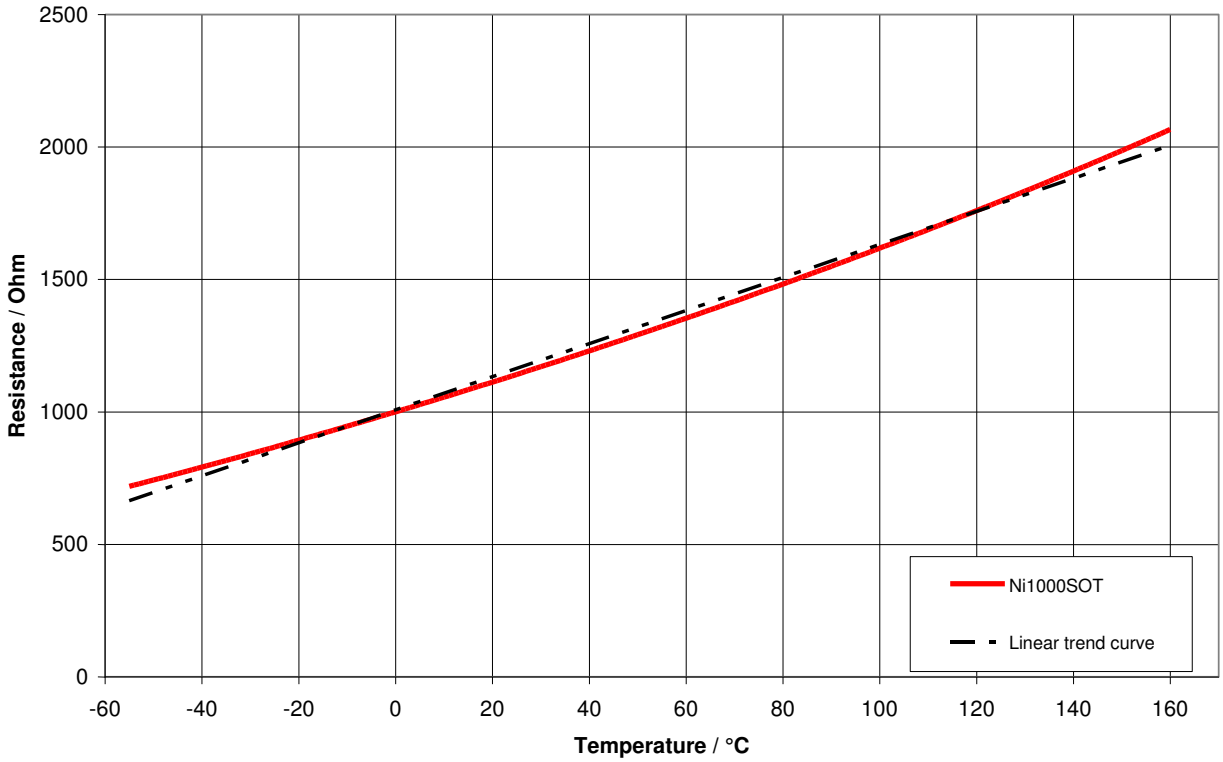
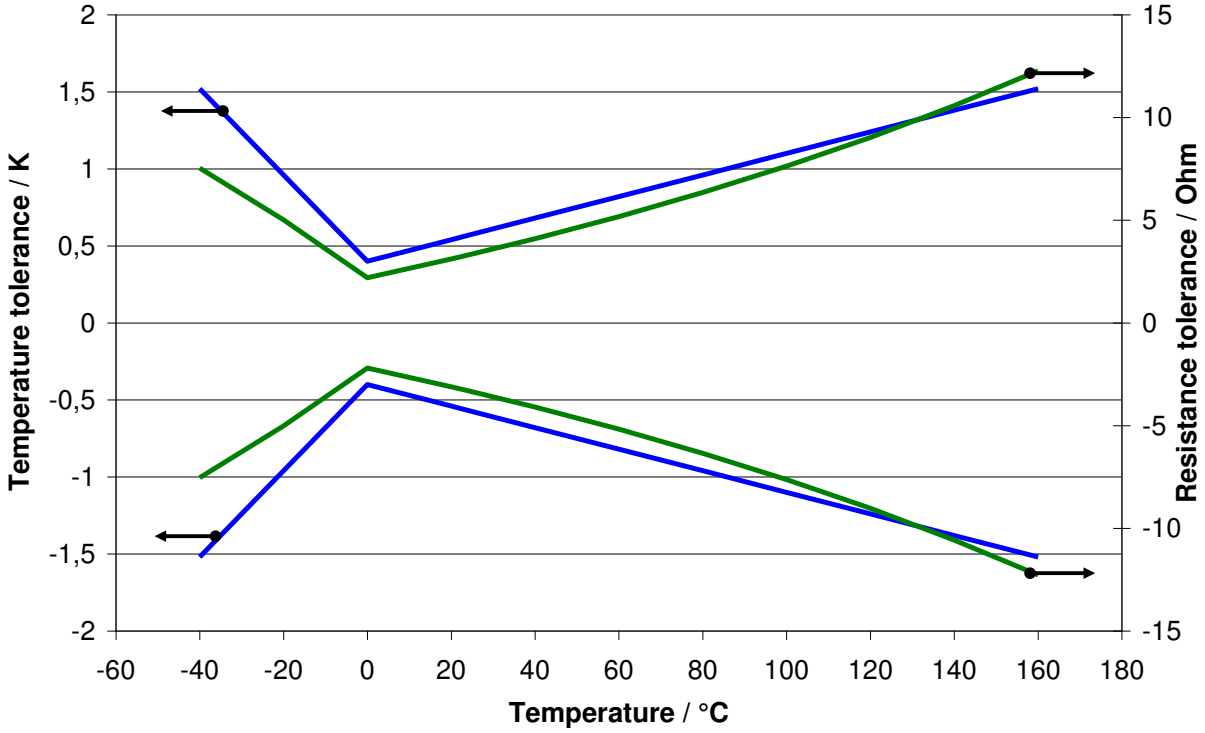
## TYPICAL PERFORMANCE CURVES




