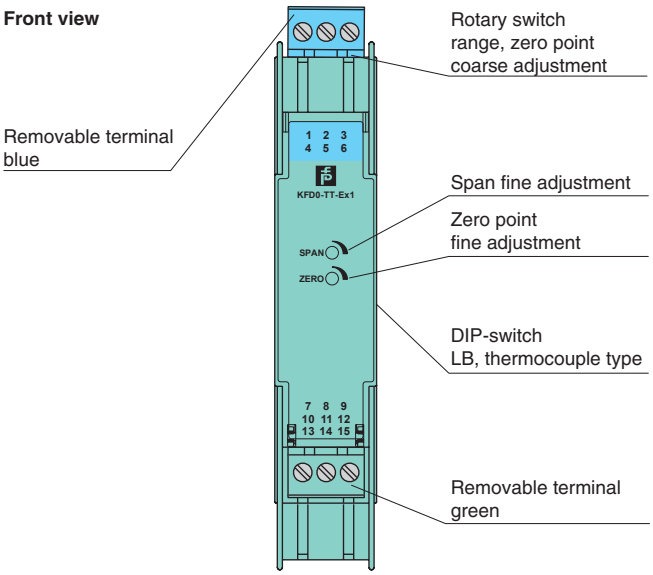
Function

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 ... 20 mA signal in the safe area.

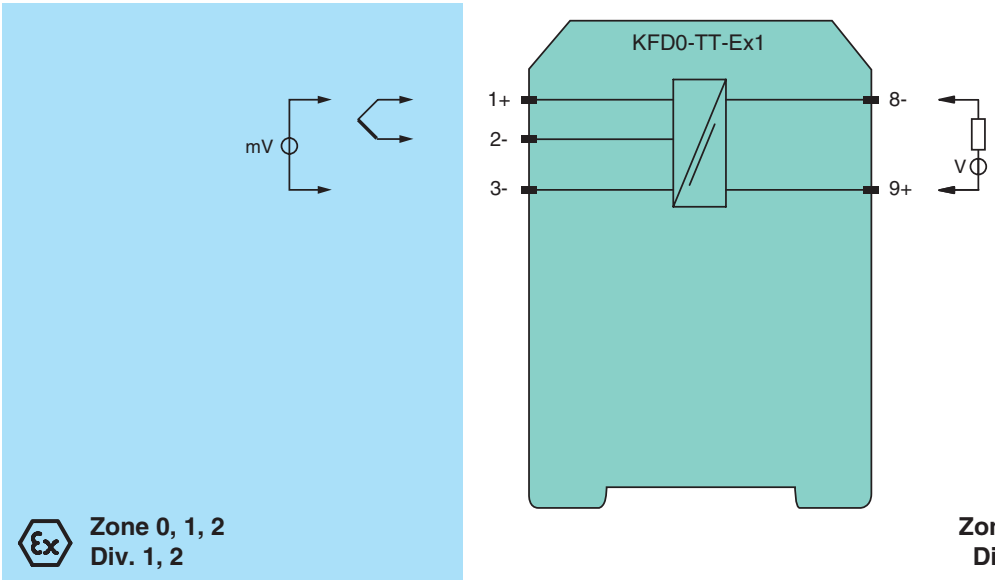
The internal cold junction compensation can be bypassed by using terminals 1 and 3.

The output current is linear to input voltage, not proportional to temperature. Zero, span, and burnout detection are field-configurable.

