



Rev. 10/16/12

# 1K (Ni) Nickel RTD Output Table

BAPI Sensor Specifications

H17

## 1K (Ni) Nickel RTD Output Table

°F	°C	Ohms
-40	-40.00	699.28
-38	-38.89	704.37
-36	-37.78	709.47
-34	-36.67	714.58
-32	-35.56	719.70
-30	-34.44	724.84
-28	-33.33	729.98
-26	-32.22	735.14
-24	-31.11	740.31
-22	-30.00	745.49
-20	-28.89	750.68
-18	-27.78	755.89
-16	-26.67	761.11
-14	-25.56	766.35
-12	-24.44	771.60
-10	-23.33	776.86
-8	-22.22	782.14
-6	-21.11	787.44
-4	-20.00	792.75
-2	-18.89	798.07
0	-17.78	803.41
2	-16.67	808.76
4	-15.56	814.13
6	-14.44	819.52
8	-13.33	824.92
10	-12.22	830.34
12	-11.11	835.77
14	-10.00	841.22
16	-8.89	846.69
18	-7.78	852.17
20	-6.67	857.66
22	-5.56	863.18
24	-4.44	868.71
26	-3.33	874.25
28	-2.22	879.81
30	-1.11	885.39
32	0.00	890.98
34	1.11	896.59

°F	°C	Ohms
36	2.22	902.21
38	3.33	907.85
40	4.44	913.51
42	5.56	919.18
44	6.67	924.87
46	7.78	930.57
48	8.89	936.29
50	10.00	942.02
52	11.11	947.77
54	12.22	953.53
56	13.33	959.31
58	14.44	965.11
60	15.56	970.92
62	16.67	976.74
64	17.78	982.59
66	18.89	988.44
68	20.00	994.31
70	21.11	1000.20
72	22.22	1006.10
74	23.33	1012.02
76	24.44	1017.95
78	25.56	1023.89
80	26.67	1029.86
82	27.78	1035.83
84	28.89	1041.82
86	30.00	1047.83
88	31.11	1053.85
90	32.22	1059.89
92	33.33	1065.94
94	34.44	1072.00
96	35.56	1078.08
98	36.67	1084.18
100	37.78	1090.29
102	38.89	1096.42
104	40.00	1102.56
106	41.11	1108.71
108	42.22	1114.89
110	43.33	1121.07

°F	°C	Ohms
112	44.44	1127.27
114	45.56	1133.49
116	46.67	1139.72
118	47.78	1145.97
120	48.89	1152.24
122	50.00	1158.52
124	51.11	1164.81
126	52.22	1171.12
128	53.33	1177.45
130	54.44	1183.79
132	55.56	1190.15
134	56.67	1196.53
136	57.78	1202.92
138	58.89	1209.33
140	60.00	1215.75
142	61.11	1222.19
144	62.22	1228.65
146	63.33	1235.12
148	64.44	1241.62
150	65.56	1248.13
152	66.67	1254.65
154	67.78	1261.20
156	68.89	1267.76
158	70.00	1274.34
160	71.11	1280.93
162	72.22	1287.55
164	73.33	1294.18
166	74.44	1300.83
168	75.56	1307.50
170	76.67	1314.19
172	77.78	1320.89
174	78.89	1327.62
176	80.00	1334.36
178	81.11	1341.12
180	82.22	1347.90
182	83.33	1354.70
184	84.44	1361.52
186	85.56	1368.36