Resistance characteristics




Tolerance chart

## ELECTRICAL CHARACTERISTIC

The characteristic of the nickel temperature sensor is specified as per DIN 43760. The large Temperature Coefficient of Resistance (TCR) of the Ni-RTD, 6178 ppm/K, offers greater sensitivity than other types of RTD's. The electrical characteristic can be described by the following equation:

$$R(T) = R_0 (1+aT+bT^2+cT^4+dT^6)$$

Coefficients:

a = $5.485 \times 10^{-3}$
b = $6.650 \times 10^{-6}$
c = $2.805 \times 10^{-11}$
d = $-2.000 \times 10^{-17}$

$$T(R) = a'+b'(1+c'R)^{1/2}+d'R^5+e'R^7$$ **dT < 0.12 K (higher order equations on request)**

Coefficients:

a´= - 412.6
b´= 140.41
c´= 0.00764
d´= - $6.25 \times 10^{-17}$
e´= $-1.25 \times 10^{-24}$

**Tolerances**: Class B ± (0.4+0.007 x |T|) in range from 0°C to +160 °C
± (0.4+0.028 x |T|) in range from -55°C to 0 °C

| T/°C | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **-60** | 695.2 | 699.9 | 704.6 | 709.3 | 714.0 | 718.7 | 723.4 | 728.2 | 733.0 | 737.8 |
| **-50** | 742.6 | 747.4 | 752.2 | 757.0 | 761.9 | 766.8 | 771.6 | 776.5 | 781.4 | 786.4 |
| **-40** | 791.3 | 796.3 | 801.2 | 806.2 | 811.2 | 816.2 | 821.2 | 826.3 | 831.3 | 836.4 |
| **-30** | 841.5 | 846.5 | 851.7 | 856.8 | 861.9 | 867.0 | 872.2 | 877.4 | 882.6 | 887.8 |
| **-20** | 893.0 | 898.2 | 903.4 | 908.7 | 913.9 | 919.2 | 924.5 | 929.8 | 935.1 | 940.5 |
| **-10** | 945.8 | 951.2 | 956.5 | 961.9 | 967.3 | 972.7 | 978.2 | 983.6 | 989.1 | 994.5 |
| **0** | 1000.0 | 1005.5 | 1011.0 | 1016.5 | 1022.0 | 1027.6 | 1033.1 | 1038.7 | 1044.3 | 1049.9 |
| **10** | 1055.5 | 1061.1 | 1066.8 | 1072.4 | 1078.1 | 1083.8 | 1089.5 | 1095.2 | 1100.9 | 1106.6 |
| **20** | 1112.4 | 1118.1 | 1123.9 | 1129.7 | 1135.5 | 1141.3 | 1147.1 | 1153.0 | 1158.8 | 1164.7 |
| **30** | 1170.6 | 1176.5 | 1182.4 | 1188.3 | 1194.2 | 1200.2 | 1206.1 | 1212.1 | 1218.1 | 1224.1 |
| **40** | 1230.1 | 1236.1 | 1242.2 | 1248.2 | 1254.3 | 1260.4 | 1266.5 | 1272.6 | 1278.8 | 1284.9 |
| **50** | 1291.1 | 1297.2 | 1303.4 | 1309.6 | 1315.8 | 1322.0 | 1328.3 | 1334.5 | 1340.8 | 1347.1 |
| **60** | 1353.4 | 1359.7 | 1366.0 | 1372.4 | 1378.7 | 1385.1 | 1391.5 | 1397.9 | 1404.3 | 1410.8 |
| **70** | 1417.2 | 1423.7 | 1430.1 | 1436.6 | 1443.1 | 1449.7 | 1456.2 | 1462.8 | 1469.3 | 1475.9 |
| **80** | 1482.5 | 1489.1 | 1495.7 | 1502.4 | 1509.1 | 1515.7 | 1522.4 | 1529.1 | 1535.9 | 1542.6 |
| **90** | 1549.3 | 1556.1 | 1562.9 | 1569.7 | 1576.5 | 1583.4 | 1590.2 | 1597.1 | 1604.0 | 1610.9 |
| **100** | 1617.8 | 1624.7 | 1631.7 | 1638.6 | 1645.6 | 1652.6 | 1659.6 | 1666.7 | 1673.7 | 1680.8 |
| **110** | 1687.9 | 1695.0 | 1702.1 | 1709.3 | 1716.4 | 1723.6 | 1730.8 | 1738.0 | 1745.2 | 1752.5 |
| **120** | 1759.7 | 1767.0 | 1774.3 | 1781.6 | 1788.9 | 1796.3 | 1803.7 | 1811.1 | 1818.5 | 1825.9 |
| **130** | 1833.3 | 1840.8 | 1848.3 | 1855.8 | 1863.3 | 1870.9 | 1878.4 | 1886.0 | 1893.6 | 1901.2 |
| **140** | 1908.9 | 1916.5 | 1924.2 | 1931.9 | 1939.6 | 1947.4 | 1955.1 | 1962.9 | 1970.7 | 1978.5 |
| **150** | 1986.3 | 1994.2 | 2002.1 | 2010.0 | 2017.9 | 2025.9 | 2033.8 | 2041.8 | 2049.8 | 2057.8 |
| **160** | 2065.9 | 2074.0 | 2082.1 | 2090.2 | 2098.3 | 2106.5 | 2114.6 | 2122.8 | 2131.1 | 2139.3 |