

Temperature Sensors DATASHEET

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Chapter IX

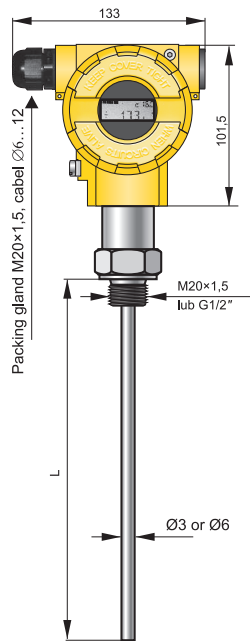
Temperature sensors

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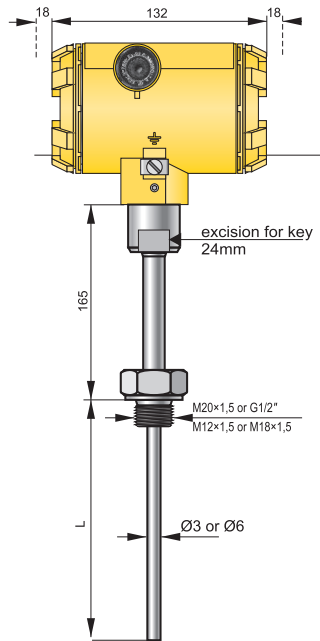
Smart temperature transmitter type APT-2000ALW



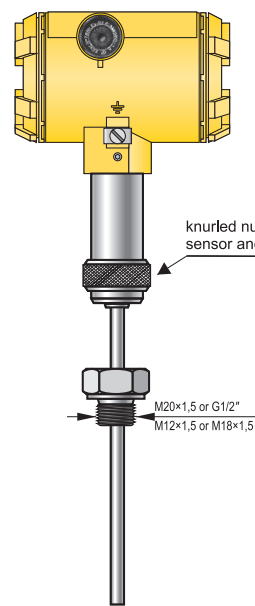
- ✓ 4...20 mA output signal + HART protocol
- ✓ Programmable range, zero shift, characteristic and damping ratio with local panel keys
- ✓ ATEX Intrinsic safety , ATEX Explosion proof
- ✓ Resistant or thermocouple measuring element
- ✓ Accuracy 0.075%
- ✓ MID (Measuring Instruments Directive) – certificate acc. to 2004/22/WE directive and OIML R140:2007 recommendations.



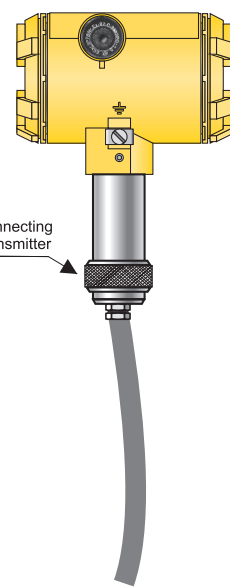
APT-2000ALW/GB



APT-2000ALW/GN



APT-2000ALW/WW



APT-2000ALW/NC

Version

APT-2000ALW/GB

version with spring loaded sensor to screwing in thermowell.

- standard version
- Exia version
- Exd version
- MID version

APT-2000ALW/GN

version with spring loaded sensor to screwing in thermowell.

- standard version
- Exia version
- Exd version

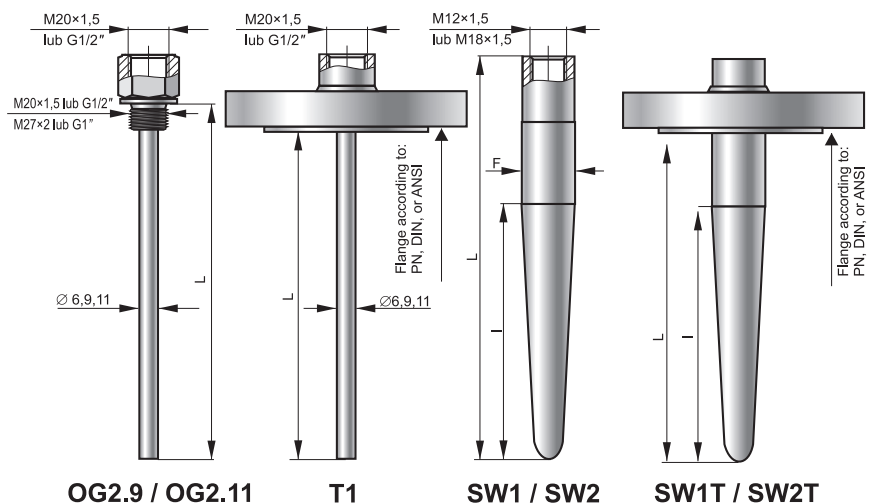
APT-2000ALW/WW

- version with replaceable measuring sensor.

APT-2000ALW/WW

- version suitable for mounting cable sensor.

Thermowell



Technical data

Metrological parameters

Error (digital value)

$\pm (0,05 + 0,05\% \cdot z + 0,001 \cdot |t|)^{\circ}\text{C}$ for sensor Pt100

$\pm (0,5 + 0,05\% \cdot z)^{\circ}\text{C}$ for sensor K i $t \leq 375^{\circ}\text{C}$

$\pm (0,5 + 0,05\% \cdot z + 0,002 \cdot (t - 375))^{\circ}\text{C}$ for sensor K i
 $t > 375^{\circ}\text{C}$

Additional error for analog output $\pm 0,04\% \cdot z$

where:

$|t|$ – absolute value of the measured temperature $^{\circ}\text{C}$

t – value of the measured temperature $^{\circ}\text{C}$

z – transmitter setting range $^{\circ}\text{C}$

Measuring range

Sensor type	Min set range	Nominal
Pt100	10°C	$-200 \dots 550^{\circ}\text{C}$
K	10°C	$-40 \dots 550^{\circ}\text{C}$

Electrical parameters

Power supply 12...55 V DC (Ex 13,5...28 V)

Additional voltage drop

when display illumination switched on 3 V

Output signal 4...20 mA + Hart protocol

ATEX certificate

Ex ia



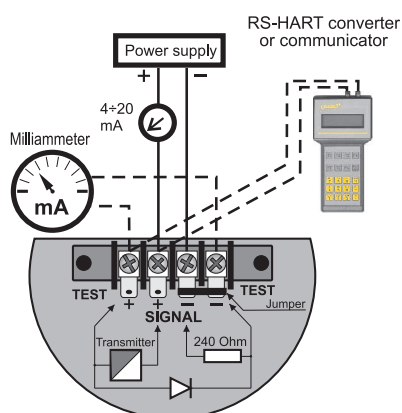
II 1/2G Ex ia IIC T4-T6 Ga/Gb
I M1 Ex ia I (version with 316ss housing)
II D Ex ia D 20 T105C

Ex d



II 1/2G Ex d/ia IIC T*
II 1/2D Ex iaD 20/tD A21 T*
 $-40^{\circ}\text{C} \leq T_a \leq +45^{\circ}\text{C} / +75^{\circ}\text{C}$

Electrical diagram



Resistance required for communication (HART) min.
240 Ω .

$$R[\Omega] = \frac{U_{ZAS}[V] - 12V}{0,0225A}$$

Load resistance

* – 15 V when display illumination switched on

Operating conditions

Ambient temperature

for version with Ex ia

$-40 \dots 85^{\circ}\text{C}$

for version with Ex d

$-40 \dots 80^{\circ}\text{C}$

$-40 \dots 75^{\circ}\text{C}$

Min. immersion length

L = 100 mm

Materials

Casing

Aluminium,

316Lss- special version

Sensor material

321ss

Thermowell

according to table page.

Communication and configuration

The communication standard for data interchange with the transmitter is the Hart protocol.

Communication with the transmitter is carried out with:

- a KAP-03, KAP-03Ex communicator,
- some other Hart type communicators,
- a PC using an Hart/RS/Bluetooth converter and Raport 2 configuration software.

The data interchange with the transmitter enables the users to:

- ♦ identify the transmitter;
- ♦ configure the output parameters;
- ♦ read the currently measured temperature value of the output current and the percentage output control level;
- ♦ force an output current with a set value;
- ♦ calibrate the transmitter in relation to a model temperature.

Standard thermowell data

Thermowell type	Standard dimensions of thermowell			Thermowell material	Available process connection
	\varnothing [mm]	L[mm]	l[mm]		
OG2.9	9x1	100, 160, 250, 400	-	316Lss	M20x1,5, M27x1 G $\frac{1}{2}$ ", G $\frac{3}{4}$ ", $\frac{1}{2}$ "NPT
OG2.11	11x2	100, 160, 250, 400	-	316Lss	M20x1,5, M27x1 G $\frac{1}{2}$ ", G $\frac{3}{4}$ ", $\frac{1}{2}$ "NPT
T1	11x2	100, 160, 250, 400	-	316Lss	Flange according to DIN and ANSI
SW1/SW2	18h7/24h7	140, 200	65, 65	15HM, 10H2M 316Lss	-
SW1T/SW2T	18h7/24h7	100, 140, 200	35, 65, 65	15HM, 10H2M 316Lss	Flange according to DIN and ANSI

Ordering procedure

APT-2000ALW/ / / / / **L = mm** / / ÷ °C /

Special version:
Ex ia - ATEX certificate
Ex d - ATEX certificate
SS- Housing material 316SS
Ip67

Version: **GB, GN, WW, NC**

Thermowell type: according to table

Type of thread of flange connection:
M20×1,5; G1/2"; M27×2; G1" or flange

Immersion length

Type of measuring element: **Pt100, K**

Set measuring range

Alarm signal: 3,8 or 23 mA

Example: Temperature transmitter APT-2000ALW thermowell type T1, ATEX version Ex ia, immersion length 250mm, flange DN50 PN40, K type sensor, set range 0 - 300°C, alarm signal 23 mA

APT-2000ALW/ Ex ia/GN/T1/DN50/L=250 mm / DN50 PN40 / K / 0 ÷ 300°C / 23 mA

SMART TEMPERATURE TRANSMITTER APT-2000ALW MID

Application

Smart temperature transmitters APT-2000ALW MID is applicable to the measurement of the temperature in application designed according to directive 2004/22/WE (MID), harmonized norm PN-EN12405-1:2005/pr A2:2009 and recommendation OIML R140:2007. Device subcomponent suitable for custody transfer measurement of gas with MID approval.

