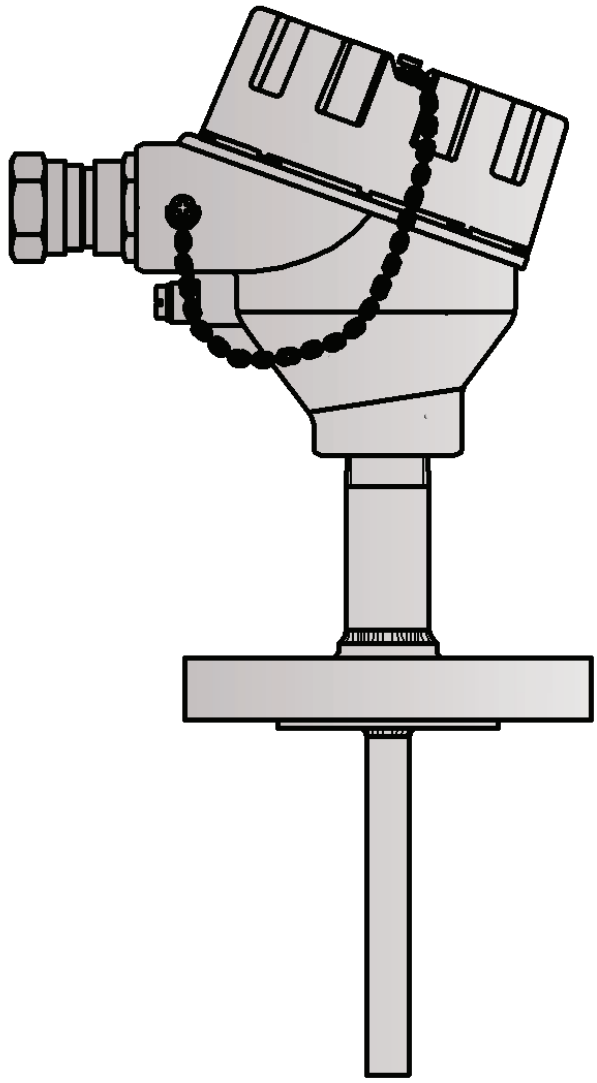
limatherm SENSOR

Flameproof Temperature Sensors with Replaceable Measuring Inserts
TOPT-Exd, TTKT-Exd, TTJT-Exd

AP 108

Temperature sensor suitable for measurement of liquid and gaseous media. It has a replaceable measuring insert adequate 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. Temperature sensor has ATEX approval for application in hazardous area:
I M2 Exd I MK (with connection head NS1,2); II 2G Exd IIC T6 Gb; III 2D Exd IIIC T85ºC Db 1P66



Specification

Temperature range / sensing element

-200÷550ºC	**Pt100**	class B
-40÷550ºC	**J, K,**	class2

Measuring insert

– 2-, 3-, 4-wire connection (for Pt100)
– 2-, 3-wire connection (for 2xPt100)
– insert length [mm]: L+164
– measuring insert diameter [mm]: 6

Thermowell

– material: steel 1.4541; flange PN16, DN20 or DN25
– diameter d [mm]: 11, 12, 14
– length L [mm]: 50÷2000

Connection head

– aluminium
XD-AD (AS1 – one cable gland, AS2 – two cable glands),
– aluminium, cover with window (for display)
XD-ADwin (AS3 - one cable gland, AS4 - two cable glands),
– stainless steel connection head
XD-SD (NS1 - one cable gland, NS2 - two cable glands),
– cable gland: ATEX II 2 GD; ATEX I M2; IP 66÷68
cable diameter: 3÷14,3mm (standard 6,1÷11,7mm)

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).

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, flange dimensions, shape and material of the thermowell 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.

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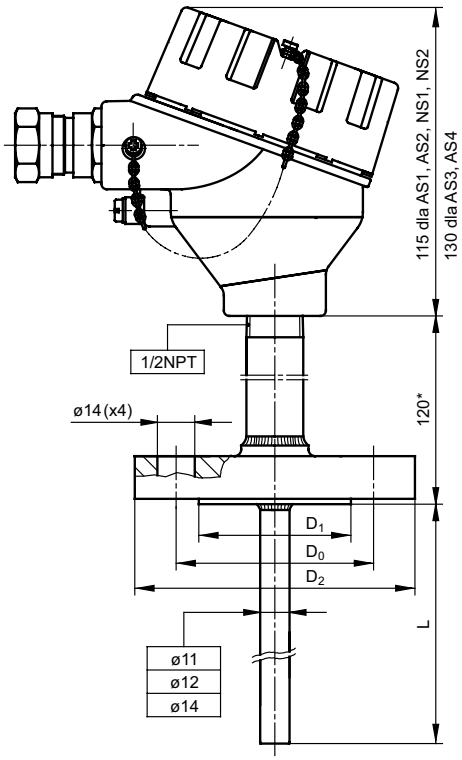


