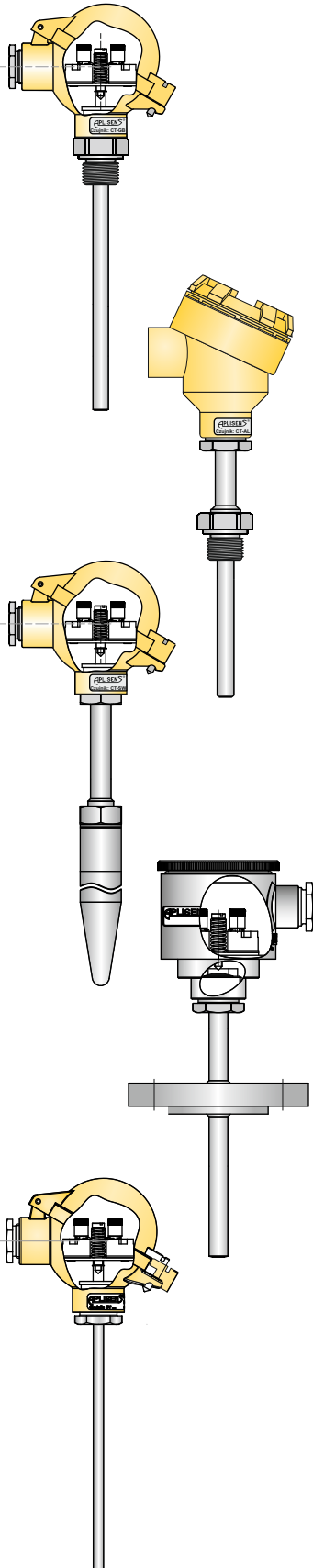


TEMPERATURE SENSORS WITH INTEGRATED PROTECTION TUBE OR ADDITIONAL THERMOWELL TYPE CT



- ✓ RTD (Pt100, Pt1000) and TC sensors
- ✓ ATEX Exia certificate
- ✓ ATEX Exd certificate
- ✓ DNV/GL marine certificate

Features

Temperature sensors CT are offered as Pt100/Pt1000 resistance thermometers or thermocouples.

In resistance sensors (RTD) platinum resistors change their electrical resistance as a function of temperature. RTD, the most commonly used sensors in industry, are suitable for applications between $-196...+600^{\circ}\text{C}$. The accuracy classes A and B are available with a tolerance acc. to IEC60751.

Thermocouples are made of two different conductors joined at the end. The temperature difference between junction, placed in measuring point (hot junction), and wire ends (cold junction), generate voltage proportional to the difference of temperature between these junctions. Thermocouples are suitable for the measurement of high temperatures, up to 1700°C .

The accuracy classes 1 and 2 are available with tolerance acc. to IEC60584.

Description

Temperature sensors model CT are offered in two designs:

- with integrated protection tube, fully welded and screwed into enclosure.
- for additional thermowell: machined from bar stock or from pipe.

In both cases sensors are equipped in spring-loaded measuring inserts which are replaceable. The interchangeable inserts can be replaced without dismantling sensor from installation. This enables inspection or, if necessary, service without stopping of running production process.

Sensors are suitable for gases and liquids. A large number of approvals and wide choice of process connections, connection heads, lengths of immersion and necks, types of measuring elements and materials of wetted parts allow for applications in:

- power industry
- chemical and petrochemical industry
- marine and offshore industry
- heavy industry
- food industry
- machine building
- plant construction

Technical details

| Process part type | Measuring range |
|-------------------|---|
| GB1 | Pt100: -70...150°C Marine version: -25...150°C |
| GN1 | Pt100: -70...500°C / -196...150°C 1) TC type J/K: -40...550°C Marine version: -25...500°C |
| T1 | Pt100: -70...500°C / -196...150°C 1) TC type J/K: -40...550°C Marine version: -25...500°C |
| P1 | Pt100: -70...500°C / -196...150°C 1) TC type J/K: -40...550°C Marine version: -25...500°C |
| GB1X + thermowell | Pt100: -70...150°C Marine version: -25...150°C |
| GN1X + thermowell | Pt100: -70...500°C TC type J/K: -40...570°C Marine version: -25...500°C |