Application

Mechanical construction and installation of the transmitter enclosure shall comply with the transmitter APT-2000ALW are described on page 1113,114 of catalogue. Temperature transmitters APT-2000ALW MID. Transmitter due to factory blockade of transmitter configuration can not be configurable by user. Electrical connection of the transmitter is according to a drawing on page 114. Available are only terminals SIGNAL + and SIGNAL -. Temperature transmitter APT-2000ALW MID are produce with GB type of sensor and with resistant sensor Pt100. Note! For custody transfer applications, the cover clamp screws have to be locked with seal wire.

Metrological parameters

Max. permissible error according to EN12no5-1 (calculated in relation to the measured value)

- in reference conditions	—
20±3°C(±1 during the measurement)	≤ 0,1%
- nominal operating conditions	≤ 0,2%
special version	≤ 0,1%
Long-term stability	< 0,2% / 5 years
Operating temperature range	-25...55°C

Measuring range

Measuring range: -20...60°C

Ordering procedure

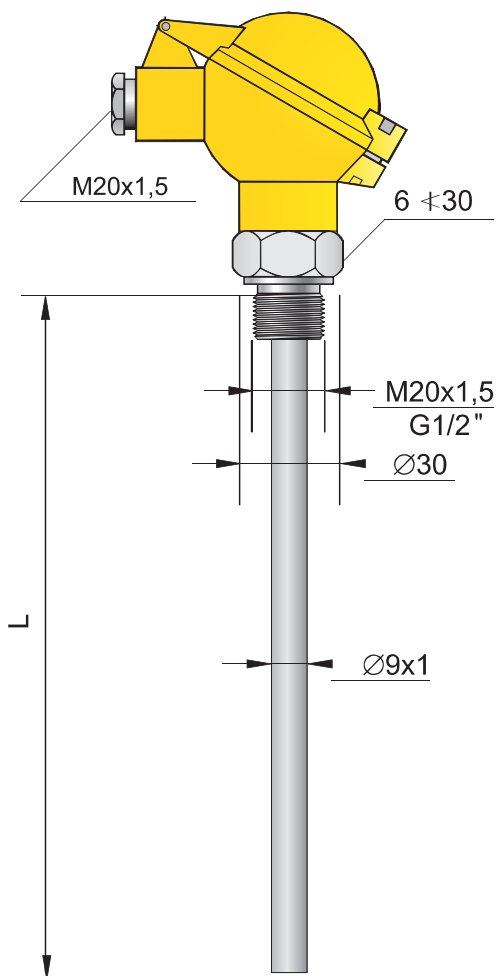
APT-2000ALW MID/ / / **L = mm**

Special version:
Ex ia
SS- Housing material 316SS

Process connection type: **M20×1,5 , G1/2"**

Immersion length

Temperature sensor type CT GB1



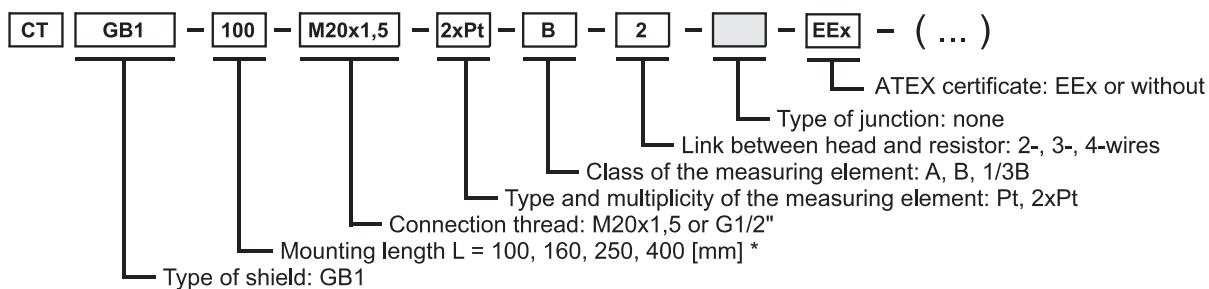
TECHNICAL DATA:

- Measuring range:
Pt: -200 ... 150 [°C]
- Admissible load:
see **Graph 2** (page 128)
- Material of wetted parts:
304ss or 316Lss
- Standard immersion length L:
100, 160, 250, 400 [mm] (*)
- Process connection:
M20x1,5 or G1/2
- Time constant:

Type of sensor	T _{0.5} [s]	T _{0.9} [s]
CT GB1	≤ 33	≤ 95

- Diameter of the measuring insert:
Ø = 6 [mm]
- Minimal immersion depth:
70 [mm]
- Admissible vibrations at mounting site:
5 ... 80 [Hz] (up to 5 [g])

Ordering procedure:

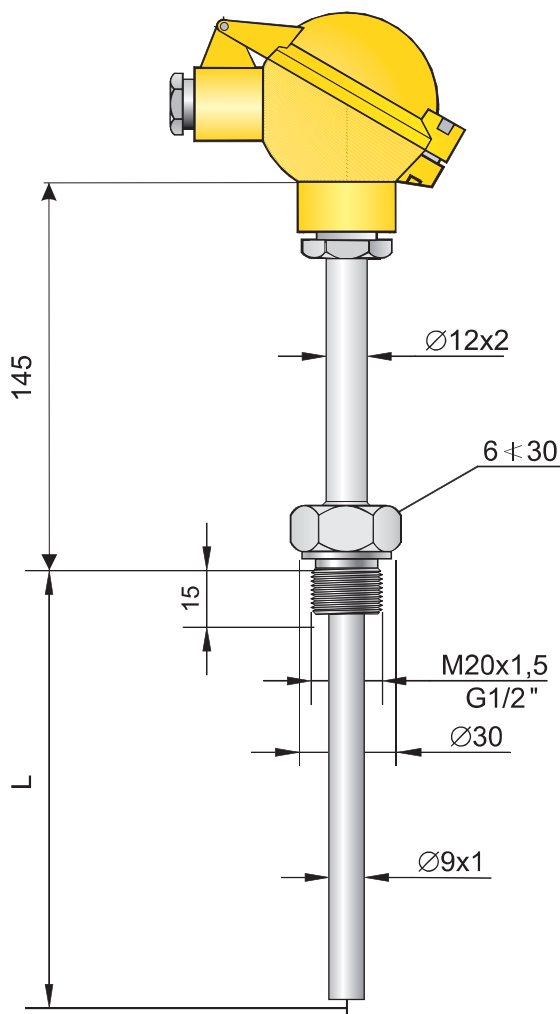


ADDITIONAL INFORMATION:

- * Non-standard length of temperature sensors on demand.
- Type of exchangeable insert: W1.
- To specify temperature sensor with the head - mounted transmitter please add code of transmitter at the end of ordering code of sensor (see chapter X) e.g.

CT Gb1 - 100 - M20x1,5 - 2xPt - B - 2 - [] - [] - (AT-2/0 + 100)

Temperature sensor type CT GN1



TECHNICAL DATA:

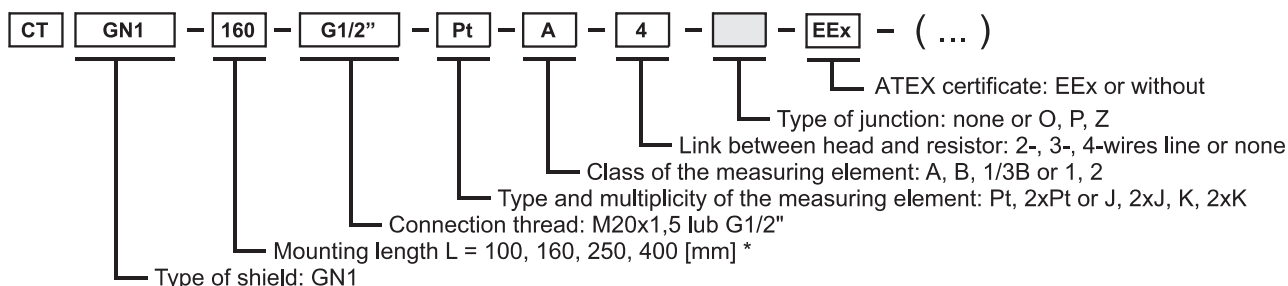
1. Measuring range:
Pt: -200 ... 550 [°C]
J/K: -200 ... 550 [°C]
2. Admissible load:
see **Graph 2** (page 128)
3. Material of wetted parts:
304ss or 316Lss
4. Standard immersion length L:
100, 160, 250, 400 [mm] (*)
5. Process connection:
M20x1.5 or G1/2"
6. Time constant:

Pt	T _{0.5} [s]	T _{0.9} [s]
	≤ 33	≤ 95

J/K	Isolated junction		Grounded junction	
	T _{0.5} [s]	T _{0.9} [s]	T _{0.5} [s]	T _{0.9} [s]
	≤ 22	≤ 62	≤ 3	≤ 8

7. Diameter of the measuring insert:
Ø= 6 [mm]
8. Minimal immersion depth:
Pt: 70 [mm]
J/K: 60 [mm]

Ordering procedure:

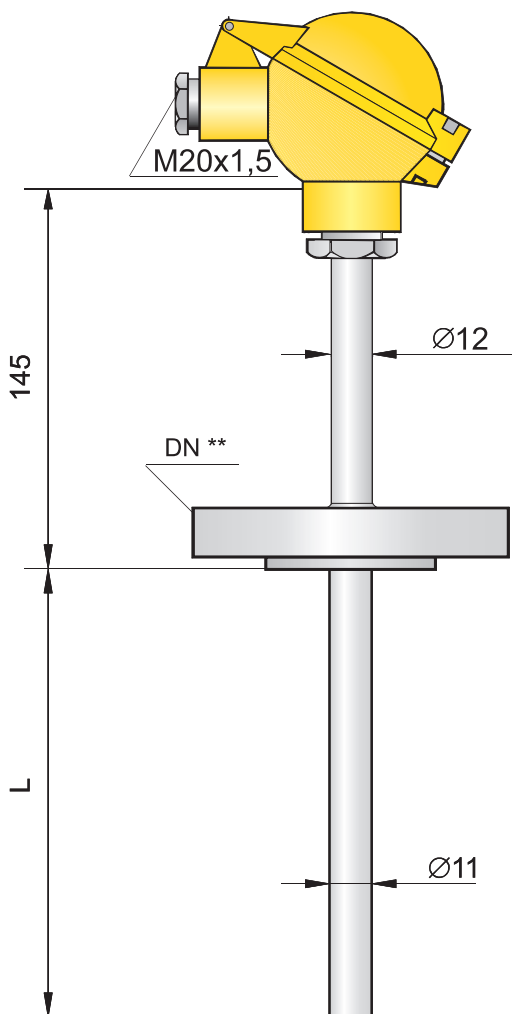


ADDITIONAL INFORMATION:

- 1.* Non-standard length and diameters of temperature sensors on demand.
2. Type of exchangeable insert: W1.
3. To specify temperature sensor with the head - mounted transmitter please add code of transmitter at the end of ordering code of sensor (see chapter X) e.g.

