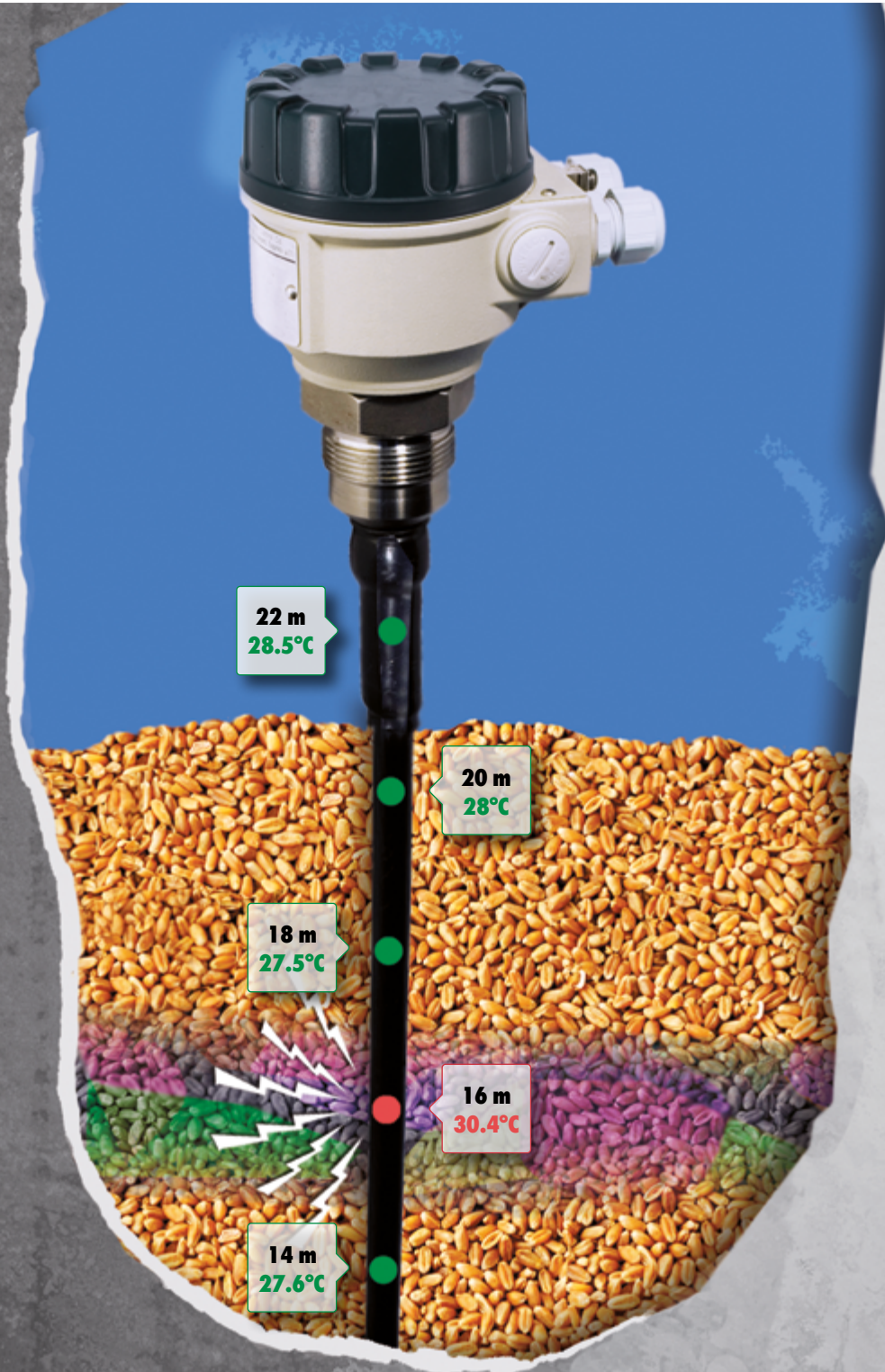


# THERMOPOINT

MULTI-POINT TEMPERATURE TRANSMITTER

5 YEARS WARRANTY



# NIVELCO

TEMPERATURE MEASUREMENT

## DESCRIPTION

**THERMOPPOINT** 2-wire Temperature Transmitters are suitable for continuous multi-point temperature-measurement, -indication and -transmission of normal and hazardous liquids, powders or granular solids. Temperature of grain, feed stored in silos needs to be monitored for maintaining quality of the stored medium. Monitoring of the total volume of the silo is needed to provide information on accidental quality loss or appearance of germs or fungus. Eventual temperature increases will alert the operator to perform operation or recycling the medium. Temperature measurement is done by electronic temperature sensors placed at equal distances in a plastic-coated stainless steel flexible tube. Each sensor sends the actual measured temperature of its environment to the transmitter head.

