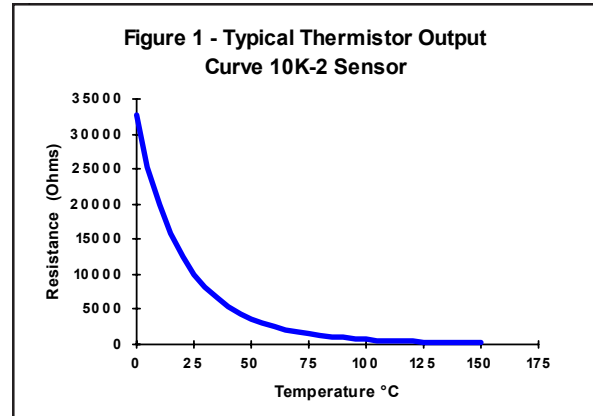


Rev. 01/31/06

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 $\pm 0.2^\circ\text{C}$ 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 $\pm 0.1^\circ\text{C}$ 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 incurring the extra expense of offsetting the controller.



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 amount of 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 3 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 thermistor products will not change more than 0.1 $^\circ\text{C}$.

Thermistor Specifications

Interchangeability Tolerance (Accuracy):

$\pm 0.2^\circ\text{C}$ (0 to 70 $^\circ\text{C}$) Standard
 $\pm 0.1^\circ\text{C}$ (0 to 70 $^\circ\text{C}$) XP Option

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

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

Sensor Type	Reference Resistance	Operating Range
1.8K	1.8 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 $^\circ\text{C}$	-80 to 150 $^\circ\text{C}$
10K-3(11K)	5.2 K Ω @ 25 $^\circ\text{C}$	-80 to 150 $^\circ\text{C}$
20K	20 K Ω @ 25 $^\circ\text{C}$	-80 to 150 $^\circ\text{C}$
50K	50 K Ω @ 25 $^\circ\text{C}$	-80 to 150 $^\circ\text{C}$
100K	100 K Ω @ 25 $^\circ\text{C}$	-80 to 150 $^\circ\text{C}$

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

10K-3(11K) Thermistor Output Table

°F	°C	Ohms
-39	-39.44	10,502
-37	-38.33	10,470
-35	-37.22	10,437
-33	-36.11	10,401
-31	-35.00	10,364
-29	-33.89	10,325
-27	-32.78	10,284
-25	-31.67	10,241
-23	-30.56	10,196
-21	-29.44	10,148
-19	-28.33	10,099
-17	-27.22	10,048
-15	-26.11	9,994
-13	-25.00	9,938
-11	-23.89	9,879
-9	-22.78	9,818
-7	-21.67	9,755
-5	-20.56	9,689
-3	-19.44	9,620
-1	-18.33	9,549
1	-17.22	9,475
3	-16.11	9,399
5	-15.00	9,320
7	-13.89	9,239
9	-12.78	9,155
11	-11.67	9,068
13	-10.56	8,979
15	-9.44	8,887
17	-8.33	8,793
19	-7.22	8,696
21	-6.11	8,597
23	-5.00	8,496
25	-3.89	8,392
27	-2.78	8,286
29	-1.67	8,178
31	-0.56	8,068
33	0.56	7,955
35	1.67	7,841

°F	°C	Ohms
37	2.78	7,725
39	3.89	7,608
41	5.00	7,489
43	6.11	7,369
45	7.22	7,247
47	8.33	7,124
49	9.44	7,001
51	10.56	6,875
53	11.67	6,749
55	12.78	6,623
57	13.89	6,497
59	15.00	6,370
61	16.11	6,244
63	17.22	6,117
65	18.33	5,990
67	19.44	5,863
69	20.56	5,736
71	21.67	5,611
73	22.78	5,486
75	23.89	5,361
77	25.00	5,238
79	26.11	5,116
81	27.22	4,995
83	28.33	4,875
85	29.44	4,756
87	30.56	4,638
89	31.67	4,522
91	32.78	4,408
93	33.89	4,295
95	35.00	4,185
97	36.11	4,076
99	37.22	3,968
101	38.33	3,863
103	39.44	3,760
105	40.56	3,657
107	41.67	3,558
109	42.78	3,460
111	43.89	3,365

°F	°C	Ohms
113	45.00	3,271
115	46.11	3,180
117	47.22	3,090
119	48.33	3,003
121	49.44	2,918
123	50.56	2,834
125	51.67	2,753
127	52.78	2,673
129	53.89	2,596
131	55.00	2,521
133	56.11	2,448
135	57.22	2,377
137	58.33	2,307
139	59.44	2,240
141	60.56	2,173
143	61.67	2,110
145	62.78	2,048
147	63.89	1,987
149	65.00	1,929
151	66.11	1,872
153	67.22	1,817
155	68.33	1,763
157	69.44	1,711
159	70.56	1,660
161	71.67	1,611
163	72.78	1,563
165	73.89	1,517
167	75.00	1,472
169	76.11	1,429
171	77.22	1,387
173	78.33	1,346
175	79.44	1,307
177	80.56	1,268
179	81.67	1,231
181	82.78	1,195
183	83.89	1,160
185	85.00	1,126
187	86.11	1,094