CT GN1 - 160 - G1/2" - Pt - A - 4 - [] - EEx - (X/100 ÷ 500)

Temperature sensor type CT T1



TECHNICAL DATA:

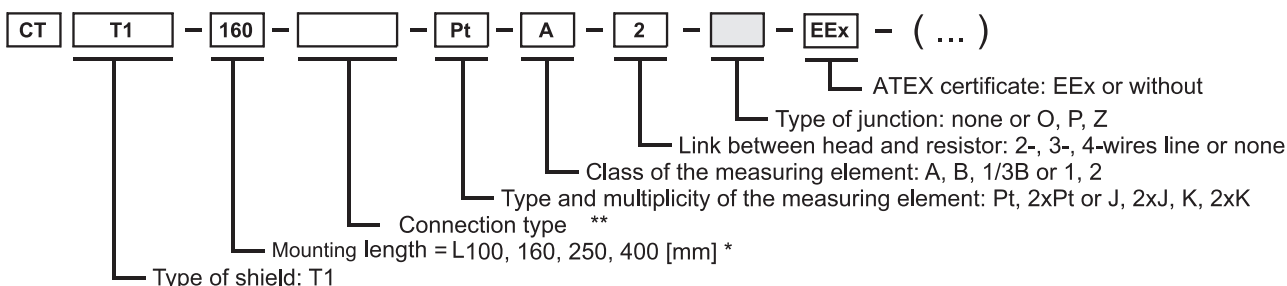
- Measuring range:
Pt: -200 ... 550 [°C]
J/K: -200 ... 550 [°C]
- Admissible load:
see **Graph 1** (page 128)
- Material of wetted parts:
304ss, Inconel.
- Standard immersion length L:
100, 160, 250, 400 [mm] (*)
- Flange process connection
- Time constant:

Pt	T _{0,5} [s]	T _{0,9} [s]
	≤ 40	≤ 120

J/K	Isolated junction		Grounded junction	
	T _{0,5} [s]	T _{0,9} [s]	T _{0,5} [s]	T _{0,9} [s]
	≤ 27	≤ 90	≤ 6	≤ 15

- Diameter of the measuring insert:
Ø = 6 [mm]
- Minimal immersion depth:
Pt: 100 [mm]
J/K: 70 [mm]

Ordering procedure:

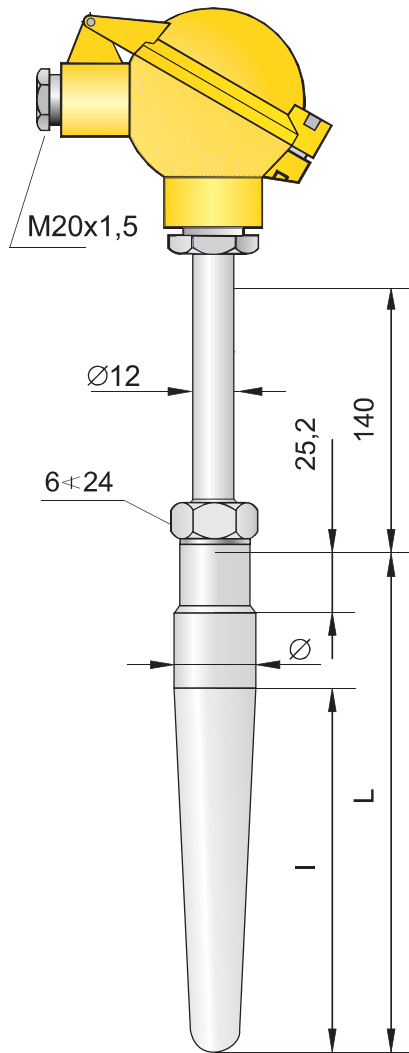


ADDITIONAL INFORMATION:

- * Non-standard length of temperature sensors on demand.
- Type of exchangeable insert: W1, W3.
- ** On demand, the flange of the measuring sensor T1 can be performed acc. to PN, ANSI or DIN and have different dimensions than indicated in the picture.
- To specify temperature sensor with the head - mounted transmitter please add code of transmitter at the end of ordering code of sensor (see chapter X) e.g.

CT T1 - 160 - DN50 - Pt - A - 2 - [] - [] - (GI-22-2/0 ÷ 500/23mA)

Temperature sensor type CT SW1, CT SW2



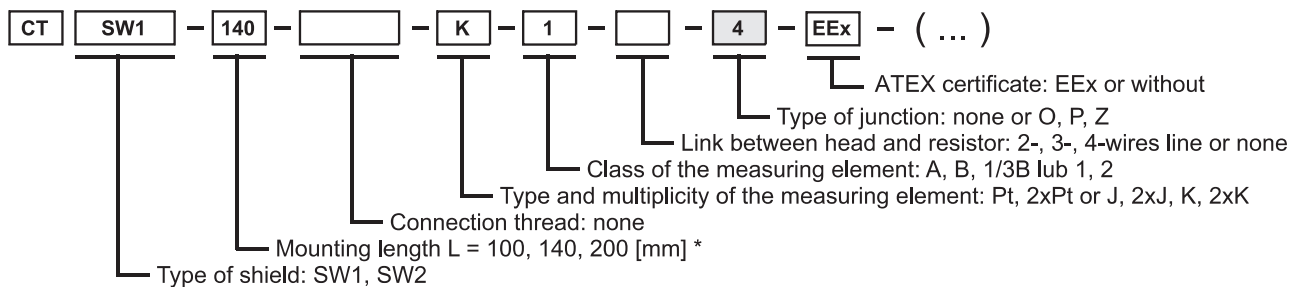
TECHNICAL DATA:

1. Measuring range:
Pt: 0 ... 570 [°C]
J/K: 0 ... 570 [°C]
2. Admissible load:
see **Graph 3** (page 128)
3. Material of wetted parts:
15HM, inconel, hastelloy
4. Standard immersion length L:
100, 140, 200 [mm] (*)
5. Fastening (welding) diameter:

CT SW1	CT SW2
Ø=18h7	Ø=24h7

Type of sensor	Shield			Measuring insert Ø [mm]
	Ø [mm]	L [mm]	l [mm]	
CT SW1	18h7	100	35	3
		140	65	3
		200	65	3
CT SW2	24h7	140	65	6
		200	65	6

Ordering procedure:

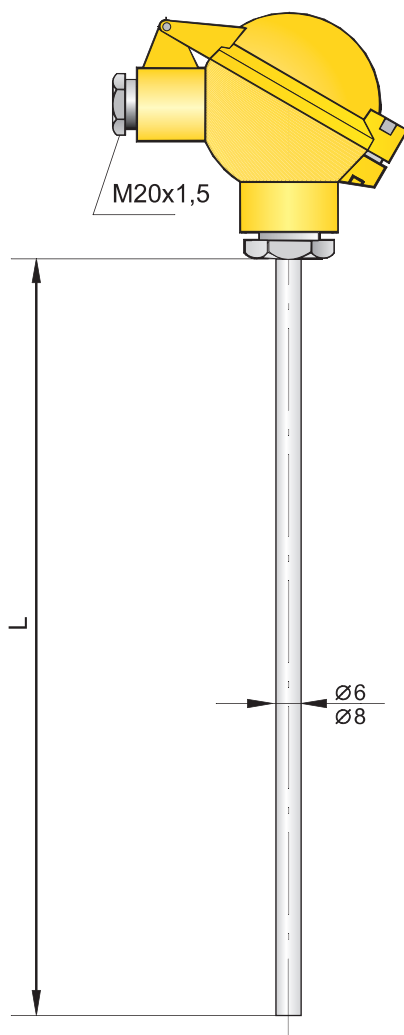


ADDITIONAL INFORMATION:

- 1.* Non-standard length of temperature sensors on demand.
2. Type of exchangeable insert: W2.
3. Please indicate the type of material to be used for the shield of sensor between brackets. Standard execution of material 10 H2M.
4. To specify temperature sensor with the head - mounted transmitter please add code of transmitter at the end of ordering code of sensor (see chapter X) e.g.

