



Rev. 10/16/12



10K-3 Thermistor Output Table

BAPI Sensor Specifications

H9

10K-3 Thermistor Output Table

°F	°C	Ohms
-39	-39.44	232032
-37	-38.33	217394
-35	-37.22	203774
-33	-36.11	191093
-31	-35.00	179281
-29	-33.89	168275
-27	-32.78	158013
-25	-31.67	148442
-23	-30.56	139511
-21	-29.44	131100
-19	-28.33	123317
-17	-27.22	116045
-15	-26.11	109247
-13	-25.00	102889
-11	-23.89	96941
-9	-22.78	91374
-7	-21.67	86160
-5	-20.56	81276
-3	-19.44	76659
-1	-18.33	72371
1	-17.22	68348
3	-16.11	64574
5	-15.00	61031
7	-13.89	57703
9	-12.78	54578
11	-11.67	51641
13	-10.56	48879
15	-9.44	46259
17	-8.33	43817
19	-7.22	41519
21	-6.11	39354
23	-5.00	37316
25	-3.89	35395
27	-2.78	33585
29	-1.67	31878
31	-0.56	30267
33	0.56	28735
35	1.67	27302

°F	°C	Ohms
37	2.78	25948
39	3.89	24670
41	5.00	23462
43	6.11	22320
45	7.22	21241
47	8.33	20220
49	9.44	19254
51	10.56	18332
53	11.67	17467
55	12.78	16648
57	13.89	15872
59	15.00	15136
61	16.11	14439
63	17.22	13778
65	18.33	13151
67	19.44	12556
69	20.56	11987
71	21.67	11451
73	22.78	10942
75	23.89	10459
77	25.00	10000
79	26.11	9564
81	27.22	9149
83	28.33	8754
85	29.44	8379
87	30.56	8019
89	31.67	7679
91	32.78	7355
93	33.89	7047
95	35.00	6754
97	36.11	6474
99	37.22	6208
101	38.33	5954
103	39.44	5712
105	40.56	5479
107	41.67	5258
109	42.78	5048
111	43.89	4847

°F	°C	Ohms
113	45.00	4656
115	46.11	4473
117	47.22	4298
119	48.33	4131
121	49.44	3971
123	50.56	3817
125	51.67	3671
127	52.78	3532
129	53.89	3398
131	55.00	3271
133	56.11	3149
135	57.22	3032
137	58.33	2920
139	59.44	2812
141	60.56	2709
143	61.67	2610
145	62.78	2516
147	63.89	2425
149	65.00	2339
151	66.11	2256
153	67.22	2176
155	68.33	2099
157	69.44	2026
159	70.56	1955
161	71.67	1887
163	72.78	1822
165	73.89	1760
167	75.00	1700
169	76.11	1642
171	77.22	1587
173	78.33	1534
175	79.44	1483
177	80.56	1433
179	81.67	1386
181	82.78	1341
183	83.89	1297
185	85.00	1255
187	86.11	1214

* All Passive Thermistors 10K Ω and smaller are CE compliant.



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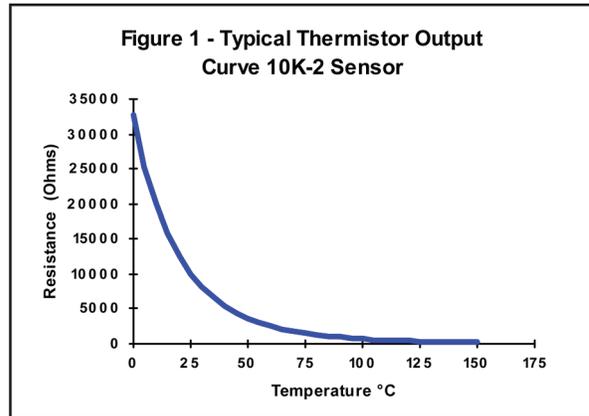


Thermistor Description

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 $^\circ\text{C}$)
Wide Range Standard: $\pm 0.4\text{ }^\circ\text{C}$ (-55 to 150 $^\circ\text{C}$)
High Accuracy [XP] Sensor: $\pm 0.1\text{ }^\circ\text{C}$ (0 to 70 $^\circ\text{C}$)
Wide Range High Accuracy: $\pm 0.2\text{ }^\circ\text{C}$ (-55 to 150 $^\circ\text{C}$)

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 $^\circ\text{C}$
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.
Example: BA/10K-2[XP]-I-2" (immersion sensor)