# FlexTop 2211 Universal Transmitter

**4...20 mA transmitter**

**RTD, T/C, mV and R inputs**

**Isolation voltage 3.75 $kV_{ac}$**

**Configuration via FlexProgrammer**

**Accuracy better than 0.1°C (Pt100)**

**Configurable linearisation, damping and status indication**

**Local, remote or fixed compensation for "cold junction" (CJC)**

**Ex approvals:**
**Demko EEx ia IIC T5/T6, ATEX II 1G**
**FM Class I, Div 1, Groups A, B, C, D**
**FM Class II, Div 1, Groups E, F, G**

## Description

FlexTop 2211 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 a remote Pt100 sensor can be used to compensate for "cold junction" (CJC) if thermocouples are connected.

FlexTop 2211 is embedded in silicone which makes it resistant to humid environments.

The configuration can be established from the dedicated FlexProgrammer configuring tool connected to a PC.

FlexTop 2211 has a 6 mm center hole for fast sensor replacement and spring loaded mounting screws which ensure a safe fastening even in vibrating environments.

BOURDON HAENNI
made to measure

## Technical Data

### Input

| | |
|---|---|
| **Digital accuracy** | See „Measuring ranges“ |
| **CJC-compensation** {1} | Local < 0.5°C |
| | Remote < 0.2°C |
| **RTD measuring current** | 0.2 mA, continuously |
| **Cable resistance** | |
| 2-wire | Max. 30 Ohm/wire {1} |
| 3-/4-wire | T > 600°C: Max. 10 Ohm/wire |
| 3-/4-wire | T < 600°C: Max. 30 Ohm/wire |
| **Protection** | +/- 35 $V_{dc}$ |
| **Suppression** | 50 and 60 Hz |
| **Resolution** | 16 bit |
| **Repeatability** | < 0.05°C |

### Output

| | |
|---|---|
| **Signal span** | 4...20 mA, 2-wire {1} |
| | 20...4 mA, 2-wire {1} |
| **Accuracy** | < 0.1% of signal span |
| Supply range | 6.5...35 Vdc |
| **Ripple immunity** | 3 $V_{rms}$ |
| **Load equation** | $R_L \leq (V_{cc} - 6.5)/23$ [kOhm] |
| **Up/Down scaling limits** | 23 mA/3.5 mA {1} |
| **Damping** | 0...30 sec. {1} |
| **Response time ($t_{90}$)** | Pt100 1.0 sec. ; T/C 1.6 sec. |
| **Resolution** | 12 bit |

### Environmental conditions

| | |
|---|---|
| **Operating temperature** | -40...85°C |
| **Storage temperature** | -55...90°C |
| **Humidity** | < 98% RH, condensing |
| **Vibrations** | Lloyds Register, test 2 |

### EMC data

| | |
|---|---|
| **Immunity** | EN 61326 |
| **Emission** | EN 61326 |
| **NAMUR** | NE 21 |

### Approval (Demko) EEx ia IIC T5/T6, ATEX II 1G

| | | |
|---|---|---|
| **Supply range** | 6.5...30 $V_{dc}$ | |
| **Internal inductivity** | $L_i \leq 15$ µH | |
| **Internal capacity** | $C_i \leq 5$ nF | |
| **Barrier data** | $U \leq 30\ V_{dc}$ ; $I \leq 0.1$ A ; $P \leq 0.75$ W | |
| **Temperature class** | T1...T5: | $-40 < T_{amb} < 85$°C |
| | T6: | $-40 < T_{amb} < 50$°C |

### Approval FM (Application Manual 2211-8900)

| | | |
|---|---|---|
| **Intrinsically Safe** | Class I, Div 1, Groups A, B, C, D<br>Class I, Zone 0, AEx ia IIC | |
| **Non incendive** | Class I, Div 2, Groups A, B, C, D | |
| **Dust proof** | Class II, Div 1, Groups E, F, G | |
| **Fibres** | Class III, Div 1 | |
| **Temperature class** | T1...T5: | $-40 < T_{amb} < 85$°C |
| | T1...T6: | $-40 < T_{amb} < 50$°C |
| **Input Entity Parameters** | $Ui \leq 30\ V_{dc}$ ; $Ii \leq 0.1$ A ; $Pi \leq 0.75$ W<br>$L_i \leq 15$ µH ; $C_i \leq 5$ nF | |

