FlexTop 2231 Temperature Transmitter

Transmitter with Profibus® PA, version 3.0 communication.

Inputs: RTD dual, RTD, T/C, mV and R

Isolation voltage 2 kV_{ac}

Configuration via Simatic® PDM® software

Accuracy < 0.1°C (Pt100)

Configurable damping

Sensor-trim

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

Ex ia IIC T4/T5, ATEX II 1G

Description

FlexTop 2231 is a Profibus® PA 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.

2-, 3- or 4-wire as well as dual Pt100 connection can be selected for the resistance input. Selecting the latter it can be configured for a differential, average or average with redundancy output signal.

The built-in temperature sensor or a remote Pt100 sensor can be used to compensate for "cold junction" (CJC) if thermocouples are connected.

FlexTop 2231 is embedded in silicone which makes it resistant to humidity.

FlexTop 2231 has a compact design in a ø44 mm enclosure for installation in a DIN-B housing, Baumer ø80 mm stainless steel housing or similar. It has a 6 mm center hole for fast sensor replacement and spring loaded mounting screws which ensure a safe fastening even in vibrating environments.

FlexTop 2231 is designed according to the Profibus® PA profile ver. 3.0 and is fully configurable via Simatic® PDM® software.

The Profibus® PA communication features on-line process monitoring, transmitter configuration and multiple process control in 2-wire networks especially suited for Ex applications.

Baumer

Technical Data

Input

Digital accuracy	See „Measuring ranges“ (IEC 770 6.1)
CJC-compensation	Local < 0.5°C Remote < 0.2°C
RTD measuring current	0.2 mA, continuously
Sample time	RTD, R, mV: max. 0.5 sec. T/C: max. 0.8 sec.
Response time (t_{99})	Max. 2 x sample time
Cable resistance (3-/4-wire)	T > 600°C: Max. 10 Ohm/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

Current (basic)	13 mA ±1 mA
Signal	IEC 1158-2
Supply range	9...32 V_{dc} (non Ex)
Damping	0...30 sec.

Profibus® data

Profile	Profibus PA, ver. 3.0 DPV1

Environmental conditions

Operating temperature	-30...85°C
Humidity	< 98% RH, condensing
Vibrations	Lloyds Reg. (IEC 60068-2-6)

EMC data

Immunity	EN 61326 Burst: 2 kV
Emission	EN 61326
NAMUR	NE21

Approval — Ex ia IIC T4/T5, ATEX II 1G

Internal inductivity	$L_i \leq 10$ µH
Internal capacity	$C_i \leq 2$ nF
Coupler/link	FISCO standard; $U \leq 17.5\ V_{dc}$; $I \leq 215$ mA ; $P \leq 2$ W
Zener barrier	$U \leq 20\ V_{dc}$; $I \leq 0.1$ A ; $P \leq 0.75$ W
Temperature class	T1...T4: $-30 < T_{amb} < 85$°C T5: $-30 < T_{amb} < 60$°C

Mechanical data

Dimensions	ø44 x 26.3 mm
Protection class	Housing: IP 55 Terminals: IP 00

Other data

Isolation voltage	2 kV_{ac}
Temperature drift	
Pt100, 3-wire	Max. 0.002% per °C
T/C - type K, 0...600°C	Max. 0.02% per °C
Power-on time	1.8...3.9 sec.
Sensor break detection	2...10 sec.

Test conditions

Configuration	Pt100; 3-wire; 0...100°C
Amb. temperature	23°C +/- 2°C

Disposal of product and packing

According to national laws or by returning to Baumer

Ordering Details - FlexTop 2231

	2231 000x (x)
Type	
Not configured, standard safety	1
Not configured, Ex ia IIC T4/T5, ATEX II 1G	2
Configuration	
Configuration according to customer specifications	**C**
GSD and EDD files on diskette. Also available from our home page.	**9000 0008**
Calibration certificate.	**0922 5212**

Configuration

Unless specified the FlexTop 2231 will be delivered with the following standard configuration:

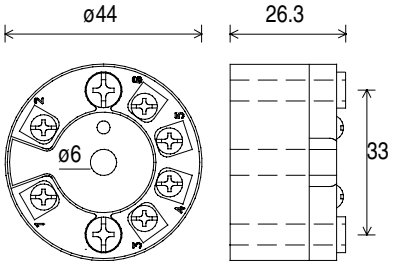
Address 126
Pt100 sensor, single mode
3-wire connection
Alarm limits: -200...850°C
Warning limits: -200...850°C

