

2212

In-head transmitter for CombiTemp- or OEM applications

2212-000#.#

Overview

- Programmable through integrated USB port
- Sensor calibration for either offset, slope or polynomial adjustment
- Accuracy better than 0.1°C for RTD elements
- Automatic cable compensation calibration (2-wire)
- Fast sampling time < 50 ms
- Galvanic isolated
- ATEX and IECEx certified



Picture similar



Technical data

Ambient conditions

Operating temperature range	-40 ... 85 °C
Storage temperature range	-50 ... 85 °C
Degree of protection (EN 60529)	IP 55
Humidity	< 98 % RH , condensing
Insulation voltage	1.5 kV AC

Input signal

Range	Refer to section "Operating conditions"
Connection variants	2-wire 3-wire 4-wire
Measuring unit	°C °F K
Min. measuring span	Refer to section "Operating conditions"
Resolution	17 bit
RTD measuring current	0.16 mA , continuous
Sample time	≤ 0.1 s
Accuracy	Refer to section "Operating conditions"
CJC-compensation	< 0.5 °C , internal < 0.2 °C , external
Input resistance	> 20 MΩ , typ.
Cable resistance	< 30 Ω/wire , 2-wire < 30 Ω/wire , 3/4-wire (T < 700°C) < 15 Ω/wire , 3/4-wire (T > 700°C)
Repeatability	Refer to section "Operating conditions"
Offset adjustment	± 500 °C , max.
Suppression	50 Hz 60 Hz
Protection	± 35 V DC

Input signal

Error detection delay	< 2.0 s
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Output signal

Characteristic	Linear or customised with max. 30 points
Output signal	4 ... 20 mA , 2-wire 20 ... 4 mA , 2-wire
Accuracy	< 0.025 % FSR
Step response time, T90	< 450 ms
Temperature drift	± 0.01 %/K , max.
Load resistance	$R_s \leq (V_{DC} - 7 V)/0.023 A$
Resolution	14 bit
Up/Down scaling limits	23 mA / 3.5 mA
Ripple immunity	< 1 % FSR (1 Vrms, 50Hz...1kHz)
Effect of variations in supply voltage	0.001 %/V
Damping	0 ... 60 s

Housing

Style	Compact transmitter, Ø44 mm DIN form B compatible
Overall size	Refer to section "Dimensional drawings"
Material	Polycarbonate

Power supply

Voltage supply range	7 ... 40 V DC , without DFON touch screen 13.5 ... 40 V DC , with DFON touch screen
Power-up time	< 3 s , RTD, Ohm, mV < 5 s , T/C
Reverse polarity protection	Yes

Factory settings

Sensor type class	RTD
Sensor type	Pt100
Connection	2-wire

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Technical data

Factory settings

Unit	°C
Output range	0 ... 100 °C
Damping	0 s
Output at sensor fault	23 mA

IECEX/ATEX II 1 G Ex ia IIC T6...T4 Ga

Maximum values for barrier selection, Ui	30 V DC
Maximum values for barrier selection, Ii	95 mA
Maximum values for barrier selection, Pi	750 mW

Internal capacitance, Ci	11 nF 26 nF , with DFON touch screen (ATEX only)
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Internal inductance, Li	24 µH 34 µH , with DFON touch screen (ATEX only)
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Temperature class, T1 ... T4	- 40 < Tamb < 80 °C - 20 < Tamb < 60 °C, with DFON touch screen (ATEX only)
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Temperature class, T5	- 40 < Tamb < 71 °C - 20 < Tamb < 60 °C, with DFON touch screen (ATEX only)
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IECEX/ATEX II 1 G Ex ia IIC T6...T4 Ga

Temperature class, T6	- 40 < Tamb < 56 °C
Sensor circuit, Uo	10.5 V DC
Sensor circuit, Io	19 mA
Sensor circuit, Po	55 mW
Sensor circuit, Co	2 µF
Sensor circuit, Lo	94 mH

IECEX/ATEX II 3 G Ex ec IIC T6...T5 Gc

Voltage supply range, Un	30 V DC
Current rating, In	20 mA
Temperature class, T1 ... T5	- 40 < Tamb < 80 °C
Temperature class, T6	- 40 < Tamb < 31 °C
Sensor circuit, Uo	2.3 V DC
Sensor circuit, Io	0.2 mA

