



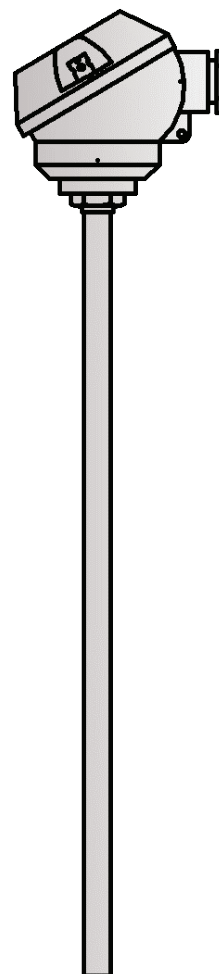
AP 108

Temperature sensor with low thermal inertia suitable for temperature measurement of processes, where fast response to temperature change of the measured medium is needed. Sensing element is placed directly in the sheath.

Specification

Temperature range / sensing element		
-200÷550°C	Pt100	class B
-40÷700°C	K, J	class 2
Measuring insert		
– non-replacable		
Sheath		
– material: steel 1.4541		
– length [mm]: 50÷2000		
Connection head		
– MA, IP54, -40÷100 °C		

Other parameters acc. to requirements



Options

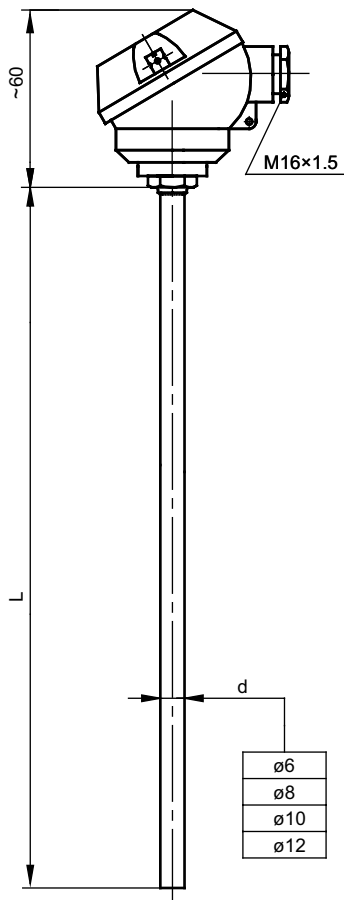
Temperature transmitter application

For Pt100 sensors temperature transmitter 4÷20mA can be installed in the connection head.

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

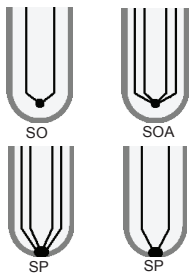
Immersion length L [mm]
100
160
200
250

Response time to temperature change

Thermowell diameter [mm]	Response time [s]
ø6	$t_{0,5} = 12$
	$t_{0,9} = 55$
ø8	$t_{0,5} = 20$
	$t_{0,9} = 85$
ø10	$t_{0,5} = 35$
	$t_{0,9} = 100$
ø12	$t_{0,5} = 45$
	$t_{0,9} = 155$

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	x	✓	✓

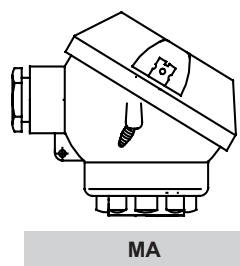
Tolerance for thermocouple classes acc. to PN-EN 60584

