



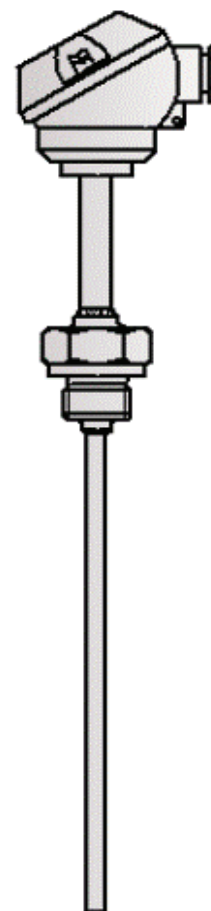
AP 108

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÷550°C	Pt100	class B
-40÷550°C	K, J	class 2
Measuring insert		
– 2-, 3-, 4-wire connection (for Pt100)		
– 2-wire connection (for 2xPt100)		
Thermowell		
– material: steel 1.4541		
– length [mm]: 60÷2000		
Connection head		
– MA, IP54, -40÷100°C		
Process connection		
– M20x1,5; G½		

Other parameters acc. to requirements



Options

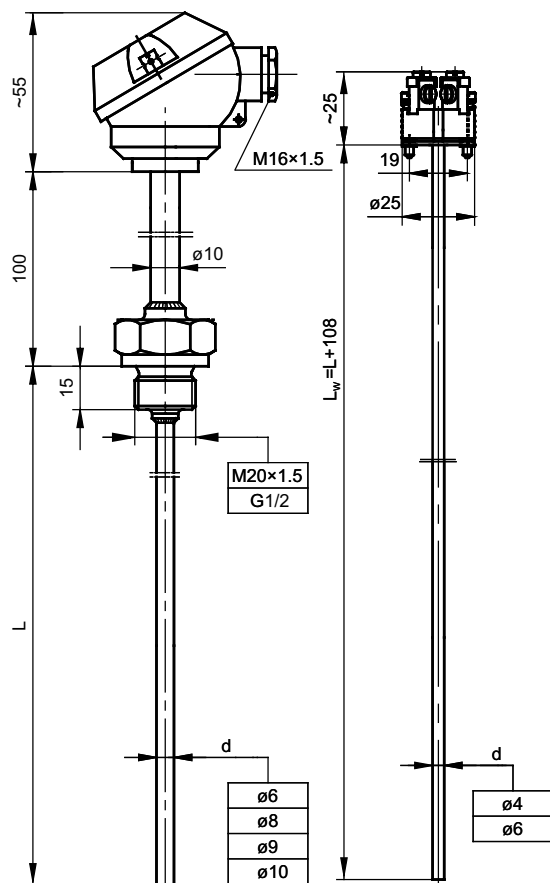
Temperature transmitter application

Temperature transmitter converting Pt100 signal into 4÷20mA output signal can be mounted in the connection head. Transmitter installation is carried out directly on the measuring insert (in place of a terminal block).

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	208
160	268
200	308
250	358

Maximum pressure (for thermowell $\varnothing 9$ and 10mm)

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

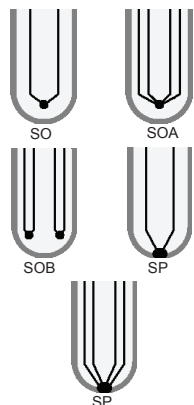
Values specified on the basis of the maximum speed of steam flow: 25 m/s and water flow: 3 m/s with thermowell standard diameter 9 mm.

Response time to temperature change

Thermowell diameter [mm]	Response time [s]
$\varnothing 6$	$t_{0,5} = 12$
	$t_{0,9} = 55$
$\varnothing 8$	$t_{0,5} = 20$
	$t_{0,9} = 85$
$\varnothing 10$	$t_{0,5} = 35$
	$t_{0,9} = 100$

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	$T = \pm(0,3 + 0,005 t)$

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	✓	✓

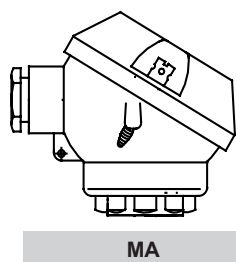
Tolerance for thermocouple classes acc. to PN-EN 60584