Compliance and approvals

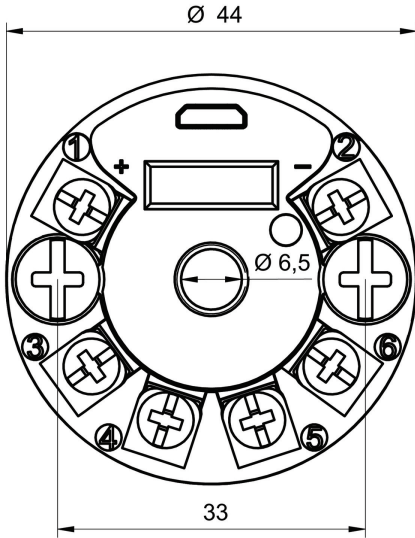
EMC	EN 61326-1 EN 50121-3-2:2016
Namur	NE21
Explosion protection	ATEX II 1 G Ex ia IIC T6...T4 ATEX II 3 G Ex ec IIC T6...T5 Gc IECEX Ex ia IIC T6...T4 IECEX Ex ec IIC T6...T5 Gc

Operating conditions

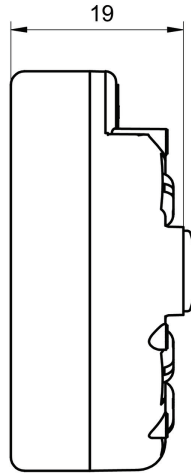
Type	Standard	Measuring range	Min. measuring span	Type	Range	Repeatability	Input accuracy	Input temperature drift (by ambient)	
Pt25...Pt1000	DIN/EN/IEC 60751	-200...850°C	10°C	Pt100-Pt200	-200...200°C	≤ ± 0.03°C	≤ ± 0.05°C	≤ ± 0.01 °C/°C change	
					200...850°C		≤ ± 0.06°C	≤ ± 0.015 °C/°C change	
					Pt500	-200...200°C	≤ ± 0.07°C	≤ ± 0.14°C	≤ ± 0.04 °C/°C change
Pt25...Pt1000	a= 0.003902	-150...650°C	10°C	Pt500	200...850°C	≤ ± 0.09°C	≤ ± 0.18°C	≤ ± 0.05 °C/°C change	
					Pt1000	-200...200°C	≤ ± 0.04°C	≤ ± 0.07°C	≤ ± 0.02 °C/°C change
						200...850°C	≤ ± 0.09°C	≤ ± 0.025 °C/°C change	
Pt25...Pt1000	a= 0.003916	-200...720°C	10°C	Pt100-Pt200	-150...650°C	≤ ± 0.03°C	≤ ± 0.05°C	≤ ± 0.013 °C/°C change	
					Pt500	-150...200°C	≤ ± 0.07°C	≤ ± 0.14°C	≤ ± 0.04 °C/°C change
						200...650°C	≤ ± 0.08°C	≤ ± 0.16°C	≤ ± 0.044 °C/°C change
Pt25...Pt1000	a= 0.003916	-200...720°C	10°C	Pt1000	-150...200°C	≤ ± 0.04°C	≤ ± 0.07°C	≤ ± 0.019 °C/°C change	
						200...650°C	≤ ± 0.08°C	≤ ± 0.022 °C/°C change	
					Pt100-Pt200	-200...200°C	≤ ± 0.03°C	≤ ± 0.04°C	≤ ± 0.01 °C/°C change
Pt25...Pt1000	a= 0.003920	-200...660°C	10°C	Pt500	200...720°C	≤ ± 0.08°C	≤ ± 0.16°C	≤ ± 0.045 °C/°C change	
					Pt1000	-200...200°C	≤ ± 0.04°C	≤ ± 0.07°C	≤ ± 0.019 °C/°C change
						200...720°C	≤ ± 0.08°C	≤ ± 0.022 °C/°C change	
Pt25...Pt1000	a= 0.003920	-200...660°C	10°C	Pt100-Pt200	-200...200°C	≤ ± 0.03°C	≤ ± 0.05°C	≤ ± 0.01 °C/°C change	
						200...660°C	≤ ± 0.06°C	≤ ± 0.013 °C/°C change	
