



Main characteristics (20 °C)

Standard process temperature	-50 ... 250 °C
Accuracy	Pt100 output as to DIN/EN/IEC 60751 Transmitter output $\pm 0.1 \text{ °C}$ / $\pm 0.25 \text{ °C}$
Connections	Threaded

Technical specification

Measuring principle	Resistance Temperature Detector (RTD)
Measuring ranges	-50...400 °C
Immersion tube, diameter	Ø6 mm, Ø8 mm
Immersion tube, length	Min. 20 mm - Max. 3000 mm
Immersion tube, tip	Normal response - Ø6/Ø8 mm Fast response - Ø6/Ø4 or Ø8/Ø4 mm
Process connections	See page 4

Environment

Temperature, Ambient	-40...160 °C
- w. transmitter	-40...85 °C
- w. display	-30...80 °C
Protection rating, IEC 529	IP67 / IP69K, depending on electrical connection

Humidity, IEC 68-2-38	98%, condensing
Vibrations	DNV high vibration strain, class B 1.6 mm, 2...25 Hz IEC60068-2-6, test FC 25...100 Hz, 4.0 g

Material

Process connection	SS 1.4404, AISI 316L
Housing	SS 1.4301, AISI 304
Sealing	See ordering table

Approvals

Apply to	EMC directive 2004/108/CE in accordance with EN61000-6-2, EN 61000-6-3 Pressure directive 97/23/CE
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Main features

- Pt100 sensor element, 2- or 4-wire
- HART®
- Built in graphical display, CombiView™ DFON optional
- Head mounted 4...20 mA transmitter, FlexTop type 22xx
- ATEX
- Programmable by touch screen
- Easy and full programmable with FlexProgrammer 9701

Applications

- Oil and Gas
- Chemical
- Energy
- General Process Industrie

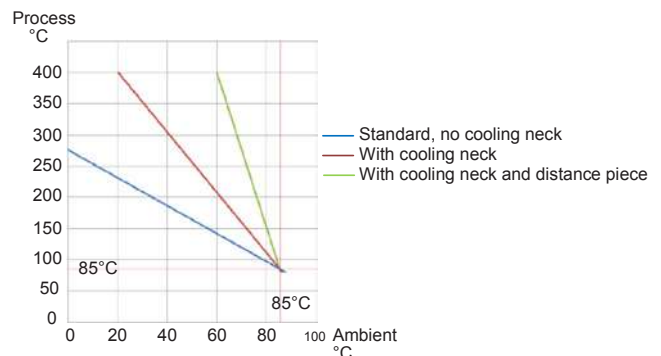
Sensor element and electrical specification

Sensor type	RTD type Pt100 (acc. to DIN/EN/IEC 60751) Single or Double 2-wire or 4-wire
Accuracy	Class 1/1 B $\pm(0,3 + (0,005 \times T)) \text{ °C}$ Class 1/3 B $\pm 1/3 \times (0,3 + (0,005 \times T)) \text{ °C}$ Class 1/6 B $\pm 1/6 \times (0,3 + (0,005 \times T)) \text{ °C}$ Class 1/1 A $\pm(0,15 + (0,002 \times T)) \text{ °C}$
Analog output	4-20 mA, 20-4 mA 4-20mA+HART® See separate data sheet, series 22xx

Time constant, τ 0,5

Medium	Liquid	Air	Air
Velocity	0,4 m/sec.	0 m/sec.	3 m/sec.
Ø 6 mm	<math>< 6,1</math>	<math>< 138</math>	<math>< 27,2</math>
Ø 6/4 mm	<math>< 1,5</math>	<math>< 136</math>	<math>< 21,4</math>
Ø 8 mm	<math>< 7,6</math>	<math>< 201</math>	<math>< 47,7</math>
Ø 8/4 mm	<math>< 1,5</math>	<math>< 181</math>	<math>< 33,6</math>

Temperature curve



Technical Data

Transmitter, type FlexTop 2202 - Standard

Input	Pt100
Output	4...20 mA
Accuracy	
Input	< ±0.25°C
Output	< ±0.1% of output span (16mA)
Range	-200...850°C
Minimum span	25°C
Supply	8...35 VDC
Programmability	By FlexProgrammer 9701
For further information please see data sheet for FlexTop 2202	

Transmitter, type FlexTop 2211 - Performance

Input	Pt100 / Pt1000 (universal)
Output	4...20 mA
Accuracy	
Input	< ±0.1°C
Output	< ±0.1% of output span (16mA)
Range	-200...850°C
Minimum span	25°C
Supply	8...35 VDC
Programmability	By FlexProgrammer 9701
For further information please see data sheet for FlexTop 2211	