Standard length

Immersion length L [mm]	Measuring insert length L_w [mm]
100	264
160	324
250	414
400	564

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 = ±(0,10 + 0,0017 |t|)
A	-100÷450	T = ±(0,15 + 0,002 |t|)
B	-196÷600	T = ±(0,3 + 0,005 |t|)

|t|- absolute value of temperature

Measurement circuit

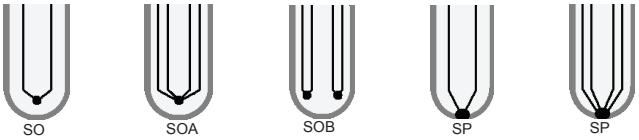
1 x Pt100			2 x Pt100			1 x TC	2 x TC
2-wire	3-wire	4-wire	2-wire	3-wire	4-wire	2-wire	2-wire
✓	✓	✓	✓	✓	x	✓	✓

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|

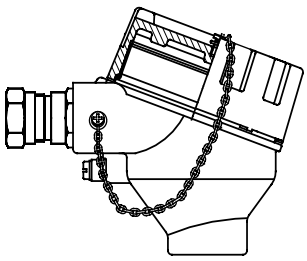
|t|- absolute value of temperature

Thermocouple hot junction types

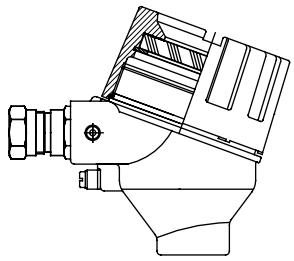


Connection head types

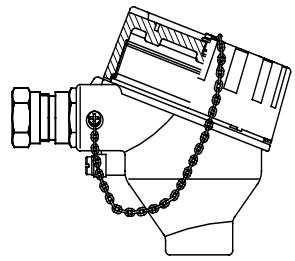
Connection head type AS1 in standard.
Possibility to mount different type of a connection head.



AS-1,2



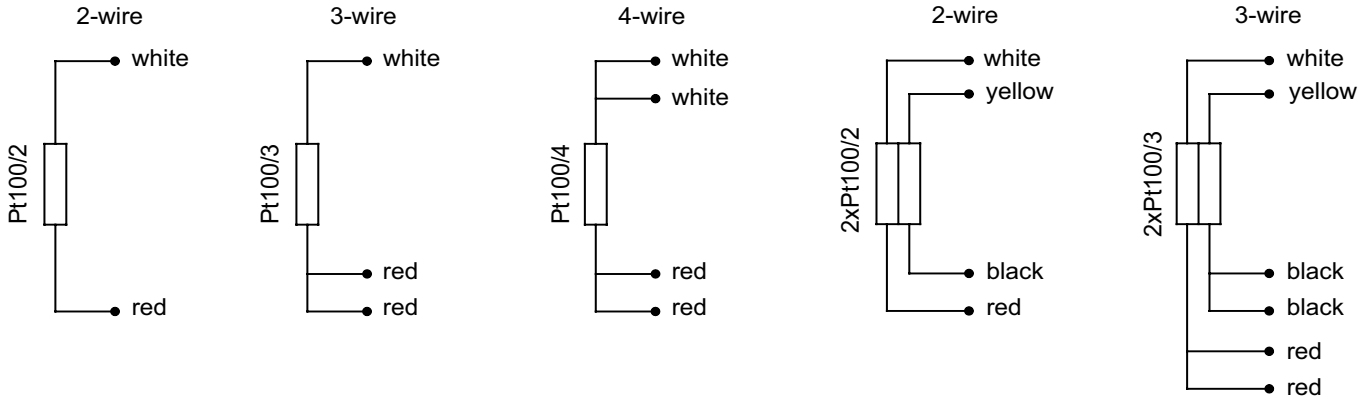
AS-3,4



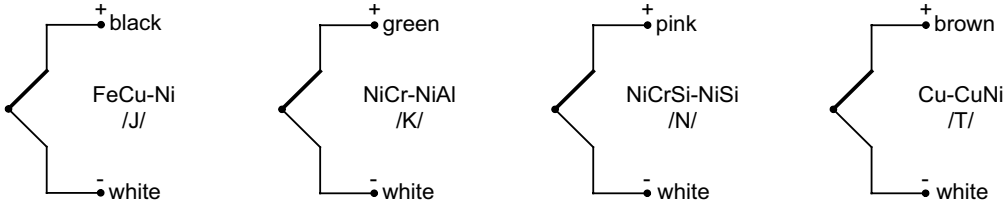
NS-1,2

Connection schemes

Pt100 (thermometric resistor)



