Thank you for choosing NIVELCO instrument.

THERMOCONT

TS / TP
TEMPERATURE SENSORS

USER'S MANUAL

1. APPLICATION

Resistance thermometer and thermocouple are used as sensors of temperature measurement in industrial process control. The sensors are installed in various kinds of mediums (e.g. liquids, gas, fumes) inside pipes, tanks and furnaces.

2. TECHNICAL DATA

Model		Thermo-couples TS, TS Ex J (Fe-Cu-Ni) K (NiCr-Ni)	Resistance thermometers (1xPt 100, 2xPt 100) TSP TSP Ex	TPP TPP Ex	TSV TSV Ex	TSG TSG Ex
Sensor	Accuracy class	1 or 2 EN 60584.1	A or B EN 60751			
	Type	See order code				
	Vibration resistance	–			EN 60751 4.4.2	–
	Electrical insulation	Ungrounded				
	Internal protection tube	EN 10025JR steel				
Housing	Material	EN AC 43100				
	Electrical connection	Screw type terminal 0.5…2.5 mm²				
Wetted part	Material	1.4571 stainless steel	PFA coated		1.4571 stainless steel	
	Probe length	60…3000 mm (see order code)				
	Process connection	See order code				
General data	Temperature range	−50…+600 °C (−58…+1112 °F)	−50…+200 °C (−58…+392 °F)		-50 °C … +600 °C (−58…+1112 °F)	
	Process pressure	25 bar (2.5 MPa, 363 psi) at +20 °C (68 °F) 16 bar (1.6 MPa, 232 psi) at +400 °C (752 °F)	1 bar (0.1 MPa, 14.5 psi)		25 bar (2.5 MPa, 363 psi) at +20 °C (68 °F) 16 bar (1.6 MPa, 232 psi) at +400 °C (752 °F)	
	Time-constant	< 3 min	4.5 min		< 3 min	< 20 sec
	Ambient temperature	−20…+80 °C (−4…+176 °F), Ex version: see temp. class table				
	Electrical connection	Normal and Ex ia: M20x1.5 cable gland, cable Ø7…10 mm (Ø 0.28…0.4") Ex d and Ex d ia: M20x1.5 cable gland, cable Ø6…12 mm (Ø 0.25…0.5")				

2.1 TEMPERATURE CLASS

Temperature class	T6	T5	T4	T3	T2	T1
Max. Ambient temperature	+65 °C (+149 °F)	+70°C (+158 °F)	+70°C (+158 °F)	+80 °C (+176 °F)	+80 °C (+176 °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)

2.2. SPECIAL DATA FOR EX CERTIFIED MODELS

TYPE	TSG-□□□-□ Ex	TP□-□□□-□ Ex	TS□-□□□-□ Ex *(except:TSG)*
Ex marking (ATEX)	Ex II 1 G Ex ia IIC T6…T1 Ga	Ex II 1 G Ex ia IIB T6…T1 Ga Ex II 1/2 G Ex d ia IIB T6…T1 Ga/Gb	Ex II 1 G Ex ia IIC T6…T1 Ga
Intrinsically safe data	U_{imax} = 30 V I_{imax} = 100 mA P_{imax} = 750 mW C_i =0 nF L_i =0 mH	U_{imax} = 30 V I_{imax} = 140 mA P_{imax} = 1W C_i =0 nF L_i =0 mH	U_{imax} = 30 V I_{imax} = 100 mA P_{imax} = 750 mW C_i =0 nF L_i =0 mH
Ex marking (ATEX)		Ex II 2 G Ex d IIB T6…T1 Gb	Ex II 2 G Ex d IIB T6…T1 Gb
Intrinsically safe data		U_{imax} = 30 V I_{imax} = 140 mA	
Ex marking (ATEX)			Ex II 1/2 G Ex d ia IIB T6…T1 Ga/Gb
Intrinsically safe data			U_{imax} = 30 V I_{imax} = 140 mA P_{imax} = 1W C_i =0 nF L_i =0 mH
Electrical protection	Class III.		
Ingress protection	IP67		
Electrical connection	Wire cross section: 0.5…1.5 mm² (AWG20…16)		
Housing	Paint coated aluminium (EN AC 43100)		

2.3. ORDER CODE

THERMOCONT T □□ – □□□ – □*

Sensor tube	Code
Tube 1.4571	S
Tube + PFA cover	P

Sensor	Code
Fe-CuNi	J
NiCr-Ni	K
Pt 100	P
Pt 100 shock proof	V
Pt 100 fast	G

Process connection	Code
DN25 flange PN 16 ***	0
M20 x 1,5	1
½" BSP	2
½" NPT	3
⅜" BSP	4
DN 40 flange PN 25 ***	5
DN 50 flange PN 25 ***	6
DN 80 flange PN 25 ***	7
DN 100 flange PN 25 ***	8
DN 150 flange PN 25 ***	9

Sensor Pt100	Code
"A" class single	1
"B" class single	2
"A" class twin	4
"B" class twin	5
"B" class + 4 wire	6
"A" class + 4 wire	7

Sensor thermocouple	Code
Class 1 single	1
Class 2 single	2
Class 1 twin	4
Class 2 twin	5

Probe length **	Code
160	1
250	2
400	3
500	4
1000	5
1500	6
2000	7
2500	8
3000	9

Certificates	Code
none	0
Ex ia	7
Ex d ia	8
Ex d	9

** The order code of an Ex version should end in „Ex"*
*** Different length on request*
**** **TS:** steel flange; **TP:** Steel flange with PTFE insert*