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

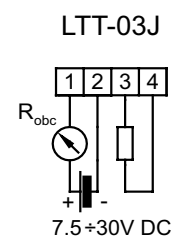
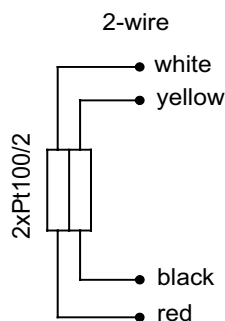
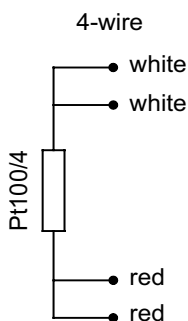
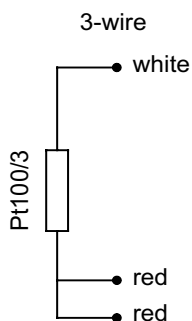
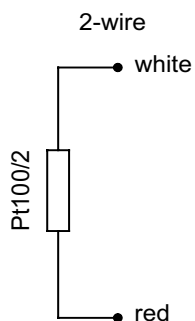
Connection head type MA in standard.



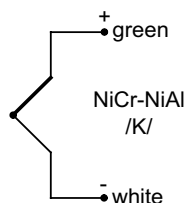
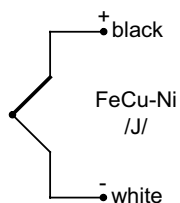
Connection schemes

Pt100 (thermometric resistor)

Transmitter



TC (thermocouple)



In double sensors one of thermocouples is additionally marked out.

Product code

		Sensor version	
0		AP	with transmitter (dla Pt100)
		no designation	single with pipe insert
		2	double with pipe insert (dla d ≥ 8mm)
1		P	single with mineral insulated insert
		2P	double with mineral insulated insert
		Sensing element	
		OP	resistor Pt
		TJ	thermocouple Fe-CuNi /J/
		TK	thermocouple NiCr-NiAl /K/
2			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 from the sheath
3	<input style="width: 40px; height: 20px;" type="text"/>	SOB hot junctions insulated from each other and from the sheath
		Thermowell length
	100	100mm
	160	160mm
	200	200mm
	250	250mm
4	<input style="width: 40px; height: 20px;" type="text"/>	other parameters acc. to requirements
		Thermowell diameter
	6	ø6mm
	8	ø8mm
	9	ø9mm
	10	ø10mm
5	<input style="width: 40px; height: 20px;" type="text"/>	other parameters acc. to requirements
		Dimension of process connection thread
	M20x1,5	metric thread M20x1,5
	G½	pipe thread (inch) G½
6	<input style="width: 40px; height: 20px;" type="text"/>	other parameters acc. to requirements
		Accuracy
	A or B	for measuring resistor
	1 or 2	for thermocouple
7	<input style="width: 40px; height: 20px;" type="text"/>	
		Measurement circuit (for resistor)
	2	2 - wire
	3	3 - wire
	4	4 - wire
8	<input style="width: 40px; height: 20px;" type="text"/>	
		Transmitter type
	LTT-03J	head mounted transmitter LTT-03J
9	<input style="width: 40px; height: 20px;" type="text"/>	other parameters acc. to requirements
		Temperature range of transmitter
	(0÷100°C)	transmitter configured for temperature range 0÷100°C
10	<input style="width: 40px; height: 20px;" type="text"/>	other parameters acc. to requirements

0	1	2	3	4	5	6	7	8	9	10										
<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	T	<input style="width: 40px; height: 20px;" type="text"/>	GN-54	-	<input style="width: 40px; height: 20px;" type="text"/>	-	<input style="width: 40px; height: 20px;" type="text"/>	-	<input style="width: 40px; height: 20px;" type="text"/>	-	<input style="width: 40px; height: 20px;" type="text"/>	-	<input style="width: 40px; height: 20px;" type="text"/>	-	<input style="width: 40px; height: 20px;" type="text"/>	-	<input style="width: 40px; height: 20px;" type="text"/>	-	<input style="width: 40px; height: 20px;" type="text"/>

Ordering example: **APTOPGN-54-100-6-G½-A-2-LTT-03J(0÷300)°C** single sensor with Pt100, class A, thermowell diameter d=6mm and length L=100mm, threaded connector G½, with transmitter 4÷20mA type LTT-03J, temperature range 0÷300°C