



### Product highlights

- 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
- IECEx / ATEX pending

### Application examples

- Tanks and vessels
- Pipe systems
- Food & Beverage
- Water & Waste water

### Technical data

#### Housing

Style	<ul style="list-style-type: none"> <li>■ Compact transmitter, Ø44 mm</li> <li>■ DIN Form B compatible</li> </ul>
Overall size	■ Refer to section "Dimensional drawings"
Material	■ Polycarbonate

#### Power supply

Voltage supply range	■ 7 ... 40 VDC
Reverse polarity protection	■ Yes
Power-up time	■ < 5 s

#### Input

Accuracy	■ Refer to section "Measuring range"
Min. measuring span	■ Refer to section "Measuring range"
Cable resistance	<ul style="list-style-type: none"> <li>■ 2-wire: max. 30 Ω/Cable</li> <li>■ 3-/4-wire: max. 30 Ω/Cable (T &lt; 700 °C)</li> <li>■ 3-/4-wire: max. 15 Ω/Cable (T &gt; 700 °C)</li> </ul>
CJC compensation	<ul style="list-style-type: none"> <li>■ Internal: &lt; 0.5 °C</li> <li>■ External: &lt; 0.2 °C</li> </ul>
Sample time	■ < 0.1 s
RTD measuring current	■ < 0.16 mA
Error detection delay	■ < 2 s
Temperature drift (by ambient)	■ Refer to section "Measuring range"
Measuring unit	■ °C, °F or K
Protection	■ ± 35 VDC
Suppression	■ 50 or 60 Hz
Resolution	■ 17 bit
Repeatability	■ Refer to section "Measuring range"
Offset adjustment	■ ± 500 °C

#### Output

Output signal	<ul style="list-style-type: none"> <li>■ 4 ... 20 mA</li> <li>■ 20 ... 4 mA</li> </ul>
Characteristics	■ Linear or customised with max. 30 points

#### Output

Accuracy	■ < ± 0.025 % of output span
Shunt resistance	■ $R_s \leq (V_s - 7 V) / 0.023 A [\Omega]$
Up/Down scaling limits	■ 23 mA / 3.5 mA
Damping	■ 0 ... 60 s
Response time T90	■ 450 ms
Resolution	■ 14 bit
Effect of variations in supply voltage	■ < 0.001 % / V
Temperature drift (by ambient)	■ < ± 0.01 % / °C change
Ripple immunity	■ < ± 1 % of output span

#### Ambient conditions

Operating temperature range	■ -40 ... 85 °C
Storage temperature range	■ -50 ... 85 °C
Humidity	■ < 98 % RH, condensing
Degree of protection (EN 60529)	■ IP55

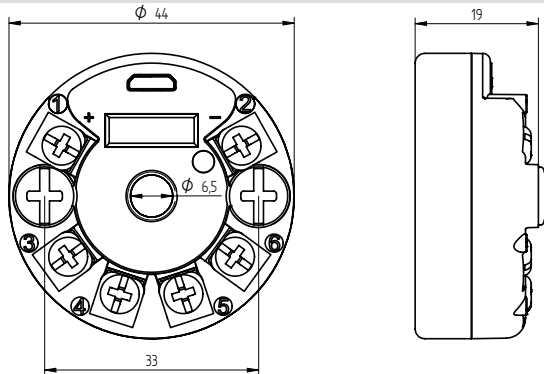
#### Compliance and approvals

EMC	<ul style="list-style-type: none"> <li>■ EN 61326-3-1:2017</li> <li>■ DNV GL - Class A</li> </ul>
Namur	■ NE21 (pending)
Railway	■ EN 50121 (pending)
Explosion protection	<ul style="list-style-type: none"> <li>■ ATEX (pending)</li> <li>■ IECEx (pending)</li> </ul>

#### Factory settings

Type	■ Pt100
Unit	■ °C
Measuring span	■ 0.0...100.0
Connection	■ 2-wire
Cable resistance	■ 0 Ω
Damping	■ 0 s
Sensor break detection	■ 23 mA

## Dimensional drawings



## Description

The FlexTop 2212 is a 4...20 mA loop-powered, configurable universal transmitter with galvanic isolation between input and output. The input can be configured for RTD or T/C sensors, resistance, current or voltage signals. Either 2-, 3- or 4-wire connection can be selected for the resistance input. The built-in temperature sensor or an external RTD element can be used to compensate for „cold junction“ (CJC) if thermocouples are connected. The configuration is done with the FlexProgram, and the connection can be established using an USB cable directly

mounted between the FlexTop and a PC. The FlexTop 2212 is embedded in silicone which makes it resistant to humid environments. It is ready for direct display mounting through UnitCom cable. Furthermore it has a 6.5 mm center hole for fast sensor replacement and spring loaded mounting screws which ensures a safe fastening even in vibrating environments.