### Mechanical data

| | |
|---|---|
| **Dimensions** | ø44 x 26.3 mm |
| **Protection class** | Housing: IP 55 |
| | Terminals: IP 10 |

### Other data

| | |
|---|---|
| **Isolation** | 3.75 $kV_{ac}$ |
| **Temperature drift** | Typ. 0.003% per °C |
| | Max. 0.01% per °C |
| **Power-on time** | 1.8...3.9 sec. |

### Test conditions

| | |
|---|---|
| **Configuration** | Pt100; 0...100°C |
| **Amb. temperature** | 23°C +/- 2°C |

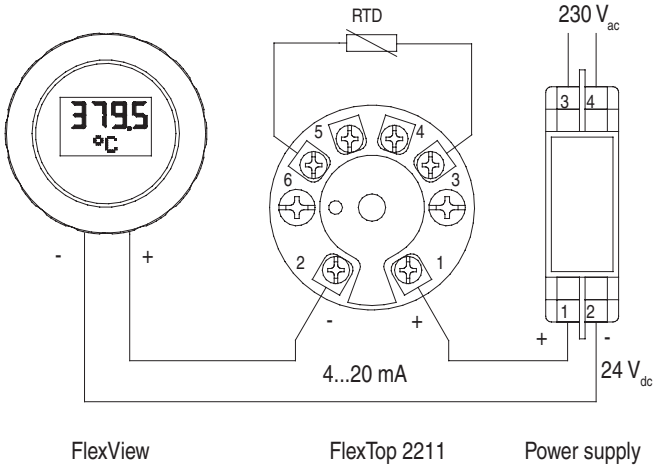
### Disposal of product and packing

According to national laws or by returning to Bourdon-Haenni

### Note

{1} Configurable

## Example of Application



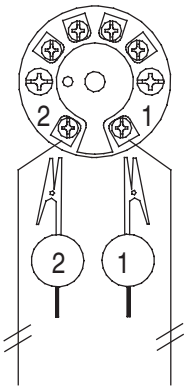
## Measuring Ranges

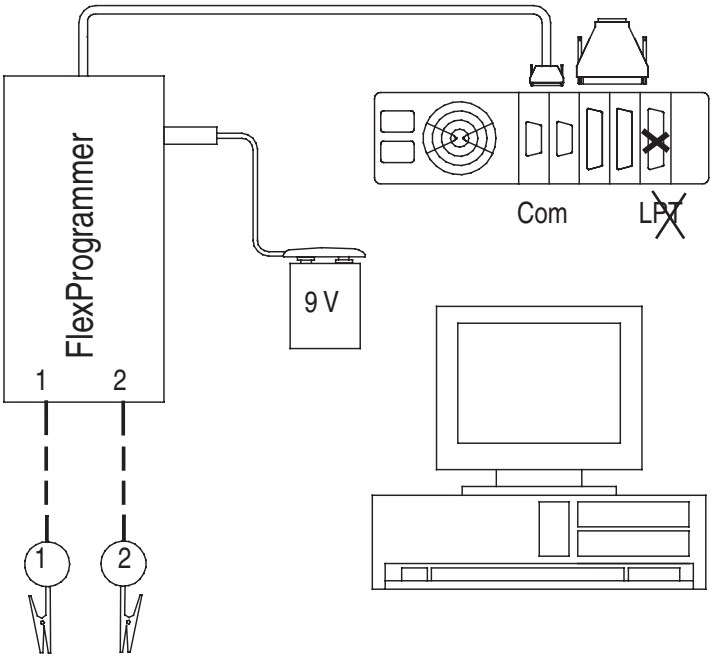
| Type | Standard | Range | Min. span | Accuracy | Resolution |
|---|---|---|---|---|---|
| Pt25...Pt1000 | DIN/EN/IEC 60751 | -200...850°C {2} | 10°C | 0.1°C | 0.1°C |
| Pt25...Pt1000 | a = 0.003902 | -200...850°C {2} | 10°C | 0.1°C | 0.1°C |
| Pt25...Pt1000 | a = 0.003916 | -200...850°C {2} | 10°C | 0.1°C | 0.1°C |
| Ni25...Ni1000 | DIN 43760 | -50...250°C {2} | 10°C | 0.1°C | 0.1°C |
| Cu25...Cu1000 | 0.428 Ohm/°C | -50...200°C | 10°C | 0.1°C | 0.1°C |
| B(PtRh30-Pt) | IEC 584 | 100...1820°C | 50°C | 2°C | 0.1°C |
