



AP 108

Temperature sensor applied in industrial pipelines, pressure tanks and different industrial devices for temperature measurement of liquids and gases. Sensing element is placed directly in the sheath.

Specification

Temperature range / sensing element		
-200+600°C	Pt100	class B
-40+700°C	K, J	class 2
Measuring insert		
– non-replacable		
Sheath		
– material: steel 1.4541		
– sheath length:		
115, 175, 245, 375, 525 [mm]: for ø6		
495, 705, 995, 1395, 1995 [mm]: for ø8		
– L _{max} [mm]: for ø6 = 1500		
– L _{max} [mm]: for ø8 = 2000		
Connection head		
BA, IP55, -40+100 °C		

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) or in the high cover connection head (solution used to enable installation of two transmitters).

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.

ATEX design

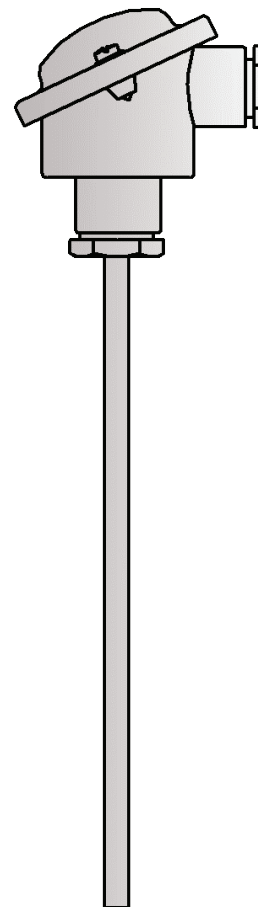
For explosion zones adequate sensor constructions are available:

- intrinsically safe Exi
- flameproof **Exd**

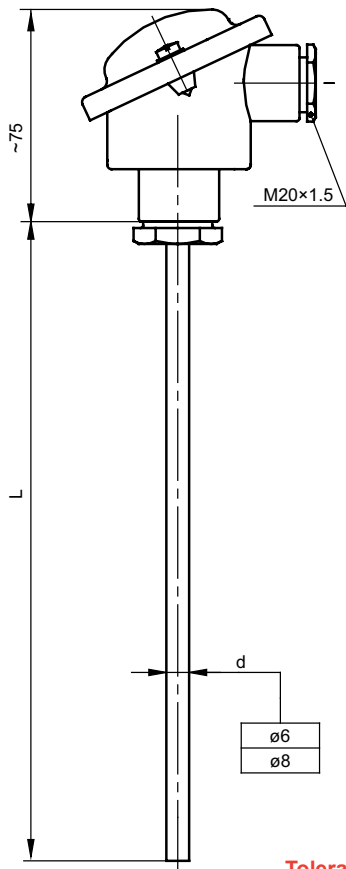
These designs possess EC-Type Examination Certificate in compliance with 94/9/EC(ATEX) directive.

Non-standard design

Immersion length, shape and material of the thermowell, connection head type 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 for ø6 mm		Immersion length for ø8mm	
L [mm]	L _w [mm]	L [mm]	L _w [mm]
115	145	495	525
175	205	705	735
245	275	995	1025
285	315	1395	1425
375	405	1995	2025
525	555	–	–

Response time to temperature change

Thermowell diameter [mm]	Response time [s]
ø6	t _{0,5} = 12
	t _{0,9} = 55
ø8	t _{0,5} = 20
	t _{0,9} = 85

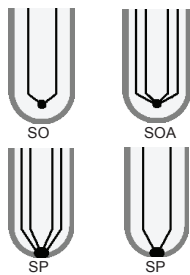
test carried out in mixed water 0,4 m/s acc. to PN-EN 60751