Display DFON

Type	Graphically LCD
Front glass	Polycarbonate
Display modes	8 modes, programmable, e.g. value, bar graph, analogue, tank illustration
Background	White, green, red - programmable
Measuring range	-9999...99999
Digit height	Max. 22 mm
Accuracy	0,1% @ ambient -10...70 °C
Voltage drop	4V...6.5 V
Output	2 configurable relay output, 60 Vp, 75 mA
Programming	Touch screen or FlexProgrammer 9701

Further information can be found in separate data sheet for DFON

Transmitter, type FlexTop 2221 - Standard

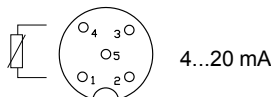
Input	Pt100 / Pt1000 (universal)
Output	4...20 mA / HART
Accuracy	
Input	< ±0.1°C
Output	< ±0.1% of output span (16mA)
Range	-200...850°C
Minimum span	25°C
Supply	8...35 VDC
Programmability	By FlexProgrammer 9701 By HART terminal/modem
For further information please see data sheet for FlexTop 2221	

Transmitter, type FlexTop 2212 - Performance

Input	Pt100 / Pt1000 (universal)
Output	4...20 mA / 20...4 mA
Accuracy	
Input	± 0.06°C
Output	< ±0.025% of output span (16mA)
Range	-200...850°C
Minimum span	10°C
Supply	7...40 VDC
Programmability	By FlexProgram
For further information please see data sheet for FlexTop 2212	

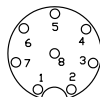
Electrical connections

M12, 5-wire

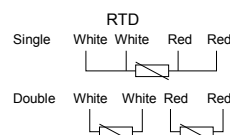
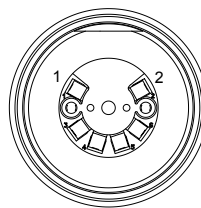


RTD Single	Double	1	+ supply, 4...20 mA
1+2	Pt100-1	2	Common for relays
3+4	Pt100-1	3	- supply, 4...20 mA
1	Pt100 - 1	4	Relay 2
2	Pt100 - 1	5	Relay 1
3	Pt100 - 2		
4	Pt100 - 2		
5	N.C.		

M12, 8-wire



1	N.C.
2	+ supply, 4...20 mA
3	Relay 2
4	Relay 1
5	Relay 1
6	Relay 1
7	- supply, 4...20 mA
8	N.C.

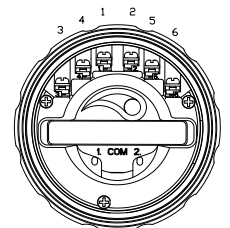


Cable gland

- Transmitter**
- +24VDC / - 4...20mA
 - 24VDC / +4...20mA
 - Red clip (FlexProgrammer)
 - Black clip (FlexProgrammer)

- Display**
- + 4...20 mA
 - 4...20 mA
 - Relay 2
 - Relay 2
 - Relay 1
 - Relay 1

- Com 1** Red clip (FlexProgrammer)
Com 2 Black clip (FlexProgrammer)



ATEX data for temperature transmitters and displays
Transmitter, type FlexTop 2202 - ATEX

Approval	Ex ia IIC T5/T6, ATEX II 1G Ex nA II T5, ATEX II 3G
Supply	8...28 VDC
Internal inductivity	$L_i \leq 10 \mu\text{H}$
Internal capacity	$C_i \leq 10 \text{nF}$
Temperature class	T1...T5: $-40 < T_{\text{amb}} < 85^\circ\text{C}$ T6: $-40 < T_{\text{amb}} < 50^\circ\text{C}$
Barrier data	U: $\leq 28 \text{VDC}$ I: $\leq 0.1\text{A}$ P: $\leq 0.75 \text{W}$



Transmitter, type FlexTop 2221 - ATEX

Approval	Ex ia IIC T5/T6, ATEX II 1G Ex nA II T5, ATEX II 3G
Supply	8...30 VDC (Ex nA: 12...30 VDC)
Internal inductivity	$L_i \leq 15 \mu\text{H}$
Internal capacity	$C_i \leq 5 \text{nF}$
Temperature class	T1...T5: $-40 < T_{\text{amb}} < 85^\circ\text{C}$ T6: $-40 < T_{\text{amb}} < 50^\circ\text{C}$
Barrier data	U: $\leq 30 \text{VDC}$ I: $\leq 0.1\text{A}$ P: $\leq 0.75 \text{W}$


