



AP 108

This sensor is used for temperature measurement of liquid and gaseous media. The temperature sensor design (replaceable measuring insert) is suitable 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.

Specification

Temperature range / sensing element

-200+150°C	Pt100	class B
-40+150°C	K, J	class 2

Measuring insert

- 2-, 3-, 4-wire connection (for Pt100)
- 2-, 3-wire connection (for 2xPt100)

Thermowell

- material: steel 1.4541
- length [mm]: 70÷2000

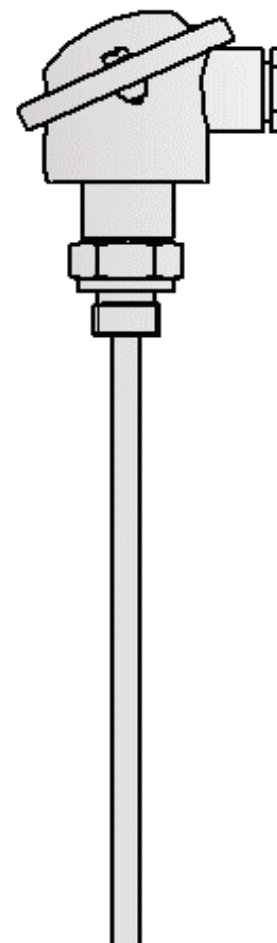
Connection head

- BA, IP55, -40÷100°C

Process connection

- M20x1,5; G½

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:

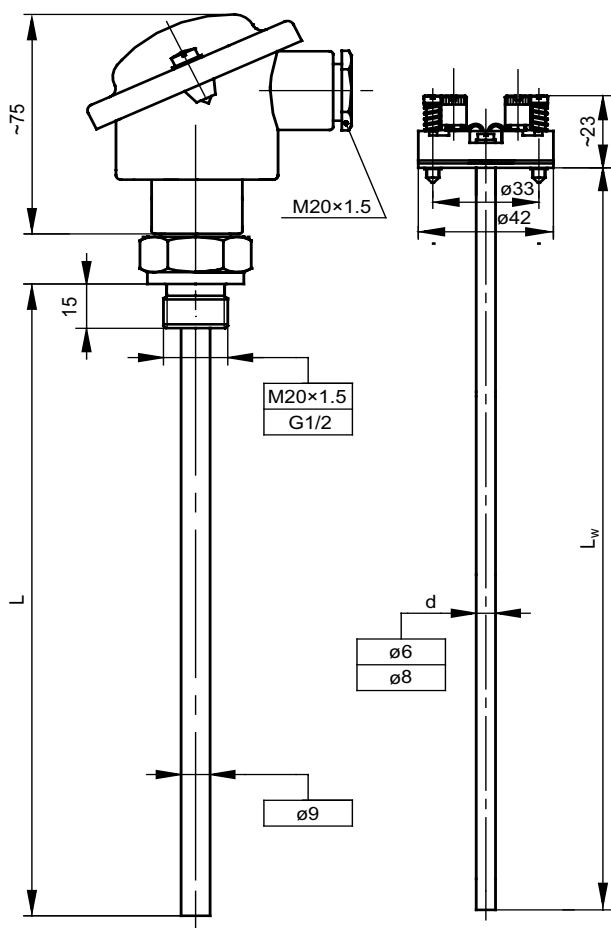
- intrinsically safe Exi
- flameproof Exd

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

Non-standard design

Immersion length, process connection thread, 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

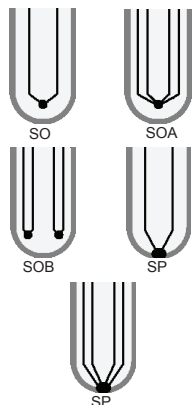
Immersion length L [mm]	Measuring insert length L _w [mm]
100	143
160	203
230	273
360	403

Maximum pressure

Length L [mm]	Maximum pressure [MPa]
do 160	6.4
do 250	4.9
do 500	2.0

Values specified on the basis of the maximum speed of steam flow: 25m/s and water flow: 3m/s