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 = ±(0,10 + 0,0017 t)
A	-100÷450	T = ±(0,15 + 0,002 t)
B	-196÷600	T = ±(0,3 + 0,005 t)

|t| - absolute value of temperature

Thermocouple hot junction types



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

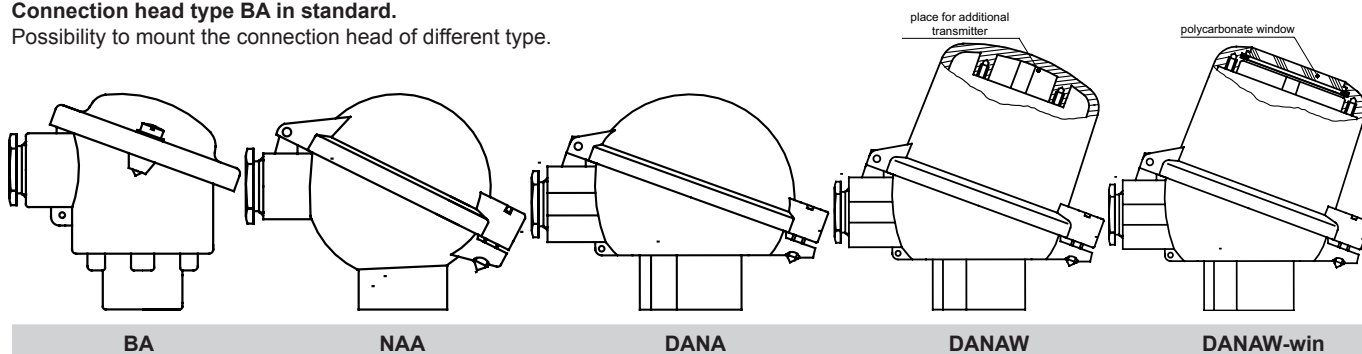
Thermocouple type	Class 1		Class 2	
	Range of application [°C]	Tolerance [°C]	Range of application [°C]	Tolerance [°C]
J Fe-CuNi	from -40 to +375 from +375 to +750	±1,5 ±0,004 t	from -40 to +333 from +333 to +750	±2,5 ±0,0075 t
K NiCr-NiAl	from -40 to +375 from +375 to +1000	±1,5 ±0,004 t	from -40 to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

|t| - absolute value of temperature

Connection head types

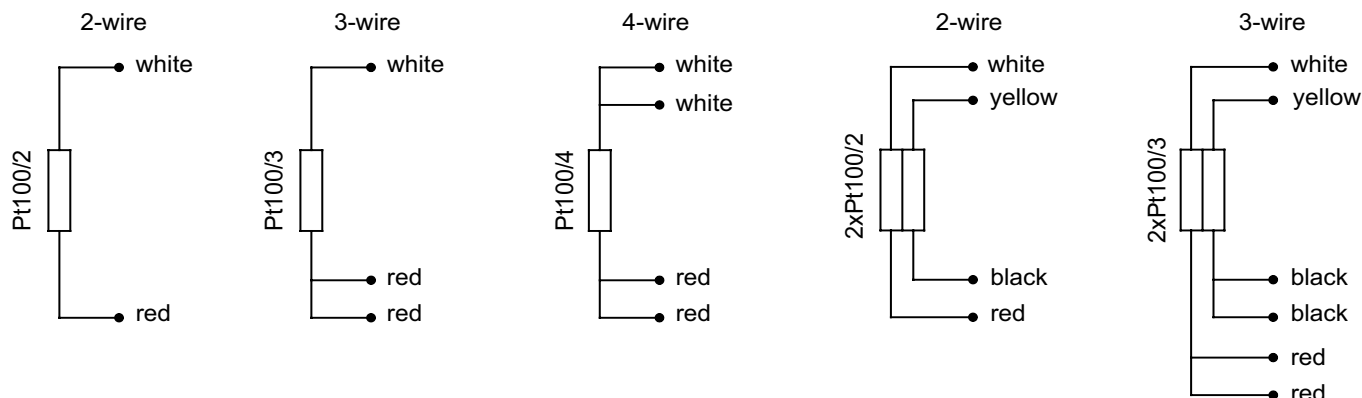
Connection head type BA in standard.

Possibility to mount the connection head of different type.

