



## 100K Thermistor Output Table

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	3916295	37	2.78	302466	113	45.00	41303
-37	-38.33	3627711	39	3.89	285206	115	46.11	39434
-35	-37.22	3362274	41	5.00	269035	117	47.22	37660
-33	-36.11	3117987	43	6.11	253877	119	48.33	35976
-31	-35.00	2893035	45	7.22	239664	121	49.44	34376
-29	-33.89	2685770	47	8.33	226331	123	50.56	32843
-27	-32.78	2494694	49	9.44	213819	125	51.67	31399
-25	-31.67	2318444	51	10.56	201971	127	52.78	30027
-23	-30.56	2155781	53	11.67	190946	129	53.89	28722
-21	-29.44	2004274	55	12.78	180588	131	55.00	27481
-19	-28.33	1865595	57	13.89	170853	133	56.11	26300
-17	-27.22	1737397	59	15.00	161700	135	57.22	25177
-15	-26.11	1618827	61	16.11	153092	137	58.33	24107
-13	-25.00	1509102	63	17.22	144992	139	59.44	23089
-11	-23.89	1407512	65	18.33	137367	141	60.56	22111
-9	-22.78	1313405	67	19.44	130189	143	61.67	21188
-7	-21.67	1226184	69	20.56	123368	145	62.78	20308
-5	-20.56	1145306	71	21.67	117000	147	63.89	19469
-3	-19.44	1069620	73	22.78	110998	149	65.00	18670
-1	-18.33	1000019	75	23.89	105338	151	66.11	17907
1	-17.22	935383	77	25.00	100000	153	67.22	17180
3	-16.11	875329	79	26.11	94963	155	68.33	16486
5	-15.00	819505	81	27.22	90208	157	69.44	15824
7	-13.89	767589	83	28.33	85719	159	70.56	15187
9	-12.78	719284	85	29.44	81479	161	71.67	14584
11	-11.67	674319	87	30.56	77438	163	72.78	14008
13	-10.56	632442	89	31.67	73654	165	73.89	13458
15	-9.44	593086	91	32.78	70076	167	75.00	12932
17	-8.33	556739	93	33.89	66692	169	76.11	12430
19	-7.22	522842	95	35.00	63491	171	77.22	11949
21	-6.11	491217	97	36.11	60461	173	78.33	11490
23	-5.00	461699	99	37.22	57594	175	79.44	11051
25	-3.89	434134	101	38.33	54878	177	80.56	10627
27	-2.78	408383	103	39.44	52306	179	81.67	10225
29	-1.67	384316	105	40.56	49847	181	82.78	9841
31	-0.56	361813	107	41.67	47538	183	83.89	9473
33	0.56	340581	109	42.78	45349	185	85.00	9121
35	1.67	320895	111	43.89	43273	187	86.11	8783

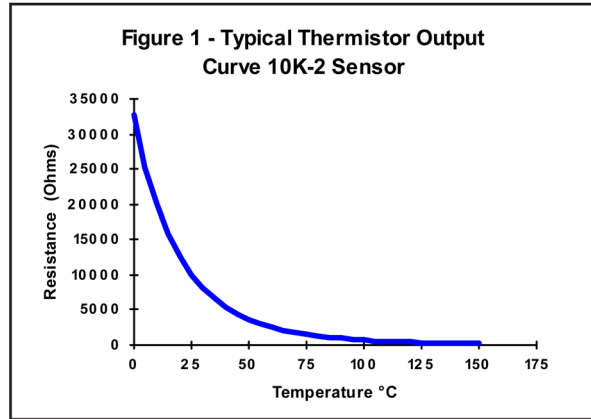


### Thermistor Description

BAPI Thermistors are thermally sensitive resistors known for exhibiting a large change in resistance with only a small change in temperature. It is important to note that a thermistor's change in resistance is non-linear. It follows a pre-defined curve which is provided by the thermistor manufacturer. An example of a thermistor output curve can be seen in **Figure 1**.

Thermistors are manufactured to follow a specific curve with a high degree of accuracy. All BAPI thermistors have a standard accuracy of  $\pm 0.2\text{ }^\circ\text{C}$  throughout the commercial temperature range of 0 to 70  $^\circ\text{C}$ . BAPI also has available a higher accuracy sensor for meeting tougher specs. The extra precision [XP] line has an initial accuracy of  $\pm 0.1\text{ }^\circ\text{C}$  throughout the commercial temperature range of 0 to 70  $^\circ\text{C}$ . Please call for availability and pricing on [XP] line thermistors. Both accuracy levels allow BAPI thermistors to be interchanged without the extra expense of offsetting the controller.

\* All Passive Thermistors 10K  $\Omega$  and smaller are CE compliant.



### Thermistor Specifications

#### DEFINITION OF SPECIFICATION TERMS

**Interchangeability Tolerance (Accuracy):**  
The maximum amount that thermistors following the same curve will differ from each other.

**Dissipation Constant:**  
The power needed to raise the thermistor's body temperature by 1 $^\circ\text{C}$ . At the heart of all BAPI thermistor products is a sensor with a 2.7 mW/ $^\circ\text{C}$  dissipation constant to ensure that self-heating stays at an absolute minimum.

**Stability (drift):**  
The amount that the resistance characteristics of a thermistor will change. BAPI uses only the highest quality, "pre-aged" thermistors with very small drift values. Over a ten year span, BAPI thermistors will not change more than 0.1 $^\circ\text{C}$ .

**Operating Range:**  
The operating range shown is for the thermistor only. The mounting package may further limit the operating range and is described on each mounting type specification. The thermal time constant will also be affected based on the added mass of the stainless steel probe and moisture protection encapsulation.

**Thermal Time Constant**  
Bare sensors are typically measured and specified in still air and are timed at the statistical 63.2% of the step temperature change. A stirred liquid test will typically result in a much faster response time and is also timed at 63.2% of the step temperature change. The time constant is always the same whatever the temperature step change may be.

#### Thermistor Specifications

**Interchangeability Tolerance (Accuracy):**  
Standard Sensor:  $\pm 0.2\text{ }^\circ\text{C}$  (0 to 70  $^\circ\text{C}$ )  
High Accuracy [XP] Sensor:  $\pm 0.1\text{ }^\circ\text{C}$  (0 to 70  $^\circ\text{C}$ )

**Dissipation Constant:** 2.7 mW/ $^\circ\text{C}$

**Stability (drift):** Less than 0.02  $^\circ\text{C}$  / year

**Thermal Time Constant:** 5 seconds (bead in still air)  
.5 seconds (stirred liquid)

Sensor Type	Reference Resistance	Operating Range
1.8K	1.8 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
2.2K	2.2 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
3K**	3 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
3.3K	3.3 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
10K-2**	10 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
10K-3**	10 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
10K-3(11K)**	5.2 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
20K**	20 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
47K	47 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
50K	50 K $\Omega$ @ 25 $^\circ\text{C}$	-80 to 150 $^\circ\text{C}$
100K**	100 K $\Omega$ @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$

Other Thermistors are available. Contact BAPI for availability and specifications of additional thermistors.

\*\*Available as an [XP] high accuracy sensor. Minimum quantities and long lead times may apply. 10K-2[XP] and 10K-3[XP] thermistors are typically stocked items