# FlexTemp 2311 Universal Transmitter

**4...20 mA transmitter**

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

**Isolation voltage 2 $kV_{ac}$**

**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)**

## Description

FlexTemp 2311 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.

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

BOURDON HAENNI
made to measure

## Technical Data

### Input

| | |
|---|---|
| **Digital accuracy** | See „Measuring ranges“ |
| **CJC-compensation** {1} | Local < 0.7°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** | < 90% RH, non-condensing |
| **Vibrations** | Lloyds Register, test 2 |

### EMC data

| | |
|---|---|
| **Generic standards** | EN 61000-6-3, EN61000-6-2 |
| **Product standard** | EN 61326 |

### Disposal of product and packing

According to national laws or by returning to Bourdon-Haenni

### Mechanical data

| | |
|---|---|
| **Dimensions** | 62 x 88 x 24 mm |
| **Protection class** | Housing: IP 30; Terminals: IP 10 |

### Other data

| | |
|---|---|
| **Isolation** | 50 $V_{ac}$ ; test 2 $kV_{ac}$ |
| **Temperature drift** | Typ. 0.003% per °C |
| | Max. 0.01% per °C |
| **Power-on time** | 1.8...3.9 sec. |
| **Standard** | NE43 |

### Test conditions

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

### Note

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

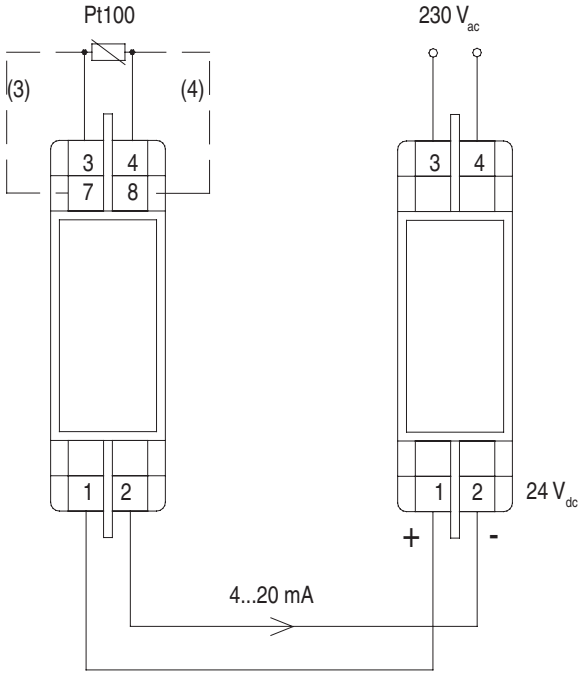
## Measuring Ranges

| 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 |

## Ordering Details - FlexTemp 2311

| | | 2311 000x (x) |
|---|---|---|
| **Type** | **5...8´ digit** | |
| Standard version | | 1 |
| **Configuration** | **9´ digit** | |
| Configuration according to customer specifications | | **C** |