					Pt500	-200...200°C	≤ ± 0.07°C	≤ ± 0.14°C	≤ ± 0.04 °C/°C change
Ni25...Ni1000	DIN 43760	-60...250°C	10°C	Ni500	200...660°C	≤ ± 0.08°C	≤ ± 0.16°C	≤ ± 0.045 °C/°C change	
					Pt1000	-200...200°C	≤ ± 0.04°C	≤ ± 0.07°C	≤ ± 0.019 °C/°C change
						200...660°C	≤ ± 0.08°C	≤ ± 0.022 °C/°C change	
Cu25...Cu1000	0.428 Ohm/°C	-50...200°C	10°C	Cu50	-200...200°C	≤ ± 0.03°C	≤ ± 0.05°C	≤ ± 0.01 °C/°C change	
						100...250°C	≤ ± 0.04°C	≤ ± 0.08°C	≤ ± 0.02 °C/°C change
					Cu100-Cu200	-60...100°C	≤ ± 0.06°C	≤ ± 0.11°C	≤ ± 0.03 °C/°C change
B(PtRh30-Pt)	IEC 584	100...1820°C	200°C	Ni1000	100...250°C	≤ ± 0.02°C	≤ ± 0.04°C	≤ ± 0.01 °C/°C change	
						100...250°C	≤ ± 0.04°C	≤ ± 0.08°C	≤ ± 0.02 °C/°C change
						-60...100°C	≤ ± 0.03°C	≤ ± 0.06°C	≤ ± 0.015 °C/°C change
E(NiCr-CuNi)	IEC 584	-250...1000°C	50°C	Cu50	100...250°C	≤ ± 0.02°C	≤ ± 0.04°C	≤ ± 0.01 °C/°C change	
						100...250°C	≤ ± 0.04°C	≤ ± 0.08°C	≤ ± 0.02 °C/°C change
						-50...200°C	≤ ± 0.04°C	≤ ± 0.08°C	≤ ± 0.02 °C/°C change
J(Fe-CuNi)	IEC 584	-210...1200°C	50°C	Cu100-Cu200	-50...200°C	≤ ± 0.02°C	≤ ± 0.04°C	≤ ± 0.01 °C/°C change	
						100...500°C	≤ ± 5°C	≤ ± 10°C	≤ ± 3.3 °C/°C change
						500...1000°C	≤ ± 1°C	≤ ± 2.0°C	≤ ± 0.6 °C/°C change
K(NiCr-Ni)	IEC 584	-250...1370°C	100°C	Cu100-Cu200	1000...1820°C	≤ ± 0.6°C	≤ ± 1.1°C	≤ ± 0.33 °C/°C change	
						-250...-40°C	≤ ± 0.5°C	≤ ± 1.03°C	≤ ± 0.3 °C/°C change
						-40...150°C	≤ ± 0.1°C	≤ ± 0.19°C	≤ ± 0.06 °C/°C change
L(Fe-CuNi)	DIN 43710	-200...900°C	50°C	Cu100-Cu200	150...1000°C	≤ ± 0.07°C	≤ ± 0.14°C	≤ ± 0.042 °C/°C change	
						-210...-40°C	≤ ± 0.25°C	≤ ± 0.52°C	≤ ± 0.16 °C/°C change
						-40...150°C	≤ ± 0.1°C	≤ ± 0.21°C	≤ ± 0.07 °C/°C change
N(NiCrSi-NiSi)	IEC 584	-250...1300°C	50°C	Cu100-Cu200	150...1200°C	≤ ± 0.09°C	≤ ± 0.18°C	≤ ± 0.055 °C/°C change	
						-250...-40°C	≤ ± 1°C	≤ ± 2.04°C	≤ ± 0.6 °C/°C change