1) On request

| Accuracy | | |
|--|------------------------|-----------------------------|
| For resistance thermoelements Pt100 acc. to PN-EN 60751:2009 | | |
| Class | Temperature range (°C) | Accuracy (°C) |
| A | -30...300 | $\pm(0,15+0,002 \cdot t)$ |
| B | -50...500 | $\pm(0,3+0,005 \cdot t)$ |
| For resistance thermocouples K acc. to PN-EN 60584-1:2014 | | |
| Class | Temperature range (°C) | Accuracy (°C) |
| 1 | -40...375 | $\pm 1,5$ |
| | 375...1000 | $\pm 0,004 \cdot t $ |
| 2 | -40...333 | $\pm 2,5$ |
| | 333...1200 | $\pm 0,0075 \cdot t $ |
| For resistance thermocouples J acc. to PN-EN 60584-1:2014 | | |
| Class | Temperature range (°C) | Accuracy (°C) |
| 1 | -40...375 | $\pm 1,5$ |
| | 375...700 | $\pm 0,004 \cdot t $ |
| 2 | -40...333 | $\pm 2,5$ |
| | 333...750 | $\pm 0,0075 \cdot t $ |

| Certification | | | | | | |
|---------------|------------------------|--|----|--|--|----|
| Exia | | II 1/2 G Ex ia IIC T6...T1 Ga/Gb II 1D Ex ia IIIC T75°C Da | | | I M1 Ex ia I Ma | 1) |
| Exd 2) | | II 2G Ex d IIB+H ₂ T ^{**} Gb II 2D Ex tb IIIC T* Db | 3) | | II 1/2G Ex d IIB+H ₂ T ^{**} Ga/Gb II 1/2D Ex tb IIIC T* Da/Db | 4) |
| MR | Marine certificate DNV | | | | | |

1) Only CT-CL version

2) Only CT-AL version

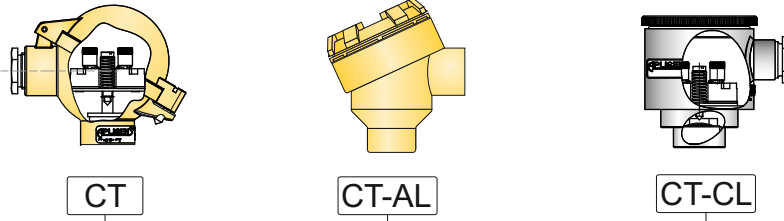
3) Location of complete equipment in zone 1 or 21

4) Measuring stem with screwed to the opening D2 of housing thermowell, with proper wall thickness (zone 0 or 20):

a) minimum 1,5mm, made of corrosion resistant steel or

b) minimum 1mm and fixed in protective thermowell (wall thickness minimum 1mm) made of corrosion resistant steel