CT SW1 - 140 - [] - K - 1 - [] - 4 - EEx - (X/100+150; 15HM)

Temperature sensor type CT I6, CT I8



TECHNICAL DATA:

- Measuring range:
Pt: -200 ... 550 [°C]
J/K: -200 ... 600 [°C]
- Admissible load:
0.1 [MPa]
- Material of wetted parts:
304ss or 316Lss
- Standard immersion length L:
100, 160, 250, 400 [mm] (*)
- Process connection:
sliding connection UG1
- Time constant:

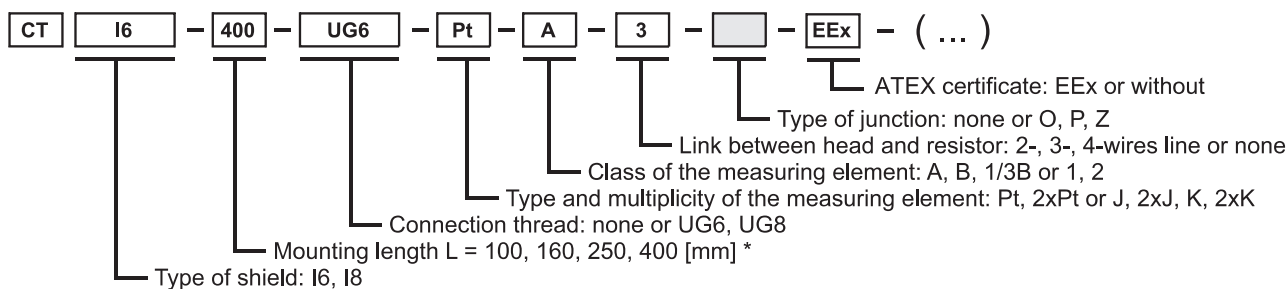
Pt	Type of sensor	T _{0.5} [s]	T _{0.9} [s]
	CTI6	≤ 4	≤ 13
	CTI8	≤ 9.5	≤ 28

J/K	Type of sensor	Isolated junction		Grounded junction	
		T _{0.5} [s]	T _{0.9} [s]	T _{0.5} [s]	T _{0.9} [s]
	CTI6	≤ 7	≤ 18	≤ 1	≤ 5
	CTI8	≤ 10	≤ 25	≤ 1.5	≤ 7

- Minimal immersion depth:

Pt:	Ø=6	60 [mm]
	Ø=8	80 [mm]
J/K:	Ø=6	40 [mm]
	Ø=8	60 [mm]

Ordering procedure:

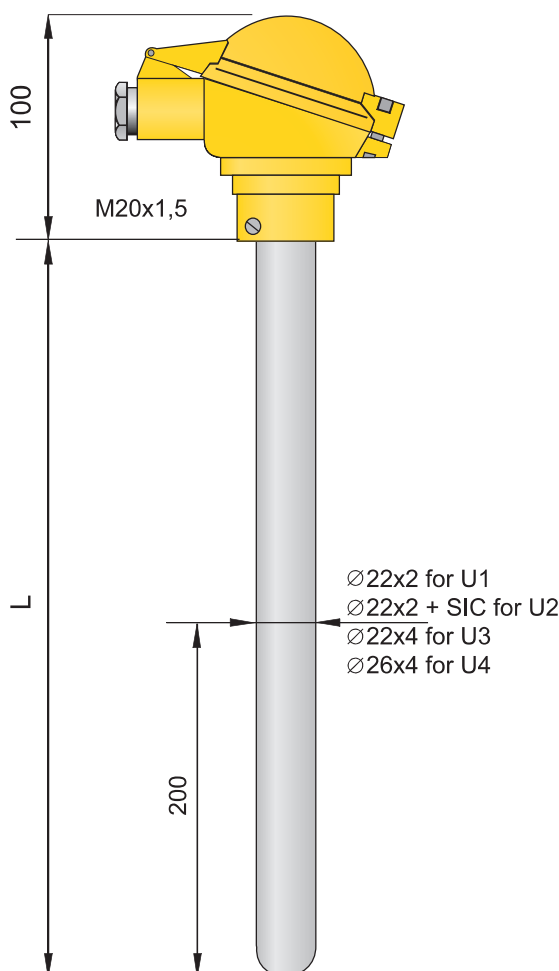


ADDITIONAL INFORMATION:

- * Non-standard length of temperature sensors on demand.
- Type of exchangeable insert: the external shield of sensor is the insert W1.
- To specify temperature sensor with the head - mounted transmitter please add code of transmitter at the end of ordering code of sensor (see chapter X) e.g.

CT I8 - 250 - [] - J - 2 - [] - 2 - [] - (GI-22-2/50 ÷ 500C/23mA)

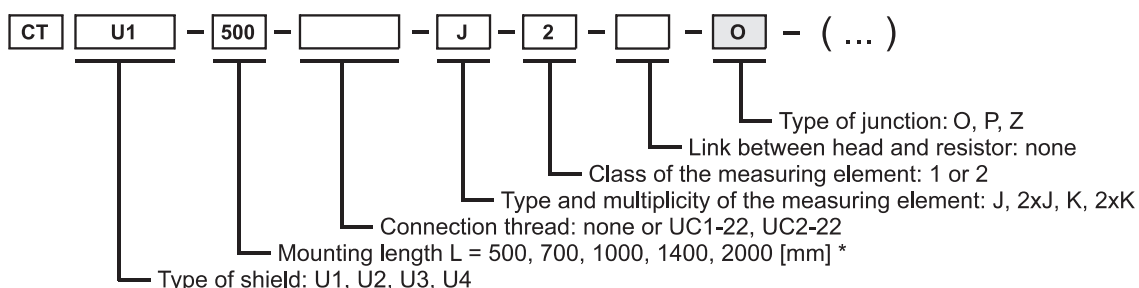
Temperature sensor type CT U1, CT U2, CT U3, CT U4



TECHNICAL DATA:

1. Measuring range (constant/momentary)
J: 0 ... 700 / 0 ... 900 [°C]
K: 0 ... 1000 / 0 ... 1150 [°C]
2. Admissible load:
0.1 [MPa]
3. Material of wetted parts:
inconel, hastelloy. Heat resisting steel.
4. Standard immersion length L:
500, 700, 1000, 1400, 2000 [mm] (*)
5. Process connection:
UC1-22, UC2-22
6. Type of measuring junction :
isolated
7. Admissible vibrations at mounting site:
5 ... 80 [Hz] (do 2 [g])

Ordering procedure:

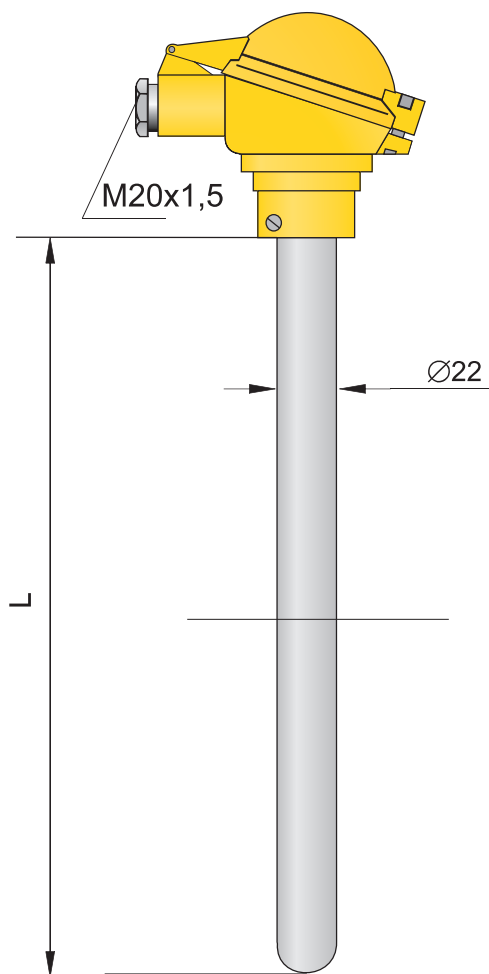


ADDITIONAL INFORMATION:

- 1.* Non-standard length of temperature sensors on demand.
2. Type of exchangeable insert: W5.
3. Please indicate the type of material to be used for the shield of sensor in brackets. Standard execution of material 10 H2M.
4. To specify temperature sensor with the head - mounted transmitter please add code of transmitter at the end of ordering code of sensor (see chapter X) e.g.

CT U3 - 1400 - [] - K - 1 - [] - Z - (GI-22-2/0 ±1000C/23mA)

Temperature sensor type CT UC

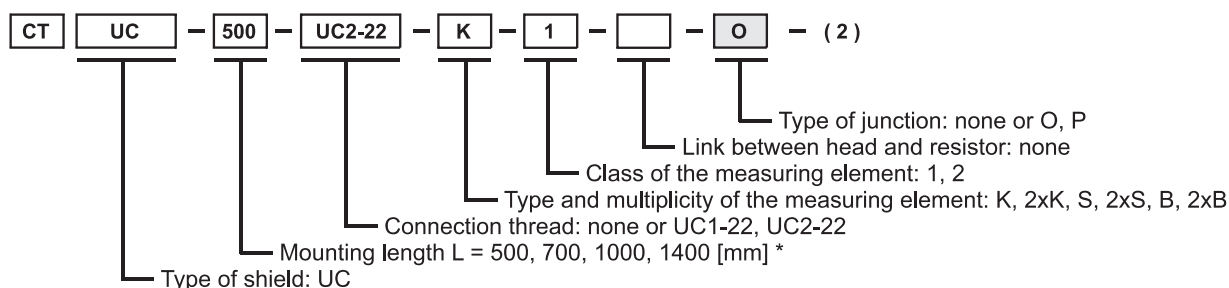


TECHNICAL DATA:

- Measuring range (constant/momentary)
K: 0 ... 1000 / 0 ... 1200 [°C]
S: 0 ... 1000 / 0 ... 1200 [°C]
B: 0 ... 1000 / 0 ... 1200 [°C]
- Material of wetted parts:
outside:
inconel, hastelloy. Heat resisting steel.
inside:
mullite ceramic material 610 for K or S
high aluminium ceramic material 799 for S or B
- Process connection:
500, 700, 1000, 1400 [mm] (*)
- Standard connection thread:
UC1-22, UC2-22
- Admissible vibrations at mounting site:
5 ... 80 [Hz] up to 2 [g]
- Diameters of thermoelectric wires:

Typ	Ø [mm]
K	1.6
S	0.35 or 0.5
B	0.5

Ordering procedure:

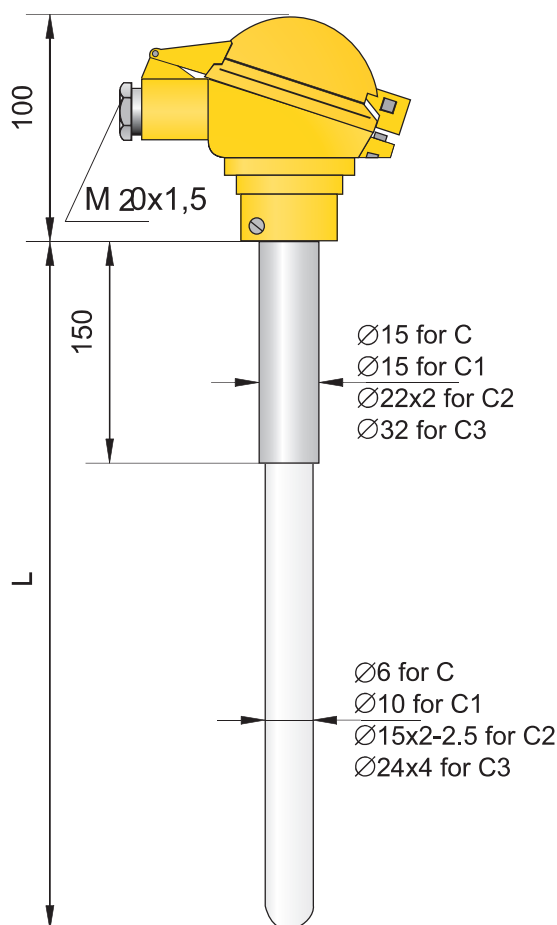


ADDITIONAL INFORMATION:

- * Non-standard length of temperature sensors on demand.
- Type of exchangeable insert: W4.
- **In brackets, please indicate the type of material of the external shield if ordering another type.
- Please indicate the diameter of the thermocouple wire in brackets.
- To specify temperature sensor with the head - mounted transmitter please add code of transmitter at the end of ordering code of sensor (see chapter X) e.g.

