

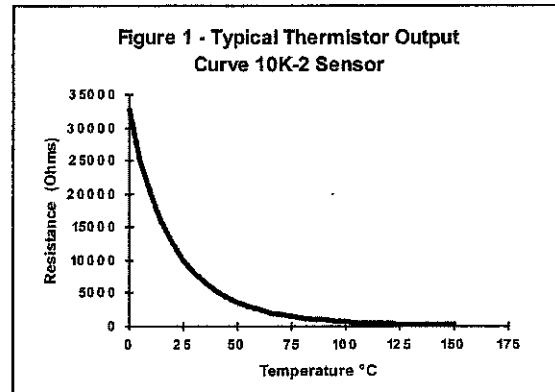


Thermistor Description

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 ± 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 K Ω @ 25 °C	-55 to 150 °C
2.2K	2.2 K Ω @ 25 °C	-55 to 150 °C
3K**	3 K Ω @ 25 °C	-55 to 150 °C
3.3K	3.3 K Ω @ 25 °C	-55 to 150 °C
10K-2**	10 K Ω @ 25 °C	-55 to 150 °C
10K-3**	10 K Ω @ 25 °C	-55 to 150 °C
10K-3(11K)**	5.2 K Ω @ 25 °C	-55 to 150 °C
20K**	20 K Ω @ 25 °C	-55 to 150 °C
47K	47 K Ω @ 25 °C	-55 to 150 °C
50K	50 K Ω @ 25 °C	-80 to 150 °C
100K**	100 K Ω @ 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



Rev. 10/16/12

50K Thermistor Output Table

BAPI Sensor Specifications

H13

50K Thermistor Output Table

°F	°C	Ohms	°F	°C	Ohms	°F	°C	Ohms
-39	-39.44	1956240	37	2.78	151235	113	45.00	20651
-37	-38.33	1812199	39	3.89	142605	115	46.11	19716
-35	-37.22	1679700	41	5.00	134519	117	47.22	18829
-33	-36.11	1557748	43	6.11	126941	119	48.33	17987
-31	-35.00	1445439	45	7.22	119834	121	49.44	17187
-29	-33.89	1341952	47	8.33	113168	123	50.56	16421
-27	-32.78	1246540	49	9.44	106912	125	51.67	15699
-25	-31.67	1158525	51	10.56	100988	127	52.78	15013
-23	-30.56	1077290	53	11.67	95475	129	53.89	14360
-21	-29.44	1001621	55	12.78	90296	131	55.00	13740
-19	-28.33	932353	57	13.89	85428	133	56.11	13150
-17	-27.22	868317	59	15.00	80852	135	57.22	12588
-15	-26.11	809086	61	16.11	76547	137	58.33	12053
-13	-25.00	754271	63	17.22	72497	139	59.44	11544
-11	-23.89	703517	65	18.33	68685	141	60.56	11055
-9	-22.78	656499	67	19.44	65095	143	61.67	10593
-7	-21.67	612919	69	20.56	61685	145	62.78	10154
-5	-20.56	572506	71	21.67	58500	147	63.89	9734
-3	-19.44	534686	73	22.78	55499	149	65.00	9335
-1	-18.33	499905	75	23.89	52669	151	66.11	8954
1	-17.22	467604	77	25.00	50000	153	67.22	8590
3	-16.11	437592	79	26.11	47481	155	68.33	8243
5	-15.00	409692	81	27.22	45104	157	69.44	7912
7	-13.89	383745	83	28.33	42859	159	70.56	7593
9	-12.78	359601	85	29.44	40739	161	71.67	7292
11	-11.67	337126	87	30.56	38718	163	72.78	7004
13	-10.56	316194	89	31.67	36826	165	73.89	6729
15	-9.44	296522	91	32.78	35037	167	75.00	6466
17	-8.33	278353	93	33.89	33345	169	76.11	6215
19	-7.22	261408	95	35.00	31745	171	77.22	5975
21	-6.11	245599	97	36.11	30230	173	78.33	5745
23	-5.00	230842	99	37.22	28796	175	79.44	5526
25	-3.89	217062	101	38.33	27438	177	80.56	5314
27	-2.78	204189	103	39.44	26152	179	81.67	5113
29	-1.67	192156	105	40.56	24923	181	82.78	4921
31	-0.56	180906	107	41.67	23768	183	83.89	4737
33	0.56	170291	109	42.78	22674	185	85.00	4561
35	1.67	160449	111	43.89	21635	187	86.11	4392