Measuring Ranges

Type	Standard	Range	Accuracy	Note
Pt25...Pt500	DIN/EN/IEC 60751	-200...850°C	0.1°C	
Pt25...Pt500	JIS C 1604	-200...850°C	0.1°C	
Pt501...Pt1000	DIN/EN/IEC 60751	-200...350°C	0.1°C	
Pt501...Pt1000	JIS C 1604	-200...350°C	0.1°C	
Ni25...Ni1000	DIN/EN/IEC 60751	-50...250°C	0.1°C	
Cu25...Cu1000	0.428 Ohm/°C	-50...200°C	0.1°C	
B(PtRh30-Pt)	DIN/EN/IEC 584-1	500...1820°C	2°C	{2}
E(NiCr-CuNi)	DIN/EN/IEC 584-1	-270...900°C	1°C	{2}
J(Fe-CuNi)	DIN/EN/IEC 584-1	-210...1200°C	1°C	{2}
K(NiCr-Ni)	DIN/EN/IEC 584-1	-270...1370°C	1°C	{2}
L(Fe-CuNi)	DIN 43710	-200...900°C	1°C	{2}
N(NiCrSi-NiSi)	BS4937	-200...1300°C	1°C	{2}
R(PtRh13-Pt)	DIN/EN/IEC 584-1	-50...1750°C	2°C	{2}
S(PtRh10-Pt)	DIN/EN/IEC 584-1	-50...1750°C	2°C	{2}
T(Cu-CuNi)	DIN/EN/IEC 584-1	-250...400°C	1°C	{2}
U(Cu-CuNi)	DIN 43710	-200...600°C	1°C	{2}
W3-Re (D)	ASTM 988	0...2300°C	2°C	{2}
W5-Re (C)	ASTM 988	0...2300°C	2°C	{2}
Lin. voltage		-10...70 mV	0.04 mV	
Lin. voltage		-0.1...1.1 V	0.4 mV	
Lin. resistance		0...390 Ohm	0.05 Ohm	
Lin. resistance		0...2200 Ohm	0.25 Ohm	

Note {2} For internal CJC 0.5°C must be added to the accuracy.

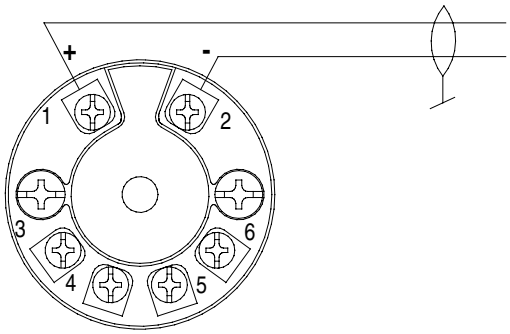
Dimensional Drawing



[mm]

ø4 mounting holes.
Spring loaded mounting screws.

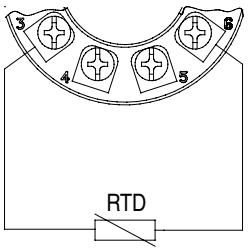
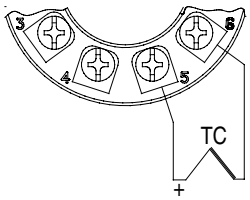
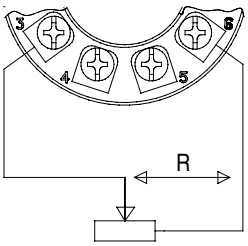
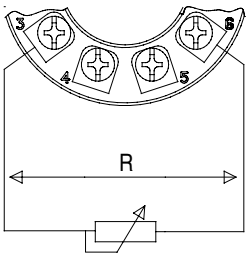
Connection to Profibus PA

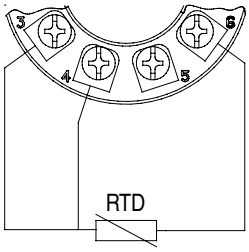
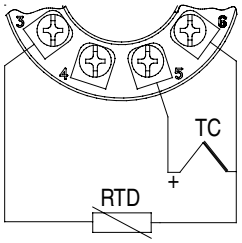
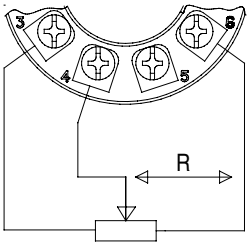
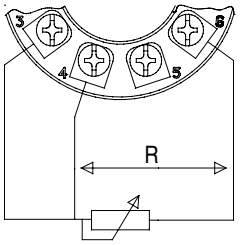


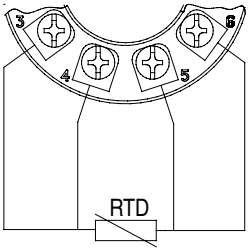
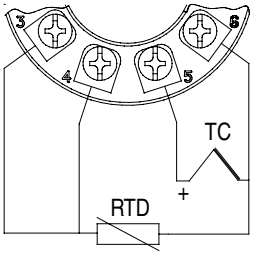
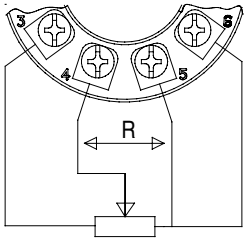
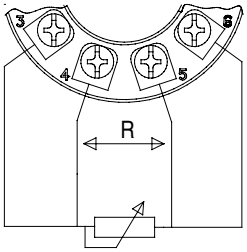
Profibus® PA cable
2-wire twisted pair with shield

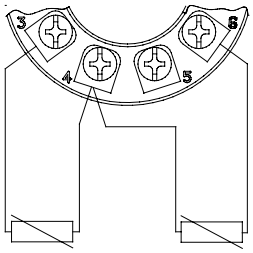
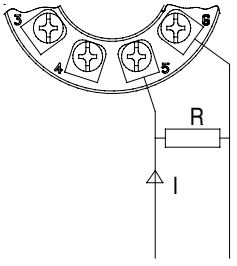
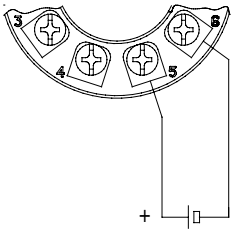
Warning: In order to minimize electrical disturbances we recommend to connect the cable shield to the metal housing.

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 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 3-wire cable compensation	4-wire compensation for transfer resistance {4}	4-wire cable compensation

Dual Pt100		Current measurement	Voltage measurement
	The dual Pt100 sensor can be configured for: Differential Average Average with redundancy		

Notes

{3} Configurable compensation for cable resistance
{4} Transfer resistance between element and wiper