

Thank you for choosing NIVELCO instrument.
We are sure that you will be satisfied throughout its use.

THERMOCONT

TS / TP
TEMPERATURE SENSORS

USER'S MANUAL



ООО "РусАвтоматизация"

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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 | Resistance thermometers (1xPt 100, 2xPt 100) | | | |
|--------------------------|--|--|---------------------------------|----------------|---------------|
| | TS, TS Ex J (Fe-Cu-Ni) K (NiCr-Ni) | TSP TSP Ex | TPP TPP Ex | TSV TSV Ex | TSG TSG Ex |
| Class of accuracy | 1 or 2 EN 60584.1 | A or B EN 60751 | | | |
| Type | See order code | | | | |
| Shock resistance | | - | | EN 60751 4.4.2 | - |
| Electrical insulation | Ungrounded | | | | |
| Internal protection tube | EN 10025JR steel | | | | |
| Material | EN AC 43100 | | | | |
| Wire connection | Screw type terminal 0.5...2.5 mm ² | | | | |
| Material | 1.4571 stainless steel | PFA coated | 1.4571 stainless steel | | |
| Insertion length | 60 ... 3000 mm (see order code) | | | | |
| Process connection | See order code | | | | |
| Temperature range | -50 °C ... +600 °C | -50 °C ... +200 °C | -50 °C ... +600 °C | | |
| Process pressure | 20 °C 2.5 MPa 400 °C 1.6 MPa | 1 MPa | 20 °C 2.5 MPa 400 °C 1.6 MPa | | |
| Delay time | < 3 min | 4.5 min | < 3 min | < 20 sec | |
| Ambient temperature | -20 °C ... +80 °C, Ex version: see temp. class table | | | | |
| Electrical connection | Normal and Ex ia: M20x1.5 cable gland, cable Ø 7-10 mm Ex d and Ex d ia: M20x1.5 cable gland, cable Ø 6-12 mm | | | | |

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2.1 TEMPERATURE CLASS

| Temperature class | T6 | T5 | T4 | T3 | T2 | T1 |
|--------------------------|-------|--------|--------|--------|--------|--------|
| Max. Ambient temperature | 65 °C | 70 °C | 70 °C | 80 °C | 80 °C | 80 °C |
| Max. Process temperature | 85 °C | 100 °C | 135 °C | 200 °C | 300 °C | 450 °C |

2.2. SPECIAL DATA FOR EX CERTIFIED MODELS

| TYPE | TSG-□□□-□ Ex | TP□-□□□-□ Ex | TS□-□□□-□ Ex (except: TSG) |
|-------------------------|--|--|--|
| Ex marking (ATEX) | II 1 G Ex ia IIC T6...T1 Ga | II 1 G Ex ia IIB T6...T1 Ga II 1/2 G Ex d ia IIB T6...T1 Ga/Gb | II 1 G Ex ia IIC T6...T1 Ga |
| Intrinsically safe data | U _{max} = 30 V I _{max} = 100 mA P _{max} = 750 mW C _i = 0 nF L _i = 0 mH | U _{max} = 30 V I _{max} = 140 mA P _{max} = 1W C _i = 0 nF L _i = 0 mH | U _{max} = 30 V I _{max} = 100 mA P _{max} = 750 mW C _i = 0 nF L _i = 0 mH |
| Ex marking (ATEX) | | II 2 G Ex d IIB T6...T1 Gb | II 2 G Ex d IIB T6...T1 Gb |
| Intrinsically safe data | | U _{max} = 30 V I _{max} = 140 mA | |
| Ex marking (ATEX) | | | II 1/2 G Ex d ia IIB T6...T1 Ga/Gb |
| Intrinsically safe data | | U _{max} = 30 V I _{max} = 140 mA P _{max} = 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 mm ² | | |
| Housing | Paint coated aluminium (EN AC 43100) | | |

2.3. ORDER CODE

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| 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 |
| 1/2" BSP | 2 |
| 1/2" NPT | 3 |
| 3/8" 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 |

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

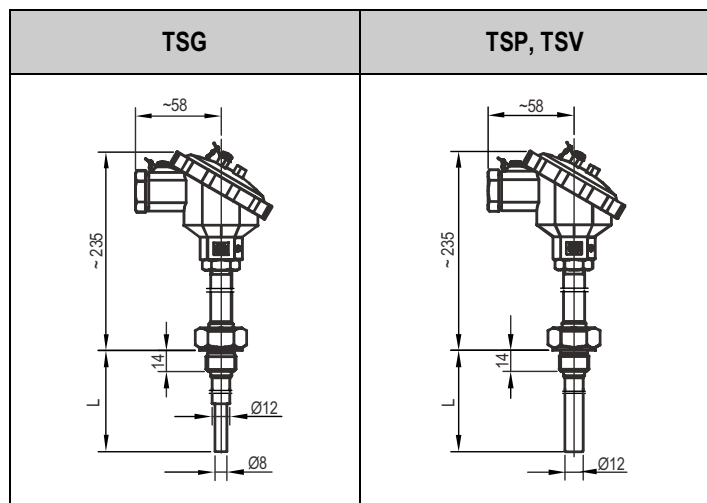
| Ex marking | Code |
|------------|------|
| none | 0 |
| Ex ia | 7 |
| Ex d ia | 8 |
| Ex d | 9 |

