



**BNsens**

TEMPERATURE SENSOR

BEL-705-U-1-12-00



**BNsens**

## DESCRIPTION

The BEL-705-U-1-12-00 Thin Film Platinum RTDs (Resistance Temperature Detectors) are designed to monitor or control critical temperatures in industrial applications. They provide a linear change in resistance versus temperature, combining high linearity, stability, accuracy, and wide temperature range in a small, fast-response package.

The BEL-705-U-1-12-00, is designed to measure temperatures from -75 to 540 [-100 to 1000 ] with high accuracy. These fully-assembled elements are ready-to-use in probe assemblies, without the need for fragile splices to extension leads.

These products are manufactured using a thin layer of platinum deposited on an alumina substrate and are laser trimmed to a resistance interchangeability of a standard  $\pm 0.2\%$  ( $\pm 0.5$  accuracy) or optional  $\pm 0.1\%$  ( $\pm 0.3$  accuracy). The sensor chip is then glassed, wired and potted or ceramic fired to result in a cylindrical alumina package with either TFE Teflon®- or fiberglass-insulated lead wires.

## CHARACTERISTICS

- Wide temperature range
- Interchangeable
- Accurate
- Linear resistance vs temperature
- Fast response
- Laser trimmed
- Ceramic case material
- TFE Teflon® or fiberglass leadwires
- Multiple small sizes
- Ready-to-use, fully assembled elements

## PREFORMANCE

Parameter	BEL-705-U-1-12-00
Sensor Type	Thin film Platinum RTD; $R_0=1000$ @0 ; ALPHA= 0.00375 / /
Temperature Range	TFE TEFLON: -70 ~ +260 (-94 ~ +500 )
Temperature Accuracy	$\pm 0.3$ OR 0.6% of Temperature , ( $R_0 \pm 0.1\%$ Trim) , whichever is greater
Base Resistance And Interchangeability , $R_0 \pm R_0$	$1000 \pm 1$ ( $\pm 0.1\%$ )@0
Linearity	$\pm 0.1\%$ of full scale temperature range from -40 ~ +125 $\pm 2.0\%$ of full scale temperature range from -75 ~ +540
Time Constant	<0.5 sec. 0.85 Inch O.D.IN Water At 3ft/sec; <1.0 sec. 0.85 Inch O.D.Instill Water
Operating Current	1 mA Maximum For Self Heating Errors Of < C
Stability	<0.25 /Year : 0.05 Per 5 Years In Occupied Environments
Self Heating	<15 mW/ For 0.85 O.D.Typical
Insulation Resistance	>50M At 50V DC At 25
Construction	Alumina Case: Epoxy Potting
Lead Material	Nickel Coated Stranded Copper , Teflon Insulated , 28 AWG.
Calibration	No Nist Calibration

# APPLICATIONS

## (1) Industrial

- HVAC equipment
- Instrument and probe assemblies
- Process control
- Motor windings and bearings
- Battery packs
- Environmental chambers
- Ovens and kilns
- Drill holes in large objects