The 2-wire loop-operated transmitter head communicates through HART® protocol with control room devices such as a **MultiCONT** or a PC, for further processing or datalogging. A salient advantage of the **MultiCONT** based system is that, if level measurement is required the system can be extended with a level transmitter. The advantage of using a multifunction system is that a new transmitter can easily be inserted into the existing loop, using the existing HART® communication.

## FEATURES

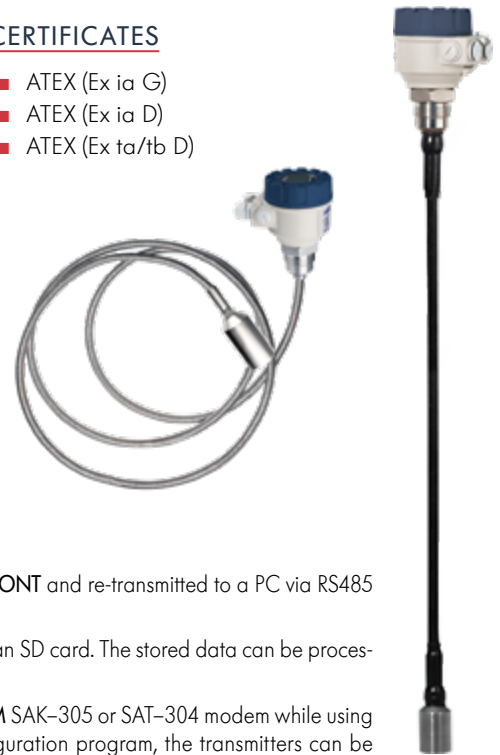
- 2-wire multi-point temperature transmitter
- Communicates with HART®
- Up to 50 m probe length
- Up to 15 sensors
- Max. 35 kN tensile force
- Replaceable sensors
- Digitally addressed sensors
- -30...+125 °C (-22...+257 °F) medium temperature
- IP67
- Ex variant

## APPLICATIONS

- For regular and hazardous materials
- Temperature measurement of powdered, granular, or free-flowing solids
- For transmitting temperature data from faraway locations
- Grain industry
- Feed industry
- Food industry

