

## RESISTANCE THERMOMETERS

**Use:** Resistance thermometers are primarily intended for industrial temperature measurement. High accuracy of measurement, wide range of measured temperature, high long-term stability and small non-linearity of dependence of resistance at certain distances, wide possibilities of their use in demanding applications. Thermometers differ in design depending on the purpose of use. In the basic design, the thermometers are fitted with a platinum measuring resistance Pt100/B. Pt100/A, possibly Pt1000, Ni1000, double sensor or other temperature sensors can also be fitted. The offer includes stem thermometers for measuring the temperatures of flowing liquid and gaseous media, attached versions for measuring the temperature of pipelines and other versions for measuring the ambient temperature. For each of the materials used, the material has proven to be practical (with a spring) and the material is proven (with a collet). We manufacture a small type of thermometers for measuring the winding temperature of electrical machines. Thermometers that have a connection head can include a built-in converter PP100, which converts the output value of the thermometer (resistance) into a current unified signal of 4-20 ma. This output is already linearized, the change in current is directly proportional to the change in temperature. The converter is designed in such a way that it can be used to replace the terminal board in the thermometer head. Technical parameters of the used Pt100 measuring resistors: This is a so-called vaporized version, where a thin layer of platinum is nano-coated onto the ceramic substrate. Using a laser, the resistance of the sensor is precisely set to the nominal value. The advantage of both designs is high shock resistance. Sensors of accuracy classes A and B are available as standard, classified with an accuracy of 0.01°C into subgroups. A certificate and full inspection are also available. The standard is ČSN EN 60751.

The temperature should be 0°C: 100 Ohm  
Size: 2x5x1.5mm and 1.6x3.2x1mm  
Measuring current: max. 2mA (max. 1mA for smaller versions)  
Terminals: gold-plated nickel 0.25x0.15x10mm  
Maximum practice. temperature: "A" -50...+400°C "B" -50...+500°C  
Stability: at temperatures above +400°C up to 6000 hours per max. or at 0°C 0.055 Ohm (0,14°C)

A class of accuracy	Toleranc (°C)	Resistance tolerance at 0°C	TCR (Alpha) Ohm/Ohm /°C
A	±(0,15+0,002t)	±0,06	0,003851±0,000005
B	±(0,30+0,005t)	±0,12	0,003851±0,000012

### Pt 100 - Resistance values depending on temperature

Temp. (°C)	-100	-0	Temp. (°C)	0	100	200	300	400	500	600	700	800
<b>0</b>	60,26	100,00	<b>0</b>	100,00	138,51	175,86	212,05	247,09	280,98	313,71	345,28	375,70
	4,07	3,91		3,90	3,78	3,67	3,56	3,44	3,32	3,21	3,10	2,98
<b>-10</b>	56,19	96,09	<b>10</b>	103,90	142,29	179,53	215,61	250,53	284,30	316,92	348,38	378,68
	4,08	3,93		3,89	3,78	3,66	3,54	3,43	3,32	3,20	3,08	2,97
<b>-20</b>	52,11	92,16	<b>20</b>	107,79	146,07	183,19	219,15	253,96	287,62	320,12	351,46	381,65
	4,11	3,94		3,88	3,76	3,65	3,53	3,42	3,30	3,18	3,07	2,95
<b>-30</b>	48,00	88,22	<b>30</b>	111,67	149,83	186,84	222,68	257,38	290,92	323,30	354,53	384,60
	4,12	3,95		3,87	3,75	3,63	3,53	3,40	3,29	3,18	3,06	2,95
<b>-40</b>	43,88	84,27	<b>40</b>	115,54	153,58	190,47	226,21	260,78	294,21	326,48	357,59	387,55
	4,16	3,96		3,86	3,75	3,63	3,51	3,40	3,28	3,16	3,05	2,93
<b>-50</b>	39,72	80,31	<b>50</b>	119,40	157,33	194,10	229,72	264,18	297,49	329,64	360,64	390,48
	4,18	3,98		3,84	3,72	3,61	3,49	3,38	3,26	3,15	3,03	
<b>-60</b>	35,54	76,33	<b>60</b>	123,24	161,05	197,71	233,21	267,56	300,75	332,79	363,67	
	4,20	4,00		3,84	3,72	3,60	3,49	3,37	3,26	3,14	3,03	
<b>-70</b>	31,34	72,33	<b>70</b>	127,08	164,77	201,31	236,70	270,93	304,01	335,93	366,70	
	4,24	4,00		3,82	3,71	3,59	3,48	3,36	3,24	3,13	3,01	
<b>-80</b>	27,10	68,33	<b>80</b>	130,90	168,48	204,90	240,18	274,29	307,25	339,06	369,71	
	4,27	4,03		3,81	3,69	3,58	3,46	3,35	3,24	3,12	3,00	
<b>-90</b>	22,85	64,30	<b>90</b>	134,71	172,17	208,48	243,64	277,64	310,49	342,18	372,71	
	4,31	4,04		3,80	3,69	3,57	3,45	3,34	3,22	3,10	2,99	
<b>-100</b>	18,52	60,26	<b>100</b>	138,51	175,86	212,05	247,09	280,98	313,71	345,28	375,70	

The numbers below the resistance values indicate the change in resistance value by every 10°C.

**We calculate the resistance values of Pt500 and Pt1000 by multiplying the above data by 5x and 10x, respectively.**

Example: -50°C = 80,31 Ohm  
+110°C = 142,29 Ohm  
+112°C = 142,29 Ohm + 0,2x3,78 = 143,05 Ohm