



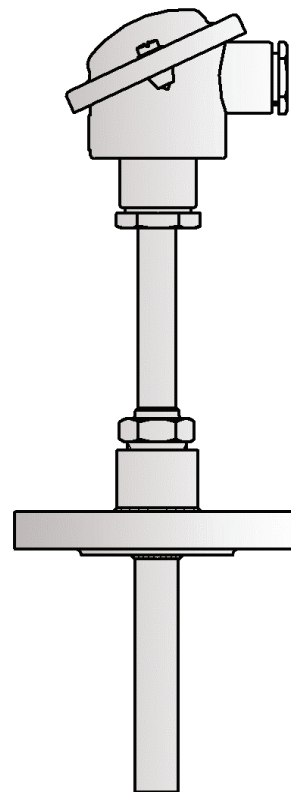
AP 108

Sensor suitable for temperature measurements, primarily in industrial pressure tanks, in all these places where mounting of a threaded process connection would be problematic. 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 guarantees an excellent connection with the bottom of the sensor thermowell.

Specification

Temperature range / sensing element		
-200÷600°C	Pt100	class B
-40÷700°C	J, K	class 2
Measuring insert		
– 2-, 3-, 4-wire connection (for Pt100)		
– 2-, 3-wire connection (for 2xPt100)		
Thermowell		
– material: steel 1.4541		
– SWG - thread M20x1,5; G½; ½NPT		
– SWT - flange PN16DN20B1; DN25, acc. to PN-EN 1092-1		
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:

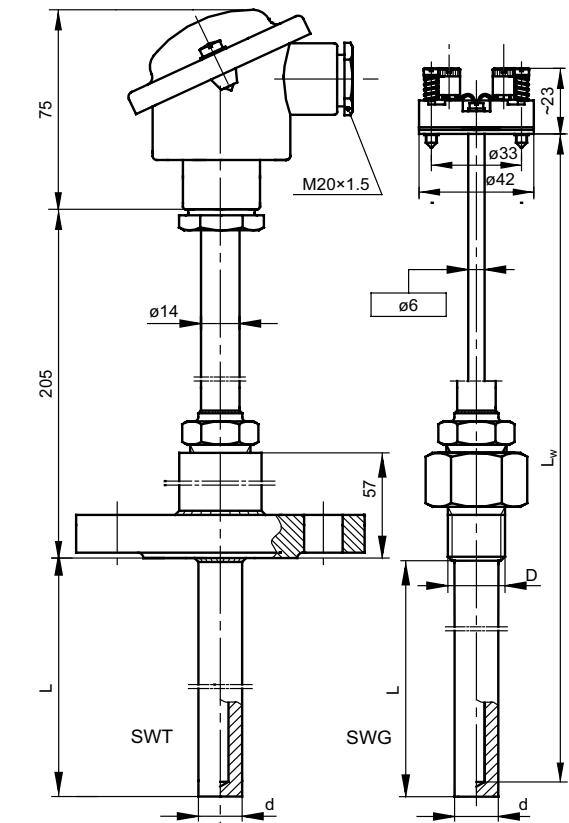
- intrinsically safe Exi
- flameproof **Exd**

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

Non-standard design

Immersion length, 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

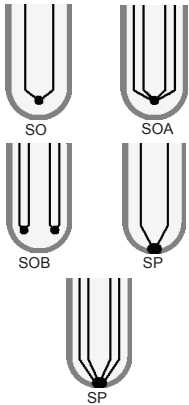
Immersion length L [mm]	Measuring insert length L _w [mm]
100	325
150	375
200	425
250	475

Max. pressure for thermowell ø18 mm in temperature 500°C

Length L [mm]	Maximum pressure [MPa]	
	water	air
100	25	15
200		12

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.