CT UC - 1000 - - S 1 - O - (GI-22-2/0 +800C INCONEL 600; 0,35mm)

Temperature sensor type CT C, CT C1, CT C2, CT C3

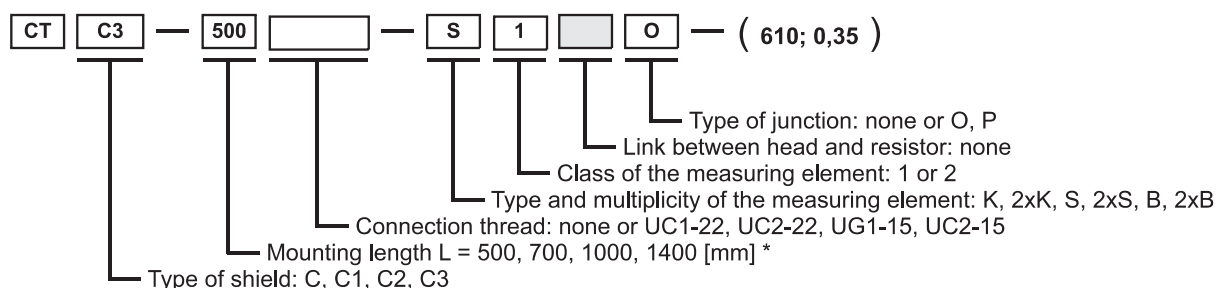


TECHNICAL DATA:

1. Measuring range (constant/momentary)
K: 0 ... 1000 / 0 ... 1100 [°C]
S: 0 ... 1300 / 0 ... 1600 [°C]
B: 0 ... 1600 / 0 ... 1800 [°C]
2. Material of wetted parts:
mullite ceramic material 610 for K or S
high aluminium ceramic material 799 for S or B
3. Standard immersion length L:
500, 700, 1000, 1400 [mm] (*)
4. Process connection:
UC1-15, UC2-15, UC1-22, UC2-22
5. Admissible vibrations at mounting site:
5 ... 80 [Hz] up to 2 [g]
6. Diameters of thermoelectric wires:

Type	Ø [mm]
K	1 for C and C1 1.6 for C2 and C3
S	0.35 or 0.5
B	0.5

Ordering procedure:

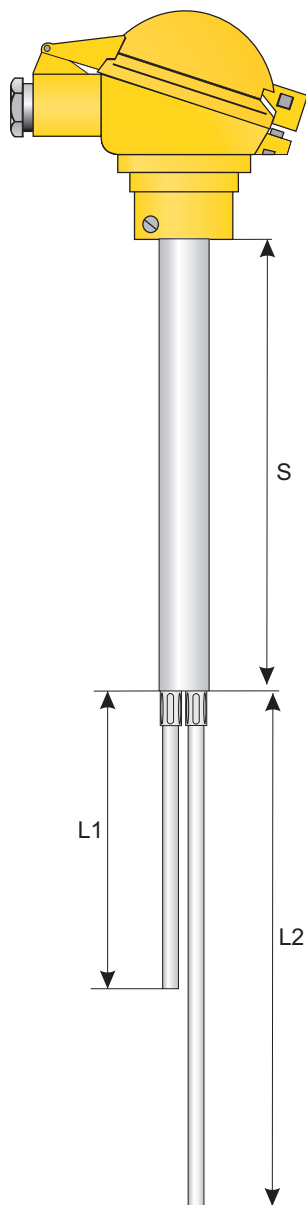


ADDITIONAL INFORMATION:

- 1.* Non-standard length of temperature sensors on demand.
2. Type of exchangeable insert: W4.
3. Please indicate the material of shield 610 or 799 and the diameter of the thermocouple in brackets.
4. To specify temperature sensor with the head - mounted transmitter please add code of transmitter at the end of ordering code of sensor (see chapter X) e.g.

CT C2 — 1000 UC1-22 — B 2 — O — (GI-22-2/0 ÷1500C/23mA; 799; 0,5)

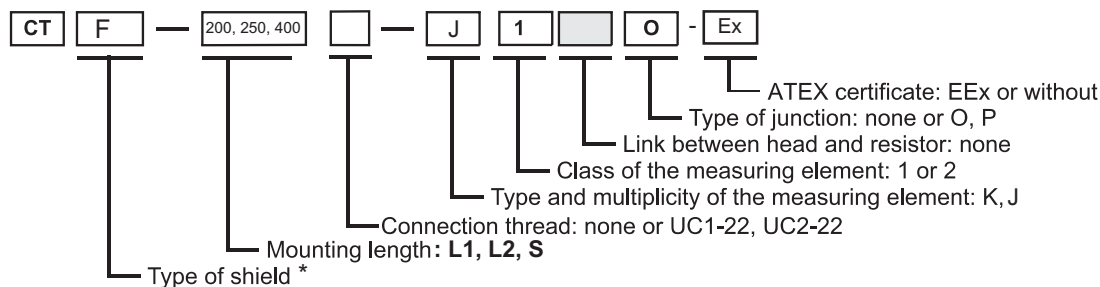
Temperature sensor type CT F



TECHNICAL DATA:

1. Measuring range
K: 0 ... 1000 [°C]
J: 0...800 [°C]
2. Material of wetted parts:
Holding element: heat resisting steel 1.4841
measuring element: inconel
3. Standard immersion length L:
L1, L2 - according to specification
4. Admissible vibrations at mounting site:
5 ... 80 [Hz] up to 2 [g]
5. Diameters of measuring elements: 1.5, 2, 3, 4.5, 6 mm

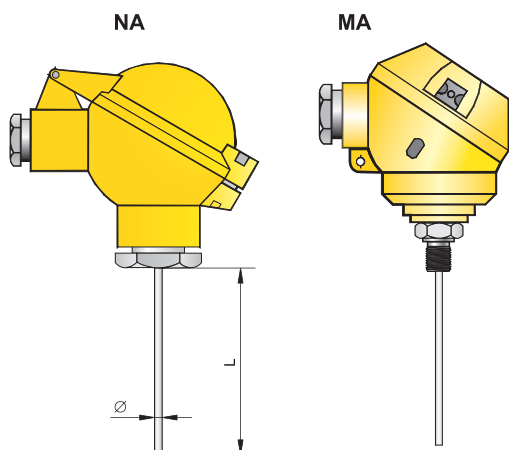
Ordering procedure:



1.* Non-standard length of temperature sensors on demand.

2. Please indicate the diameter of the thermocouple wire in brackets.

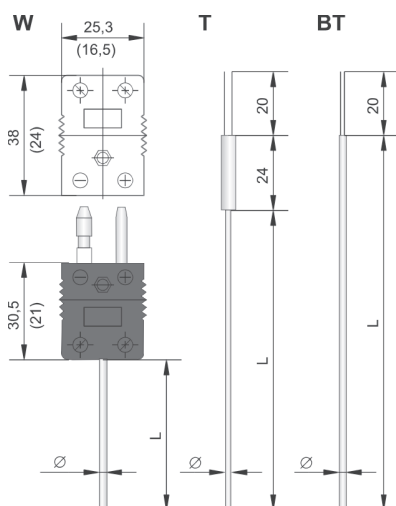
Temperature sensor type CT X



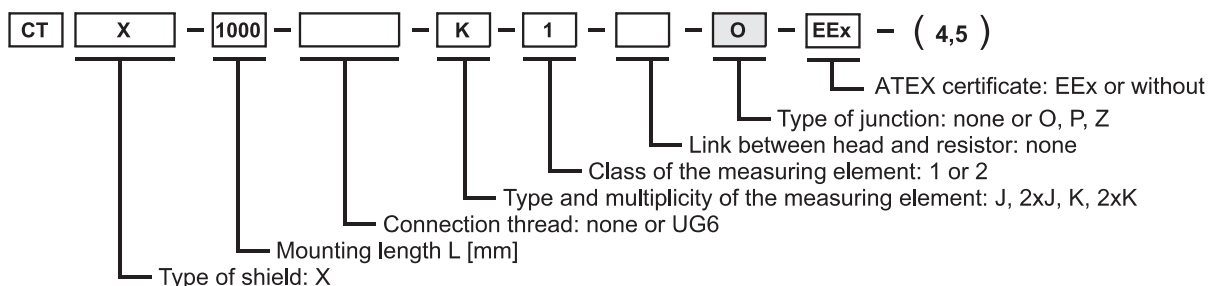
TECHNICAL DATA:

- Measuring range:
K (NiCr-NiAl) / Inconel: up to 1000 [°C]
J (Fe-CuNi) / Inconel: do 800 [°C]
- Admissible load:
4 [MPa]
- Material of wetted parts:
I - Inconel
- Standard immersion length L:
following the demand
- External mantle diameter Ø:
3; 4,5; 6 [mm]
- Minimal bending radius: 2 x Ø
- Time constant:

Średnica	Isolated junction		Grounded junction	
	T _{0.5} [s]	T _{0.9} [s]	T _{0.5} [s]	T _{0.9} [s]
Ø=3	≤ 0.5	≤ 1.5	≤ 0.35	≤ 1.2
Ø=6	≤ 2.5	≤ 6.0	≤ 0.8	≤ 2.5



Ordering procedure:



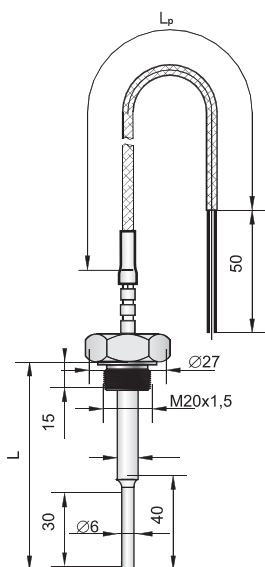
ADDITIONAL INFORMATION:

- * Non-standard length of temperature sensors on demand.
- The mantled thermocouples should be ordered with the specification of the external diameter 3; 4,5 or 6 [mm].
- Please indicate the type of head: NA, MA, W, T or BT in brackets.
- To specify temperature sensor with the head - mounted transmitter please add code of transmitter at the end of ordering code of sensor (see chapter X) e.g.