| E(NiCr-CuNi) | IEC 584 | -270...900°C | 50°C | 1°C | 0.1°C |
| J(Fe-CuNi) | IEC 584 | -210...1200°C | 50°C | 1°C | 0.1°C |
| K(NiCr-Ni) | IEC 584 | -250...1370°C | 50°C | 1°C | 0.1°C |
| L(Fe-CuNi) | DIN 43710 | -200...900°C | 50°C | 1°C | 0.1°C |
| N(NiCrSi-NiSi) | IEC 584 | -200...1300°C | 50°C | 1°C | 0.1°C |
| R(PtRh13-Pt) | IEC 584 | -50...1750°C | 100°C | 2°C | 0.1°C |
| S(PtRh10-Pt) | IEC 584 | -50...1750°C | 100°C | 2°C | 0.1°C |
| T(Cu-CuNi) | IEC 584 | -250...400°C | 40°C | 1°C | 0.1°C |
| U(Cu-CuNi) | DIN 43710 | -200...600°C | 50°C | 1°C | 0.1°C |
| W5-Re (Type C) | ASTM 988 | 0...2300°C | 100°C | 2°C | 0.1°C |
| W3-Re (Type D) | ASTM 988 | 0...2300°C | 100°C | 2°C | 0.1°C |
| Lin. voltage | | -10...70 mV | 2 mV | 0.04 mV | 0.1 mV |
| Lin. voltage | | -0.1...1.1 V | 20 mV | 0.4 mV | 1 mV |
| Lin. resistance | | 0...390 Ohm | 5 Ohm | 0.05 Ohm | 0.01 Ohm |
| Lin. resistance | | 0...2200 Ohm | 25 Ohm | 0.25 Ohm | 0.1 Ohm |

{2} The max. temperature is lower for RTD-elements in the range 500...1000, i.e. Pt1000 max. 350°C.

## Configuration

Note:
Disconnect loop supply before connecting the FlexProgrammer to FlexTop 2211.

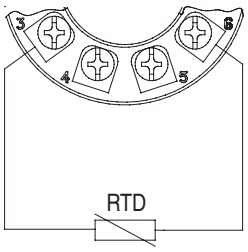
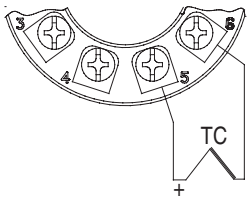
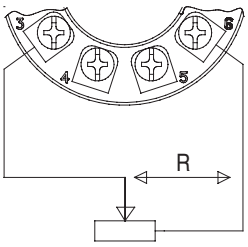
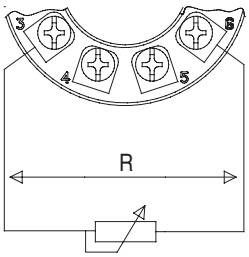