						-40...150°C	≤ ± 0.15°C	≤ ± 0.27°C	≤ ± 0.08 °C/°C change
R(PtRh13-Pt)	IEC 584	-50...1750°C	100°C	Cu100-Cu200	150...1370°C	≤ ± 0.13°C	≤ ± 0.25°C	≤ ± 0.075 °C/°C change	
						-200...50°C	≤ ± 0.17°C	≤ ± 0.33°C	≤ ± 0.1 °C/°C change
						50...620°C	≤ ± 0.1°C	≤ ± 0.20°C	≤ ± 0.06 °C/°C change
S(PtRh10-Pt)	IEC 584	-50...1760°C	100°C	Cu100-Cu200	620...900°C	≤ ± 0.09°C	≤ ± 0.17°C	≤ ± 0.05 °C/°C change	
						-250...-40°C	≤ ± 1.75°C	≤ ± 3.45°C	≤ ± 1.0 °C/°C change
						-40...500°C	≤ ± 0.2°C	≤ ± 0.40°C	≤ ± 0.12 °C/°C change
T(Cu-CuNi)	IEC 584	-250...400°C	50°C	Cu100-Cu200	500...1300°C	≤ ± 0.13°C	≤ ± 0.26°C	≤ ± 0.08 °C/°C change	
						-50...100°C	≤ ± 1.35°C	≤ ± 2.7°C	≤ ± 0.8 °C/°C change
						100...500°C	≤ ± 0.7°C	≤ ± 1.33°C	≤ ± 0.4 °C/°C change
U(Cu-CuNi)	DIN 43710	-200...600°C	50°C	Cu100-Cu200	500...1750°C	≤ ± 0.45°C	≤ ± 0.9°C	≤ ± 0.28 °C/°C change	
						-50...100°C	≤ ± 1.3°C	≤ ± 2.5°C	≤ ± 0.75 °C/°C change
						100...500°C	≤ ± 0.7°C	≤ ± 1.37°C	≤ ± 0.41 °C/°C change
W3-Re (Type D)	ASTM 988	0...2300°C	100°C	Cu100-Cu200	500...1760°C	≤ ± 0.5°C	≤ ± 1.01°C	≤ ± 0.3 °C/°C change	
						-250...-40°C	≤ ± 0.8°C	≤ ± 1.6°C	≤ ± 0.5 °C/°C change
						-40...100°C	≤ ± 0.15°C	≤ ± 0.29°C	≤ ± 0.09 °C/°C change
W5-Re (Type C)	ASTM 988	0...2310°C	100°C	Cu100-Cu200	100...400°C	≤ ± 0.1°C	≤ ± 0.21°C	≤ ± 0.065 °C/°C change	
						-200...50°C	≤ ± 0.25°C	≤ ± 0.5°C	≤ ± 0.15 °C/°C change
						50...300°C	≤ ± 0.13°C	≤ ± 0.25°C	≤ ± 0.08 °C/°C change
Linear voltage			5 mV		-140...140 mV	≤ ± 0.005 mV	≤ ± 10 µV	≤ ± 0.007 mV/°C change	
			75 mV		-500...2000 mV	≤ ± 0.1 mV	≤ ± 125 µV	≤ ± 0.04 mV/°C change	
			5 Ω		0...390 Ω	≤ ± 0.007 Ω	≤ ± 15 mΩ	≤ ± 0.004 Ω/°C change	
Linear resistance			5 Ω		0...820 Ω	≤ ± 0.015 Ω	≤ ± 30 mΩ	≤ ± 0.007 Ω/°C change	
			50 Ω		0...7000 Ω	≤ ± 0.15 Ω	≤ ± 250 mΩ	≤ ± 0.07 Ω/°C change	
			50 Ω						