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 $

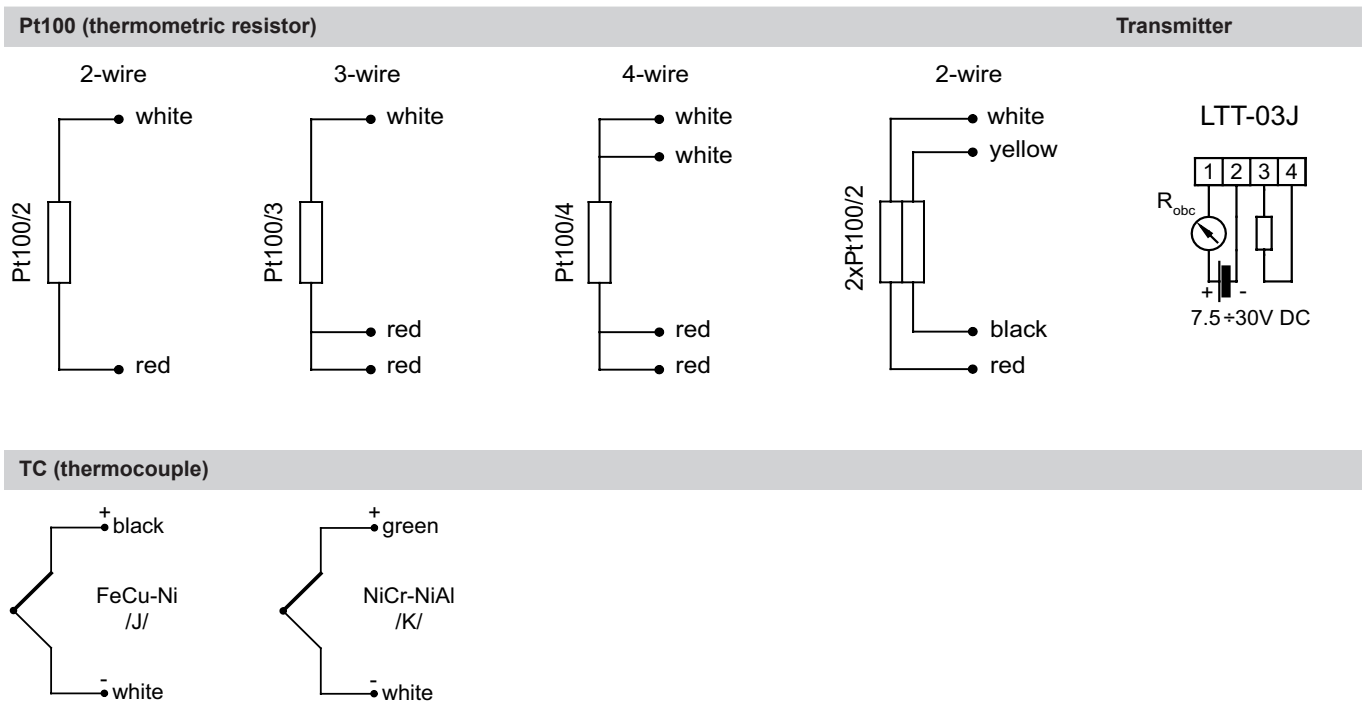
|t| - absolute value of temperature

Connection head types

Connection head type MA in standard.



Connection schemes



In double sensors one of thermocouples is additionally marked out.

Product code

Sensor version	
no designation	single
2	double
AP	with transmitter (only 1xPt100)
Sensing element	
OP	resistor Pt
TJ	thermocouple Fe-CuNi /J/
TK	thermocouple NiCr-NiAl /K/
	other parameters acc. to requirements
Thermocouple hot junction type	
SO	insulated hot junction
SP	grounded hot junction
SOA	one hot junction for two thermocouples insulated form the sheath

1

2

3

		Thermowell diameter
		6 ø6mm
		8 ø8mm
		10 ø10mm
		12 ø12mm
4		other parameters acc. to requirements
		Sheath length
		100 100mm
		160 160mm
		200 200mm
		250 250mm
5		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
		3 3 - wire
7		4 4 - wire
		Transmitter type (optionally)
		LTT03J head mounted LTT03J transmitter
8		other parameters acc. to requirements
		Temperature range of transmitter
		(0÷100°C) transmitter configured for temperature range 0÷100°C
9		other parameters acc. to requirements

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

Ordering example: TTJI-3-SO-8-500-1 single sensor with thermocouple Fe-CuNi /J/, class 1, insulated hot junction SO, sheath diameter 8 mm and length L=500 mm