



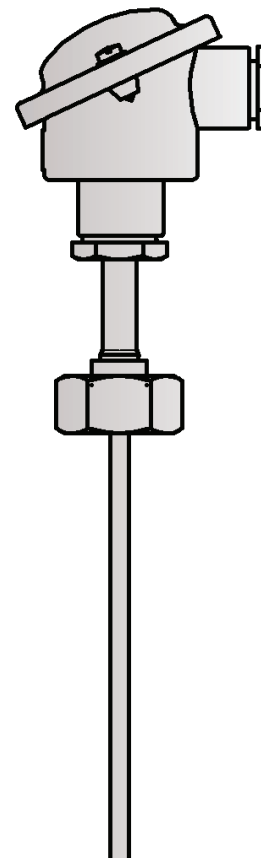
AP 108

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 thermowell.

Specification

Temperature range / sensing element		
-200÷550°C	Pt100	class B
-40÷550°C	K, J	class 2
Measuring insert		
– non-replacable		
Thermowell		
– material: steel 1.4541		
– length [mm]:50÷1500		
Connection head		
– BA, IP55, -40÷100 °C		
Process connection		
G½; G¾; M20x1,5; M27x2		

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).

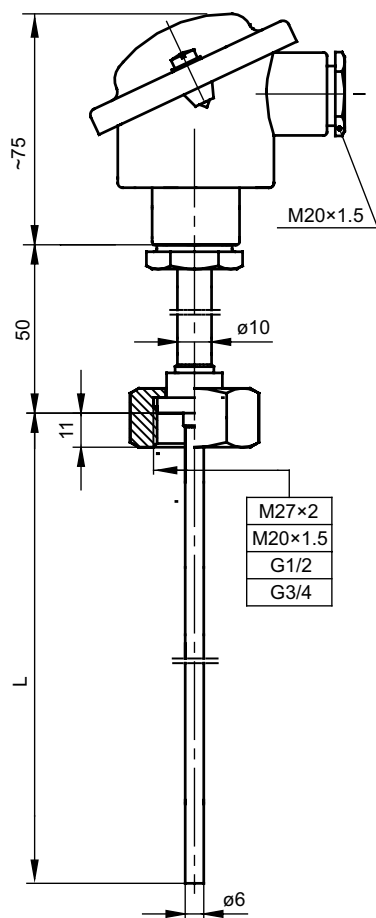
Local display application

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.

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]
100
160
200
250

Maximum pressure

Length L [mm]	Maximum pressure [MPa]
to 160	6.4
to 250	4.9
to 400	2.0

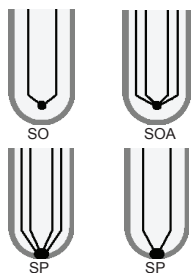
Values specified on the basis of the maximum speed of steam flow: 25 m/s and water flow: 3 m/s with thermowell standard diameter 9 mm.

Response time to temperature change

Thermowell diameter [mm]	Response time [s]
ø6	$t_{0.5} = 12$
	$t_{0.9} = 55$

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

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

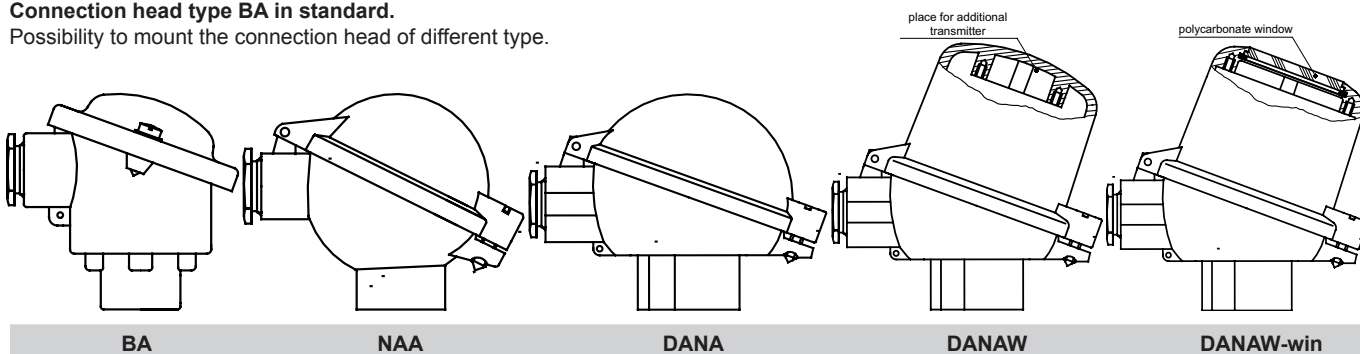
Thermocouple type	Class 1		Class 2	
	Range of application [°C]	Tolerance [°C]	Range of application [°C]	Tolerance [°C]
J Fe-CuNi	from -40 to +375 from +375 to +750	$\pm 1,5$ $\pm 0,004 t $	from -40 to +333 from +333 to +750	$\pm 2,5$ $\pm 0,0075 t $
K NiCr-NiAl	from -40 to +375 from +375 to +1000	$\pm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