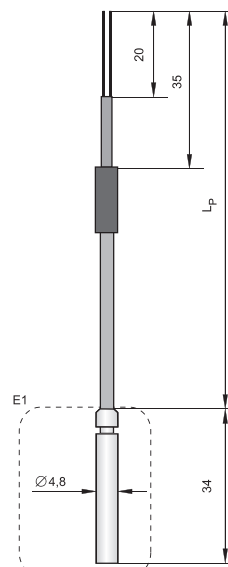
CT X - 2000 - UG6 - K - 1 - [] - O - EEx - (6, W)

CT X - 5000 - [] - K - 1 - [] - O - EEx - (X/0÷700; 3; Na)

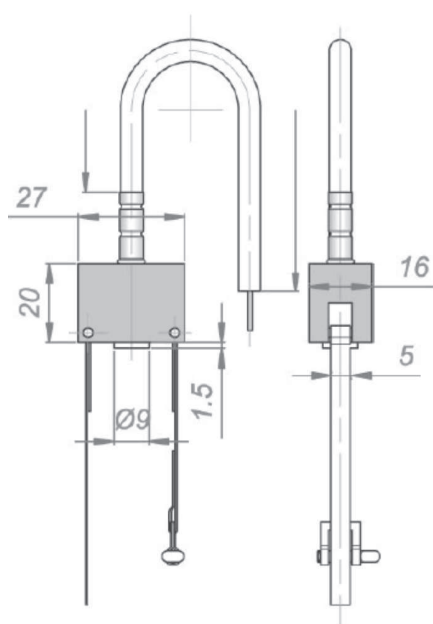
Cable temperature sensors type CT GE1, CT E1, CT R6, CT E2



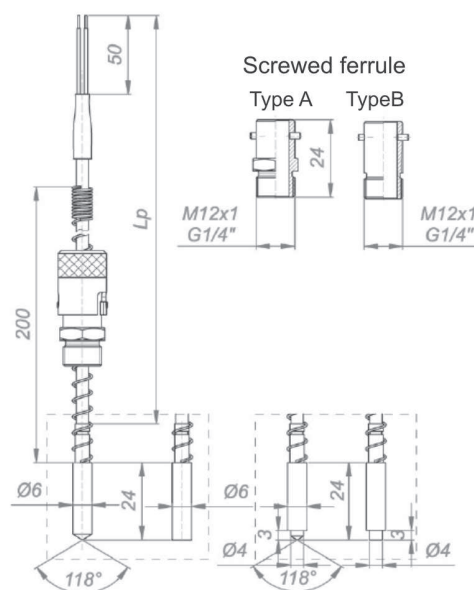
CT GE1



CT E1

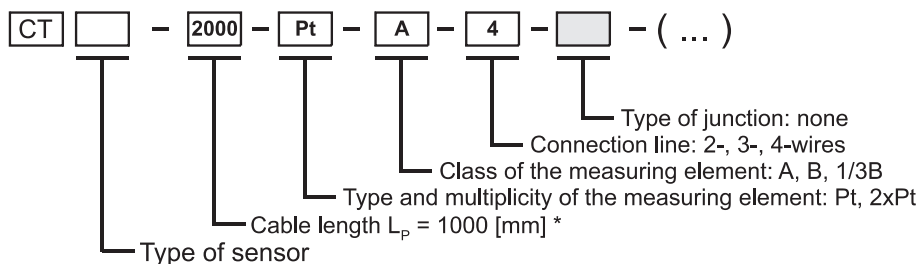


CT R6



CT E2

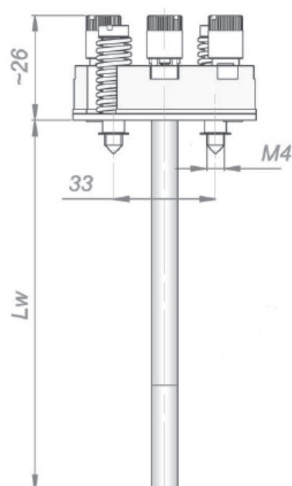
Ordering procedure:



ADDITIONAL INFORMATION:

1. Non-standard length of temperature sensors on demand.

Measuring insert W1, W2, W4, W5



W1, W2

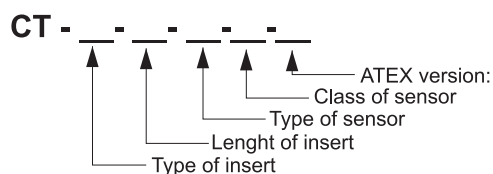


W4, W5

Measuring range of insert

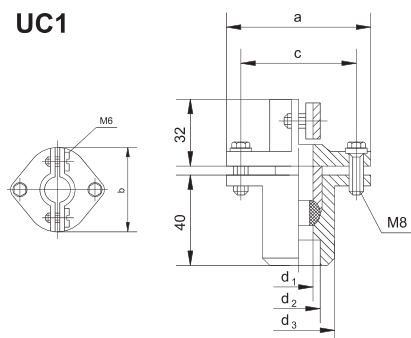
Insert type				
	W1	W2	W4	W5
Pt	-200÷550°C	-70÷500°C		
Ni	-50÷150°C			
J	-200÷600°C	-200÷600°C		0÷700°C (900°C)*
K	-200÷600°C	-200÷600°C	0÷1000°C (1150°C)*	0÷1000°C (1150°C)*
S			0÷1300°C (1600°C)*	
B			0÷1600°C (1800°C)*	
Shield material	1.4301	1.4301	ceramic	ceramic

Ordering procedure:

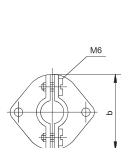


CLAMPING GRIPS APPLIED FOR MOUNTING THE TEMPERATURE SENSORS

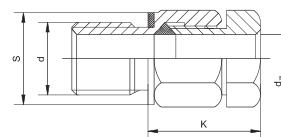
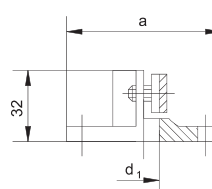
UC1



UC2

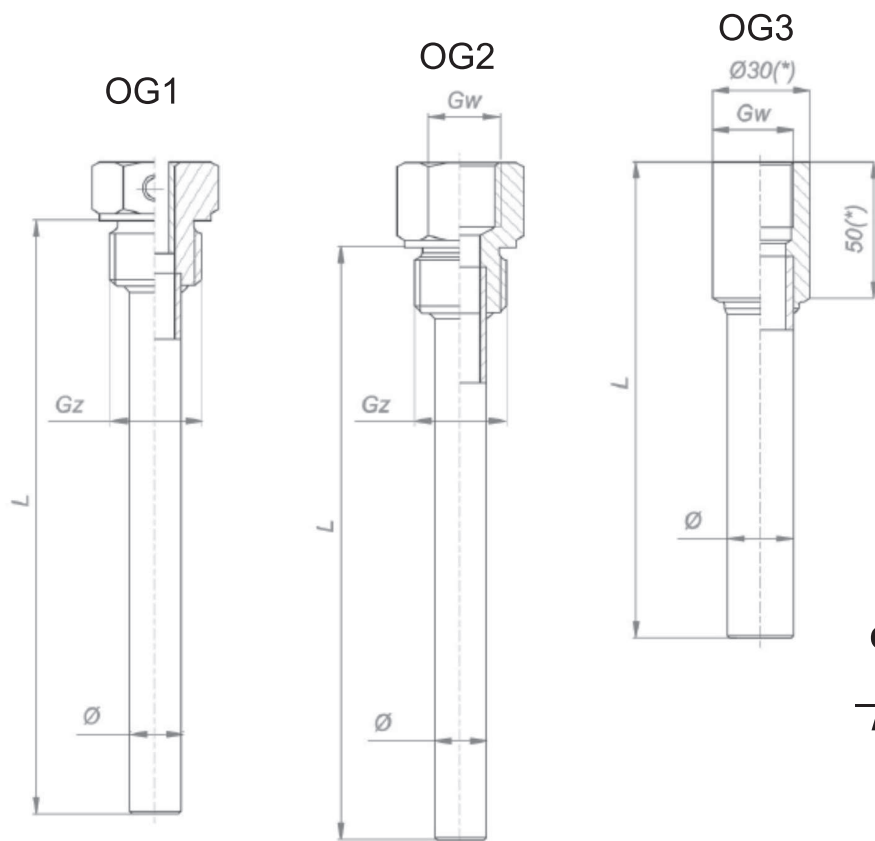


UG

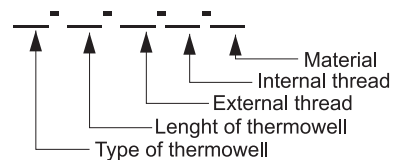


Type	Marking	External diameter of sensor's shield [mm]	Dimensions [mm]										
			dw	s	l	d	k	a	b	c	d ₁	d ₂	d ₃
UG	UG6	6	6.5	22	16	M16x1.5	28						
	UG8	8	8.5	22	16	M16x1.5	28						
	UG15	15	15.5	32	20	M24x2	32						
UC1	UC1-15	15						75	50	55	16	26	35
	UC1-22	22						90	65	70	23	33	40
UC2	UC2-15	15						75	50	55	16		
	UC2-22	22						90	65	70	23		

Thermowell OG1, OG2, OG3

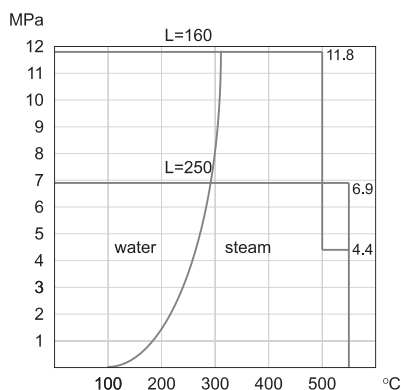


Ordering procedure:

