



## FlexTop 2221 Universal Transmitter

4...20 mA transmitter with HART® communication.

RTD, T/C, mV and R inputs

Isolation voltage 3.75 kV<sub>ac</sub>

Configuration via FlexProgrammer  
or HART® configurator

Accuracy < 0.1°C (Pt100)

Configurable linearisation,  
damping and status indication

Current-trim and sensor-trim

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

Transmitter temperature alarm

Ex approvals (pending):  
Demko EEx ia IIC T5/T6, ATEX II 1G/D  
FM Class 1, Div 1, Groups A, B, C, D



### Description

FlexTop 2221 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 HART® communication feature on-line process calibration and adjustment, transmitter configuration and multiple process control in 2-wire networks.

The configuration can be established from a standard HART® configurator or the dedicated FlexProgrammer configuring tool connected to a PC.

FlexTop 2221 is embedded in silicone which makes it resistant to humid environments.

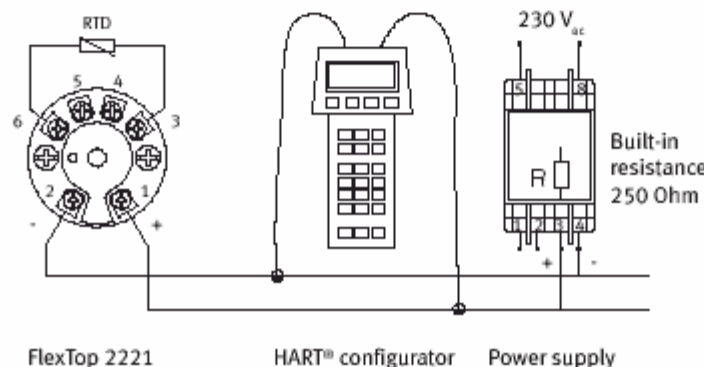
FlexTop 2221 has a 6 mm center hole for fast sensor replacement and spring loaded mounting screws which ensure a safe fastening even in vibrating environments.



## Technical Data

Input		EMC data	
Digital accuracy	See „Measuring ranges“	Immunity	EN 61326
CJC-compensation	Local < 0.5°C Remote < 0.2°C	Emission	EN 61326
RTD measuring current	0.2 mA, continuously	NAMUR	NE 21
Cable resistance (3-/4-wire)	T > 600°C: Max. 10 Ohm/wire {1} T < 600°C: Max. 30 Ohm/wire {1}	<b>Approval (Demko) EEx ia IIC T5/T6, ATEX II 1G/D (pending)</b>	
Protection	+/- 35 V <sub>dc</sub>	Supply range	8...30 Vdc
Suppression	50 and 60 Hz	Internal inductivity	Li < 15 µH
Resolution	16 bit	Internal capacity	Ci < 5 nF
Repeatability	< 0.05°C	Barrier data	U < 30 V <sub>dc</sub> ; I < 0.1 A; P < 0.75 W
<b>Output</b>		Temperature class	T1...T5: -40 < T <sub>amb</sub> < 85°C T1...T6: -40 < T <sub>amb</sub> < 50°C
Signal span	4...20 mA, 2-wire {1} 20...4 mA, 2-wire {1}	<b>Approval FM (Application Manual 2221-8900) (pending)</b>	
Accuracy	< 0.1% of signal span	Explosion proof	Class I, Div 1, Groups A, B, C, D
Supply range	8...35 V <sub>dc</sub>	Dust ignition proof	Class II, Div 1, Groups E, F, G
Ripple immunity	3 V <sub>rms</sub>	Suited for	Class III, Div1
Load equation	$R_L < (V_{cc} - 12)/23$ [kOhm]	Non incensive	Class I, Div 2, Groups A, B, C, D
Up/Down scaling limits	23 mA/3.5 mA {1}	Temperature class	T1...T5: -40 < T <sub>amb</sub> < 85°C T1...T6: -40 < T <sub>amb</sub> < 50°C
Damping	0...15 sec. {1}	<b>Mechanical data</b>	
Response time (t <sub>90</sub> )	Pt100 1.0 sec.; T/C 1.6 sec.	Dimensions	ø44 x 26.3 mm
Resolution	12 bit	Protection class	Housing: IP 55 Terminals: IP 10
<b>HART® data</b>		<b>Other data</b>	
Protocol	HCF standard, Rev.5	Isolation	3.75 kV <sub>ac</sub>
Features 1)	Read serial number Read/Change user ID Read/Change configuration Read input signal value Read output signal value Input signal logging 2-point sensor-trim 2-point current-trim	Temperature drift	Typ. 0.003% per °C Max. 0.01% per °C
<b>Environmental conditions</b>		Power-on time	1.8...3.9 sec.
Operating temperature	-40...85°C	<b>Test conditions</b>	
Storage temperature	-55...90°C	Configuration	Pt100; 0...100°C
Humidity	< 98% RH, condensing	Amb. temperature	23°C +/- 2°C
Vibrations	Lloyds Register, test 2	<b>Disposal of product and packing</b>	
		According to national laws or by returning to Bourdon-Haenni	
		<b>Note</b>	
		{1} Configurable	