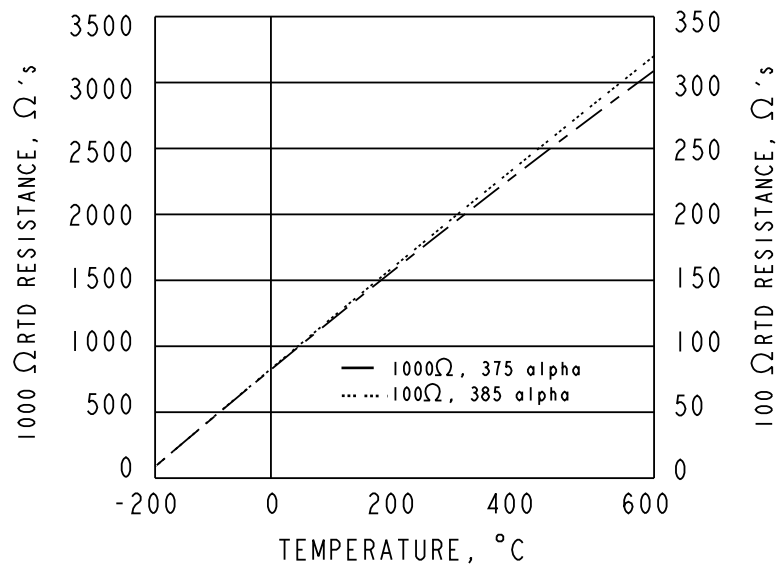
## (2) Medical

- Autoclaves

## (3) Aerospace/Defense

- Aircraft
- Space vehicles

# RESISTANCE VS TEMPERATURE CURVE



# ACCURACY VS TEMPERATURE

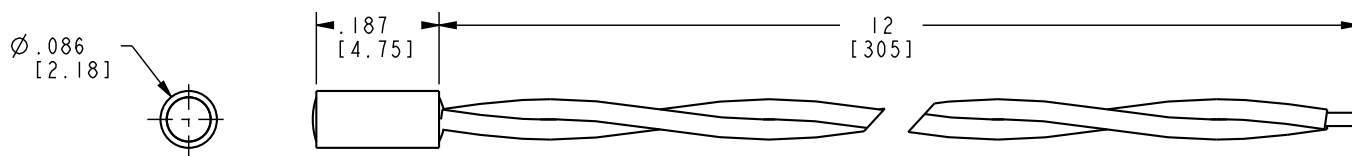
Tolerance Temperature ( )	Standard $\pm 0.2\%$		Optional $\pm 0.1\%$	
	$\pm R^{(1)}$ ( )	$\pm T$ ( )	$\pm R^{(1)}$ ( )	$\pm T$ ( )
-100	2.9	0.8	2.4	0.6
0	2.0	0.5	1.0	0.3
100	2.9	0.8	2.2	0.6
200	5.6	1.6	4.3	1.2
300	8.2	2.4	6.2	1.8
400	11.0	3.2	8.3	2.5
500	12.5	4.0	9.6	3.0
600	15.1	4.8	10.4	3.3

## Note

- (1) 1000 RTD. divide by 10 for 100 RTD. specifications 112636 - Ar

## DIMENSIONS

Dimensions and Tolerances in mm



## BEL-705-U-1-12-00 Pt1000 sensor RT Reference

Temperature ( °C)	R lower limit (Ω)	Norminal (Ω)	R upper limit (Ω)
-70	722.185	723.345	724.746
-69	726.194	727.346	728.726
-68	730.201	731.344	732.705
-67	734.206	735.341	736.683
-66	738.210	739.337	740.660
-65	742.213	743.331	744.636
-64	746.214	747.324	748.610
-63	750.213	751.315	752.584
-62	754.211	755.304	756.556
-61	758.207	759.292	760.527
-60	762.202	763.278	764.497
-59	766.196	767.263	768.466
-58	770.187	771.247	772.433
-57	774.178	775.229	776.400
-56	778.167	779.210	780.365
-55	782.154	783.189	784.329
-54	786.140	787.166	788.292
-53	790.125	791.143	792.254
-52	794.108	795.117	796.215
-51	798.090	799.091	800.174
-50	802.070	803.063	804.133
-49	806.049	807.033	808.090
-48	810.026	811.003	812.046
-47	814.002	814.970	816.001
-46	817.977	818.937	819.955
-45	821.950	822.902	823.907
-44	825.922	826.865	827.859
-43	829.893	830.828	831.809
-42	833.862	834.789	835.759
-41	837.830	838.748	839.707
-40	841.796	842.707	843.654
-39	845.761	846.663	847.599
-38	849.725	850.619	851.544
-37	853.688	854.573	855.487
-36	857.649	858.526	859.430
-35	861.609	862.478	863.371
-34	865.567	866.428	867.311
-33	869.524	870.377	871.250
-32	873.480	874.325	875.187
-31	877.435	878.271	879.124
-30	881.388	882.217	883.059
-29	885.340	886.160	886.993
-28	889.291	890.103	890.927
-27	893.241	894.044	894.859
-26	897.189	897.985	898.789
-25	901.136	901.923	902.719
-24	905.081	905.861	906.647
-23	909.026	909.797	910.575
-22	912.969	913.732	914.501

