Thank you for choosing NIVELCO instrument.

THERMOCONT

TEMPERATURE SENSORS
WITH DRILLED THERMOWELL

USER'S MANUAL

NIVELCO

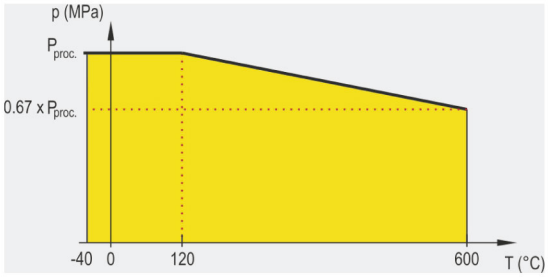
1. APPLICATION

Resistance thermometers and thermocouples with drilled thermowell cases are used as temperature measurement sensors in industrial process control. The sensors are installed in various media types (e.g., liquids, gas, fumes) inside pipes, tanks, or furnaces.
A protective assembly, consisting of an outer and an inner tube, is used to shield the thermal sensors and protect them from vibrations. The outer protective tube is machined stainless steel welded to the flange for safety reasons. The ribbing on the outer protective tube does not allow the external ambient temperature to interfere with the accuracy of the measurement. The head has a protective chain to prevent falling off. The sensor insert can be replaced without dismantling the technological system.

2. TECHNICAL DATA

Type		T□P–□□□–□	T□K–□□□–□
Sensor	Accuracy class	Pt100 A or B (EN 60751) see order code	1 or 2 class NiCr-thermo-couple (EN 60584.1); see order code
	Type	See order code	
	Material of inner protective tube	1.4571 (316Ti) stainless steel	
	Mounting	Spring loaded	
	Vibration resistance	EN 60751.4.4.2	
	Electrical insulation	Ungrounded	
Head	Housing material	EN AC 43100 Al alloy, painted	
	Electrical connection	M20×1.5 cable glands or internally threaded ½" NPT connection, cable outer diameter: Ø6…12 mm (Ø0.25…0.5"), or plug	
	Wire connection	Terminal with fixing screw	
	Ingress protection	IP65, EN 60529:2001	
Wetted parts	Process connection	Flange or 1" NPT	
	Material	1.4571 (316Ti) Stainless steel	
	Insertion length	See order code	
	Flange	See order code	
	Process pressure	40 bar (580 psi) with process connection 1" NPT (see 2.1 Pressure–Temperature diagram)	
Measuring range		–50…+600 °C (–58…+1112 °F)	
Ambient temperature		–20…+80 ° C (–4…+176 °F)	
Overvoltage category		I.	
Electrical protection		Class III	

2.1 Pressure – temperature diagram



2.2 Explosion Protection, Designation, Limit Values

Ex protection modes	Ex ia	Ex d	Ex d ia
Ex marking	⟨Ex⟩ II 1 G Ex ia IIC T6…T1 Ga	⟨Ex⟩ II 2 G Ex d IIB T6…T1 Gb	⟨Ex⟩ II 1/2 G Ex d ia IIB T6…T1 Ga/Gb
Ex power supply, intrinsically safety data	Ui = 30 V, Ii = 100 mA, Pi = 750 mW, Ci = 0 nF, Li = 0 mH	Supply voltage: max. 28 V, Current: max. 100 mA	Ui = 30 V; Ii = 140 mA; Pi = 1,4 W; Ci = 0 nF; Li = 0 mH
Electrical connection	M20×1.5 plastic cable glands, Cable outer diameter: Ø6…12 mm (Ø0.25…0.5")	M20×1.5 brass nickel-plated cable glands, cable outer diameter: Ø6…12 mm (Ø0.25…0.5")	
Wire cross-section	0.5…1.5 mm² (20…15AWG)		
Ambient and process temperature	See Table 2.3.		
Reference document	tnp4719m0600h_04		

2.3 Ex Temperature classes

Temperature class	T6	T5	T4	T3(1)	T2(1)	T1(1)
Max. ambient temperature	+65 °C (+149 °F)	+70 °C (+158 °F)		+80 °C (+176 °F)		
Max. process temperature	+85 °C (+185 °F)	+100 °C (+212 °F)	+135 °C (+275 °F)	+200 °C (+392 °F)	+300 °C (+572 °F)	+450 °C (+842 °F)
Min. ambient temperature	–20 °C (–4 °F)					

(1)Only TN/TU types

2.4 Accessories

– User's Manual
– Warranty Card
– EU Declaration of Conformity

2.5 Order code (Not all combinations are available)

THERMOCONT T ☐☐ – ☐☐☐ – ☐*

Sensor tube	Code
Drilled, tapered	N
Standard with Stellite coating	C
Protecting tube INCONEL 600	I
Straight with Stellite coating	K
Drilled straight	U

Sensor	Code
Thermocouple Fe-CuNi	J
Thermocouple NiCr-Ni (IEC 584)	K
Resistance Temperature Sensor Pt100 (IEC 751)	P