Thermocouple hot junction types



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

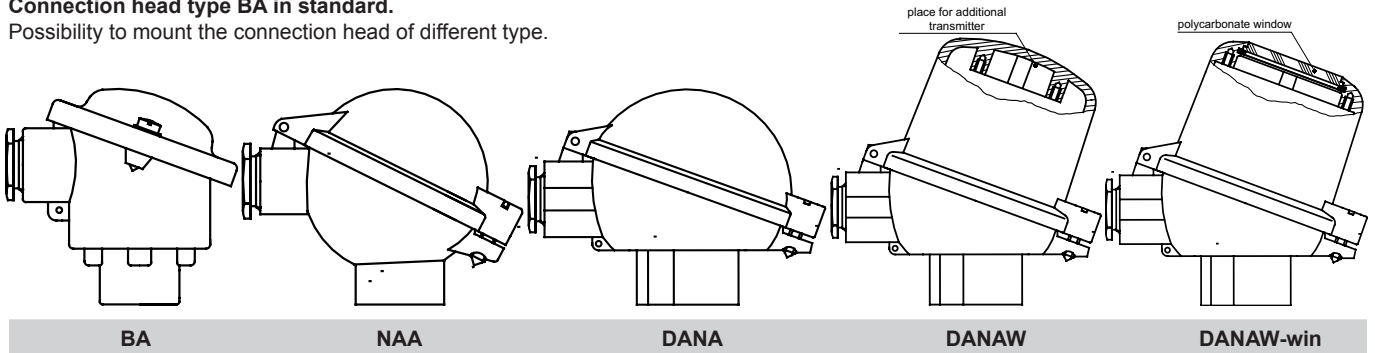
Thermocouple type	Class 1		Class 2	
	Range of application [°C]	Tolerance [°C]	Range of application [°C]	Tolerance [°C]
J Fe-CuNi	from -40 to +375 from +375 to +750	±1,5 ±0,004 t	from -40 to +333 from +333 to +750	±2,5 ±0,0075 t
K NiCr-NiAl	from -40 to +375 from +375 to +1000	±1,5 ±0,004 t	from -40 to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

|t|- absolute value of temperature

Connection head types

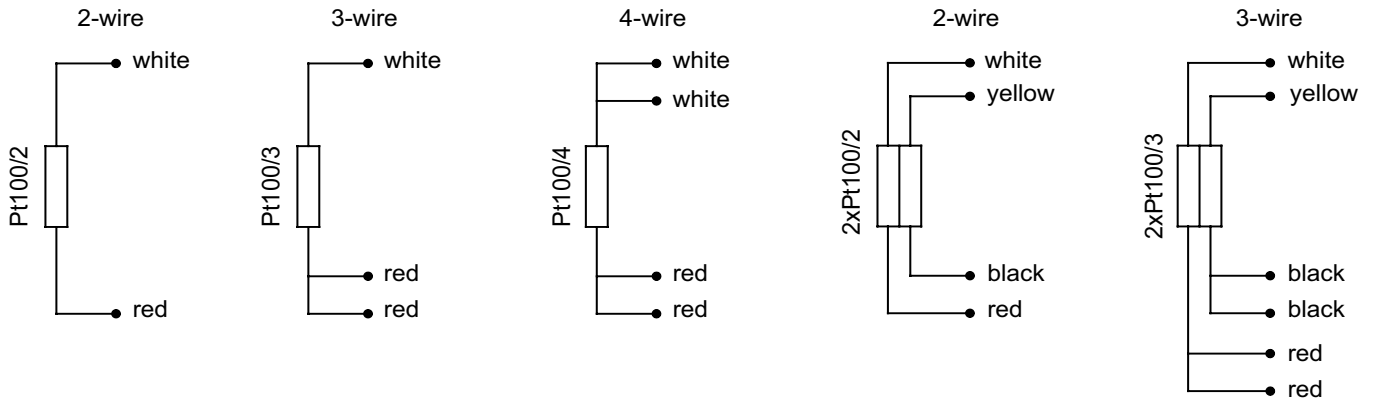
Connection head type BA in standard.

Possibility to mount the connection head of different type.