-21	916.911	917.666	918.426
-20	920.852	921.599	922.350
-19	924.791	925.530	926.273
-18	928.730	929.461	930.194
-17	932.667	933.390	934.115
-16	936.603	937.317	938.034
-15	940.537	941.244	941.952
-14	944.471	945.169	945.869
-13	948.403	949.093	949.785
-12	952.334	953.016	953.700
-11	956.264	956.938	957.613
-10	960.192	960.859	961.526
-9	964.120	964.778	965.437
-8	968.046	968.696	969.347
-7	971.971	972.613	973.256
-6	975.895	976.529	977.164
-5	979.818	980.444	981.070
-4	983.739	984.358	984.976
-3	987.660	988.270	988.880
-2	991.579	992.181	992.783
-1	995.497	996.091	996.685
0	999.414	1000.000	1000.586
1	1003.314	1003.908	1004.502
2	1007.213	1007.814	1008.416
3	1011.111	1011.720	1012.329
4	1015.007	1015.624	1016.241
5	1018.903	1019.527	1020.151
6	1022.797	1023.429	1024.061
7	1026.690	1027.330	1027.969
8	1030.582	1031.229	1031.877
9	1034.473	1035.128	1035.783
10	1038.363	1039.025	1039.688
11	1042.251	1042.921	1043.591
12	1046.139	1046.816	1047.494
13	1050.025	1050.710	1051.396
14	1053.910	1054.603	1055.296
15	1057.794	1058.495	1059.195
16	1061.677	1062.385	1063.093
17	1065.559	1066.274	1066.990
18	1069.439	1070.162	1070.885
19	1073.319	1074.049	1074.780
20	1077.197	1077.935	1078.673
21	1081.074	1081.820	1082.565
22	1084.950	1085.703	1086.456
23	1088.825	1089.585	1090.346
24	1092.698	1093.467	1094.235
25	1096.571	1097.347	1098.122
26	1100.442	1101.225	1102.009
27	1104.312	1105.103	1105.894
28	1108.181	1108.980	1109.778
29	1112.049	1112.855	1113.661
30	1115.916	1116.729	1117.543
31	1119.781	1120.602	1121.423

32	1123.646	1124.474	1125.303
33	1127.509	1128.345	1129.181
34	1131.371	1132.215	1133.058
35	1135.232	1136.083	1136.934
36	1139.092	1139.950	1140.809
37	1142.951	1143.817	1144.682
38	1146.808	1147.681	1148.555
39	1150.664	1151.545	1152.426
40	1154.520	1155.408	1156.296
41	1158.374	1159.270	1160.165
42	1162.227	1163.130	1164.033
43	1166.078	1166.989	1167.900
44	1169.929	1170.847	1171.765
45	1173.779	1174.704	1175.630
46	1177.627	1178.560	1179.493
47	1181.474	1182.414	1183.355
48	1185.320	1186.268	1187.216
49	1189.165	1190.120	1191.075
50	1193.009	1193.971	1194.934
51	1196.851	1197.821	1198.791
52	1200.693	1201.670	1202.647
53	1204.533	1205.518	1206.503
54	1208.372	1209.364	1210.356
55	1212.210	1213.210	1214.209
56	1216.047	1217.054	1218.061
57	1219.882	1220.897	1221.911
58	1223.717	1224.739	1225.760
59	1227.550	1228.579	1229.609
60	1231.382	1232.419	1233.455
61	1235.213	1236.257	1237.301
62	1239.043	1240.095	1241.146
63	1242.872	1243.931	1244.989
64	1246.700	1247.766	1248.832
65	1250.526	1251.600	1252.673
66	1254.352	1255.432	1256.513
67	1258.176	1259.264	1260.352
68	1261.999	1263.094	1264.189
69	1265.821	1266.923	1268.026
70	1269.641	1270.751	1271.861
71	1273.461	1274.578	1275.695
72	1277.279	1278.404	1279.528
73	1281.096	1282.228	1283.360
74	1284.913	1286.052	1287.191
75	1288.728	1289.874	1291.021
76	1292.541	1293.695	1294.849
77	1296.354	1297.515	1298.676
78	1300.165	1301.334	1302.502
79	1303.976	1305.152	1306.327
80	1307.785	1308.968	1310.151
81	1311.593	1312.783	1313.973
82	1315.400	1316.597	1317.795
83	1319.206	1320.411	1321.615
84	1323.010	1324.222	1325.434