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

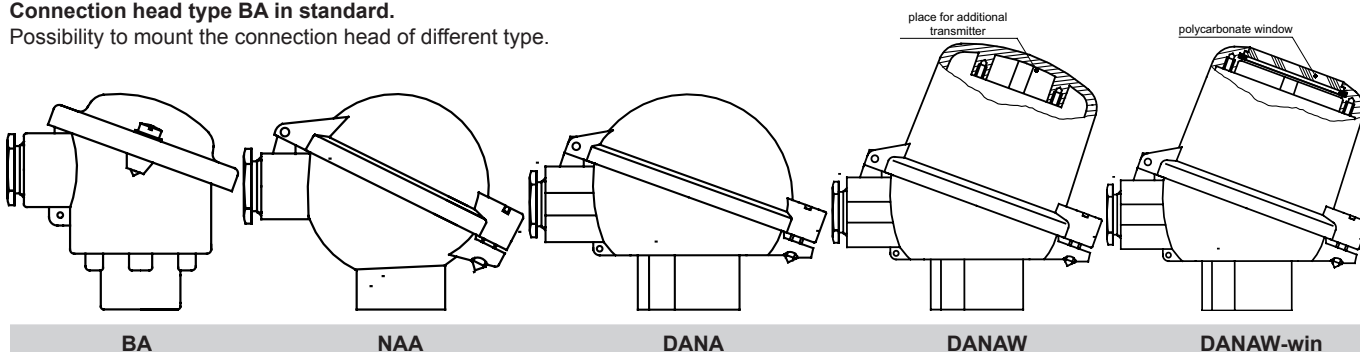
Thermocouple type	Class 1		Class 2	
	Range of application [°C]	Tolerance [°C]	Range of application [°C]	Tolerance [°C]
J Fe-CuNi	from -40 to +375 from +375 to +750	±1,5 ±0,004 t	from -40 to +333 from +333 to +750	±2,5 ±0,0075 t
K NiCr-NiAl	from -40 to +375 from +375 to +1000	±1,5 ±0,004 t	from -40 to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

|t| - absolute value of temperature

Connection head types

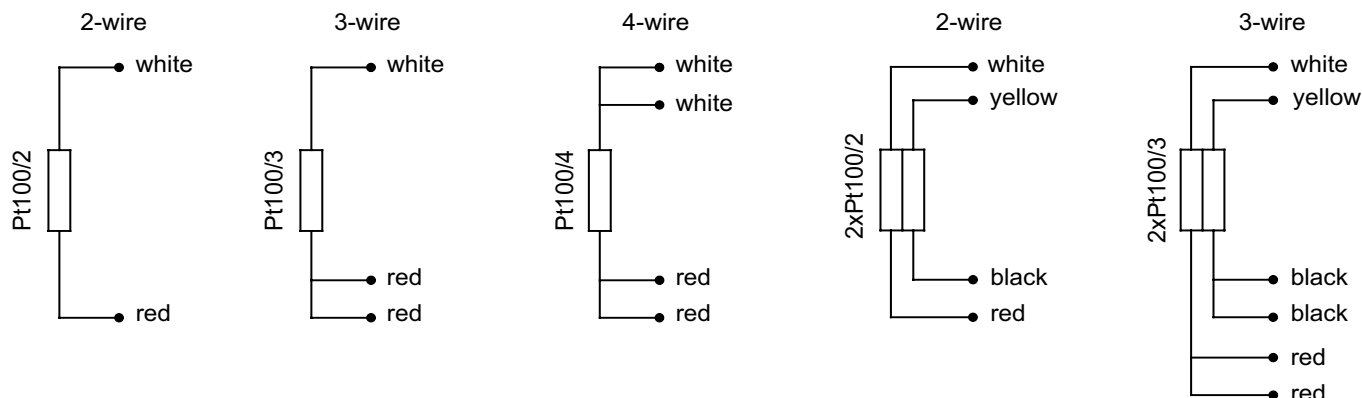
Connection head type BA in standard.

Possibility to mount the connection head of different type.