|t| - absolute value of temperature

Connection head types

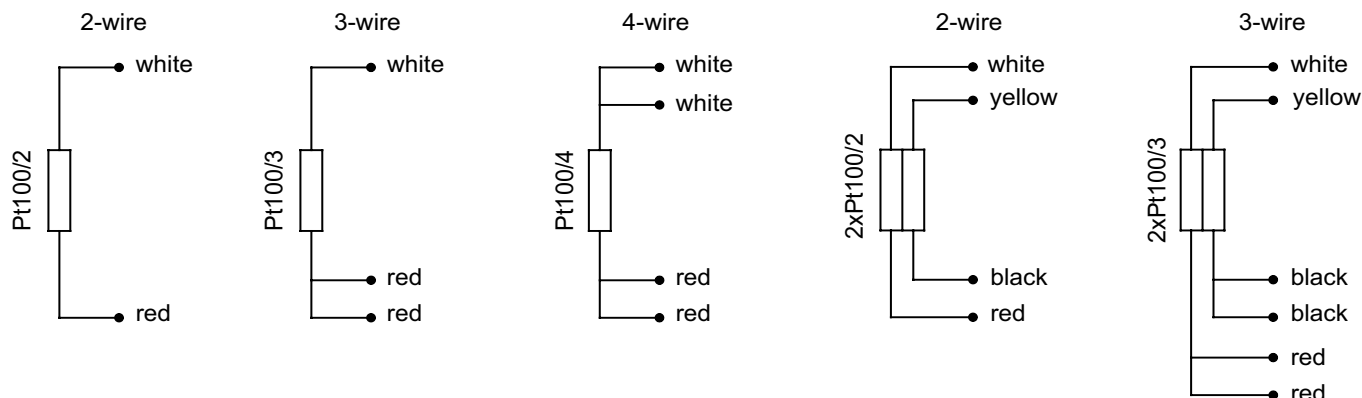
Connection head type BA in standard.

Possibility to mount the connection head of different type.

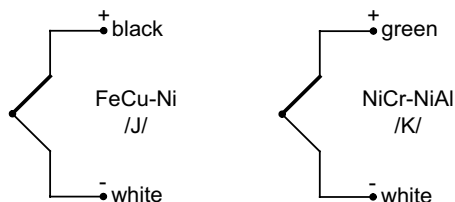


Connection schemes

Pt100 (thermometric resistor)



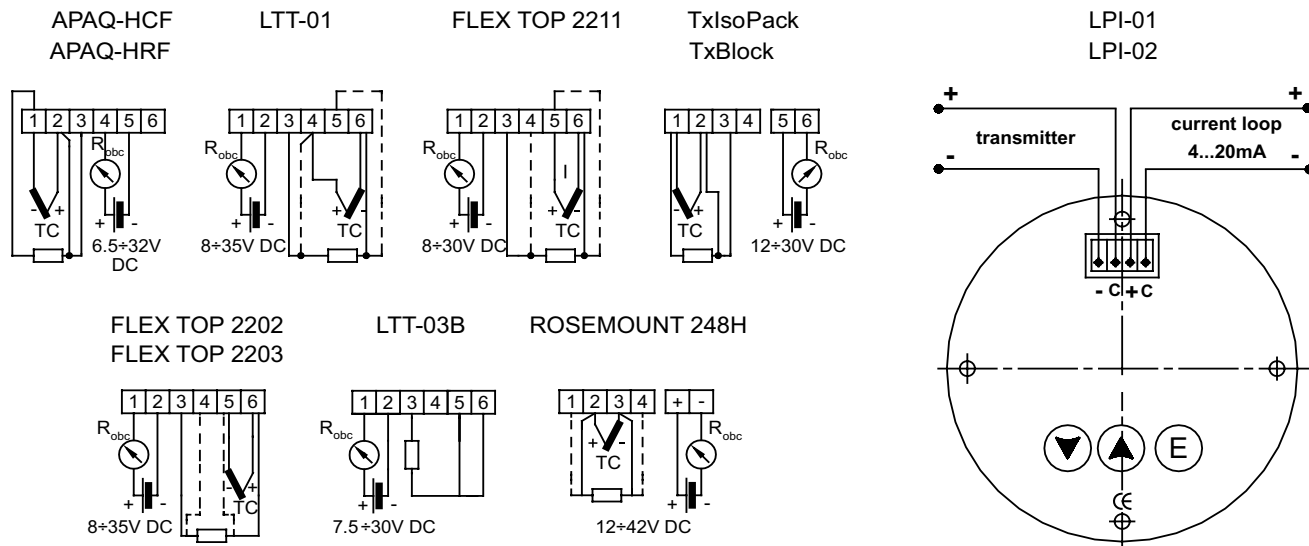
TC (thermocouple)



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	with terminal block
		2	double
2		Sensing element	
		OP	resistor Pt
		TJ	thermocouple Fe-CuNi /J/
		TK	thermocouple NiCr-NiAl /K/
			other parameters acc. to requirements
3		Thermocouple hot junction type	
		SO	insulated hot junction
		SP	grounded hot junction
		SOA	one hot junction for two thermocouples insulated from the sheath
		SOB	hot junctions insulated from each other and from the sheath
4		Thermowell length	
		100	100mm
		160	160mm
		200	200mm
		250	250mm
			other parameters acc. to requirements
5		Dimension of process connection thread	
		M20x1,5	metric thread M20x1,5
		M27x2	metric thread M27x2
		G½	pipe thread (inch) G½
		G¾	pipe thread (inch) G¾
			other parameters acc. to requirements
6		Accuracy	
		A or B	for measuring resistor
		1 or 2	for thermocouple
7		Measurement circuit (for resistor)	
		2	2 - wire
		3	3 - wire
		4	4 - wire
8		Transmitter type (optionally)	
		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 GWN-4 – – – – – – –

Ordering example: TTJGWN-4-SO-600-M20x1,5-1 single sensor with thermocouple Fe-CuNi /J/, class 1, insulated hot junction SO, thermowell diameter 6 mm and L=600 mm, threaded fitting M20x1