



AP 108

Temperature sensor suitable for measurement of liquid and gaseous media. It has a replaceable measuring insert adequate for various industrial applications. Replacement of the measuring insert does not cause the technological installation damage. Spring-loaded insert ensures an excellent connection with the bottom of the sensor thermowell. Temperature sensor has ATEX approval for application in hazardous area: **I M2 Exd I MK (with connection head NS1,2); II 2G Exd IIC T6 Gb; III 2D Exd IIIC T85°C Db 1P66**

### Specification

#### Temperature range / sensing element

-200+550°C	<b>Pt100</b>	class B
-40+550°C	<b>J, K,</b>	class2

#### Measuring insert

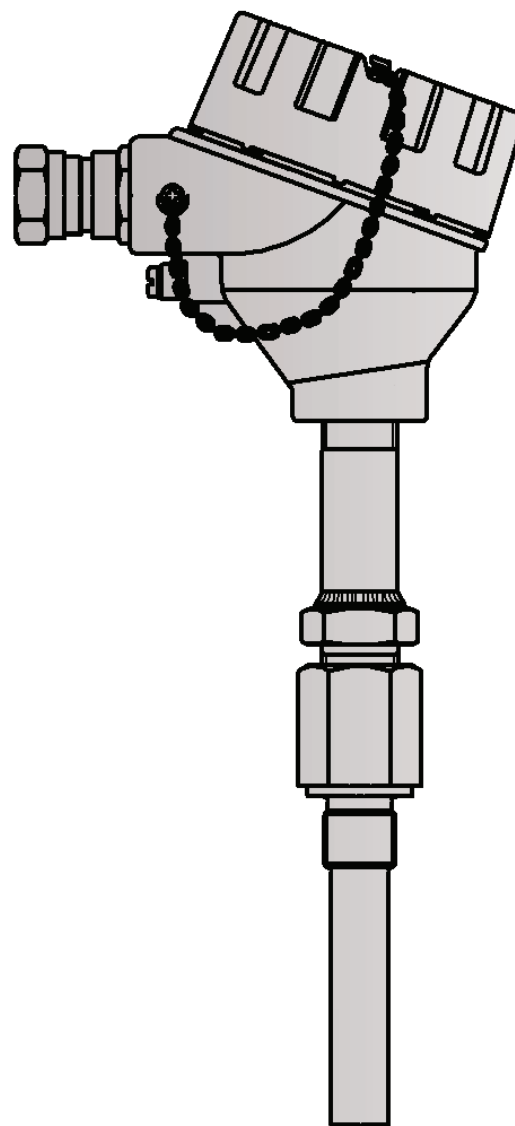
- 2-, 3-, 4-wire connection (for Pt100)
- 2-, 3-wire connection (for 2xPt100)
- insert length [mm]: L+215
- measuring insert diameter [mm]: 6

#### Thermowell

- material: steel 1.4541
- diameter d [mm]: min.16
- length L [mm]: 100+570

#### Connection head

- aluminium
- XD-AD (AS1 – one cable gland, AS2 – two cable glands),
- aluminium, cover with window (for display)
- XD-ADwin (AS3 - one cable gland, AS4 - two cable glands),
- stainless steel connection head
- XD-SD (NS1 - one cable gland, NS2 - two cable glands),
- cable gland: ATEX II 2 GD; ATEX I M2; IP 66+68
- cable diameter: 3+14,3mm (standard 6,1+11,7mm)



Other parameters acc. to requirements

### Options

#### Temperature transmitter application

Temperature transmitter with standard 4+20mA, 0+10V output signals and with the HART or PROFIBUS communication protocols can be mounted in the connection head. Transmitter installation is carried out directly on the measuring insert (in place of a terminal block).