85	1326.814	1328.033	1329.252
86	1330.616	1331.843	1333.069
87	1334.417	1335.651	1336.885
88	1338.217	1339.458	1340.699
89	1342.016	1343.264	1344.512
90	1345.814	1347.069	1348.325
91	1349.610	1350.873	1352.136
92	1353.406	1354.676	1355.945
93	1357.200	1358.477	1359.754
94	1360.993	1362.277	1363.562
95	1364.785	1366.077	1367.368
96	1368.576	1369.875	1371.173
97	1372.365	1373.671	1374.977
98	1376.154	1377.467	1378.780
99	1379.941	1381.262	1382.582
100	1383.727	1385.055	1386.382
101	1387.512	1388.847	1390.182
102	1391.296	1392.638	1393.980
103	1395.079	1396.428	1397.777
104	1398.861	1400.217	1401.573
105	1402.641	1404.005	1405.368
106	1406.420	1407.791	1409.161
107	1410.199	1411.576	1412.954
108	1413.976	1415.360	1416.745
109	1417.751	1419.143	1420.535
110	1421.526	1422.925	1424.324
111	1425.300	1426.706	1428.112
112	1429.072	1430.485	1431.899
113	1432.843	1434.264	1435.684
114	1436.613	1438.041	1439.468
115	1440.382	1441.817	1443.252
116	1444.150	1445.592	1447.034
117	1447.917	1449.366	1450.815
118	1451.682	1453.138	1454.594
119	1455.447	1456.910	1458.373
120	1459.210	1460.680	1462.150
121	1462.972	1464.449	1465.926
122	1466.733	1468.217	1469.701
123	1470.492	1471.984	1473.475
124	1474.251	1475.750	1477.248
125	1478.008	1479.514	1481.020
126	1481.765	1483.277	1484.790
127	1485.520	1487.040	1488.559
128	1489.274	1490.801	1492.327
129	1493.027	1494.561	1496.094
130	1496.778	1498.319	1499.860
131	1500.529	1502.077	1503.625
132	1504.278	1505.833	1507.388
133	1508.026	1509.589	1511.150
134	1511.774	1513.343	1514.911
135	1515.519	1517.096	1518.671
136	1519.264	1520.847	1522.430
137	1523.008	1524.598	1526.188



138	1526.750	1528.347	1529.944
139	1530.492	1532.096	1533.700
140	1534.232	1535.843	1537.454
141	1537.971	1539.589	1541.207
142	1541.709	1543.334	1544.959
143	1545.445	1547.078	1548.709
144	1549.181	1550.820	1552.459
145	1552.915	1554.562	1556.207
146	1556.649	1558.302	1559.955
147	1560.381	1562.041	1563.701
148	1564.112	1565.779	1567.446
149	1567.842	1569.516	1571.189
150	1571.570	1573.251	1574.932
151	1575.298	1576.986	1578.673
152	1579.024	1580.719	1582.414
153	1582.749	1584.451	1586.153
154	1586.474	1588.182	1589.891
155	1590.196	1591.912	1593.627
156	1593.918	1595.641	1597.363
157	1597.639	1599.368	1601.097
158	1601.358	1603.095	1604.831
159	1605.077	1606.820	1608.563
160	1608.794	1610.544	1612.294
161	1612.510	1614.267	1616.024
162	1616.225	1617.989	1619.752
163	1619.938	1621.709	1623.480
164	1623.651	1625.429	1627.206
165	1627.362	1629.147	1630.931
166	1631.073	1632.864	1634.655
167	1634.782	1636.580	1638.378
168	1638.490	1640.295	1642.100
169	1642.197	1644.009	1645.821
170	1645.902	1647.721	1649.540
171	1649.607	1651.433	1653.258
172	1653.310	1655.143	1656.975
173	1657.012	1658.852	1660.691
174	1660.713	1662.560	1664.406
175	1664.413	1666.267	1668.120
176	1668.112	1669.972	1671.832
177	1671.810	1673.677	1675.543
178	1675.506	1677.380	1679.253
179	1679.201	1681.082	1682.962
180	1682.896	1684.783	1686.670
181	1686.589	1688.483	1690.377
182	1690.281	1692.181	1694.082
183	1693.971	1695.879	1697.786
184	1697.661	1699.575	1701.490
185	1701.349	1703.271	1705.192
186	1705.036	1706.965	1708.892
187	1708.723	1710.658	1712.592
188	1712.408	1714.349	1716.291
189	1716.091	1718.040	1719.988
190	1719.774	1721.729	1723.684