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

2.4 ACCESSORIES

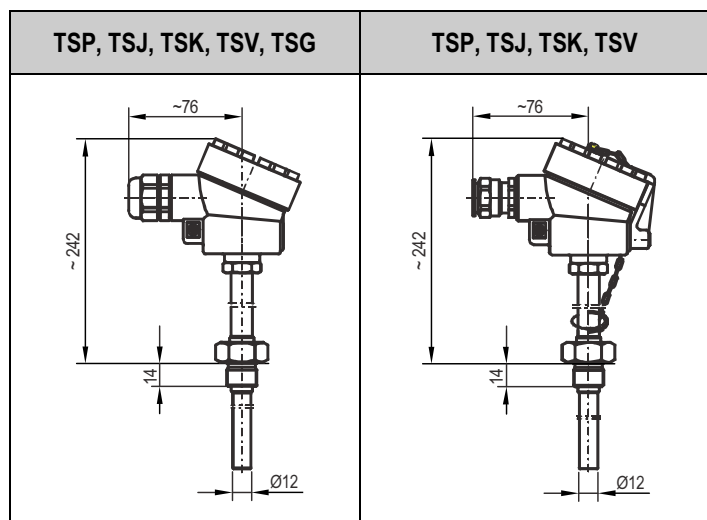
- User's Manual
- Warranty Card
- Declaration of Conformity,
- Sealing

2.5 DIMENSIONS



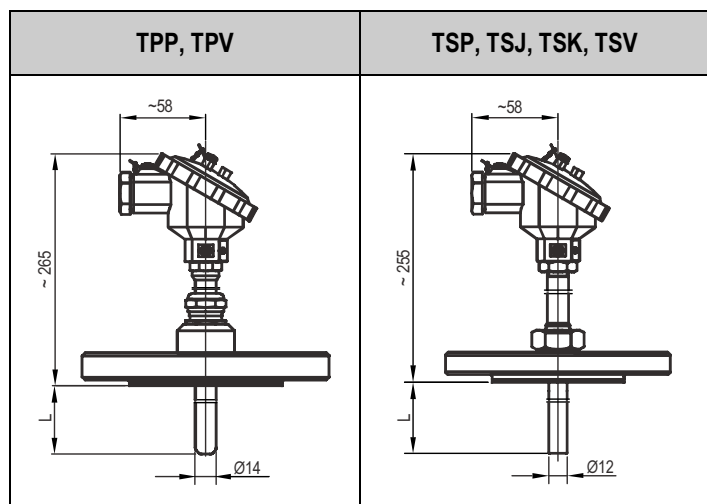
Normal

Normal



Ex ia

Ex d, Ex d ia



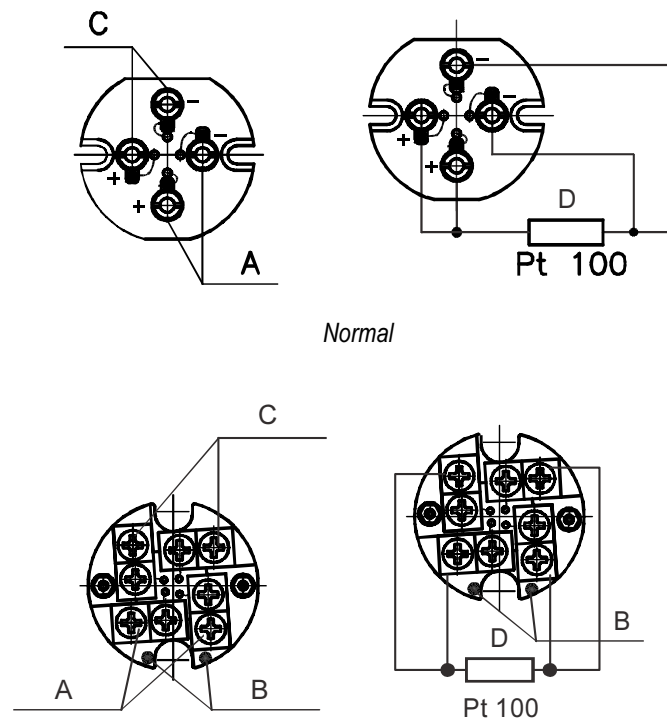
Normal

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 instrument does not require regular maintenance. Repairs during or beyond guarantee period are carried out solely by the manufacturer.

6. STORAGE CONDITIONS

Environment temperature -25 °C ... +55 °C.

7. WARRANTY

NIVELCO provides warranty of 3 (three) years in compliance with details described in the Warranty Card.

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Nivelco reserves the right to change technical specification without notice.