## Measuring range

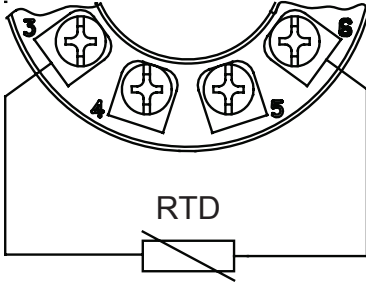
Type	Standard	Measuring range	Min. measuring span	Type	Range	Repeatability	Input accuracy	Input temperature drift (by ambient)
Pt25 ... Pt1000	DIN/EN/IEC 60751	-200 ... 850 °C	10 °C	Pt100-Pt200	-200 ... 200 °C	≤ ± 0.03 °C	≤ ± 0.05 °C	≤ ± 0.01 °C/°C change
					200 ... 850 °C		≤ ± 0.06 °C	≤ ± 0.015 °C/°C change
				Pt500	-200 ... 200 °C	≤ ± 0.07 °C	≤ ± 0.14 °C	≤ ± 0.04 °C/°C change
					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= 0.003902	-150 ... 650 °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
				Pt500	200 ... 650 °C	≤ ± 0.08 °C	≤ ± 0.16 °C	≤ ± 0.044 °C/°C change
					Pt1000	-150 ... 200 °C	≤ ± 0.04 °C	≤ ± 0.07 °C
				Pt1000	200 ... 650 °C	≤ ± 0.08 °C		≤ ± 0.022 °C/°C change
				Pt25 ... Pt1000	a= 0.003916	-200 ... 720 °C	10 °C	Pt100-Pt200
200 ... 720 °C	≤ ± 0.05 °C	≤ ± 0.013 °C/°C change						
Pt500	-200 ... 200 °C	≤ ± 0.07 °C	≤ ± 0.14 °C					≤ ± 0.04 °C/°C change
	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
					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