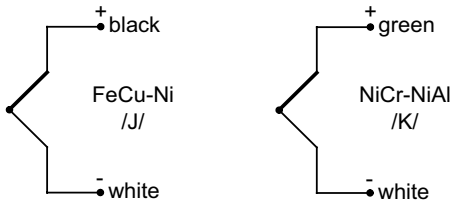


Connection schemes

Pt100 (thermometric resistor)



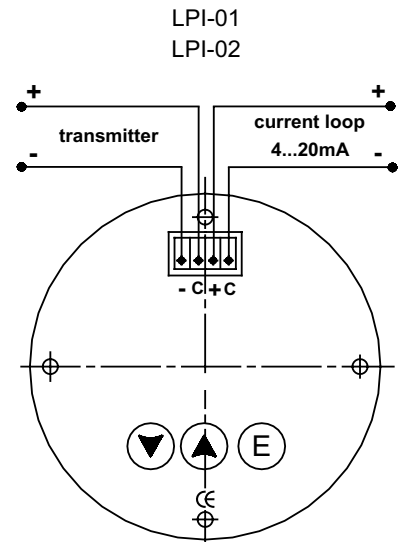
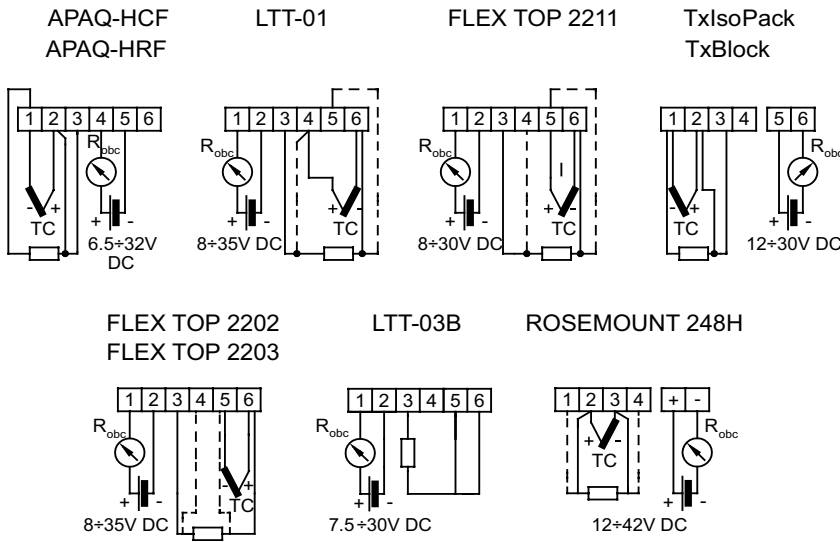
TC (thermocouple)



In double sensors one of thermocouples is additionally marked out.

Transmitters

Local LED display



Product code

		Sensor version
		AP with transmitter
		2AP with two transmitters
0	<input style="width: 30px; height: 20px;" type="text"/>	APW with display
		no designation single with pipe insert
		2 double with pipe insert
1	<input style="width: 30px; height: 20px;" type="text"/>	P single with mineral insulated insert
		2P double with mineral insulated insert
		Sensing element
		OP resistor Pt
		TJ thermocouple Fe-CuNi /J/
2	<input style="width: 30px; height: 20px;" type="text"/>	TK thermocouple NiCr-NiAl /K/
		other parameters acc. to requirements
		Thermocouple hot junction type
		SO insulated hot junction
		SP grounded hot junction
3	<input style="width: 30px; height: 20px;" type="text"/>	SOA one hot junction for two thermocouples insulated from the sheath
		SOB hot junctions insulated from each other and from the sheath
		Thermowell length
		100 100mm
		160 160mm
		230 230mm
4	<input style="width: 30px; height: 20px;" type="text"/>	360 360mm
		other parameters acc. to requirements
		Thermowell diameter
5	<input style="width: 30px; height: 20px;" type="text"/>	9 ø9mm
		other parameters acc. to requirements
		Dimension of process connection thread
		M20x1,5 metric thread M20x1,5
6	<input style="width: 30px; height: 20px;" type="text"/>	G½ pipe thread (inch) G½
		other parameters acc. to requirements
		Accuracy
7	<input style="width: 30px; height: 20px;" type="text"/>	A or B for measuring resistor
		1 or 2 for thermocouple
		Measurement circuit (for resistor)
		2 2 - wire
8	<input style="width: 30px; height: 20px;" type="text"/>	3 3 - wire
		4 4 - wire
		Transmitter type (optionally)
9	<input style="width: 30px; height: 20px;" type="text"/>	Tx head mounted transmitter TxBlock
		other parameters acc. to requirements
		Temperature range of transmitter
10	<input style="width: 30px; height: 20px;" type="text"/>	(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 10

T

GB-11

Ordering example: **2TOPGB-11-160-9-G½-A-3** double sensor with Pt100, class A, 3-wire connection, thermowell diameter 9mm and length L=160mm, with threaded connector G½