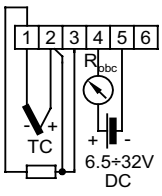
TC (thermocouple)



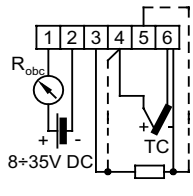
In double sensors one of thermocouples is additionally marked out.

Transmitters

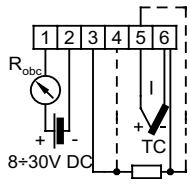
APAQ-HCF
APAQ-HRF



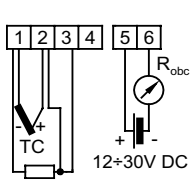
LTT-01



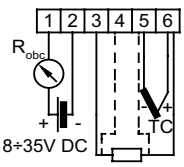
FLEX TOP 2211



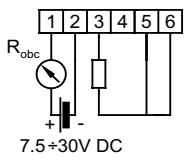
TxIsoPack
TxBlock



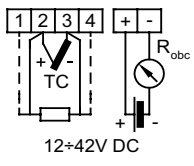
FLEX TOP 2202
FLEX TOP 2203



LTT-03B

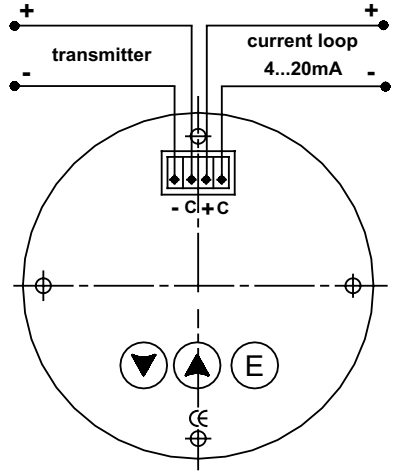


ROSEMOUNT 248H



Local LED display

LPI-01
LPI-02



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TOPT-Exd, TTKT-Exd, TTJT-Exd

Product code

		Sensor version	
		no designation	single
		2	double
1		**AP**	with transmitter
		Sensing element	
		OP	resistor Pt
		TJ	thermocouple Fe-CuNi /J/
		TK	thermocouple NiCr-NiAl /K/
		TN	thermocouple NiCrSi-NiSi /N/
2		**TT**	thermocouple Cu-CuNi /T/
		Connection head type	
		AS-1, AS2	aluminium connection head for sensors
		AS-3, AS-4	aluminium connection head with window
3		**NS1, NS2**	stainless steel connection head
		Immersion length / Sheath diameter	
		300/14	300mm/ø14mm
4			other parameters acc. to requirements
		Flange type	
		DN20	DN20 or DN25 (for standard PN16, lap B1)
		PN40DN25B2	other parameters: pressure PN, diameter DN, connection e.g. lap B2
5			other parameters acc. to requirements
		Accuracy	
		aA or aB****	for resistor Pt (** a=1 for Pt100, a=5 for Pt500, a=10 for Pt1000)
6		**1 or 2**	for thermocouple
		Measurement circuit (for resistor) / hot junction type for TC	
		2	2 - wire
		3	3 - wire
		4	4 - wire
		SO	insulated hot junction
		SP	grounded hot junction
		SOA	one hot junction for two thermocouples insulated from the thermowell
7		**SOB**	two hot junctions insulated from each other and from the thermowell
		Transmitter type (optionally)	
		Tx	head mounted transmitter TxBlock
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
		Cable diameter for cable gland	
		a	3,2mm÷8,7mm
		b	6,1mm÷11,7mm (standard)
10		**c**	6,5mm÷14mm

1	2				3	4	5	6	7	8	9	10
	T		T	– Exd –		–	–	–	–	–	–	–

Ordering example: **TOPT-Exd–NS1–600/11–DN20–1A–3–a**