## Example of Application, Point-to-point





## Measuring Ranges

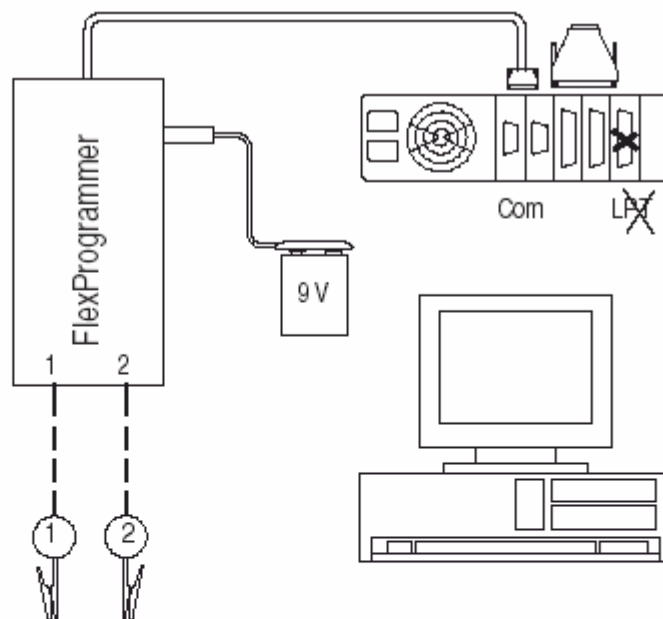
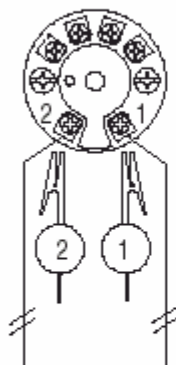
Type	Standard	Range	Min. span	Accuracy	Resolution
Pt25...Pt1000	DINEN/IEC 60751	-200...850°C {2}	10°C	0.1°C	0.1°C
Pt25...Pt1000	a = 0.003902	-200...850°C {2}	10°C	0.1°C	0.1°C
Pt25...Pt1000	a = 0.003916	-200...850°C {2}	10°C	0.1°C	0.1°C
Ni25...Ni1000	DIN 43760	-50...250°C {2}	10°C	0.1°C	0.1°C
Cu25...Cu1000	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 2221.