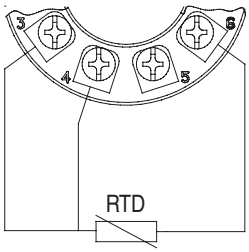
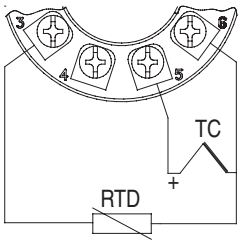
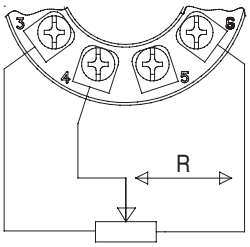
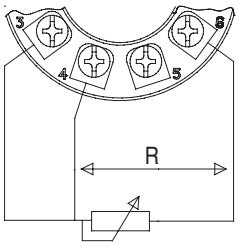



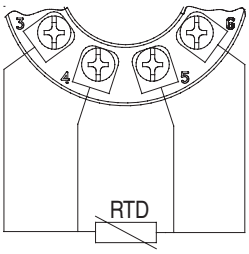
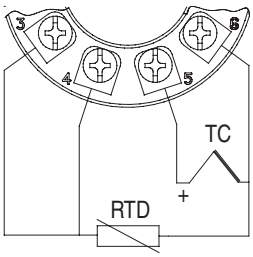
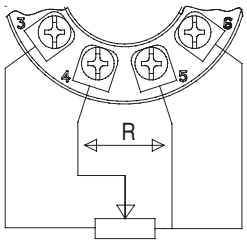
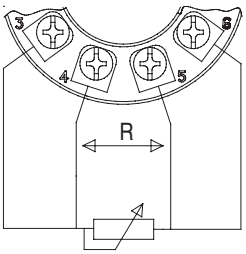

## Ordering Details - FlexTop 2211

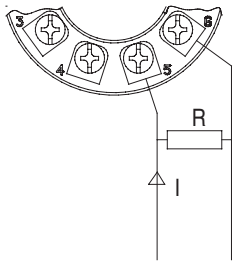
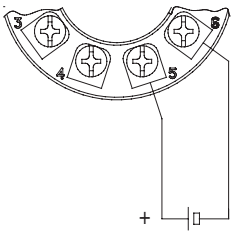
| | | 2211 000x (x) |
|---|---|---|
| **Type** | **5...8´ digit** | |
| Standard version, non-ex | | 1 |
| Demko EEx ia IIC T5/T6, ATEX II 1G and FM approval | | 2 |
| **Configuration** | **9´ digit** | |
| Configuration according to customer specifications | | **C** |

## Electrical Installation

| RTD | T/C | Potentiometer | Resistance |
|---|---|---|---|
|  |  |  |  |
| No cable compensation {3} | Internal CJC-compensation | No compensation {3} | No compensation {3} |

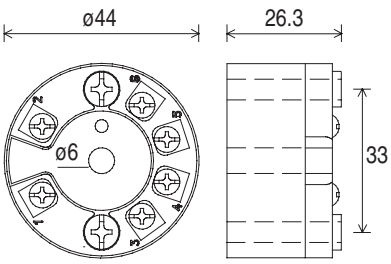
| RTD | T/C | Potentiometer | Resistance |
|---|---|---|---|
|  |  |  |  |
| 3-wire cable compensation | External CJC-compensation<br>No cable compensation {3} | 3-wire compensation for transfer resistance {4} | 3-wire cable compensation |

| RTD | T/C | Potentiometer | Resistance |
|---|---|---|---|
|  |  |  |  |
| 4-wire cable compensation | External CJC-compensation<br>3-wire cable compensation | 4-wire compensation for transfer resistance {4} | 4-wire cable compensation |

| Current measurement | Voltage measurement | Notes |
|---|---|---|
|  |  | {3} Configurable compensation for cable resistance<br>{4} Transfer resistance between element and wiper |

### Dimensional drawing

[mm]




ø4 mounting hole.
Spring loaded mounting screws.

### Accessories

FlexProgrammer configuration set,
type number 82 23-903 comprises:
FlexProgrammer with 9 pole RS232C cable
Software CD
Battery plug
Cable with test plugs

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