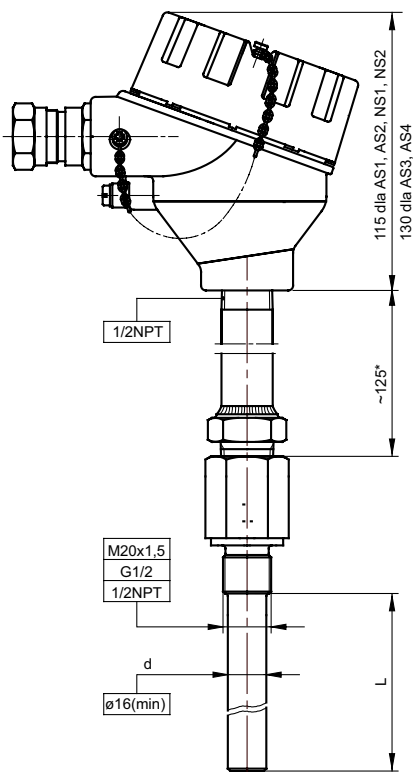
#### Local display application

The temperature sensor can be equipped with the connection head enabling the local LED display installation. The local display operates in current loop 4+20mA. This version makes the local temperature reading and transmission of the analogue signal possible.

#### Non-standard design

Immersion length, process connection thread, shape and material of the thermowell and the measuring insert parameters can be customized per client request.

**Calibrations performed by Limatherm Sensor Sp. z o.o. are confirmed with the Calibration Certificate of the Accredited Laboratory for Temperature Measurements.**



### Standard length

Immersion length L [mm]	Measuring insert length L <sub>w</sub> [mm]
100	315
150	365
250	465
400	615

### Tolerance for classes of sensors with resistors Pt acc. to PN-EN 60751

Sensor classes	Range of application [°C]	Formula for calculating acceptable deviations [°C]
AA	-50÷250	$T = \pm(0,10 + 0,0017  t )$
A	-100÷450	$T = \pm(0,15 + 0,002  t )$
B	-196÷600	$T = \pm(0,3 + 0,005  t )$

|t| - absolute value of temperature

### Measurement circuit

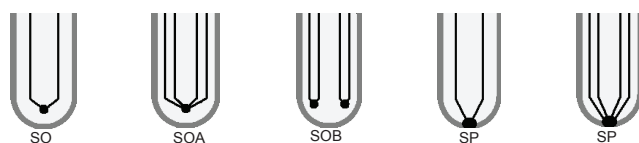
1 x Pt100			2 x Pt100			1 x TC	2 x TC
2-wire	3-wire	4-wire	2-wire	3-wire	4-wire	2-wire	2-wire
✓	✓	✓	✓	✓	x	✓	✓

### Tolerance for thermocouple classes acc. to PN-EN 60584

Thermocouple type	Class 1		Class 2	
	Range of application [°C]	Tolerance [°C]	Range of application [°C]	Tolerance [°C]
<b>J</b> Fe-CuNi	from -40 to +375 from +375 to +750	±1,5 ±0,004  t	from -40 to +333 from +333 to +750	±2,5 ±0,0075  t
<b>K</b> NiCr-NiAl	from -40 to +375 from +375 to +1000	±1,5 ±0,004  t	from -40 to +333 from +333 to +1200	±2,5 ±0,0075  t

|t| - absolute value of temperature

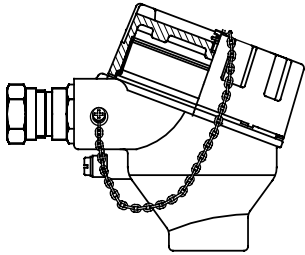
### Thermocouple hot junction types



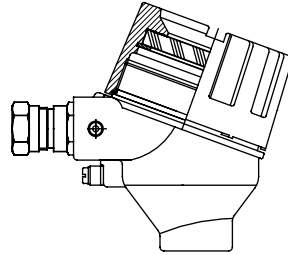
### Connection head types

Connection head type AS1 in standard.

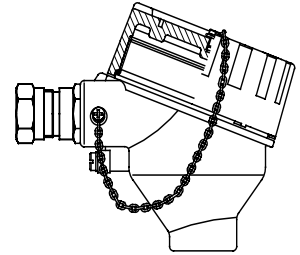
Possibility to mount different type of a connection head.