## CERTIFICATES

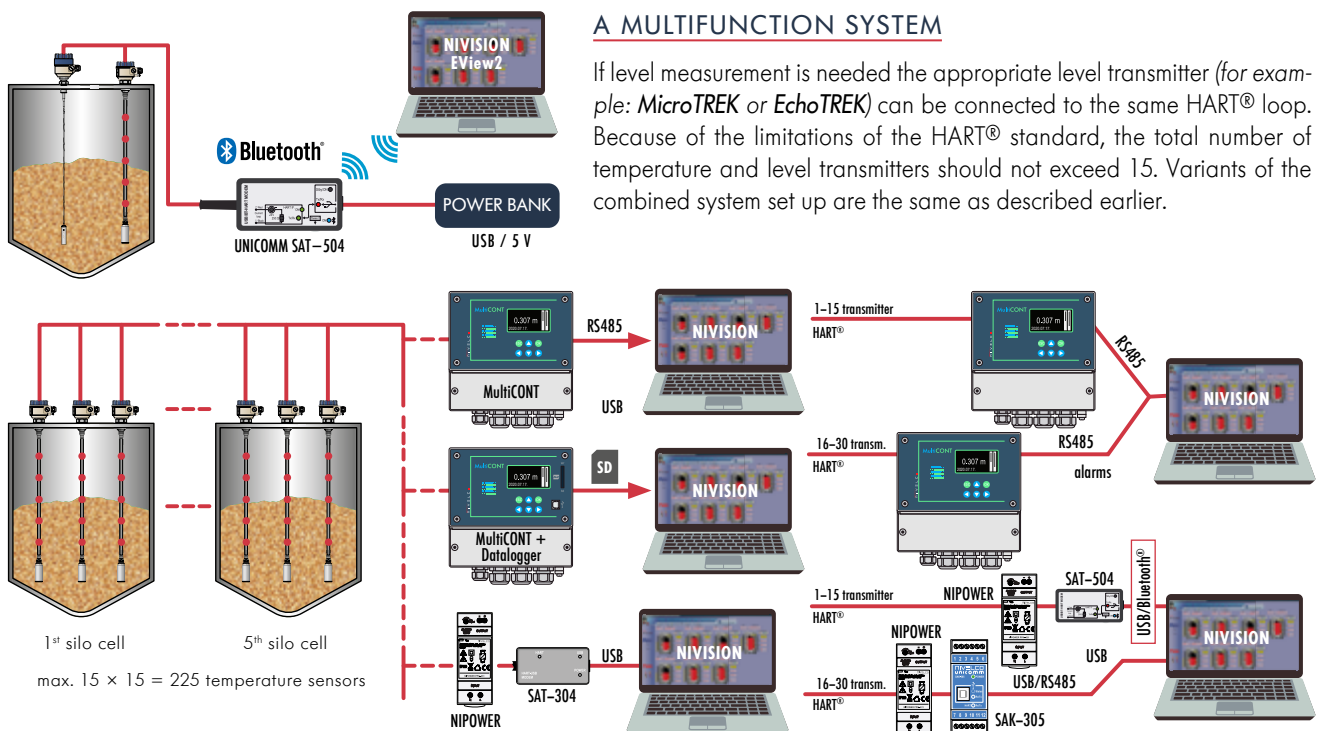
- ATEX (Ex ia G)
- ATEX (Ex ia D)
- ATEX (Ex ta/tb D)



## SYSTEM SET-UP VARIATIONS

Depending on the required processing the system set up can be the following.

1. Information transmitted by the cable via HART® communication are received by **MultiCONT** and re-transmitted to a PC via RS485 protocol. Relays of **MultiCONT** can serve alarm functions.
2. Same as above but a **MultiCONT** with Datalogger function stores the incoming data in an SD card. The stored data can be processed or archived in any PC.
3. HART® signals are transmitted to a PC via a USB/RS485 connection using a **UNICOMM SAK-305** or **SAT-304** modem while using a **SAT-504** modem wirelessly via a Bluetooth® connection. With the **EView2** configuration program, the transmitters can be programmed from a PC, and with the **NIVISION** process display software, they can be integrated into a process control system.