**Measuring range**

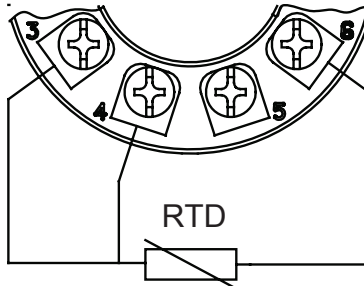
Type	Standard	Measuring range	Min. measuring span	Type	Range	Repeatability	Input accuracy	Input temperature drift (by ambient)
Ni25 ... Ni1000	DIN 43760	-60 ... 250 °C	10 °C	Ni100-Ni200	-60 ... 100 °C	≤ ± 0.03 °C	≤ ± 0.05 °C	≤ ± 0.01 °C/°C change
					100 ... 250 °C		≤ ± 0.04 °C	≤ ± 0.006 °C/°C change
				Ni500	-60 ... 100 °C	≤ ± 0.06 °C	≤ ± 0.11 °C	≤ ± 0.03 °C/°C change
					100 ... 250 °C	≤ ± 0.04 °C	≤ ± 0.08 °C	≤ ± 0.02 °C/°C change
Ni1000	-60 ... 100 °C	≤ ± 0.03 °C	≤ ± 0.06 °C	≤ ± 0.015 °C/°C change				
	100 ... 250 °C	≤ ± 0.02 °C	≤ ± 0.04 °C	≤ ± 0.01 °C/°C change				
Cu25 ... Cu1000	0.428 Ohm/°C	-50 ... 200 °C	10 °C	Cu50	-50 ... 200 °C	≤ ± 0.04 °C	≤ ± 0.08 °C	≤ ± 0.02 °C/°C change
				Cu100-Cu200	-50 ... 200 °C	≤ ± 0.02 °C	≤ ± 0.04 °C	≤ ± 0.01 °C/°C change
B(PtRh30-Pt)	IEC 584	100 ... 1820 °C	200 °C		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
					1000 ... 1820 °C	≤ ± 0.6 °C	≤ ± 1.1 °C	≤ ± 0.33 °C/°C change
E(NiCr-CuNi)	IEC 584	-250 ... 1000 °C	50 °C		-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
					150 ... 1000 °C	≤ ± 0.07 °C	≤ ± 0.14 °C	≤ ± 0.042 °C/°C change
J(Fe-CuNi)	IEC 584	-210 ... 1200 °C	50 °C		-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
					150 ... 1200 °C	≤ ± 0.09 °C	≤ ± 0.18 °C	≤ ± 0.055 °C/°C change
K(NiCr-Ni)	IEC 584	-250 ... 1370 °C	100 °C		-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
					150 ... 1370 °C	≤ ± 0.13 °C	≤ ± 0.25 °C	≤ ± 0.075 °C/°C change
L(Fe-CuNi)	DIN 43710	-200 ... 900 °C	50 °C		-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
					620 ... 900 °C	≤ ± 0.09 °C	≤ ± 0.17 °C	≤ ± 0.05 °C/°C change
N(NiCrSi-NiSi)	IEC 584	-250 ... 1300 °C	50 °C		-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
					500 ... 1300 °C	≤ ± 0.13 °C	≤ ± 0.26 °C	≤ ± 0.08 °C/°C change
R(PtRh13-Pt)	IEC 584	-50 ... 1750 °C	100 °C		-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
					500 ... 1750 °C	≤ ± 0.45 °C	≤ ± 0.9 °C	≤ ± 0.28 °C/°C change
S(PtRh10-Pt)	IEC 584	-50 ... 1760 °C	100 °C		-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
					500 ... 1760 °C	≤ ± 0.5 °C	≤ ± 1.01 °C	≤ ± 0.3 °C/°C change
T(Cu-CuNi)	IEC 584	-250 ... 400 °C	50 °C		-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
					100 ... 400 °C	≤ ± 0.1 °C	≤ ± 0.21 °C	≤ ± 0.065 °C/°C change
U(Cu-CuNi)	DIN 43710	-200 ... 600 °C	50 °C		-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
					300 ... 600 °C	≤ ± 0.09 °C	≤ ± 0.17 °C	≤ ± 0.05 °C/°C change
W5-Re (Type C)	ASTM 988	0 ... 2310 °C	100 °C		0...1750 °C	≤ ± 0.4 °C	≤ ± 0.75 °C	≤ ± 0.22 °C/°C change
					1750...2310 °C	≤ ± 0.55 °C	≤ ± 1.09 °C	≤ ± 0.22 °C/°C change
W3-Re (Type D)	ASTM 988	0 ... 2300 °C	100 °C		0...400 °C	≤ ± 0.5 °C	≤ ± 1 °C	≤ ± 0.3 °C/°C change
					400...1200 °C	≤ ± 0.26 °C	≤ ± 0.52 °C	≤ ± 0.16 °C/°C change
					1200...2300 °C	≤ ± 0.5 °C	≤ ± 1 °C	≤ ± 0.3 °C/°C change
Linear voltage			5 mV		-140...140 mV	≤ ± 0.005 mV	≤ ± 10 µV	≤ ± 0.007 mV/°C change
Linear voltage			75 mV		-500...2000 mV	≤ ± 0.1 mV	≤ ± 125 µV	≤ ± 0.04 mV/°C change
Linear resistance			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
Linear resistance			50 Ω		0...7000 Ω	≤ ± 0.15 Ω	≤ ± 250 mΩ	≤ ± 0.07 Ω/°C change

