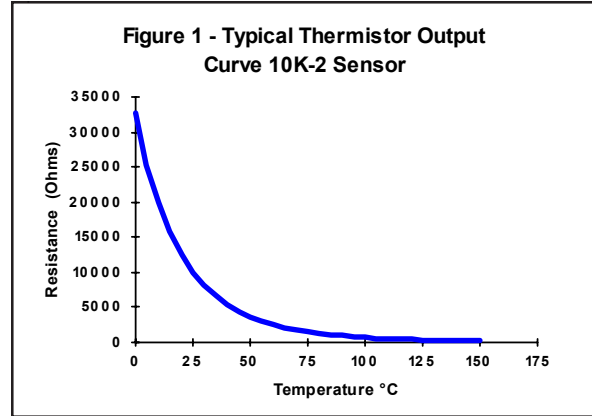


Rev. 01/31/06

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.

3K Thermistor Output Table

°F	°C	Ohms
-39	-39.44	96,941
-37	-38.33	90,108
-35	-37.22	83,804
-33	-36.11	77,983
-31	-35.00	72,607
-29	-33.89	67,637
-27	-32.78	63,041
-25	-31.67	58,789
-23	-30.56	54,851
-21	-29.44	51,173
-19	-28.33	47,795
-17	-27.22	44,663
-15	-26.11	41,756
-13	-25.00	39,059
-11	-23.89	36,553
-9	-22.78	34,225
-7	-21.67	32,061
-5	-20.56	30,047
-3	-19.44	28,157
-1	-18.33	26,414
1	-17.22	24,790
3	-16.11	23,277
5	-15.00	21,865
7	-13.89	20,549
9	-12.78	19,320
11	-11.67	18,173
13	-10.56	17,101
15	-9.44	16,091
17	-8.33	15,155
19	-7.22	14,280
21	-6.11	13,461
23	-5.00	12,694
25	-3.89	11,975
27	-2.78	11,302
29	-1.67	10,671
31	-0.56	10,079
33	0.56	9,519
35	1.67	8,999

°F	°C	Ohms
37	2.78	8,510
39	3.89	8,050
41	5.00	7,619
43	6.11	7,213
45	7.22	6,831
47	8.33	6,472
49	9.44	6,134
51	10.56	5,813
53	11.67	5,513
55	12.78	5,231
57	13.89	4,965
59	15.00	4,714
61	16.11	4,478
63	17.22	4,254
65	18.33	4,043
67	19.44	3,844
69	20.56	3,655
71	21.67	3,477
73	22.78	3,309
75	23.89	3,150
77	25.00	3,000
79	26.11	2,858
81	27.22	2,723
83	28.33	2,596
85	29.44	2,475
87	30.56	2,360
89	31.67	2,252
91	32.78	2,149
93	33.89	2,051
95	35.00	1,959
97	36.11	1,871
99	37.22	1,788
101	38.33	1,709
103	39.44	1,634
105	40.56	1,562
107	41.67	1,494
109	42.78	1,430
111	43.89	1,368

°F	°C	Ohms
113	45.00	1,310
115	46.11	1,255
117	47.22	1,202
119	48.33	1,151
121	49.44	1,104
123	50.56	1,058
125	51.67	1,014
127	52.78	973
129	53.89	933
131	55.00	895
133	56.11	860
135	57.22	825
137	58.33	793
139	59.44	761
141	60.56	731
143	61.67	703
145	62.78	676
147	63.89	650
149	65.00	625
151	66.11	601
153	67.22	578
155	68.33	556
157	69.44	536
159	70.56	516
161	71.67	496
163	72.78	478
165	73.89	461
167	75.00	444
169	76.11	428
171	77.22	413
173	78.33	398
175	79.44	384
177	80.56	370
179	81.67	357
181	82.78	345
183	83.89	333
185	85.00	321
187	86.11	310