## TECHNICAL DATA

	For liquids		For solids
	Rigid Probe version	Flexible Probe version	Flexible Plastic-coated Probe version
Insertion length	1...4 m (3.3...13 ft)		1...50 m (3.3...164 ft)
Number of temp. sensors	Up to 15		
Position of sensors	Up to 10 m (33 ft): 1 sensor at every one meter, between 11...50 m (36...164 ft): 1 sensor at every 2 m (6.6 ft) from the bottom positioned sensor		
Temperature range	-30...+105 °C (-22...+221 °F) (for max. 1 hour: +125°C [+257 °F])		-30...+80 °C (-22...+176 °F) (for max. 1 hour: +85°C [+185 °F])
Highest medium pressure	25 bar (2.5 MPa, 363 psi)	16 bar (1.6 MPa, 232 psi)	3 bar (0.3 MPa, 43.5 psi)
Resolution (digital)	0.1°C (+0.18 °F)		
Accuracy	-30...-10 °C: ±2 °C; -10...+85 °C: ±0.5 °C; +85...+125 °C: ±2 °C (-22...+14 °F: ±3.6 °F; +14...+185 °F: ±0.9 °F; +185...+257 °F: ±3.6 °F)		
Measurement cycle	Maximum (Nx1) sec, where N is the number of sensors		
Probe	Tensile force	-	
	Dimension	Ø14 mm (0.55")	Ø16 mm (0.63")
Material of wetted parts	Stainless Steel: 1.4571	Stainless Steel: 1.4571 + 1.4301	Stainless Steel: 1.4571 + Antistatic PE-coated steel + 1.4301
Ambient temperature	With plastic housing: -20... +65 °C (-4...+149 °F); with metal housing: -30...+65 °C (-22...+149 °F); with SAP-300 display: -20...+65 °C (-4...+149 °F)		
Output	Analog	4...20 mA	
	Digital	HART®	
	Display	SAP-300 LCD	
Output load	$R_{max} = (U_{Supply} - U_{Supplymin})/0.02 \text{ A [Q]}$ , load during HART® communication: $R_{min} = 250 \Omega$		
Power supply	$U_{Supply} = 12...36 \text{ V DC}$		
Electrical protection	Class III		
Ingress protection	Electronic housing: IP67		
	Probe housing: IP68 (up to medium pressure)		Probe housing: IP66
Process connection	As per order code		
Electrical connection	2x M20x1.5 plastic cable gland, cable outer diameter: Ø6...Ø12 mm (0.236...0.472"), wire cross section: max. 1.5 mm <sup>2</sup> (AWG16); Two internally threaded ½" NPT connection for protective pipes		
Housing material	Powder-coated cast aluminum or plastic (PBT)		
Weight	1.7 kg + probe: 0.6 kg/m	2.9 kg + probe cable: 0.3 kg/m + weight 3 kg	2.9 kg + probe cable: 0.7 kg/m

## Ex INFORMATION

	Intrinsic safety	Intrinsic safety and Dust Ex	Dust Ex
Ex marking	⊕ II 1 G Ex ia IIB T6...T4 Ga	⊕ II 1 D Ex ia IIIC T85°C Da	⊕ II 1/2 D Ex ta/tb IIIC T85°C Da/Db
Ex electrical limits	Only Ex ia certified power supply should be used! $U_{imax} \leq 30 \text{ VDC}$ $I_{imax} \leq 140 \text{ mA}$ $P_{imax} \leq 1 \text{ W}$ $C_i \leq 15 \text{ nF}$ $L_i \leq 200 \mu\text{H}$		$U_{max} < 30 \text{ VDC}$ $I_{max} < 200 \text{ mA}$ $P \approx 6 \text{ W}$
Power supply	$U_i = 12.5...30 \text{ VDC}$		
Medium temperature	See table of Thermal Limits		
Ambient temperature	See table of Thermal Limits, For SAP-300 display: -20...+60 °C (-4...+140 °F)		
Cable introduction	M20x1.5 cable gland		certified "ta" protective gland M20x1.5
Cable diameter	Ø7...Ø13 mm (0.275...0.511")		
Electrical connection	Wire cross section: 0.5...1.5 mm <sup>2</sup> (AWG20...16)		

## DIMENSIONS

	For liquids	For solids	
	Rigid Probe	Flexible Probe	Flexible Plastic-coated Probe

## THERMAL LIMITS OF Ex ia COMPLIANT MODELS

Type of enclosure and measuring pipe	Ambient temperature	Medium temperature	Temperature class
Metal enclosure with rigid or flexible measuring tube	-30...+65 °C (-22...+149 °F)	-30...+80 °C (-22...+176 °F) -30...+95 °C (-22...+203 °F) -30...+105 °C (-22...+221 °F)	T6 T5 T4
Plastic enclosure with rigid or flexible measuring tube	-20...+65 °C (-4...+149 °F)	-30...+80 °C (-22...+176 °F) -30...+95 °C (-22...+203 °F) -30...+105 °C (-22...+221 °F)	T6 T5 T4
Metal enclosure with plastic-coated flexible measuring tube	-30...+65 °C (-22...+149 °F)	-20...+80 °C (-4...+176 °F)	T6

