47K Thermistor Output Table

BAPI Sensor Specifications

Rev. 10/16/12

47K Thermistor Output Table

°F	°C	Ohms
-39	-39.44	1531956
-37	-38.33	1425406
-35	-37.22	1326920
-33	-36.11	1235843
-31	-35.00	1151576
-29	-33.89	1073571
-27	-32.78	1001327
-25	-31.67	934386
-23	-30.56	872330
-21	-29.44	814274
-19	-28.33	760902
-17	-27.22	711353
-15	-26.11	665333
-13	-25.00	622569
-11	-23.89	582814
-9	-22.78	545838
-7	-21.67	511432
-5	-20.56	479403
-3	-19.44	449314
-1	-18.33	421538
1	-17.22	395646
3	-16.11	371501
5	-15.00	348974
7	-13.89	327948
9	-12.78	308315
11	-11.67	289975
13	-10.56	272835
15	-9.44	256671
17	-8.33	241692
19	-7.22	227677
21	-6.11	214557
23	-5.00	202271
25	-3.89	190762
27	-2.78	179975
29	-1.67	169862
31	-0.56	160377
33	0.56	151399
35	1.67	143050
37	2.78	135211
39	3.89	127847
41	5.00	120927
43	6.11	114422
45	7.22	108304
47	8.33	102549
49	9.44	97134
51	10.56	91991
53	11.67	87192
55	12.78	82672
57	13.89	78412
59	15.00	74395
61	16.11	70608
63	17.22	67035
65	18.33	63663
67	19.44	60480
69	20.56	57448
71	21.67	54611
73	22.78	51929
75	23.89	49395
77	25.00	46998
79	26.11	44731
81	27.22	42586
83	28.33	40557
85	29.44	38635
87	30.56	36799
89	31.67	35076
91	32.78	33443
93	33.89	31895
95	35.00	30428
97	36.11	29036
99	37.22	27715
101	38.33	26462
103	39.44	25272
105	40.56	24133
107	41.67	23061
109	42.78	22042
111	43.89	21073
113	45.00	20153
115	46.11	19278
117	47.22	18445
119	48.33	17653
121	49.44	16899
123	50.56	16175
125	51.67	15493
127	52.78	14842
129	53.89	14223
131	55.00	13632
133	56.11	13070
135	57.22	12533
137	58.33	12021
139	59.44	11533
141	60.56	11064
143	61.67	10620
145	62.78	10196
147	63.89	9791
149	65.00	9404
151	66.11	9035
153	67.22	8682
155	68.33	8345
157	69.44	8022
159	70.56	7711
161	71.67	7416
163	72.78	7135
165	73.89	6865
167	75.00	6607
169	76.11	6359
171	77.22	6123
173	78.33	5896
175	79.44	5679
177	80.56	5469
179	81.67	5270
181	82.78	5079
183	83.89	4896
185	85.00	4721
187	86.11	4552

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Thermistor Overview

BAPI Sensor Specifications

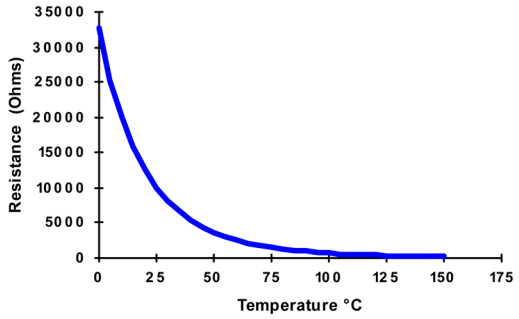
CE *

Rev. 11/09/17

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**.

Figure 1 - Typical Thermistor Output Curve 10K-2 Sensor



Thermistors are manufactured to follow a specific curve with a high degree of accuracy. All BAPI thermistors have a standard accuracy of ± 0.2 °C throughout the commercial temperature range of 0 to 70 °C. BAPI also has available a higher accuracy sensor for meeting tougher specs. The extra precision [XP] line has an initial accuracy of ± 0.1 °C throughout the commercial temperature range of 0 to 70 °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°C. At the heart of all BAPI thermistor products is a sensor with a 2.7 mW/°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°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: ± 0.2 °C (0 to 70 °C)
High Accuracy [XP] Sensor: ± 0.1 °C (0 to 70 °C)

Dissipation Constant: 2.7 mW/°C

Stability (drift): Less than 0.02 °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 KΩ @ 25 °C	-55 to 150 °C
2.2K	2.2 KΩ @ 25 °C	-55 to 150 °C
3K**	3 KΩ @ 25 °C	-55 to 150 °C
3.3K	3.3 KΩ @ 25 °C	-55 to 150 °C
10K-2**	10 KΩ @ 25 °C	-55 to 150 °C
10K-3**	10 KΩ @ 25 °C	-55 to 150 °C
10K-3(11K)**	5.2 KΩ @ 25 °C	-55 to 150 °C
20K**	20 KΩ @ 25 °C	-55 to 150 °C
47K	47 KΩ @ 25 °C	-55 to 150 °C
50K	50 KΩ @ 25 °C	-80 to 150 °C
100K**	100 KΩ @ 25 °C	-55 to 150 °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

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