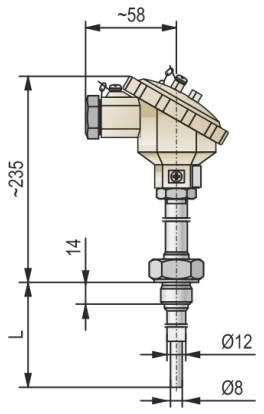
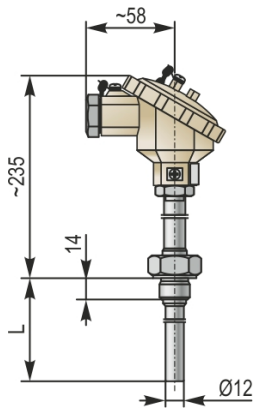
Manufacturer:
NIVELCO Process Control Co.
H-1043 Budapest, Dugonics u. 11.
Tel.: +36-1-889-0100
E-mail: sales@nivelco.com www.nivelco.com

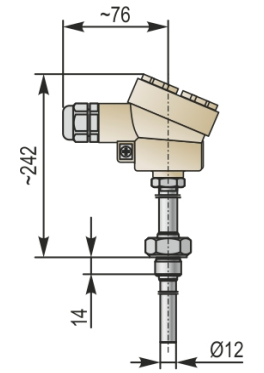
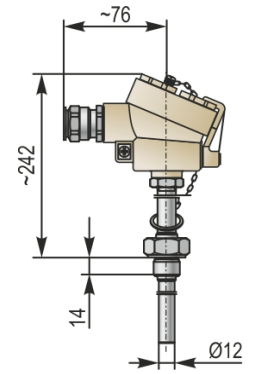
Dodávateľ:
MICROWELL spol. s r. o.
SNP 2018/42, 927 00 Šaľa
Tel.: (+421) 31/ 770 7585, 770 7082
E-mail: microwell@microwell.sk www.microwell.sk

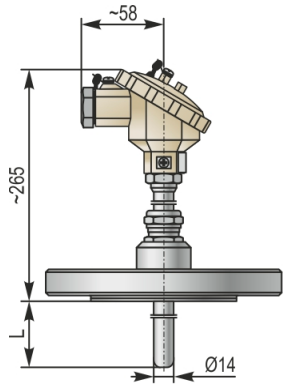
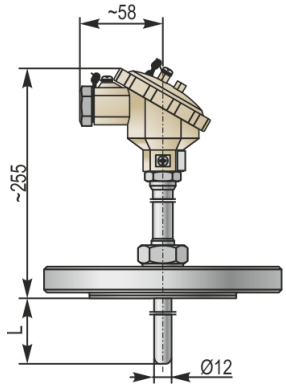
2.4 ACCESSORIES

- User's Manual
- Warranty Card
- EU-declaration of Conformity
- Sealing

2.5 DIMENSIONS

TSG	TSP, TSV
	
Normal	*Normal*

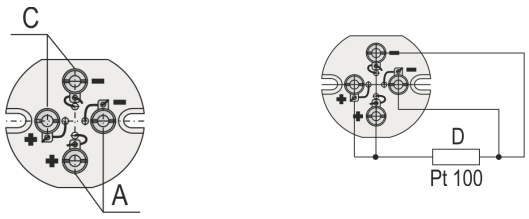
TSP, TSJ, TSK, TSV, TSG	TSP, TSJ, TSK, TSV
	
Ex ia	*Ex d, Ex d ia*

TPP, TPV	TSP, TSJ, TSK, TSV
	
Normal	*Normal*

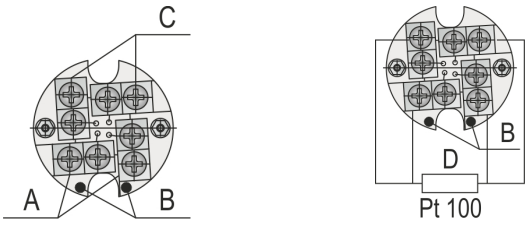
3. INSTALLATION

Installation may be done by process connection (including flange) detailed in Technical Data and figures. The device should be handled with care to avoid damage or bend of the protection tube during transportation and installation.

4. ELECTRICAL CONNECTION



Normal



Ex ia, Ex d, Ex d ia devices

LEGEND:

A: Pt 100 or thermocouple No 1.
B: Marking
C: Pt 100 or thermocouple No 2.
D: 4 wire system

Four wire system is requiring parallel connection of marked and not marked points of wire terminal to the Pt sensor. Thermocouple + end connection is according to the (+) or (·) point.

4.1 SPECIAL CONDITIONS FOR SAFE USE

- The place and mode of the installation should guarantee the protection of the apparatus against external mechanical effects during operation and service.
- The units with "ia" protection type should be powered from an Ex ia IIC certified intrinsically safe isolator.
- The units with "d" or „d ia" protection type should be only operated with Ex d IIB certified cable glands.
- Heat resistance of the cable insulation should meet the highest value (up to 80 °C) of the ambient temperature allowed at the place of application.
- Since the housing of the units is made of die cast aluminium, when the units are installed into a location which requires 'Ga' protection level, the units should be mounted that they are protected against impacts and friction effects which may be source of a potential ignition.
- The PFA plastic coated type units should be powered from an Ex ia IIB certified intrinsically safe isolator and in case of units with Ex d protection type they can be only used in IIB gas group medium.
- The housing of the instrument shall be connected to an EP network.

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 www.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 from any hazardous substances.

6. STORAGE CONDITIONS

Ambient temperature −25...+55 °C (−13...+131 °F).

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