Process connection	Code
1" NPT	1
DN40 PN40 [PN25]	2
DN40 PN64	3
DN40 PN100	4
DN50 PN40 [PN25]	5
DN50 PN64	6
DN50 PN160 [PN100]	7
DN80 PN40 [PN25]	8
DN80 PN64	9
DN100 PN40 [PN25]	A
DN100 PN64	B
DN150 PN40 [PN25]	C
DN150 PN64	D
2" ANSI 150 RF	E
2" ANSI 300 RF	F
2" ANSI 600 RF	G
2" ANSI 900 RF	H
3" ANSI 150 RF	J
3" ANSI 300 RF	K
3" ANSI 600 RF	L
3" ANSI 900 RF	M

Pt100 sensor	Code
Class A, single, 2-wire	1
Class B, single, 2-wire	2
Class A, dual, 3-wire	4
Class B, dual, 3-wire	5
Class B, single, 4-wire	6
Class A, single, 4-wire	7

Sensor: th.-couple	Code
Class 1, single	1
Class 2, single	2
Class 1, dual	4
Class 2, dual	5

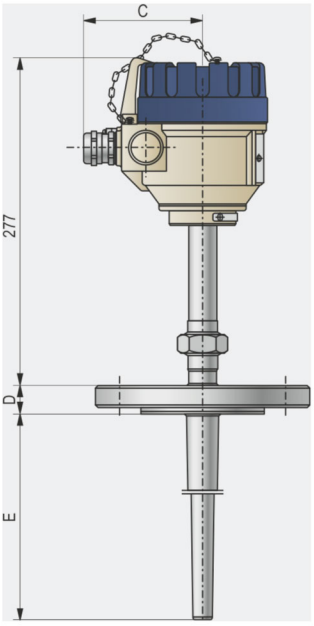
Process conn.	Code
4" ANSI 150 RF	N
4" ANSI 300 RF	P
4" ANSI 600 RF	R
4" ANSI 900RF	S
1½" ANSI 300RF	T
DN25 PN40	O
M33x2	V

Insertion length	Code
160 mm	1
200 mm	2
250 mm	3
300 mm	4
350 mm	5
400 mm	6
450 mm	7
500 mm	8
600 mm	9
700 mm	A
800 mm	B
900 mm	C
1000 mm	D
2000 mm	H
3000 mm	M

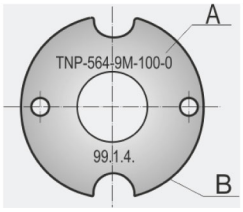
Ex certificate	Code
None	0
Ex d ia / M20x1.5; without cable gland	5
Ex d ia / ½" NPT; without cable gland	6
Ex ia	7
Ex d ia	8
Ex d	9
Ex d / M20x1.5 without cable gland	A
Ex d / ½" NPT without cable gland	B

For explosion-proof devices, the article number is followed by "Ex" on the data plate!

2.5 Dimensions



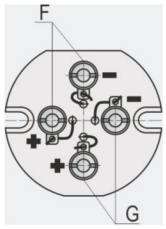
Label of mounted sensor



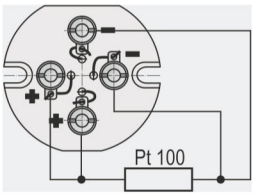
LEGEND

A: Drawing No.,
B: Date (year, week)
C: Depends on size of gland
D, E: See order code
F: 2nd sensor connection
G: 1st sensor connection

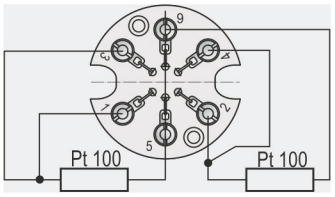
4. ELECTRICAL CONNECTION



Single and twin thermocouple connection



4-wire thermo resistor connection



3-wire twin thermo resistor connection

3. INSTALLATION

Installation may be done by process connection (including flange) detailed in Technical Data and figures. Ex-version installation claims Ex-certified cable glands.

3.1 Special conditions for safe use

The temperature sensors are certified according to the protection mode ⟨Ex⟩ II 1/2 G Ex d ia IIB T…Ga/Gb or ⟨Ex⟩ II 1G Ex ia IIB T…Ga must be operated only with certified [Ex ia] IIC or [Ex ia] IIB protected intrinsically safe circuit according to the following technical data:

$U_{o\ max} \leq 30$ V, $I_{o\ max} \leq 140$ mA, $P_{o\ max} \leq 1.4$ W

In the case of THERMOCONT T☐☐–☐☐☐–5/6/A/B Ex devices, the protective plug must be removed and the device must be installed with a properly fitted and sealed "Ex d" certified gland before commissioning!

5. MAINTENANCE, REPAIR

The device does not require regular maintenance. The warranty card contains the terms and conditions. Before returning the device for repairs, it must be cleaned thoroughly. The parts in contact with the medium may contain harmful substances; therefore, they must be decontaminated.

Our official form (Returned Equipment Handling Form) must be filled and enclosed in the parcel. Download it from our website nivelco.com. The device must be sent back with a declaration of decontamination. A statement must be provided in the declaration that the decontamination process was successfully completed and that the device is clean of any hazardous substances.

6. STORAGE CONDITIONS

Ambient temperature: –25…+55 °C (–13…+131 °C).