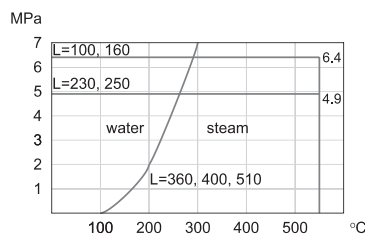


Material	Diameter Ø [mm]	External thread	Internal thread	Length L[mm]
10H2M	12x1.5	M20x1.5	M20x1.5	50....1000
15HM	15x1.5	G1/2"	G1/2"	
1.4301	15x2	½"NPT	½"NPT	
	16x2			

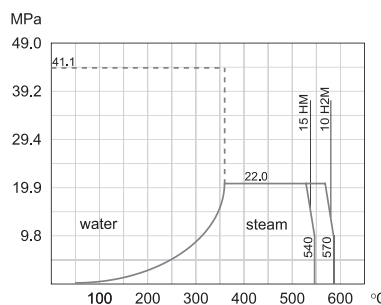
ADMISSIBLE LOADS FOR PARTICULAR TYPES OF SHIELDS AT SPECIFIED WORKING CONDITIONS



Graph 1. Admissible load of the G1 and T1 shields at the conditions of work - 15 HM, 1H18N9T, H17N13M2T



Graph 2. Admissible load of the GN1 and GB1 shields at the conditions of work - 15 HM, 1H18N9T, H17N13M2T



Graph 3. Admissible load of the SW1 and SW2 shields at the conditions of work

Chapter X

Temperature transmitters

Temperature transmitter type AT-2	130
Temperature transmitter type ATX-2.....	131
Temperature transmitter type GI-22-2, GIX-22-2	132
Temperature transmitter type ATL	133
Temperature transmitter type LI-24	134

Head-mounted temperature transmitter type AT-2



- ✓ Programmable sensor type PT100 i Ni100
- ✓ Programmable measuring range.
- ✓ Thermoresistance line compensation (3 wires line)
- ✓ Output signal 4...20mA
- ✓ Head- mounting system.

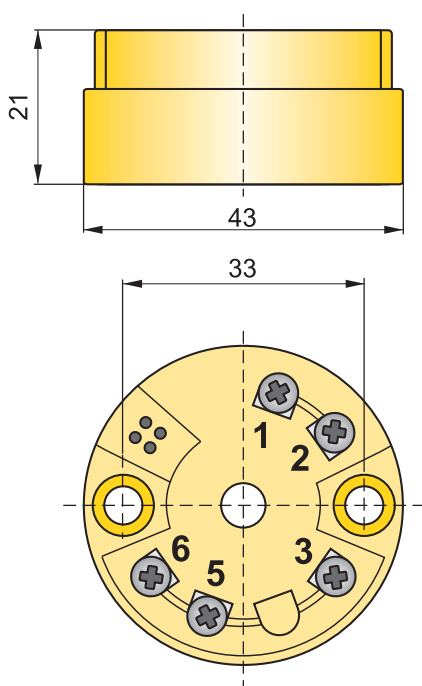
Application and function

The temperature economical transmitter AT-2 is applicable to converting resistance of temperature sensor to standard current signal 4...20mA.

Most of parameters such as: sensor type, input signal, measuring range may be adapted by user for specific requirements of his measuring system. The transmitter is programmed using PC with RS converter and Aplisens AT configuration software.

If you define type of sensor, measuring range in the order, then the transmitter is programmed with required parameters and their values are printed on serial number label.

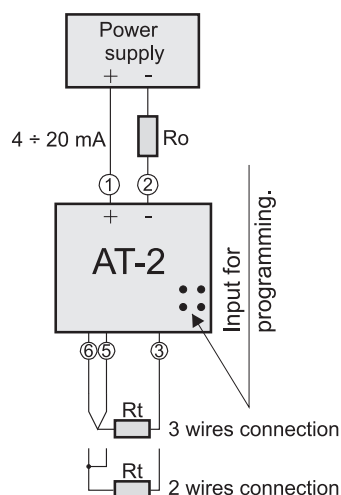
Transmitter for head mounting.



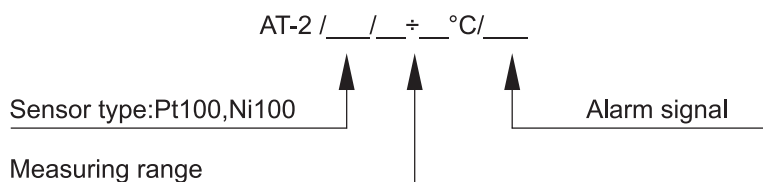
Technical data

Input signal	Pt 100, Ni 100
Limit process	20Ω < R < 380Ω
Min. measuring range	25°C
Output signal	4 – 20 mA
Power supply	7,5...36V DC
Load resistance	$R_d[k\Omega] < (U_z - 7,5V)/22mA$
Alarm signal	22mA or 3,6mA
Accuracy for $\Delta R > 20\Omega$	± 0,1%
Thermal error	± 0,1% / 10°C
Ambient temperature	-40...+85°C
Error due to supply voltage changes	±0,01%/V

Electrical diagrams



Ordering procedure.



Example: temperature transmitter AT-2, sensor type Pt100, measuring range 0...100°C, alarm signal 22mA.

AT-2/Pt100/ 0...100°C/22mA

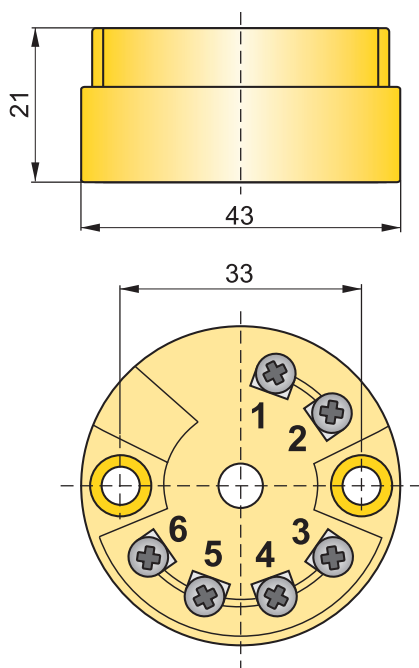
Head-mounted temperature transmitter type ATX-2



- ✓ Programmable sensor type Pt100, Pt500, Pt1000, Ni100
- ✓ Programmable measuring range.
- ✓ Thermoresistance line compensation (3 wires line)
- ✓ Output signal 4...20mA
- ✓ ATEX certificate Ex II 1G Exia II CT6
- ✓ Head-mounting system.

Application and function

The temperature transmitter ATX-2 is applicable to converting resistance of temperature sensor to standard current signal 4...20mA in hazardous area. Most of parameters such a sensor type, input signal, measuring range may be adapted by user for specific requirements of his measuring system. The transmitter is programmed using PC with RS converter and Aplsens configuration software. If in order are specified sensor type and measuring range, transmitter is set according to order in Aplsens production and required parameters are printed on serial number label.

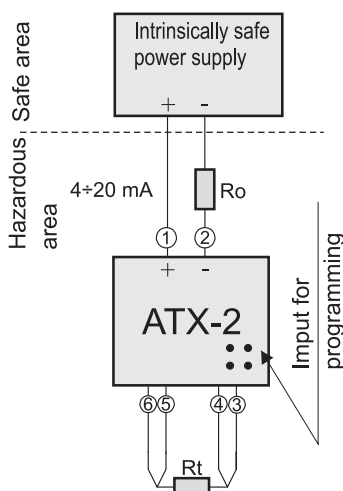


Technical data

Input signal	Pt, Ni
Min. measuring range	10°C
Output signal	4-20mA
Power supply	8...30VDC
Load resistance	$R_d[k\Omega] < (U_z - 8V) / 22mA$
Alarm signal	21mA or 3,5mA
Accuracy for $\Delta R > 20\Omega$	$\pm 0,2\%$
Thermal error	$\pm 0,05\% / 10^\circ C$
Ambient temperature	-40...+85°C
Accuracy:	

PT100: -100÷200°C	$\pm 0,2^\circ C$	PT1000: -100÷200°C	$\pm 0,2^\circ C$
PT100: -200÷850°C	$\pm 0,4^\circ C$	PT1000: -100÷250°C	$\pm 0,4^\circ C$
PT500: -100÷200°C	$\pm 0,2^\circ C$	Ni100: -60÷250°C	$\pm 0,2^\circ C$

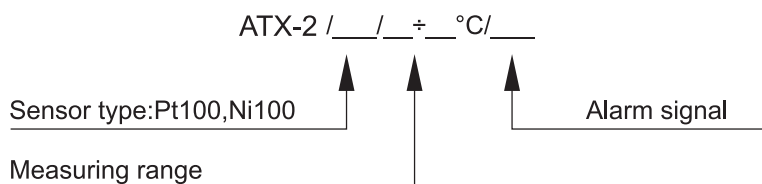
Electrical diagrams



Input parameters

Input terminals 3, 4, 5, 6:
 $U_o = 9,6V$, $I_o = 4,5mA$, $P_o = 11mW$,
 $L_o = 4,5mH$ dla IIC; 8,5mH dla IIB
 $C_o = 709nF$ dla IIC; 1300nF dla IIB
 Supply terminals 1(+) 2(-):
 $U_i = 30V$, $I_i = 100mA$, $P_i = 750mW$, $L_i \sim 0$, $C_i \sim 0$

Ordering procedure.



Example: temperature transmitter ATX-2, sensor type Pt100, measuring range 0...100°C, alarm signal 23mA.

ATX-2/Pt100/0...100°C/23mA

Head-mounted temperature transmitter type GI-22-2, GIX-22-2



- ✓ Galvanic insulation (In, out)
- ✓ Programmable sensor type
- ✓ Programmable measuring range
- ✓ Thermoresistance line compensation (3 and wires line)
- ✓ Compensation of thermocouple cold junction
- ✓ Output signal 4...20mA
- ✓ Head-mounting system
- ✓ Certificate ATEX Ex II 1G Exia IIC T6 (GIX-22-2 version).