AS-1,2



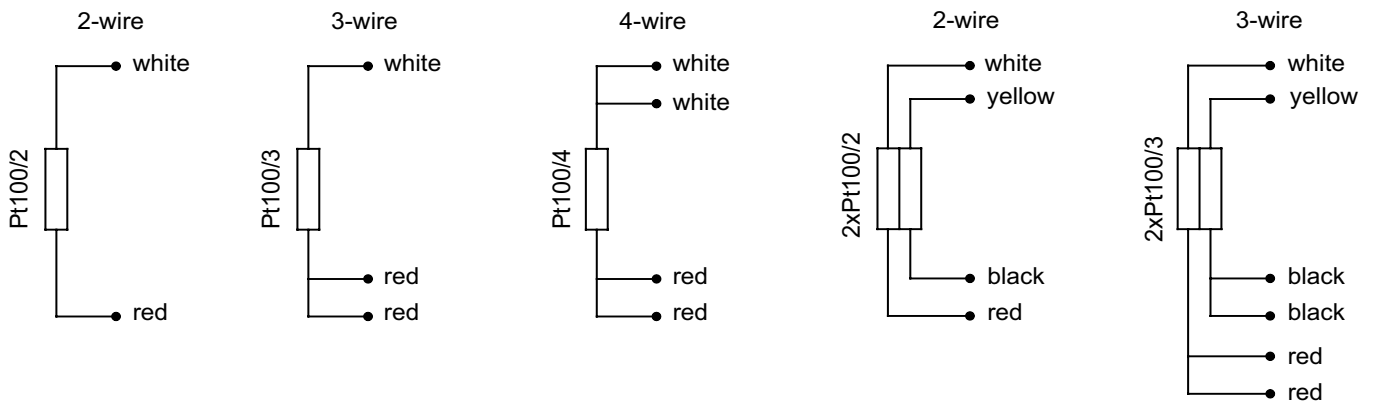
AS-3,4



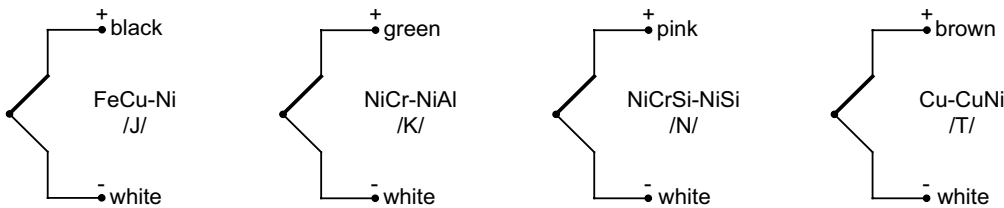
NS-1,2

### Connection schemes

#### Pt100 (thermometric resistor)



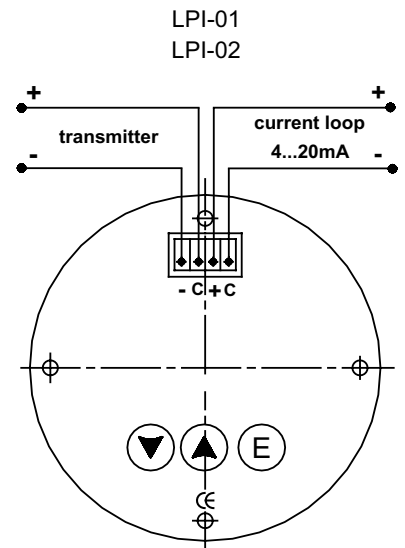
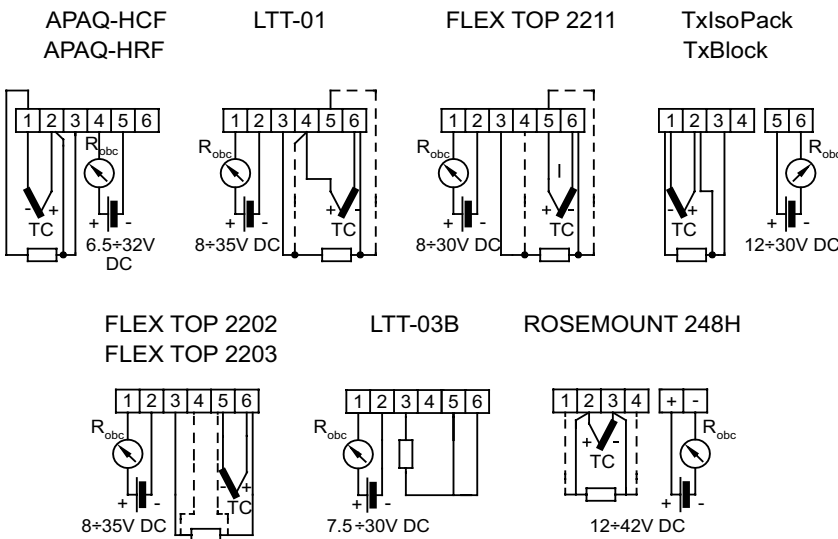
#### TC (thermocouple)



