



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)

Demko EEx 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, Bourdon-Haenni 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.



Technical Data

Input		EMC data	
Digital accuracy	See „Measuring ranges“ (IEC 770 6.1)	Immunity	EN 61326 Burst: 2 kV
CJC-compensation	Local < 0.5°C Remote < 0.2°C	Emission	EN 61326
RTD measuring current	0.2 mA, continuously	NAMUR	NE21
Sample time	RTD, R, mV: max. 0.5 sec. T/C: max. 0.8 sec.	Approval (Demko)	EEx ia IIC T4/T5, ATEX II 1G
Response time (t ₉₀)	Max. 2 x sample time	Internal inductivity	L _i ≤ 10 µH
Cable resistance (3-/4-wire)	T > 600°C: Max. 10 Ohm/wire T < 600°C: Max. 30 Ohm/wire	Internal capacity	C _i ≤ 2 nF
Protection	+/- 35 V _{dc}	Coupler/link	FISCO standard; U ≤ 17.5 V _{ac} ; I ≤ 215 mA; P ≤ 2 W
Suppression	50 and 60 Hz	Zener barrier	U ≤ 20 V _{dc} ; I ≤ 0.1 A; P ≤ 0.75 W
Resolution	16 bit	Temperature class	T1...T4: -40 < T _{amb} < 85°C T1...T5: -40 < T _{amb} < 60°C
Repeatability	< 0.05°C	Mechanical data	
Output		Dimensions	ø44 x 26.3 mm
Current (basic)	13 mA ± 1 mA	Protection class	Housing: IP 55 Terminals: IP 00
Signal	IEC 1158-2	Other data	
Supply range	9...32 V _{dc} (non Ex)	Isolation voltage	2 kV _{ac}
Damping	0...30 sec.	Temperature drift	Pt100, 3-wire: Max. 0.002% per °C T/C - type K, 0...600°C: Max. 0.02% per °C
Profibus® data		Power-on time	1.8...3.9 sec.
Profile	Profibus PA, ver. 3.0 DPV1	Sensor break detection	2... 10 sec.
Environmental conditions		Test conditions	
Operating temperature	-40...85°C	Configuration	Pt100; 3-wire; 0...100°C
Humidity	< 98% RH, condensing	Amb. temperature	23°C +/- 2°C
Vibrations	Lloyds Reg. (IEC 60068-2-6)	Disposal of product and packing	
		According to national laws or by returning to Bourdon-Haenni	

Ordering Details - FlexTop 2231

Type	2231 000x (x)
Not configured, standard safety	0001
Not configured, Demko EEx ia IIC T4/T5, ATEX II 1G	0002
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

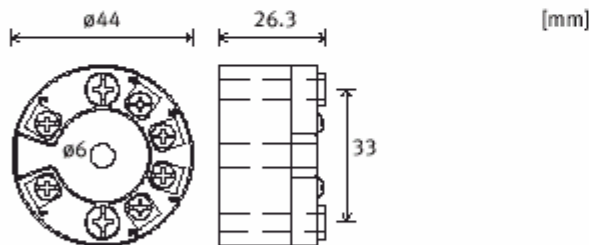


Measuring Ranges

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	

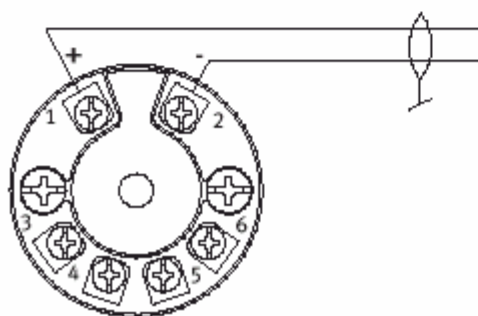
Note {2} For internal CJC 0.5°C must be added to the accuracy.

Dimensional Drawing



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
<p>No cable compensation {3}</p>	<p>Internal CJC-compensation</p>	<p>No compensation {3}</p>	<p>No compensation {3}</p>
RTD	T/C	Potentiometer	Resistance
<p>3-wire cable compensation</p>	<p>External CJC-compensation No cable compensation {3}</p>	<p>3-wire compensation for transfer resistance {4}</p>	<p>3-wire cable compensation</p>
RTD	T/C	Potentiometer	Resistance
<p>4-wire cable compensation</p>	<p>External CJC-compensation 3-wire cable compensation</p>	<p>4-wire compensation for transfer resistance {4}</p>	<p>4-wire cable compensation</p>
Dual Pt100	Current measurement	Voltage measurement	
<p>The dual Pt100 sensor can be configured for: Differential Average Average with redundancy</p>			
Notes			
<p>{3} Configurable compensation for cable resistance {4} Transfer resistance between element and wiper</p>			

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