Transmitter, type FlexTop 2211 - ATEX

Approval	Ex ia IIC T5/T6, ATEX II 1G Ex nA II T5, ATEX II 3G
Supply	6.5...30 VDC
Internal inductivity	$L_i \leq 1.5 \mu\text{H}$
Internal capacity	$C_i \leq 5 \text{nF}$
Temperature class	T1...T5: $-40 < T_{\text{amb}} < 85^\circ\text{C}$ T6: $-40 < T_{\text{amb}} < 50^\circ\text{C}$
Barrier data	U: $\leq 30 \text{VDC}$ I: $\leq 0.1\text{A}$ P: $\leq 0.75 \text{W}$

Display DFON - ATEX
ATEX Gas ia and for ATEX Dust ia

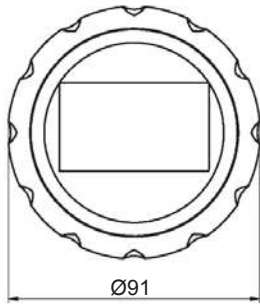
Approval	Gas Zone 0/1 Dust Zone 20/21	 II 1 G, Ex ia IIC T5 Ga  II 1 D, Ex ia IIIC T100°C Da
Voltage drop	U_{Disp}	4.5 ... 6.5 VDC
Temperature class	$L_i \leq 1.5 \mu\text{H}$ $C_i \leq 5 \text{nF}$	
Temperature class	T1...T5	Zone 0 and 20 $-20 \dots 60^\circ\text{C}$ Zone 1/2 and 21/22 $-40 \dots 65^\circ\text{C}$
Internal inductivity	L_i	$< 10 \mu\text{H}$
Internal capacity	C_i	$< 15 \text{nF}$
Barrier data	U_i I_i P_i	$< 30 \text{VDC}$ $< 0.1 \text{A}$ $< 0.75 \text{W}$

ATEX Gas nA

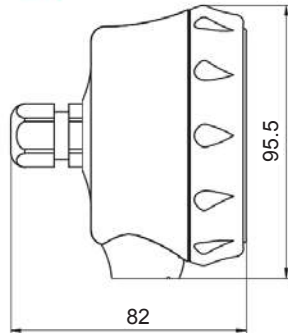
Approval	Gas Zone 2	 II 3 G, Ex nA II T5
Voltage drop	U_{Disp}	4.5 ... 6.5 VDC
Temperature class	T1...T5	$-30 < T_{\text{amb}} < 65^\circ\text{C}$
Internal inductivity	L_i	$< 10 \mu\text{H}$
Internal capacity	C_i	$< 15 \text{nF}$
Maximum voltage	U_{max}	$< 35 \text{VDC}$
Maximum current	U_{max}	$< 35 \text{VDC}$

Dimensions (mm)

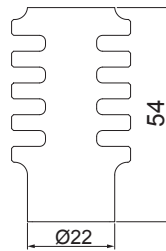
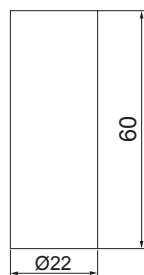
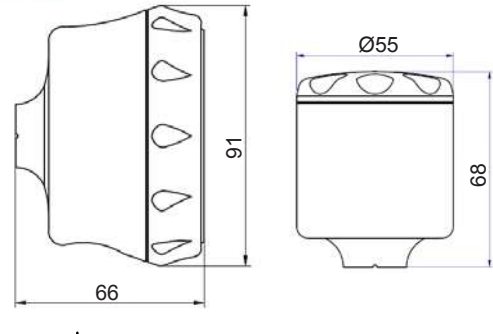
Ø80 mm housing front view



Ø80 mm housing bottom connection



Ø80 mm housing rear connection



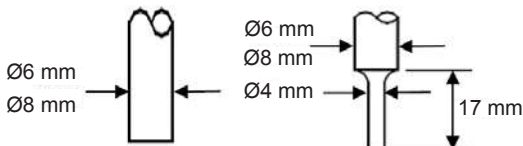
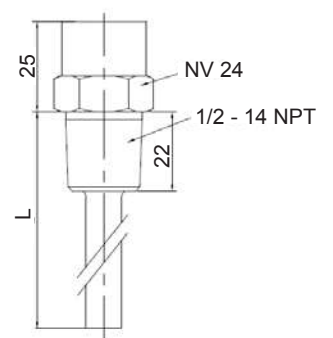
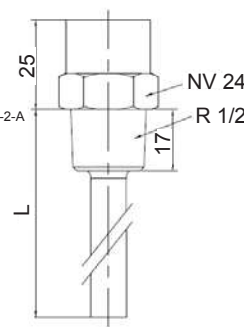
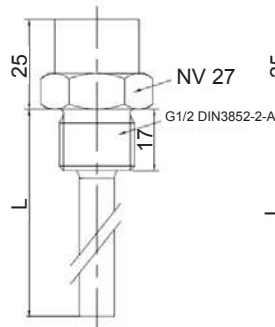
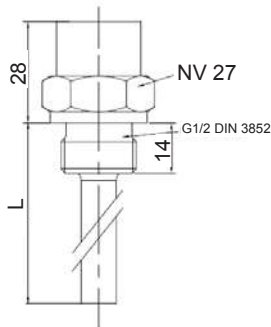
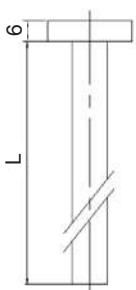
Tube without connection
Code 10

