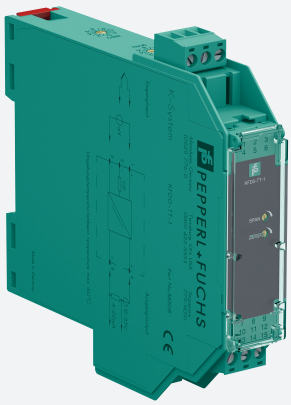


Thermocouple Converter

KFD0-TT-1

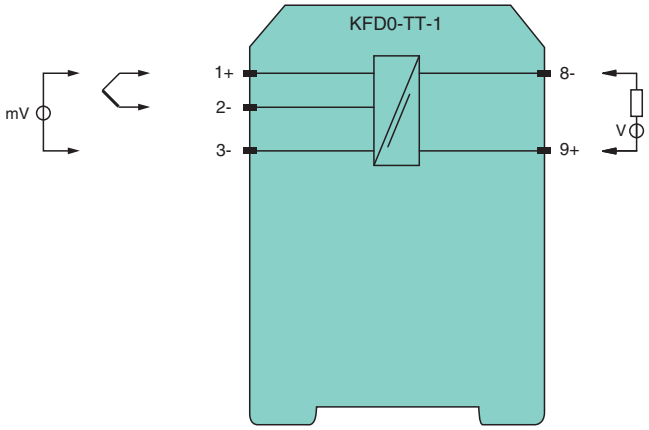
- 1-channel signal conditioner
- 24 V DC supply (loop powered)
- Thermocouple input
- Output 4 mA ... 20 mA
- Internal cold junction compensation
- Sensor breakage detection
- DIP switch selectable ranges

CE

Function

This isolated signal conditioner is a loop-powered isolator that converts thermocouple inputs to a 4 mA ... 20 mA signal and provides isolation for non-intrinsically safe applications.
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- thermocouples type 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

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Technical Data

Output		
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 °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) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions
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
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com.

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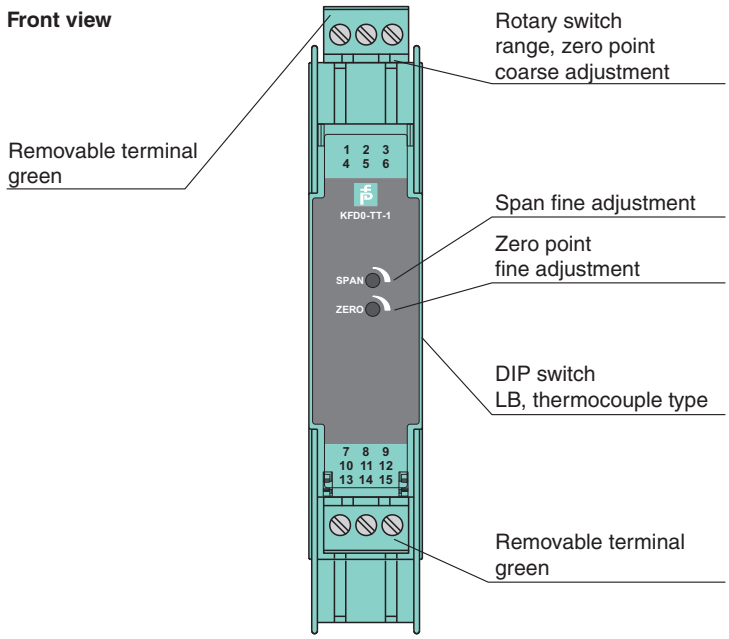
Assembly



Matching System Components

	**K-DUCT-GY**	Profile rail, wiring comb field side, gray

Accessories

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

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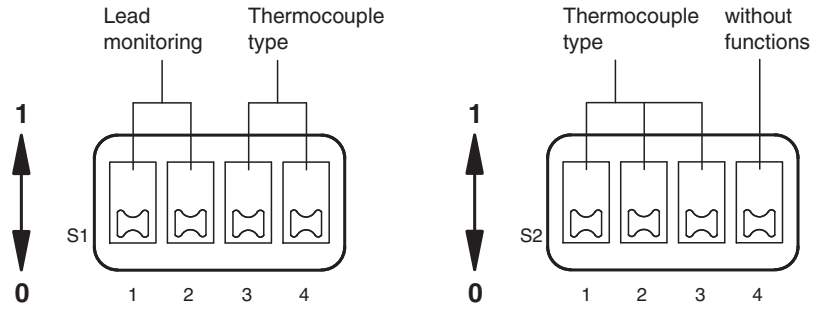
Configuration

DIP switches function

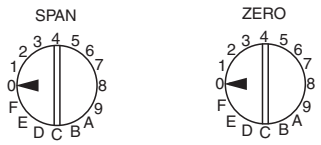


Switch	Position	Function	
S1.1/S1.2	1/0	LB UP-upscaled	}*
S1.1/S1.2	0/1	LB DOWN-downscaled	
S1.3	1	Thermocouple type E	
S1.4	1	Thermocouple type J	
S2.1	1	Thermocouple type K, T	
S2.2	1	Thermocouple type N	
S2.3	1	Thermocouple type R, S	

* 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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