Assembly



Connection



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General specifications		
Signal type		Analog input
Supply		
Rated voltage	U_n	12 ... 35 V DC loop powered
Power loss		0.4 W
Input		
Connection		terminals 1+, 2-, 3- thermocouple E, J, K, N, R, S or T, cold junction referenced to 0 °C (32 °F)
Lead resistance		≤ 100 Ω per lead
Current		lead monitoring ON: ≤ 15 nA; OFF: ≤ 1 nA
Output		
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 °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
Electrical isolation		
Input/Output		safe isolation according to EN 50178, rated insulation voltage 253 V_{eff}
Directive conformity		
Electromagnetic compatibility		
Directive 2004/108/EC		EN 61326-1:2006
Conformity		
Insulation coordination		EN 50178
Electrical isolation		EN 50178
Electromagnetic compatibility		NE 21
Degree of protection		IEC 60529
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Mass		approx. 150 g
Dimensions		20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in) , housing type B2
Data for application in connection with Ex-areas		
EC-Type Examination Certificate		ZELM 00 ATEX 0035 , for additional certificates see www.pepperl-fuchs.com
Group, category, type of protection		⟨Ex⟩ II (1)GD [EEx ia] IIC
Voltage	U_o	16.1 V
Current	I_o	0.8 mA
Power	P_o	3.2 mW
Type of protection [EEx ia and EEx ib]		
Output		
Maximum safe voltage	U_m	60 V (Attention! The rated voltage can be lower.)
Statement of conformity		TÜV 01 ATEX 1777X , observe statement of conformity
Group, category, type of protection, temperature class		⟨Ex⟩ II 3G Ex nA II T4
Electrical isolation		
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 94/9/EC		EN 50014, EN 50020 , EN 60079-0:2006, EN 60079-15:2005
International approvals		
CSA approval		
Control drawing		116-0132
General information		
Supplementary information		EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com.

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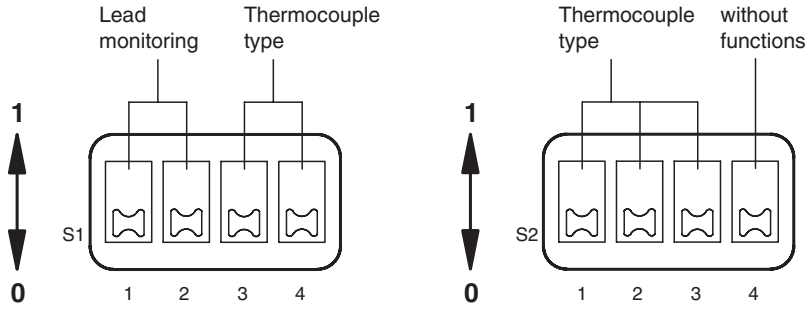
Configuration

DIP switches function

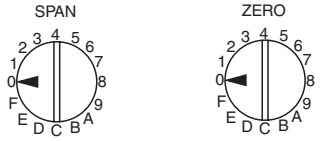


Switch	Position	Function
S1.1/S1.2	1/0	LB UP-upscaled
S1.1/S1.2	0/1	LB DOWN-downscaled
S1.3	1	Thermocouple type E
S1.4	1	Thermocouple type J
S2.1	1	Thermocouple type K, T
S2.2	1	Thermocouple type N
S2.3	1	Thermocouple type R, S

* 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)
0	100.0 ... 53.0
1	55.0 ... 30.0
2	32.0 ... 20.0
3	22.0 ... 5.0
4	17.0 ... 12.0
5	14.0 ... 11.0
6	13.0 ... 9.0
7	11.0 ... 8.0
8	10.0 ... 7.0
9	9.0 ... 6.0
A	8.0 ... 5.5
B	7.5 ... 5.0
C	7.0 ... 4.5
D	6.5 ... 4.2
E	6.2 ... 4.1
F	6.1 ... 4.0

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	-12.0 ... -8.0	-13.6 ... -8.5
1	-8.3 ... -3.7	-9.0 ... -4.0
2	-4.0 ... 1.0	-4.3 ... 1.1
3	0.5 ... 5.6	0.5 ... 6.1
4	4.6 ... 10.2	5.2 ... 11.2
5	9.3 ... 14.9	10.2 ... 16.2
6	13.9 ... 19.5	15.2 ... 21.1
7	18.3 ... 23.9	20.1 ... 25.6
8	23.0 ... 28.6	24.7 ... 31.0
9	27.6 ... 33.1	30.0 ... 36.0
A	32.1 ... 37.6	35.0 ... 40.5
B	36.6 ... 42.1	39.4 ... 46.0
C	41.1 ... 46.6	45.1 ... 51.0
D	45.5 ... 51.0	50.1 ... 56.0
E	50.0 ... 55.5	55.0 ... 61.0
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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