Application and function

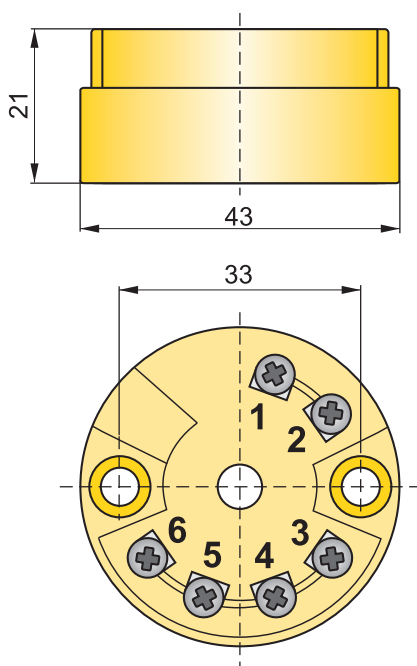
The temperature transmitters are applicable to converting resistance of temperature or voltage of thermocouple sensor to standard current signal 4...20mA.

Most of parameters such as: sensor type, input signal, measuring range, may be adapted by user for specific requirements of his measuring system.

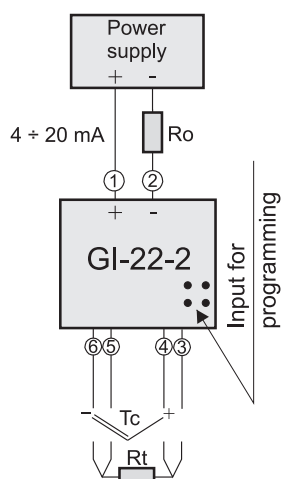
The transmitter is programmed using PC with RS converter and Aplisens AT configuration software.

If user define type of sensor, measuring range in the order, then the transmitter are programmed with required parameters and their values are printed on serial number label.

Transmitter for head mounting.



Electrical diagrams



Technical data

Input signal J, L, U, T, E, K, N, S, R, B, Pt, Ni

Min. measuring range 10°C for Pt, Ni
50°C for J, L, U, T, E, K, N
500°C for S, R, B

Output signal 4 – 20mA

Power supply 8...35V DC

8-30V DC for GIX-22-2

Load resistance $R_0[k\Omega] < (U_z - 11V)/25mA$

Alarm signal 22mA or 3,6 mA

Galvanic insulation Optoelectrical

Accuracy

PT100: -100÷200°C	±0,2°C	J: -210÷1200°C	±0,5°C over -150°C
PT100: -200÷850°C	±0,4°C	L: -200÷900°C	±0,5°C
PT500: -100÷200°C	±0,2°C	U: -200÷600°C	±0,5°C
PT100: -200÷250°C	±0,4°C	T: -270÷400°C	±0,5°C over -200°C
PT1000: -100÷200°C	±0,2°C	E: -270÷1000°C	±0,5°C over -150°C
PT1000: -100÷250°C	±0,4°C	K: -270÷1372°C	±0,5°C over -140°C
Ni100: -60÷250°C	±0,2°C	N: -270÷1300°C	±1°C over -100°C
		S: -50÷1768°C	±2°C over +20°C
		R: -50÷1768°C	±2°C over +50°C
		B: 0÷1820°C	±2°C over +400°C

Thermal error ±0,05 %/10°C

Voltage error ±0,01%/V

Ambient temperature -40...+85°C

Ordering procedure

GIX-22-2 / _ / _ ÷ °C / _

GI-22-2 / _ / _ ÷ °C / _

Sensor type

Measuring range

alarm signal:
22mA or 3,6mA

Rail-mounted temperature transmitter type ATL

- ✓ Programmable sensor type PT100 i Ni100
- ✓ Programmable measuring range.
- ✓ Thermoresistance line compensation (3 wires line)
- ✓ Output signal 4...20mA
- ✓ Rail- mounting system.

Application and function

The temperature economical transmitter ATL is applicable to converting resistance of temperature sensor to standard current signal 4...20mA.

Most of parameters such as: sensor type, input signal, measuring range may be adapted by user for specific requirements of his measuring system. The transmitter is programmed using PC with RS converter and Aplisens AT configuration software.

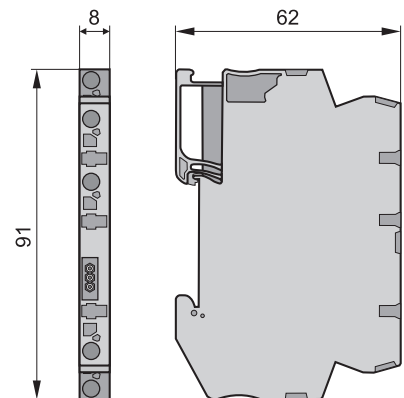
If you define type of sensor, measuring range in the order, then the transmitter is programmed with required parameters and their values are printed on serial number label.

Transmitter for rail mounting.

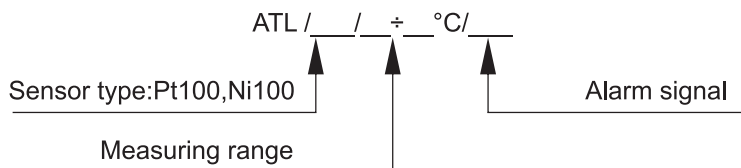


Technical data

Input signal	Pt 100, Ni 100
Limit process	$20\Omega < R < 380\Omega$
Min. measuring range	10Ω
Output signal	4 – 20 mA
Power supply	10...36V DC
Load resistance	$R_o[k\Omega] < (U_z - 7V)/25mA$
Alarm signal	23mA or 3,8mA
Accuracy for $\Delta R > 20\Omega$	$\pm 0,2\%$
Thermal error	$\pm 0,1\% / 10^\circ C$
Ambient temperature	$-25...+80^\circ C$
Error due to supply voltage changes	$\pm 0,1\%$



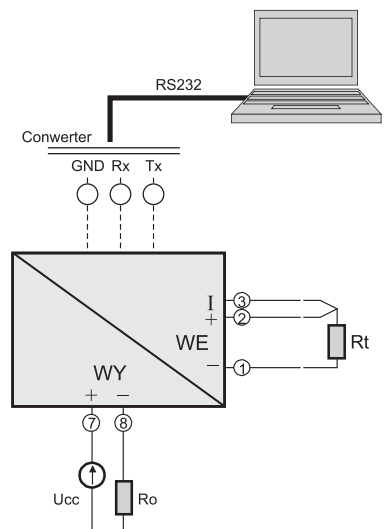
Ordering procedure.



Example: temperature transmitter ATL, sensor type Pt100, measuring range 0...100°C, alarm signal 23mA.

ATL/Pt100/ 0...100°C/23mA

Electrical diagrams



Rail-mounted smart temperature transmitter type LI-24, LI-24Ex



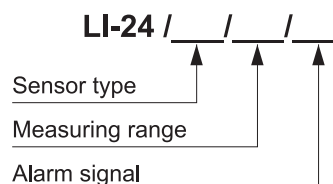
- ✓ Galvanic insulation (In, out)
- ✓ Programmable sensor type
- ✓ Programmable measuring range
- ✓ Resistant thermoresistance line compensation
- ✓ Compensation of thermocouple cold junction
- ✓ Output signal 4...20mA + Hart protocol
- ✓ Ambient temperature from -25 to +80 °C
- ✓ Rail mounting system.
- ✓ Autodiagnostic system
- ✓ Hart protocol
- ✓ ATEX certificate

II 1G Ex ia IIC T4/T5
I M1 Ex ia I
FTZU 08 ATEX 0160x

Outer dimensions:

width: 27,5mm
height: 80mm
depth: 106,7mm

Ordering procedure



Technical data

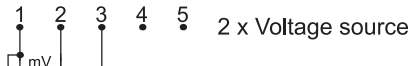
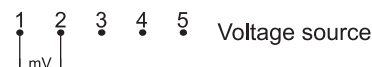
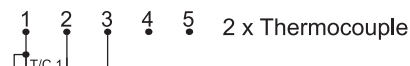
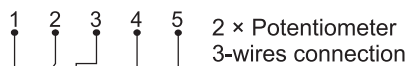
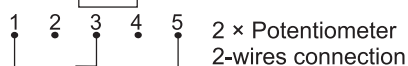
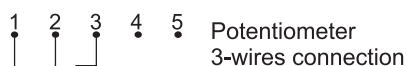
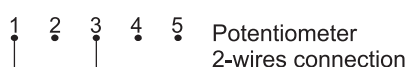
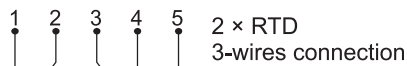
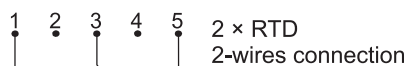
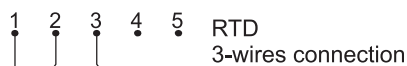
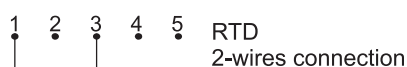
Input signal	K, J, S, B, N, T voltage Pt100, Ni100 resistance
Limit process	- 10mV < E < 100mV or -100mV < E < 1000mV 0Ω < R < 400Ω or 0Ω < R < 2000Ω
Min. measuring range	10mV or 10Ω
Output signal	4 – 20mA
Power supply	13...50V DC
Max. Wires resistance	500Ω
Alarm signal	21,5mA or 3,75 mA or setting by user
Sensor current	0,42mA
Galvanic insulation	Optoelectrical
Accuracy	± 0,1%
Time constant	0,3s
Additional electronic damping	0..30s
Ambient temperature	-25...+75°C

Application and function

The temperature transmitter LI-24 is applicable to converting resistance of temperature or voltage of thermocouple sensor to standard current signal 4-20mA. The transmitter has two separate measuring channels enabling measurement of difference temperature, average, average with redundancy, max or min temperature. Transmitter has compensation of ambient temperature influence and compensation of thermocouple cold junction using internal/external (Pt100) sensor or constant temperature.

Most of parameters such as: sensor type, measuring range, current alarm signal when electric circuit is broken, output characteristic correction, user characteristic (60 points) are programmed using PC with RS/Hart converter and Aplisens MPT2 configuration software or KAP-03 communicator. For request Aplisens can set temperature transmitter parameters like measuring range, type of sensor. Their values are printed on label. Transmitter for rail mounting (TS-35).

Electrical diagrams.



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