In double sensors one of thermocouples is additionally marked out.

#### Transmitters

#### Local LED display



**Product code**

		<b>Sensor version</b>	
		<b>no designation</b>	single
		<b>2</b>	double
1	<input type="text"/>	<b>AP</b>	with transmitter
		<b>Sensing element</b>	
		<b>OP</b>	resistor Pt
		<b>TJ</b>	thermocouple Fe-CuNi /J/
		<b>TK</b>	thermocouple NiCr-NiAl /K/
		<b>TN</b>	thermocouple NiCrSi-NiSi /N/
2	<input type="text"/>	<b>TT</b>	thermocouple Cu-CuNi /T/
		<b>Connection head type</b>	
		<b>AS-1, AS2</b>	aluminium connection head for sensors
		<b>AS-3, AS-4</b>	aluminium connection head with window
3	<input type="text"/>	<b>NS1, NS2</b>	stainless steel connection head
		<b>Immersion length / Sheath diameter</b>	
		<b>400/20</b>	400mm/ø20mm
4	<input type="text"/>		other parameters acc. to requirements
		<b>Thread dimension</b>	
		<b>M20x1,5</b>	metric thread M20x1,5
		<b>G½</b>	pipe thread (inch) G½
		<b>½NPT</b>	tapered thread (inch) ½NPT
5	<input type="text"/>		other parameters acc. to requirements
		<b>Accuracy</b>	
		<b>aA** or aB**</b>	for resistor Pt ( ** a=1 for Pt100, a=5 for Pt500, a=10 for Pt1000)
6	<input type="text"/>	<b>1 or 2</b>	for thermocouple
		<b>Measurement circuit (for resistor) / hot junction type for TC</b>	
		<b>2</b>	2 - wire
		<b>3</b>	3 - wire
		<b>4</b>	4 - wire
		<b>SO</b>	insulated hot junction
		<b>SP</b>	grounded hot junction
		<b>SOA</b>	one hot junction for two thermocouples insulated from the thermowell
7	<input type="text"/>	<b>SOB</b>	two hot junctions insulated from each other and from the thermowell
		<b>Transmitter type (optionally)</b>	
		<b>Tx</b>	head mounted transmitter TxBlock
8	<input type="text"/>		other parameters acc. to requirements
		<b>Temperature range of transmitter</b>	
		<b>(0÷100°C)</b>	transmitter configured for temperature range 0÷100°C
9	<input type="text"/>		other parameters acc. to requirements
		<b>Cable diameter pod cable gland</b>	
		<b>a</b>	3,2mm÷8,7mm
		<b>b</b>	6,1mm÷11,7mm (standard)
10	<input type="text"/>	<b>c</b>	6,5mm÷14mm

1            2                            3            4            5            6            7            8            9            10  
 T  SWG -  Exd -  -  -  -  -  -  -  -  -

**Ordering example:**     **APTTSWG-Exd-NS2-570/16-G1/2-2-SO-Tx-(0÷300)°C-b**