G1/2A DIN 3852-E
Code 11

G1/2A DIN 3852-A
Code 12

R1/2
Code 13

1/2" NPT
Code 30



Ordering details

	-																			
Model																				
CombiTemp™										TFRN										
Housing material																				
Ø80 mm, Stainless steel, AISI 304 Bottom										5										
Ø80 mm, Stainless steel, AISI 304 Rear										6										
Field housing Ø55, stainless steel, AISI 304										7										
Electrical connection																				
M12, 5 pins										1										
M12, 8 pins										3										
Cable gland, M16										5										
Cable gland, M20										B										
Material el. connection																				
Plastic										1										
AISI 304										3										
Display																				
Without display, Ø55 housing										0										
Without display										1										
With display No relays activated										2										
With display With activated relays										4										
Transmitter / socket																				
Flying leads										0										
Ceramic socket Pt100										1										
Transmitter 2202 4-20 mA ±0,25 °C (Accuracy class)										2										
Transmitter 2211 4-20 mA ±0,10 °C (Accuracy class)										3										
Transmitter 2221 4-20 mA / HART® ±0,10 °C (Accuracy class)										4										
Transmitter 2212 4-20 / 20-4 mA ±0,06 °C (Accuracy class)										6										
Safety																				
Standard										0										
Ex ia IIC T4/T5 1G (Gas)										1										
Ex nA II T4/T5 3G (Gas)										3										
Ex ia II 1 G Eex ia IIC, Zone 0, simple apparatus										9										
Configuration																				
No configuration										0										
Configuration of Range										1										
Configuration of Range + Display										2										
Configuration of Range + Display incl. 2 relays										3										
Sensor element (DIN/EN/IEC 60751)																				
None (for cable sensor)										0										
1x Pt100 Class 1/1 B										1										
2x Pt100 Class 1/1 B										2										
1x Pt100 Class 1/3 B										5										
2x Pt100 Class 1/3 B										6										
1x Pt100 Class 1/6 B										7										
2x Pt100 Class 1/6 B										8										
1x Pt100 Class 1/1 A										A										
2x Pt100 Class 1/1 A										B										
1x Pt100 Class 1/1 B, < 600°C										C										
Sensor insert type																				
Sensor tube with embedded sensor element 2-wire										1										
Sensor tube with embedded sensor element 4-wire										2										
Cable sensor Pt100 Class 1/1 B (1xPt100 only, for ø 8 mm only)										A										
Cable sensor Pt100 Class 1/3 B (1xPt100 only, for ø 8 mm only)										B										
Cable sensor Pt100 Class 1/6 B (1xPt100 only, for ø 8 mm only)										C										
Cable sensor Pt100 Class 1/1 A (1xPt100 only, for ø 8 mm only)										D										
Cooling neck																				
None										0										
Cooling neck										4										
Cooling neck + 1 spacer										5										
Cooling neck + 2 spacers										6										
Process connection																				
Tube without connection										10										
G½ Male DIN 3852 form E										11										
G½ Male DIN 3852 form A										12										
R½ Male ISO 7/1										13										
½"-14 NPT Male ANSI/ASME B1.20.1										30										
Seal																				
No seal										0										
Seal NBR For G½ DIN 3852 - E										1										
Seal EPDM For G½ DIN 3852 - E										2										
Seal FKM (Viton®) For G½ DIN 3852 - E										3										
Sensor diameter																				
No sensor										0										
ø 6 mm AISI 316										1										
ø 8 mm AISI 316										2										
Sensor tip																				
No sensor										0										
Standard Normal response										1										
Fast Fast response ø 4 mm tip Max sensor length : 300 mm										2										
Approvals																				
None										0										
DNV marine approval										3										
EAC (TR CU 020/2011)										B										
Sensor tube length																				
Length in mm (min. 20 mm)										x x x x										

If the product wanted is not available from above list please inquire.