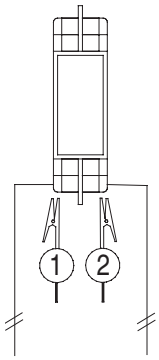
## Application Example

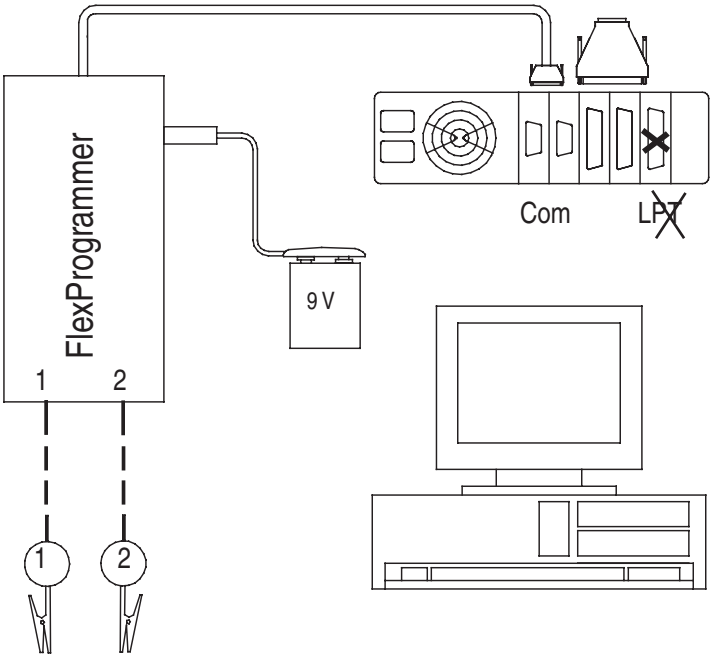



FlexTemp 2311 Power supply

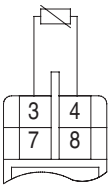
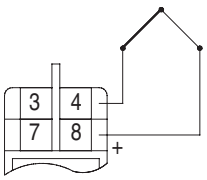
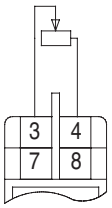
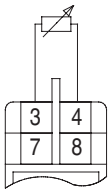
## Configuration

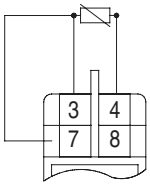
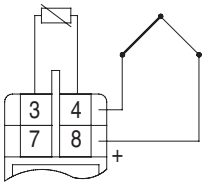
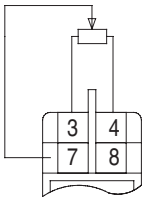
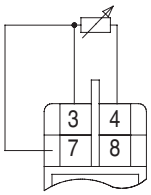
Note:
Disconnect loop supply before connecting the FlexProgrammer to FlexTemp 2311.

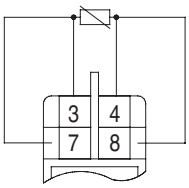
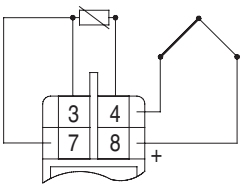
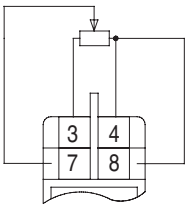
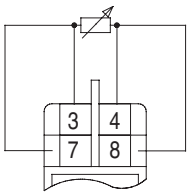


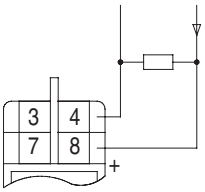
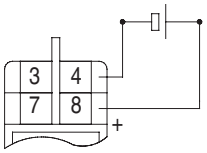



## Electrical Installation

| 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 |

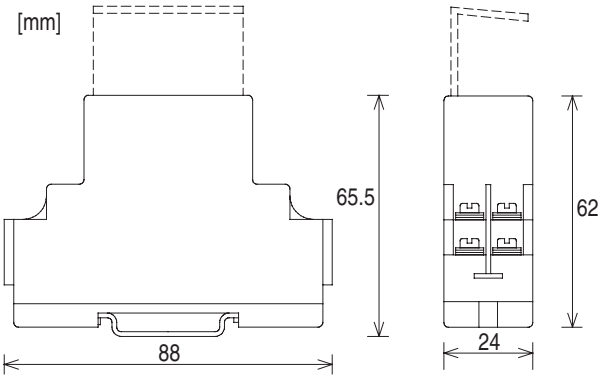
| RTD | T/C | Potentiometer | Resistance |
|---|---|---|---|
|  |  |  |  |
| 4-wire cable-compensation | External CJC-compensation<br>3-wire cable compensation | 4-wire compensation for transfer resistance {4} | 4-wire cable compensation |

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

### Accessories

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

### Dimensional drawings

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