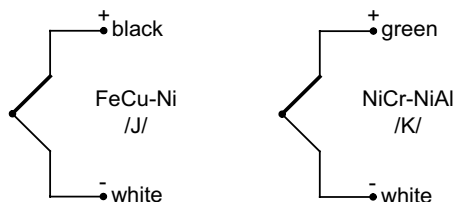


Connection schemes

Pt100 (thermometric resistor)



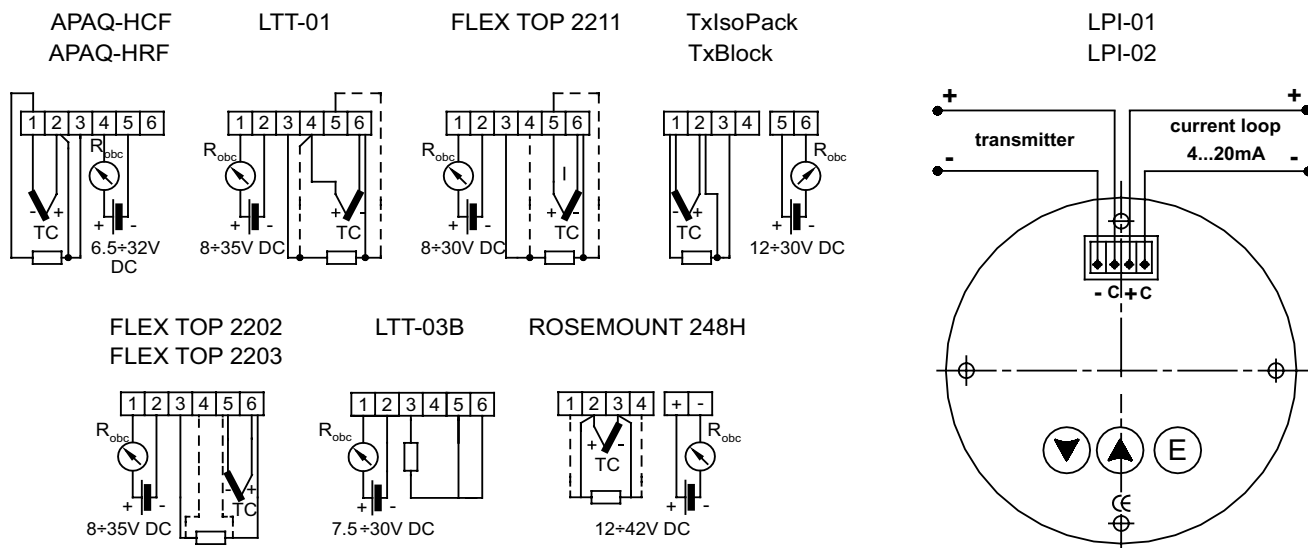
TC (thermocouple)



In double sensors one of thermocouples is additionally marked out.

Transmitters

Local LED display



Product code

0		Sensor version	
		AP	with transmitter
		2AP	with two transmitters
		APW	with display
1		no designation	single
		2	double
2		Sensing element	
		OP	resistor Pt
		TJ	thermocouple Fe-CuNi /J/
		TK	thermocouple NiCr-NiAl /K/
			other parameters acc. to requirements
3		Thermowell diameter	
		6	ø6mm
		8	ø8mm
			other parameters acc. to requirements
4		Thermocouple hot junction type	
		SO	insulated hot junction
		SP	grounded hot junction
		SOA	one hot junction for two thermocouples insulated form the sheath
		Sheath length	
5		ø6 / ø8	ø6 / ø8
		115 495	115mm 495mm
		175 705	175mm 705mm
		245 995	245mm 995mm
		285 1395	285mm 1395mm
		375 1995	375mm 1995mm
		525 -	525mm -
			other parameters acc. to requirements
		Accuracy	
		A or B	for measuring resistor
6		1 or 2	for thermocouple
		Measurement circuit (for resistor)	
		2	2 - wire
7		3	3 - wire
		4	4 - wire
		Transmitter type (optionally)	
8		TX	head mounted transmitter TxBlock
			other parameters acc. to requirements
9		Temperature range of transmitter	
		(0÷100°C)	transmitter configured for temperature range 0÷100°C
			other parameters acc. to requirements

0 1 2 3 4 5 6 7 8 9
 T I - - - - - - -

Ordering example: **TOPI-6-115-B-2** single sensor with Pt100, class B, 2-wire connection, sheath diameter 6mm and length L=115mm