Casing



Process part

with integrated protection tube

for additional thermowell

GB1

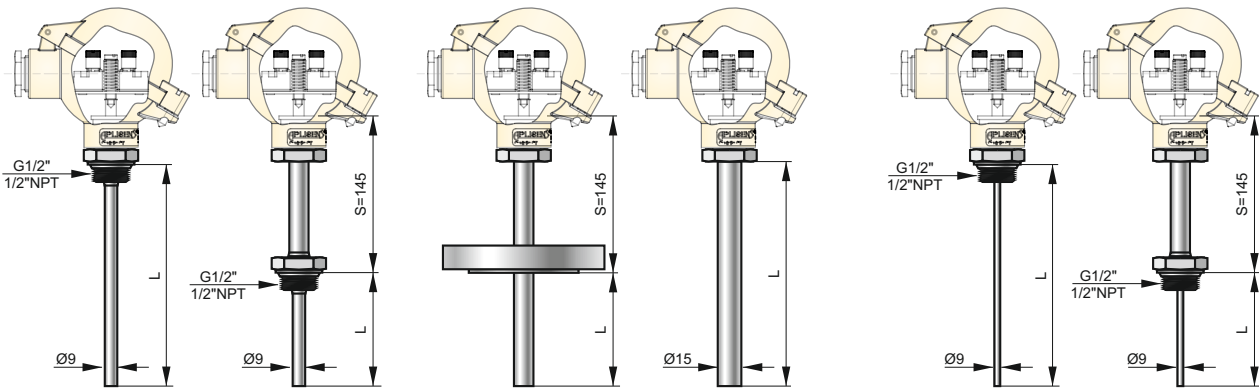
GN1

T1

P1

GB1X

GN1X



thermowell

OG2.

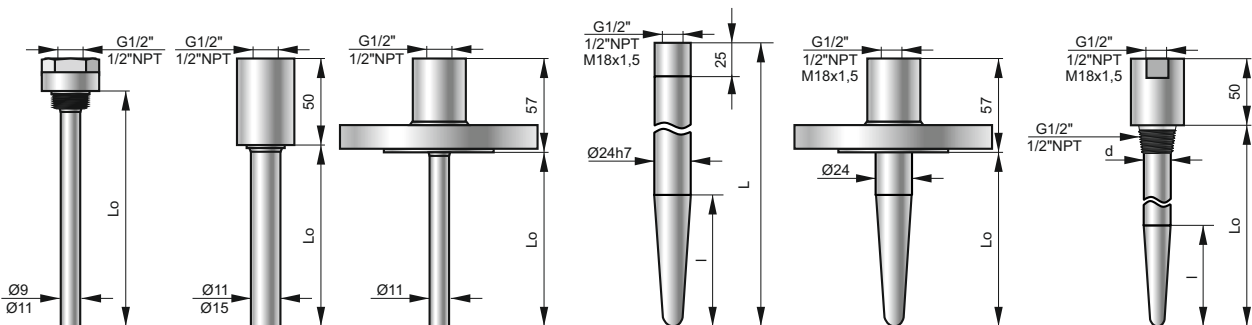
OG3.

