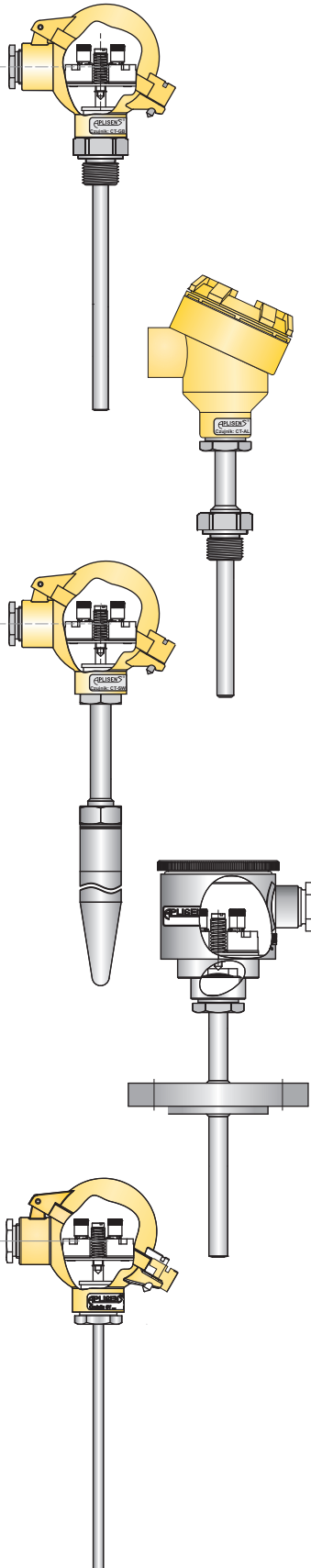


# TEMPERATURE SENSORS WITH INTEGRATED PROTECTION TUBE OR ADDITIONAL THERMOWELL TYPE CT



- ✓ 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  $-196\dots+600^{\circ}\text{C}$ . 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  $1700^{\circ}\text{C}$ . 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 <sub>2</sub> T <sup>**</sup> Gb II 2D Ex tb IIIC T* Db	3)		II 1/2G Ex d IIB+H <sub>2</sub> T <sup>**</sup> 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

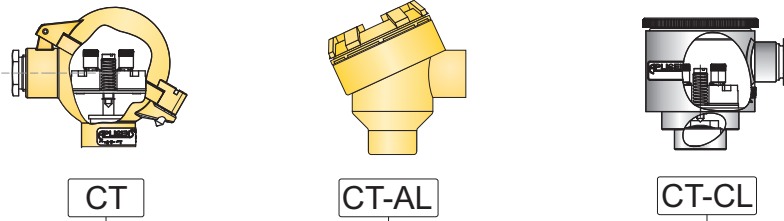
3) Location of complete equipment in zone 1 or 21

