20K Thermistor Output Table

°F	°C	Ohms
-39	-39.44	776470
-37	-38.33	719538
-35	-37.22	667144
-33	-36.11	618900
-31	-35.00	574453
-29	-33.89	533481
-27	-32.78	495691
-25	-31.67	460818
-23	-30.56	428619
-21	-29.44	398615
-19	-28.33	371140
-17	-27.22	345732
-15	-26.11	322223
-13	-25.00	300459
-11	-23.89	280301
-9	-22.78	261622
-7	-21.67	244304
-5	-20.56	228239
-3	-19.44	213201
-1	-18.33	199368
1	-17.22	186518
3	-16.11	174575
5	-15.00	163471
7	-13.89	153140
9	-12.78	143526
11	-11.67	134575
13	-10.56	126236
15	-9.44	118397
17	-8.33	111156
19	-7.22	104402
21	-6.11	98099
23	-5.00	92214
25	-3.89	86719
27	-2.78	81583
29	-1.67	76783
31	-0.56	72294
33	0.56	68057
35	1.67	64129
37	2.78	60451
39	3.89	57005
41	5.00	53777
43	6.11	50750
45	7.22	47912
47	8.33	45249
49	9.44	42750
51	10.56	40383
53	11.67	38180
55	12.78	36111
57	13.89	34165
59	15.00	32336
61	16.11	30615
63	17.22	28996
65	18.33	27472
67	19.44	26037
69	20.56	24674
71	21.67	23400
73	22.78	22200
75	23.89	21068
77	25.00	20001
79	26.11	18994
81	27.22	18043
83	28.33	17145
85	29.44	16297
87	30.56	15488
89	31.67	14731
91	32.78	14016
93	33.89	13339
95	35.00	12699
97	36.11	12092
99	37.22	11519
101	38.33	10975
103	39.44	10461
105	40.56	9969
107	41.67	9507
109	42.78	9069
111	43.89	8654
113	45.00	8260
115	46.11	7886
117	47.22	7531
119	48.33	7194
121	49.44	6874
123	50.56	6567
125	51.67	6278
127	52.78	6004
129	53.89	5742
131	55.00	5494
133	56.11	5258
135	57.22	5033
137	58.33	4819
139	59.44	4616
141	60.56	4420
143	61.67	4235
145	62.78	4059
147	63.89	3892
149	65.00	3732
151	66.11	3579
153	67.22	3434
155	68.33	3295
157	69.44	3163
159	70.56	3035
161	71.67	2914
163	72.78	2799
165	73.89	2689
167	75.00	2584
169	76.11	2484
171	77.22	2388
173	78.33	2296
175	79.44	2208
177	80.56	2123
179	81.67	2043
181	82.78	1966
183	83.89	1892
185	85.00	1822
187	86.11	1754

Thermistor Overview

BAPI Sensor Specifications

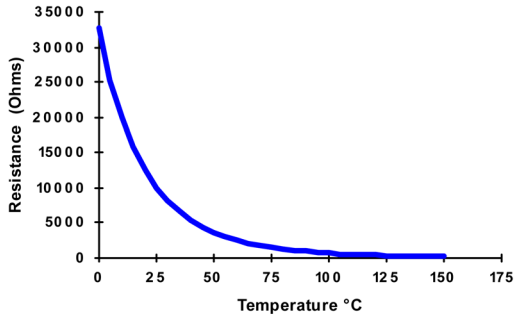
CE *

Rev. 05/07/21

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
10K-4	10 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

BAPI
Building Automation Products, Inc. • 750 North Royal Avenue, Gays Mills, WI 54631 USA
Tel: +1-608-735-4800 • Fax: +1-608-735-4804 • Email: sales@bapihvac.com • Web: www.bapihvac.com