

## TEMPERATURE SENSOR TYPE

### TP-Exi-431, TP-Exi-432, TP-Exi-433, TP-Exi-434










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Temperature measurement in mines, gas and dust hazardous areas

ATEX designation **CE**  I M1 Ex ia I Ma  
**CE**  II 2G Ex ia IIC T6-T1 Gb  
**CE**  II 1D Ex ia IIIC T85 ÷ 700°C Da

Temperature range -40°C... +700°C (J)  
-40°C... +1100°C (K)  
-40°C... +1250°C (N)

Option - temperature transmitter

Sensor type	Atmosphere type	Temperature range	ATEX designation
TP-Exi-43X-XJ	mines	-20 ÷ 150°C	 I M1 Ex ia I Ma
	gases	-40 ÷ 700°C	 II 2G Ex ia IIC T6-T1 Gb
	dusts	-40 ÷ 700°C	 II 1D Ex ia IIIC T85 ÷ 700°C Da
TP-Exi-43X-XK	mines	-20 ÷ 150°C	 I M1 Ex ia I Ma
	gases	-40 ÷ 1100°C	 II 2G Ex ia IIC T6-T1 Gb
	dusts	-40 ÷ 1100°C	 II 1D Ex ia IIIC T85 ÷ 1100°C Da
TP-Exi-43X-XN	mines	-20 ÷ 150°C	 I M1 Ex ia I Ma
	gases	-40 ÷ 1250°C	 II 2G Ex ia IIC T6-T1 Gb
	dusts	-40 ÷ 1250°C	 II 1D Ex ia IIIC T85 ÷ 1250°C Da

These temperature sensors are recommended for temperature measurements in mines (sensor category M1) in explosive gases (sensor category 2 G) and dusts (sensor category 1 D).

The sensing element of the sensor, thermocouple type J, K and N is sheathed thermocouple in a flexible Inconel 600 casing (J, K) or in the case of type N Microbell.

Sheathed thermocouples are made using thermoelectric wires insulated with highly compacted mineral powder (99% MgO) and a metal sheath (casing) providing mechanical and chemical protection of thermocouple wires and measuring junction. This design allows for high flexibility, high mechanical resistance and short reaction time.

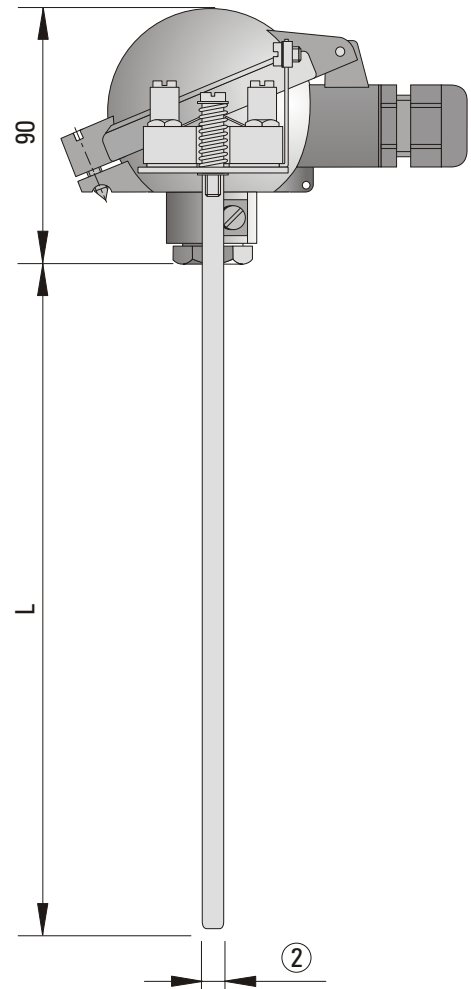
An ATEX certified temperature transmitter which converts the measured values to a 4-20mA, 0-20mA or 0-10V (option) signal can be mounted in the connection head.

For each sensor an Instruction Manual, Warranty Card and Declaration of Conformity are supplied. A free of charge Quality Certificate specifying the class of the sensor or payable Calibration Certificate for the specified temperature values is supplied on request.

#### TECHNICAL DATA

Process connection	without or compression gland, stainless steel 1.4541 (option)
Protection sheath	Ø3, Ø4,5, Ø6, Ø8mm, Inconel 600 (J, K), Microbell (N)
Sensing element	J (Fe-CuNi) insulated EN 60584 class 1 K (NiCr-NiAl) insulated EN 60584 class 1 N (NiCrSi-NiSi) insulated EN 60584 class 1
Connection head and cable gland	head type XE-DANA, IP65, ATEX II 2GD cable gland ATEX II GD, IP65, for cable of outer diameter Ø6 ÷ Ø8mm head type XE-BE, IP65, ATEX I M2, operating temperature up to 100°C cable gland ATEX I M2, Ip65, for cable of outer diameter Ø6 ÷ Ø12mm
Ambient temperature (Tamb)	-40°C +75°C
Response time	t <sub>05</sub> ca.3s (in water 0,2 m/s for Ø3mm), t <sub>09</sub> ca.14s (in water 0,2 m./s for Ø8mm)
Maximum operating pressure	0,1MPa
Temperature transmitter (option)	ATEX certified

**Temperature sensor type TP-Exi-431, TP-Exi-432, TP-Exi-433, TP-Exi-434**  
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(1) Basic version  
 TP-Exi

(2) Protection sheath  
 431      Ø3,0mm  
 432      Ø4,5mm  
 433      Ø6,0mm  
 434      Ø8,0mm

(3) Sensing element  
 1J      1xJ (1 x Fe-CuNi)  
 1K      1xK (1 x NiCr-NiAl)  
 1N      1xN (1 x NiCrSi-NiSi)  
 2J      2xJ (2 x Fe-CuNi)  
 2K      2xK (2 x NiCr-NiAl)  
 2N      2xN (2 x NiCrSi-NiSi)

(4) Length in mm (100 < L < 5000)  
 100      100 mm  
 150      150 mm  
 ...      other length (by 50 mm)

(5) ATEX designation  
 mines      I M1 Ex ia I Ma  
 gases      II 2G Ex ia IIC T6 Gb  
 dusts      II 1D Ex ia IIIC T85°C Da

(6) Additional accessories (option)  
 0      without  
 KP      compression gland (type acc. to catalogue page)  
 T      ATEX certified temperature transmitter (parameters acc. to catalogue page)

**Ordering code:**

(1)	(2)	(3)	(4)	(5)	(6)
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**Example:**      TP-Exi    —    431    —    1P2    —    1200    —    IM1ExialMa    —    0

Additional accessories please specify at the end, for example KPM10x1-3

The designer of the installation will be responsible for selecting a type of sensor and method of its implementation such that after installation, during extreme operating conditions, the temperature of the sensor's hottest surface is lower than the temperature class for a given substance (gas, mist, vapor).

The designer of the installation will be responsible for selecting a type of sensor and method of its implementation such that after installation, during extreme operating conditions, the temperature of the sensor's hottest surface is lower than 2/3 of the ignition temperature of dust cloud  $T_{ci}$  or ignition temperature of a 5-millimeter layer of dust  $T_{5mm}$  reduced by 75K.