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

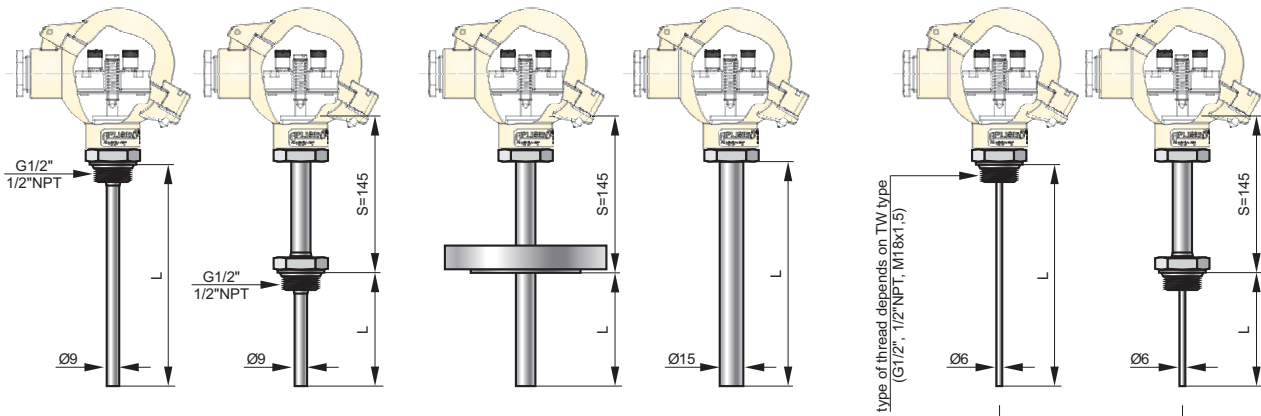
GN1

T1

P1

GB1X

GN1X



thermowell

OG2.9  
OG2.12

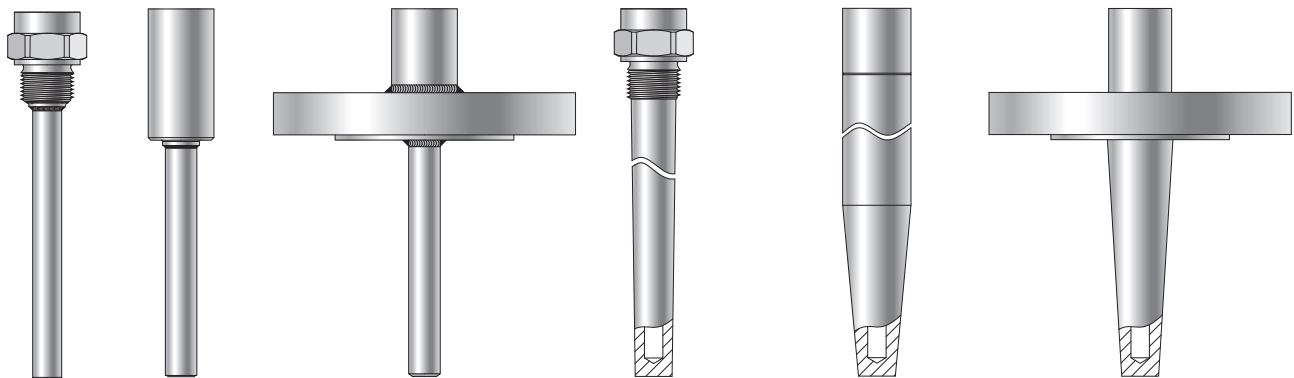
OG3.12

OGT.12

SWG

SW2

SWT

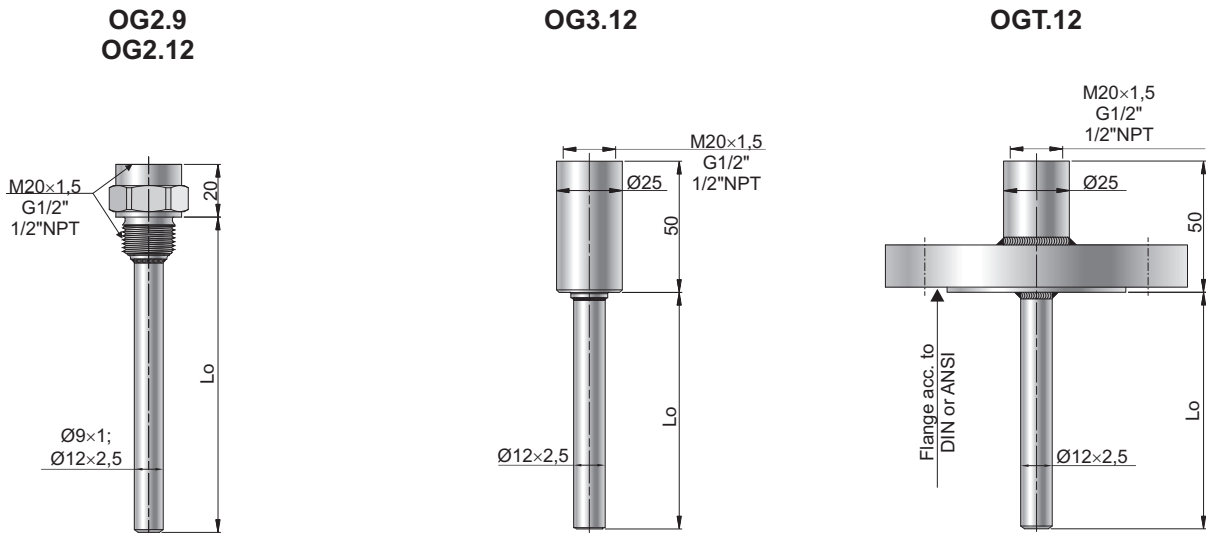


## ORDERING PROCEDURE

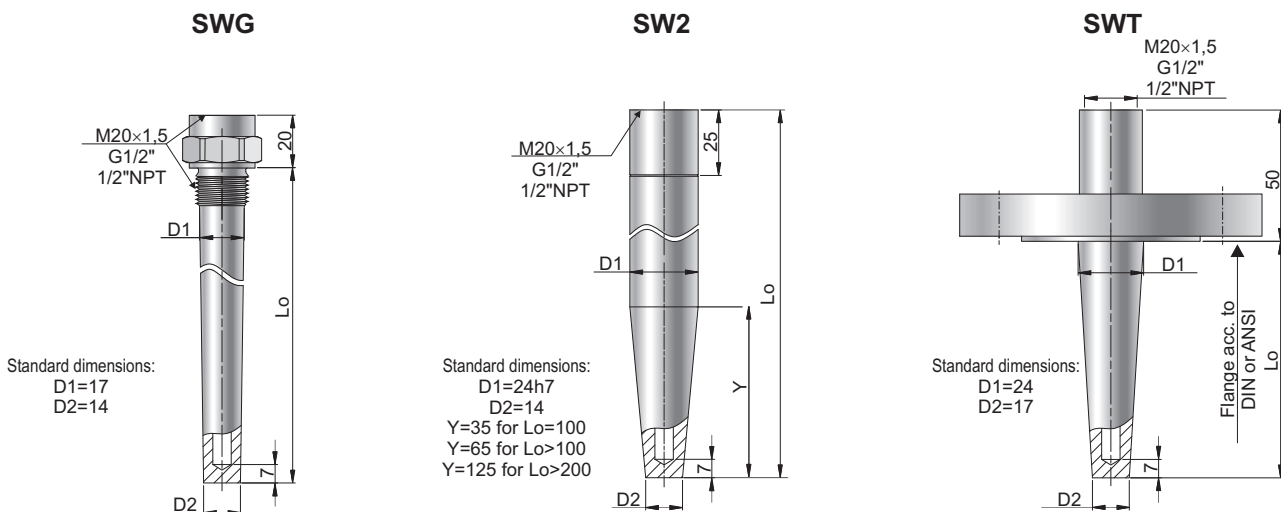
Head Material		
CT		aluminum housing NA type
CT-AL		aluminum housing DAO type
CT-CL		stainless steel housing KO type
Process part		
sensors with integrated protection tube		
GB1		sensor with threaded process connection, diameter of sensor 9mm, 316ss
GN1		sensor with threaded process connection, diameter 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
Exd		II 2G Ex d IIB+H <sub>2</sub> T** Gb II 2D Ex tb IIIC T* Db
		II 1/2G Ex d IIB+H <sub>2</sub> T** Ga/Gb II 1/2D Ex tb IIIC T* Da/Db
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
<b>Measuring range</b>		
...		set range [deg C]
<b>Alarm signal</b>		
HI		signal >20mA
LO		signal <4mA
<b>Special version</b>		
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

## Welded thermowells



## Drilled thermowells



### Materials:

Welded thermowells **OG2.9, OG2.11, OG3.12, OGT.12** - pipe: 316Ti, connectors and flanges: 316L

Drilled thermowells **SWG, SWT** - 316L, **SW2** - 316L, 1.7335 (15HM), 1.7380 (10H2M), 1.0425 (P265GH)