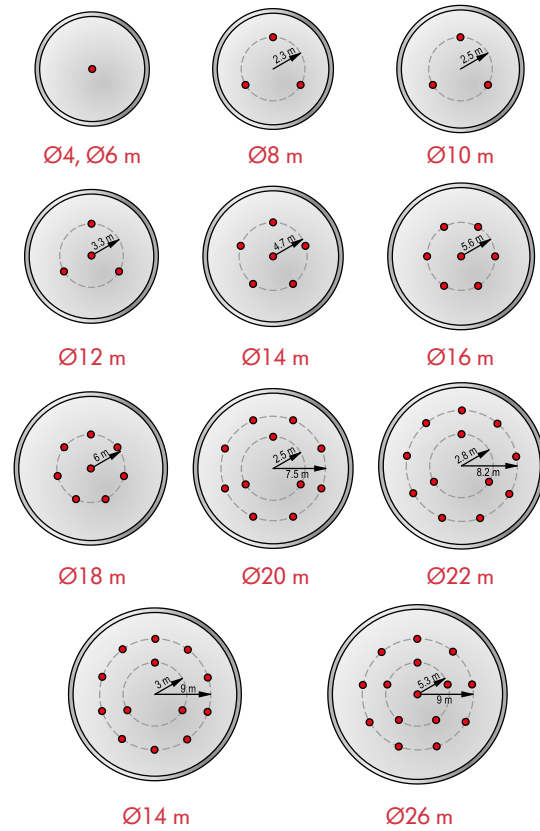


## INSTALLATION (APPLICATION EXAMPLE)

Because the mediums stored in silos are usually good heat-insulating materials the reliable measurement of the temperature is critical. Depending on the diameter of the silo the following arrangements are recommended.

Silo diameter (m)	Number of probes (pcs)	Number of probes in the centre (pcs)	Probe in the first arc		Probe in the second arc	
			(pcs)	R (m)	(pcs)	R (m)
4	1	1	-	-	-	-
6	1	1	-	-	-	-
8	3	-	3	2.3	-	-
10	3	-	3	2.5	-	-
12	4	1	3	3.3	-	-
14	6	1	5	4.7	-	-
16	7	1	6	5.6	-	-
18	8	1	7	6	-	-
20	11	-	3	2.5	8	7.5
22	12	-	3	2.8	9	8.2
24	13	-	3	3	10	9
26	15	1	5	5.3	9	10.5

## ARRANGEMENT OF THE PROBES (APPLICATION EXAMPLE)



## ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

THERMOPOINT T ■■■■■■ - ■■■■■■ - ■■■■■■ (1)

Version	Code
Multi-point transmitter	M
Multi-point transmitter with local LCD display	J

Housing	Code
Aluminum (powder-coated)	5
Plastic, PBT, glass fiber reinforced <sup>(2)</sup>	6
Stainless Steel	7

Code	Probe length (m)	Code	
1	1 / 31	19 / 49	K
2	2 / 32	20 / 50	L
:	:	21	M
9	9 / 39	22	N
A	10 / 40	23	P
B	11 / 41	24	R
C	12 / 42	25	S
D	13 / 43	26	T
E	14 / 44	27	U
F	15 / 45	28	V
G	16 / 46	29	W
H	17 / 47	30	Z
J	18 / 48		

Output / Ex	Code
HART®	4
HART® / Ex ia D	5
HART® / Ex ia G	6
HART® / Ex ta/tb D	8

Process connection / Probe length	Code	
Rod probe	1" BSP / 1...4 m	R
	1" NPT / 1...4 m	A
	M20x1.5 / 1...4 m	J
Cable probe	1½" BSP / 1...30 m	K
	1½" NPT / 1...30 m	E
	1½" BSP / 31...50 m	N
	1½" NPT / 31...50 m	L
Coated cable probe	1½" BSP / 1...30 m	H
	1½" NPT / 1...30 m	C
	1½" BSP / 31...50 m	F
1½" NPT / 31...50 m	G	

Number of sensors	Code
1	1
:	:
9	9
10	A
:	:
15	F

## ACCESSORIES

- Counterweight, Ø80 x 150 mm (CTN-103-0M-400-00)
- HART®-USB modem (SAT-304)
- HART®-USB/Bluetooth® modem (SAT-504)
- HART®-USB/RS485 modem / Ex ia G (SAK-305)
- Plug-in display (SAP-300)
- Multichannel process controller (MultiCONT)
- Process visualization software (NIVISION)

<sup>(1)</sup> The order code of an Ex version should end in "Ex"

<sup>(2)</sup> Only normal or Ex ia version is available