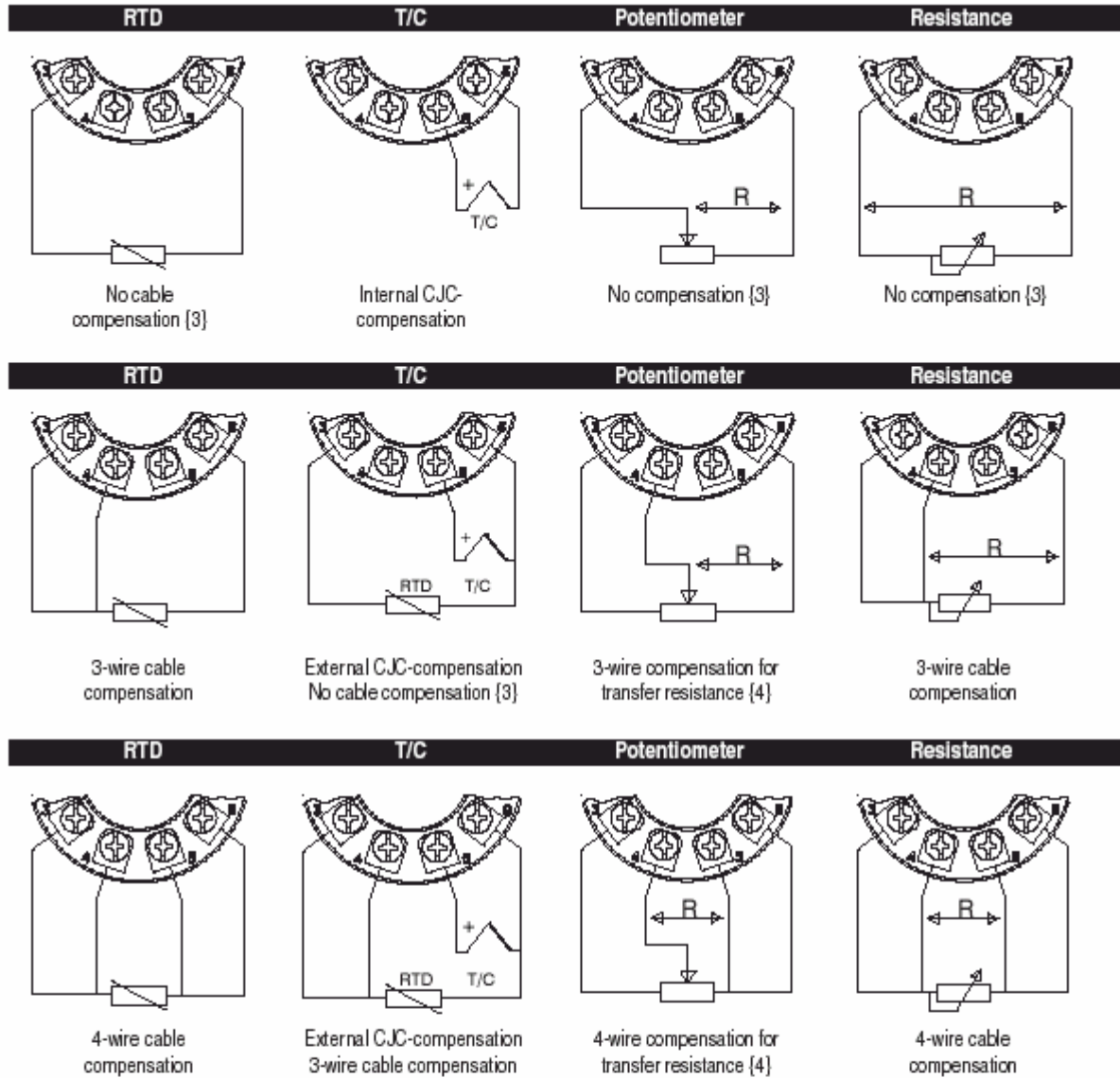


## Ordering Details - FlexTop 2221

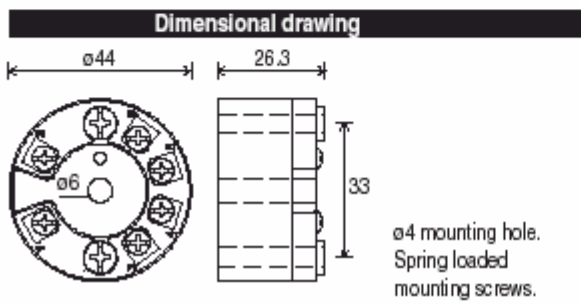
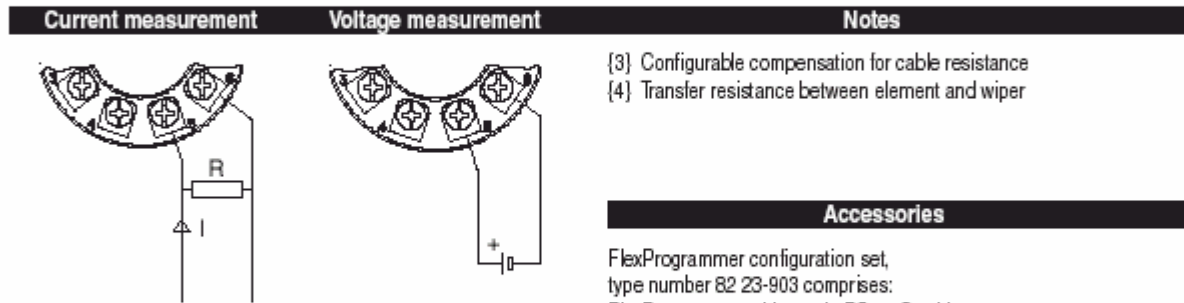
Type	2221 000x (x)
Standard version, non-ex	5...8 digit 1
Demko EEx ia IIC T5/T6, ATEX II 1G/D and FM Class 1, Div 1, Groups A, B, C, D	2
Configuration	9 digit C
Configuration according to customer specifications	



**Electrical Installation**



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**Accessories**

FlexProgrammer configuration set, type number 82 23-903 comprises:  
 FlexProgrammer with 9 pole RS232C cable  
 3.5" Program diskettes  
 Battery plug  
 Cable with test plugs