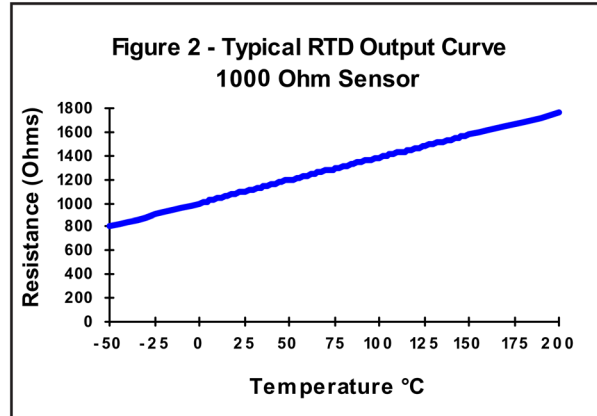


### RTD Description

BAPI RTDs (Resistance Temperature Detectors) are thermally sensitive resistive elements that exhibit a small change in resistance per degree of temperature change. RTDs are especially recognized for excellent linearity throughout their temperature range with a high degree of accuracy and repeatability. An example of an RTD output curve can be seen in **Figure 2**.

RTDs supplied in BAPI products feature a standard interchangeability tolerance of  $\pm 0.3$  °C measured at 0 °C. Higher accuracy sensors are also available. The Class A line [A] has an interchangeability tolerance of  $\pm 0.15$  °C measured at 0 °C. Please call for availability and pricing on Class A RTDs. Whether standard or Class A, BAPI RTDs have such a high accuracy that they can be interchanged without the expense of offsetting the controller.

Most RTD sensing elements can be packaged to withstand an extremely broad temperature range (-200 to 600°C). For most purposes, the standard operating range should be sufficient, but we also have RTDs with a higher or lower operating temperature range. BAPI offers 1 kΩ Platinum RTDs with the ranges shown in the table at right.



### Standard & Extreme Temperature Ranges for the 1 KΩ Platinum RTD

Range	°C	°F
Standard	-60 to 150	-76 to 302
Low Temp [1]	-200 to 0	-328 to 32
High Temp [2]	100 to 210	212 to 410
Very High Temp [3]	200 to 600	392 to 1,112

When ordering a sensor with an "extreme" temperature range, include the number in brackets [ ] after the sensor type. Ex: **BA/1K[2]** is a 1 kΩ RTD with an operating range of 100 to 210°C.

### RTD Specifications

#### Definition of Specification Terms

#### Tolerance of Resistance (Accuracy)

The maximum amount any RTD will differ from the standard resistance curve.

#### Stability (drift)

The amount that the resistance characteristics of a RTD will change over time under certain conditions.

#### Operating Range

The operating range shown is for the RTD sensor only. The mounting package may further limit the operating range and is described on each mounting type specification.

### RTD Specifications

#### Tolerance of Resistance (Accuracy):

- Single Point Standard: 0.12% at 0 °C
- Single Point Class A: 0.06% at 0 °C
- Averaging Standard: 0.2% at 0 °C

#### Tolerance in °C:

- Single Point Standard:  $\pm(0.3 + 0.005T)$ ; T= Temp in °C
- Single Point Class A:  $\pm(0.15 + 0.002T)$ ; T= Temp in °C
- Averaging Standard:  $\pm(0.5 + 0.005(T-25))$ ; T= Temp in °C

#### Stability (drift):

- 0.14 °C with 6,000 continuous hours at 400 °C

#### Sensitivity:

- 1KΩ: 3.85Ω/°C (2.14Ω/°F)

#### Self Heating (1K RTD only):

- 0.4°C/mW at 0°C

#### Standardization:

- DIN 43760-1980, IEC Pub 751-1983, JIS C1604-1989

Sensor Type	Reference Resistance	Temp. Coefficient	Operating Range
BA/1K[375]*	1 kΩ @ 0 °C	3.75Ω/°C	-60 to 150 °C
BA/1K[Ni]*	1 kΩ @21 °C	5.68Ω/°C	-60 to 200 °C
BA/1K*	1 kΩ @ 0 °C	3.85Ω/°C	-60 to 150 °C
BA/2K	2 kΩ @ 20 °C	8Ω/°C	-60 to 150 °C

\*Available as an [A] high accuracy sensor.

Example: BA/1K[A]-I-2" (high accuracy immersion sensor)