T

SW2

SW2T

SWG



ORDERING PROCEDURE

| Head Material | | | |
|---|--|---|--|
| CT | | aluminum housing NA type | |
| CT-AL | | aluminum housing DAO type | |
| CT-CL | | stainless steel housing KO type | |
| Process part | | | |
| sensors with integrated protection tube | | | |
| GB1 | | sensor with threaded process connection, diameter of sensor 9mm, 316ss | |
| GN1 | | sensor with threaded process connection, diameter of sensor 9mm, neck S=145mm, wetted parts 316ss | |
| T1 | | diameter of sensor 11mm, neck S=145mm, wetted parts 316ss | |
| P1 | | diameter of sensor 15mm, wetted parts 316ss | |
| sensors for additional thermowell | | | |
| GB1X | | spring loaded sensor with threaded process connection, wetted parts 316ss | |
| GN1X | | spring loaded sensor with threaded process connection, neck S=145mm, wetted parts 316ss | |
| Certificate | | | |
| x | | standard version, no certificates | |
| Exia /II | | II 1/2 G Ex ia IIC T6...T1 Ga/Gb II 1D Ex ia IIIC T75°C Da | |
| Exia /I | | I M1 Ex ia I Ma | available in CT-CL housing only |
| Exd | | II 2G Ex d IIB+H ₂ T** Gb II 2D Ex tb IIIC T* Db | available in CT-AL housing only, location of complete equipment in zone 1 or 21 |
| | | II 1/2G Ex d IIB+H ₂ T** Ga/Gb II 1/2D Ex tb IIIC T* Da/Db | available in CT-AL housing only, measuring stem with screwed to the opening D2 of housing thermowell, with proper wall thickness (zone 0 or 20): a) minimum 1,5mm, made of corrosion resistant steel or b) minimum 1mm and fixed in protective thermowell (wall thickness minimum 1mm) made of corrosion resistant steel |
| MR | | marine certificate | |
| Measuring element | | | |
| Pt | | Pt100 | |
| 2xPt | | 2xPt100 | |
| Pt1000 | | Pt1000 | |
| J | | TC type J | |
| 2xJ | | 2x TC type J | |
| K | | TC type K | |
| 2xK | | 2xTC type K | |
| Class of element | | | |
| A/3 | | TR sensor, Class A, 3 wires | |
| A/4 | | TR sensor, Class A, 4 wires | |
| B/2 | | TR sensor, Class B, 2 wires | |
| 1/O | | TC sensor, Class 1, ungrounded junction | |
| 2/O | | TC sensor, Class 2, ungrounded junction | |
| Thermowell | | | |
| x | | no thermowell | |
| OG2.9 | | welded type, ext. diameter 9mm, wetted parts mat. 316ss | |
| OG2.11 | | welded type, ext. diameter 11mm, wetted parts mat. 316ss | |
| OG2.15 | | welded type, ext. diameter 15mm, wetted parts mat. 316ss | |
| OG3.11 | | welded type, ext. diameter 11mm, wetted parts mat. 316ss | |
| OG3.15 | | welded type, ext. diameter 15mm, wetted parts mat. 316ss | |
| OGT1.11 | | welded type, ext. diameter 11mm, wetted parts mat. 316ss | |
| OGT1.15 | | welded type, ext. diameter 15mm, wetted parts mat. 316ss | |
| SWG | | drilled type, ext. diameter 17mm, wetted parts mat. 316ss | |
| SW2 | | drilled type, ext. diameter 24h7, wetted parts mat. 316ss, | |
| SW2T | | drilled type, ext. diameter 24mm, wetted parts mat. 316ss, | |
| Process connection | | | |
| threaded type | | | |
| M20x1,5 | | thread M20x1,5 | |
| G1/2 | | thread G1/2" | |
| 1/2NPT | | Thread 1/2"NPT | |
| flange type | | | |
| DN25PN40 | | flange DN25PN40 | |
| DN40PN40 | | flange DN40PN40 | |
| DN50PN40 | | flange DN50PN40 | |
| ANSI 1" #150 | | flange ANSI 1" #150 | |
| ANSI 1,5" #150 | | flange ANSI 1,5" #150 | |
| ANSI 2" #150 | | flange ANSI 2" #150 | |
| Clamping grips | | | |
| UG15 | | diameter 15mm, thread M24x2 | |
| Length of immersion part L | | | |
| L= | | required length of immersion [mm] | |

| Equipment of housing | | |
|----------------------|------------------------|--|
| KZ | | terminal block |
| TR | | wires connections for assembling of temperature transmitter |
| AT-2 | | transmitter 4...20mA model AT-2 |
| ATX-2 | | ATEX transmitter 4...20mA model ATX-2 |
| LI-24G | | smart transmitter 4...20mA + HART model LI-24G |
| LI-24G/Ex | | ATEX smart transmitter 4...20mA + HART model LI-24G/Ex |
| LI-24G/SIL2 | | SIL 2, smart transmitter 4...20mA + HART model LI-24G/SIL2 |
| LI-24G/Ex/SIL2 | | SIL 2, ATEX smart transmitter 4...20mA + HART model LI-24G/Ex/SIL2 |
| GI-22-2 | | transmitter 4...20mA model GI-22-2 |
| GIX-22-2 | | ATEX transmitter 4...20mA model GIX-22-2 |
| | Measuring range | |
| | ... | set range [deg C] |
| | Alarm signal | |
| | HI | signal >20mA |
| | LO | signal <4mA |
| | Special version | |
| | ND=... | diameter of sensor or thermowell different than standard [mm] |
| | NE=... | length of neck different than 145mm [mm] |
| | NM..... | wetted parts material different than standard |
| | NPC... | process connection different than standard |
| | ... | description of required parameters |