



100K Thermistor Output Table

°F	°C	Ohms
-39	-39.44	3916295
-37	-38.33	3627711
-35	-37.22	3362274
-33	-36.11	3117987
-31	-35.00	2893035
-29	-33.89	2685770
-27	-32.78	2494694
-25	-31.67	2318444
-23	-30.56	2155781
-21	-29.44	2004274
-19	-28.33	1865595
-17	-27.22	1737397
-15	-26.11	1618827
-13	-25.00	1509102
-11	-23.89	1407512
-9	-22.78	1313405
-7	-21.67	1226184
-5	-20.56	1145306
-3	-19.44	1069620
-1	-18.33	1000019
1	-17.22	935383
3	-16.11	875329
5	-15.00	819505
7	-13.89	767589
9	-12.78	719284
11	-11.67	674319
13	-10.56	632442
15	-9.44	593086
17	-8.33	556739
19	-7.22	522842
21	-6.11	491217
23	-5.00	461699
25	-3.89	434134
27	-2.78	408383
29	-1.67	384316
31	-0.56	361813
33	0.56	340581
35	1.67	320895

°F	°C	Ohms
37	2.78	302466
39	3.89	285206
41	5.00	269035
43	6.11	253877
45	7.22	239664
47	8.33	226331
49	9.44	213819
51	10.56	201971
53	11.67	190946
55	12.78	180588
57	13.89	170853
59	15.00	161700
61	16.11	153092
63	17.22	144992
65	18.33	137367
67	19.44	130189
69	20.56	123368
71	21.67	117000
73	22.78	110998
75	23.89	105338
77	25.00	100000
79	26.11	94963
81	27.22	90208
83	28.33	85719
85	29.44	81479
87	30.56	77438
89	31.67	73654
91	32.78	70076
93	33.89	66692
95	35.00	63491
97	36.11	60461
99	37.22	57594
101	38.33	54878
103	39.44	52306
105	40.56	49847
107	41.67	47538
109	42.78	45349
111	43.89	43273

°F	°C	Ohms
113	45.00	41303
115	46.11	39434
117	47.22	37660
119	48.33	35976
121	49.44	34376
123	50.56	32843
125	51.67	31399
127	52.78	30027
129	53.89	28722
131	55.00	27481
133	56.11	26300
135	57.22	25177
137	58.33	24107
139	59.44	23089
141	60.56	22111
143	61.67	21188
145	62.78	20308
147	63.89	19469
149	65.00	18670
151	66.11	17907
153	67.22	17180
155	68.33	16486
157	69.44	15824
159	70.56	15187
161	71.67	14584
163	72.78	14008
165	73.89	13458
167	75.00	12932
169	76.11	12430
171	77.22	11949
173	78.33	11490
175	79.44	11051
177	80.56	10627
179	81.67	10225
181	82.78	9841
183	83.89	9473
185	85.00	9121
187	86.11	8783

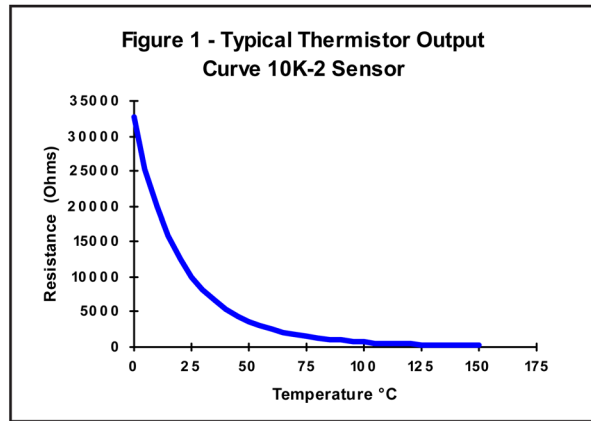


Thermistor Description

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 Ω 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 Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
2.2K	2.2 K Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
3K**	3 K Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
3.3K	3.3 K Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
10K-2**	10 K Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
10K-3**	10 K Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
10K-3(11K)**	5.2 K Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
10K-4	10 K Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
20K**	20 K Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
47K	47 K Ω @ 25 $^\circ\text{C}$	-55 to 150 $^\circ\text{C}$
50K	50 K Ω @ 25 $^\circ\text{C}$	-80 to 150 $^\circ\text{C}$
100K**	100 K Ω @ 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