Electrical connection

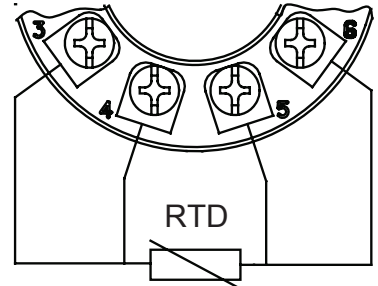
RTD



No cable compensation

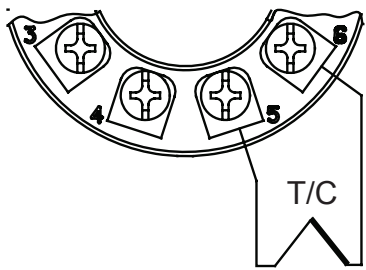


3-wire cable compensation

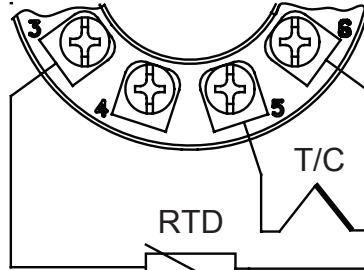


4-wire cable compensation

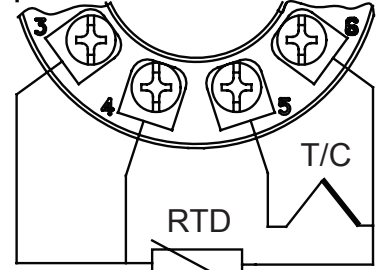
T/C



Internal CJC-compensation

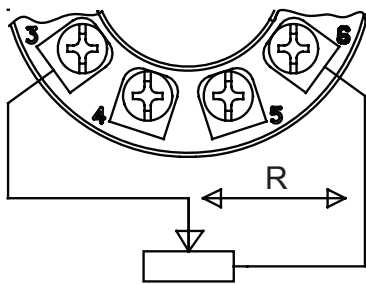


External CJC-compensation, no cable compensation

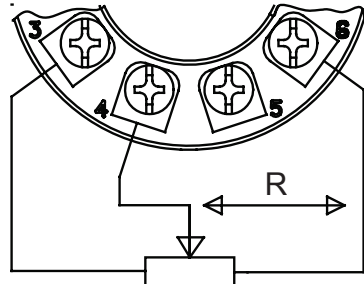


External CJC-compensation, 3-wire cable compensation

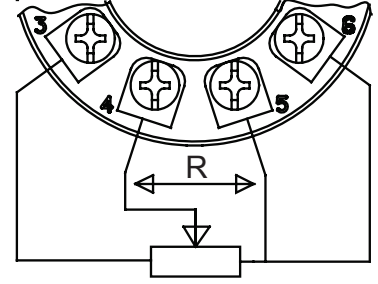
Potentiometer



No compensation



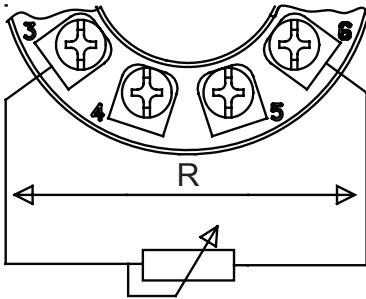
3-wire compensation for transfer resistance



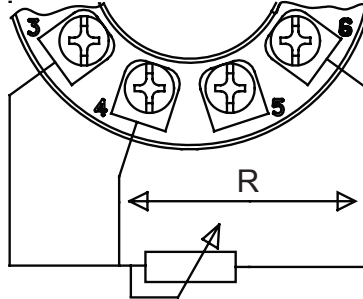
4-wire compensation for transfer resistance

## Electrical connection

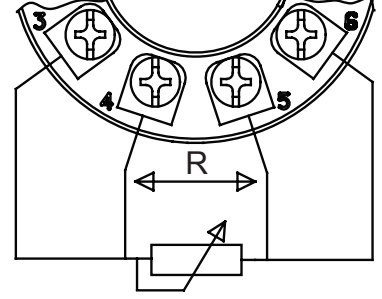
### Resistance



No compensation

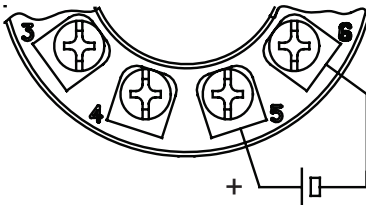


3-wire cable compensation

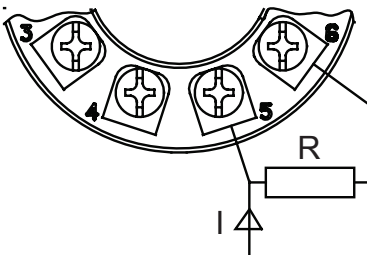


4-wire cable compensation

### Voltage measurement



### Current measurement



## Ordering information

### Ordering Key

	<b>2212</b>	-	<b>000</b>	x	·	<b>x</b>
<b>Product line</b>						
Universal temperature transmitter	2212					
<b>Type</b>						
Standard					1	
<b>Configuration</b>						
Without						0
Configuration of range						C