191	1723.456	1725.418	1727.379
192	1727.136	1729.105	1731.073
193	1730.815	1732.791	1734.766
194	1734.493	1736.475	1738.457
195	1738.170	1740.159	1742.148
196	1741.846	1743.842	1745.837
197	1745.520	1747.523	1749.525
198	1749.194	1751.203	1753.212
199	1752.866	1754.882	1756.898
200	1756.537	1758.560	1760.582
201	1760.207	1762.237	1764.266
202	1763.876	1765.912	1767.948
203	1767.544	1769.587	1771.629
204	1771.210	1773.260	1775.309
205	1774.876	1776.932	1778.988
206	1778.540	1780.603	1782.666
207	1782.203	1784.273	1786.342
208	1785.865	1787.941	1790.017
209	1789.526	1791.609	1793.692
210	1793.186	1795.275	1797.365
211	1796.844	1798.940	1801.036
212	1800.501	1802.604	1804.707
213	1804.158	1806.267	1808.377
214	1807.813	1809.929	1812.045
215	1811.467	1813.590	1815.712
216	1815.119	1817.249	1819.378
217	1818.771	1820.907	1823.043
218	1822.421	1824.564	1826.707
219	1826.071	1828.220	1830.369
220	1829.719	1831.875	1834.031
221	1833.366	1835.529	1837.691
222	1837.012	1839.181	1841.350
223	1840.656	1842.832	1845.008
224	1844.300	1846.483	1848.665
225	1847.942	1850.132	1852.320
226	1851.584	1853.779	1855.975
227	1855.224	1857.426	1859.628
228	1858.863	1861.072	1863.280
229	1862.500	1864.716	1866.931
230	1866.137	1868.359	1870.581
231	1869.773	1872.001	1874.230
232	1873.407	1875.642	1877.877
233	1877.040	1879.282	1881.524
234	1880.672	1882.921	1885.169
235	1884.303	1886.558	1888.813
236	1887.933	1890.194	1892.456
237	1891.561	1893.830	1896.097
238	1895.189	1897.463	1899.738
239	1898.815	1901.096	1903.377
240	1902.440	1904.728	1907.015
241	1906.064	1908.359	1910.652
242	1909.687	1911.988	1914.288
243	1913.309	1915.616	1917.923

244	1916.929	1919.243	1921.557
245	1920.549	1922.869	1925.189
246	1924.167	1926.494	1928.820
247	1927.784	1930.117	1932.450
248	1931.400	1933.740	1936.079
249	1935.015	1937.361	1939.707
250	1938.628	1940.981	1943.334
251	1942.241	1944.600	1946.959
252	1945.852	1948.218	1950.583
253	1949.462	1951.835	1954.207
254	1953.071	1955.450	1957.829
255	1956.679	1959.065	1961.449
256	1960.286	1962.678	1965.069
257	1963.892	1966.290	1968.688
258	1967.496	1969.901	1972.305
259	1971.099	1973.510	1975.921
260	1974.701	1977.119	1979.536

# DISCLAIMER

## Warning

### LIFE OR PROPERTY RISK

- Please ensure that this product has been designed as part of whole system and already considered related risks, make sure the product has the correct ratings and is designed based on the entire system. It must not be used when applications related to serious life or property damage risks.

Failure to follow this instruction can result in death or serious injury.

## Warning

### PERSONAL INJURY

- DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to follow this instruction can result in death or serious injury.

## Warning

### MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to follow this instruction can result in death or serious injury.

## Warranty/Remedy

Banning warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Banning's standard product warranty applies unless agreed to otherwise by Banning in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Banning during the period of coverage, Banning will repair or replace, at its option, without charge those items that Banning, in its sole discretion, finds defective. The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Banning be liable for consequential special, or indirect damages.

While Banning may provide application assistance personally, through our literature and the Banning web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Banning assumes no responsibility for its use.

## SALES & SERVICE

Banning serves its clients through a worldwide network of sales offices, agents and distributors. For application assistance specifications, prices or names with the nearest authorized dealer, please contact your sales specialist or contact us directly:

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WeChat



Invoice

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INTEGRITY  
INTERNATIONAL  
INNOVATION

**BNsens**