Dimensional drawings (mm)

Housing



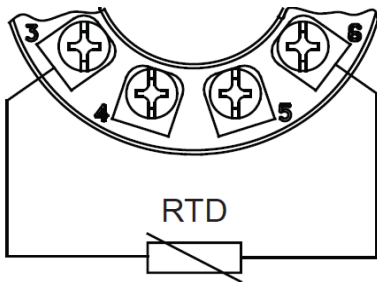
Front view



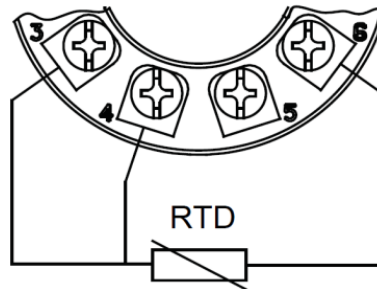
Side view

Electrical connection

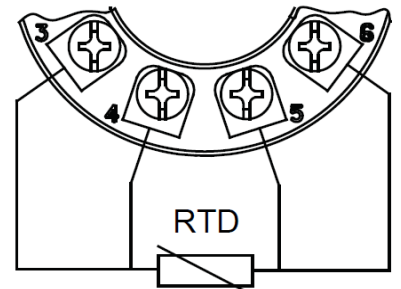
RTD



No cable compensation

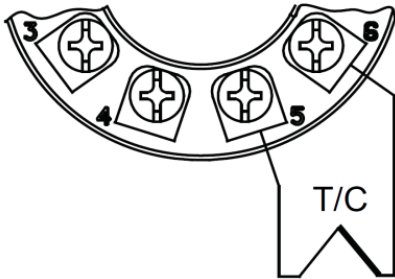


3-wire cable compensation

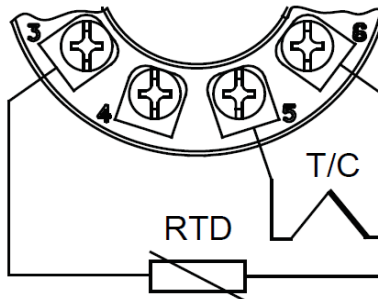


4-wire cable compensation

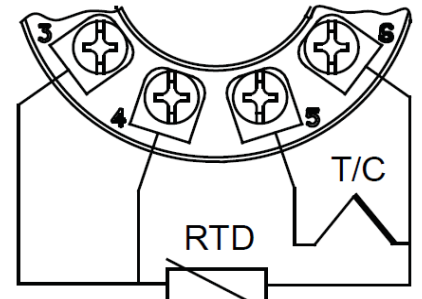
T/C



Internal CJC-compensation



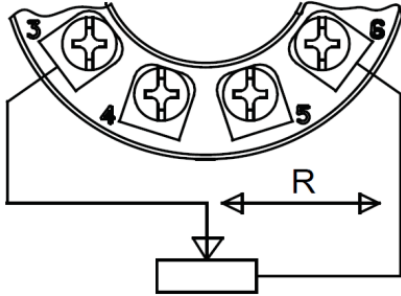
External CJC-compensation, no cable compensation



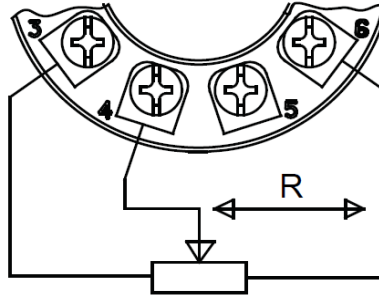
External CJC-compensation, 3-wire cable compensation

Electrical connection

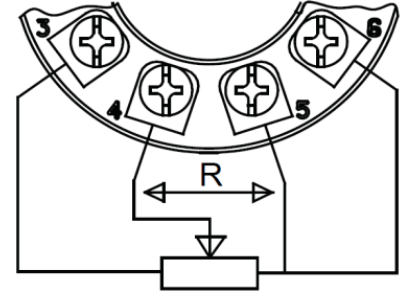
Potentiometer



No compensation

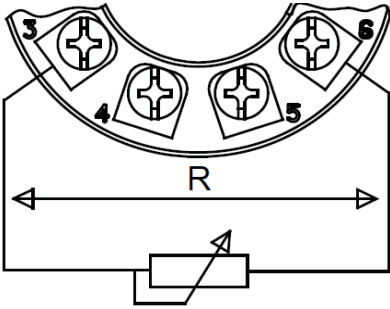


3-wire compensation for transfer resistance

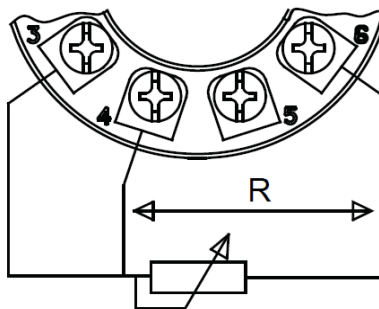


4-wire compensation for transfer resistance

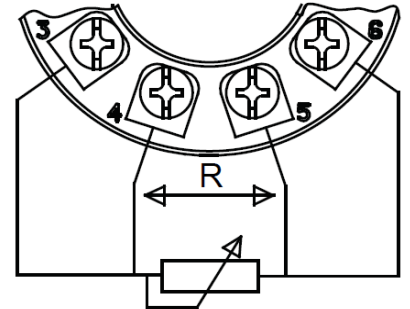
Resistance



No compensation

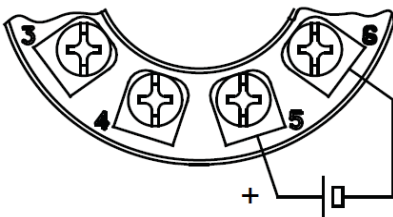


3-wire cable compensation

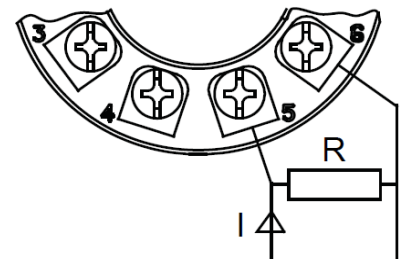


4-wire cable compensation

Voltage measurement



Current measurement



Ordering information

Ordering key - Configuration possibilities see website

	22	12	-	####	.	#
Product	22					
Type		12				
Universal input / 4-20 mA out / USB						
Safety						
Standard						0001
IECEX / ATEX ia						0002
IECEX / ATEX ec						0003
Configuration						
None						0
Programmed acc. to customer specification						C