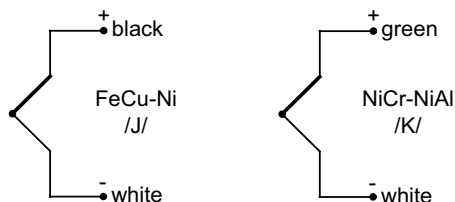


Connection schemes

Pt100 (thermometric resistor)



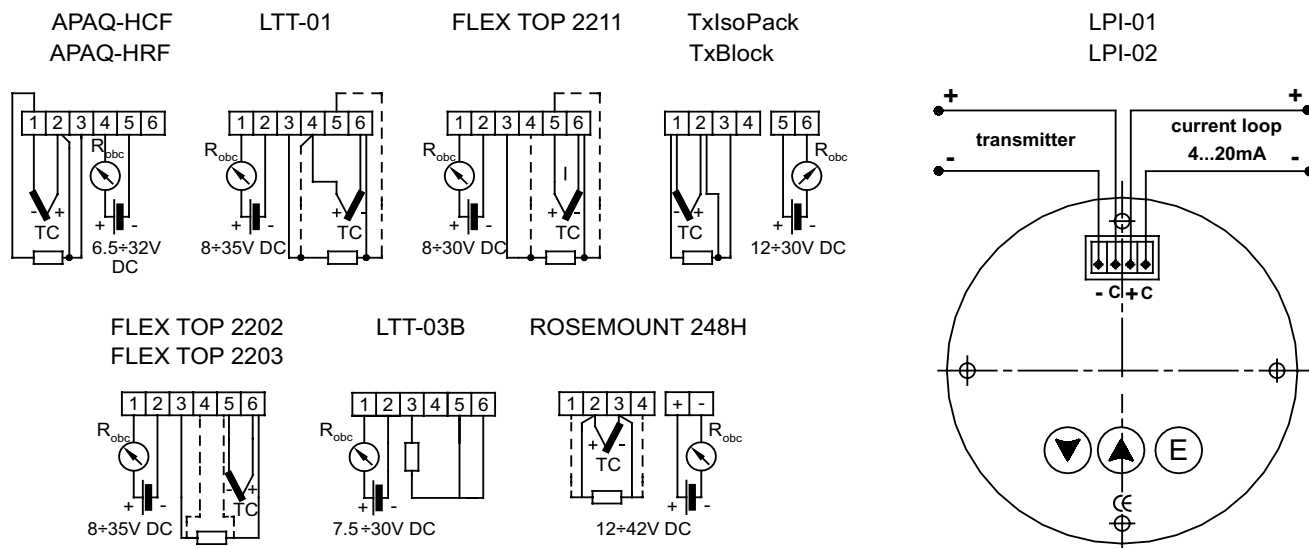
TC (thermocouple)



In double sensors one of thermocouples is additionally marked out.

Transmitters

Local LED display



Product code

		Sensor version	
0		AP	with transmitter
		2AP	with two transmitters
		APW	with display
1		no designation	single with pipe insert
		2	double with pipe insert
		P	single with mineral insulated insert
2		2P	double with mineral insulated insert
		Sensing element	
		OP	resistor Pt
3		TJ	thermocouple Fe-CuNi /J/
		TK	thermocouple NiCr-NiAl /K/
			other parameters acc. to requirements
4		Thermowell type	
		SWT	flanged
		SWG	threaded
5		Thermocouple hot junction type	
		SO	insulated hot junction
		SP	grounded hot junction
6		SOA	one hot junction for two thermocouples insulated from the sheath
		SOB	hot junctions insulated from each other and from the sheath
7		Thermowell dimensions dxL	
		16x200	16x200mm
			other parameters acc. to requirements
8		Thermowell material	
		1.4541	stainless steel
			other parameters acc. to requirements
9		Accuracy	
		A or B	for measuring resistor
		1 or 2	for thermocouple
10		Measurement circuit (for resistor)	
		2	2 - wire
		3	3 - wire
11		4	4 - wire
		Flange designation or thread dimension	
		PN40DN20B1	flange acc. to PN-EN 1092-1
12		M20x1,5	metric thread M20x1,5 – thread dimension D
		Transmitter type (optionally)	
		Tx	head mounted transmitter TxBlock
13			other parameters acc. to requirements
		Temperature range of transmitter	
		(0÷100°C)	transmitter configured for temperature range 0÷100°C
14			other parameters acc. to requirements

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Ordering example: **APTTKSWG-11-SO-16x400-1.4541-2-G½- Tx-(0÷550)°C** single sensor with thermocouple NiCr-NiAl /K/, class 2, insulated hot junction SO, thermowell SWG type material steel 1.4541, dimensions 16x400 mm, thread G½, with transmitter 4÷20mA for temperature range 0÷550°C