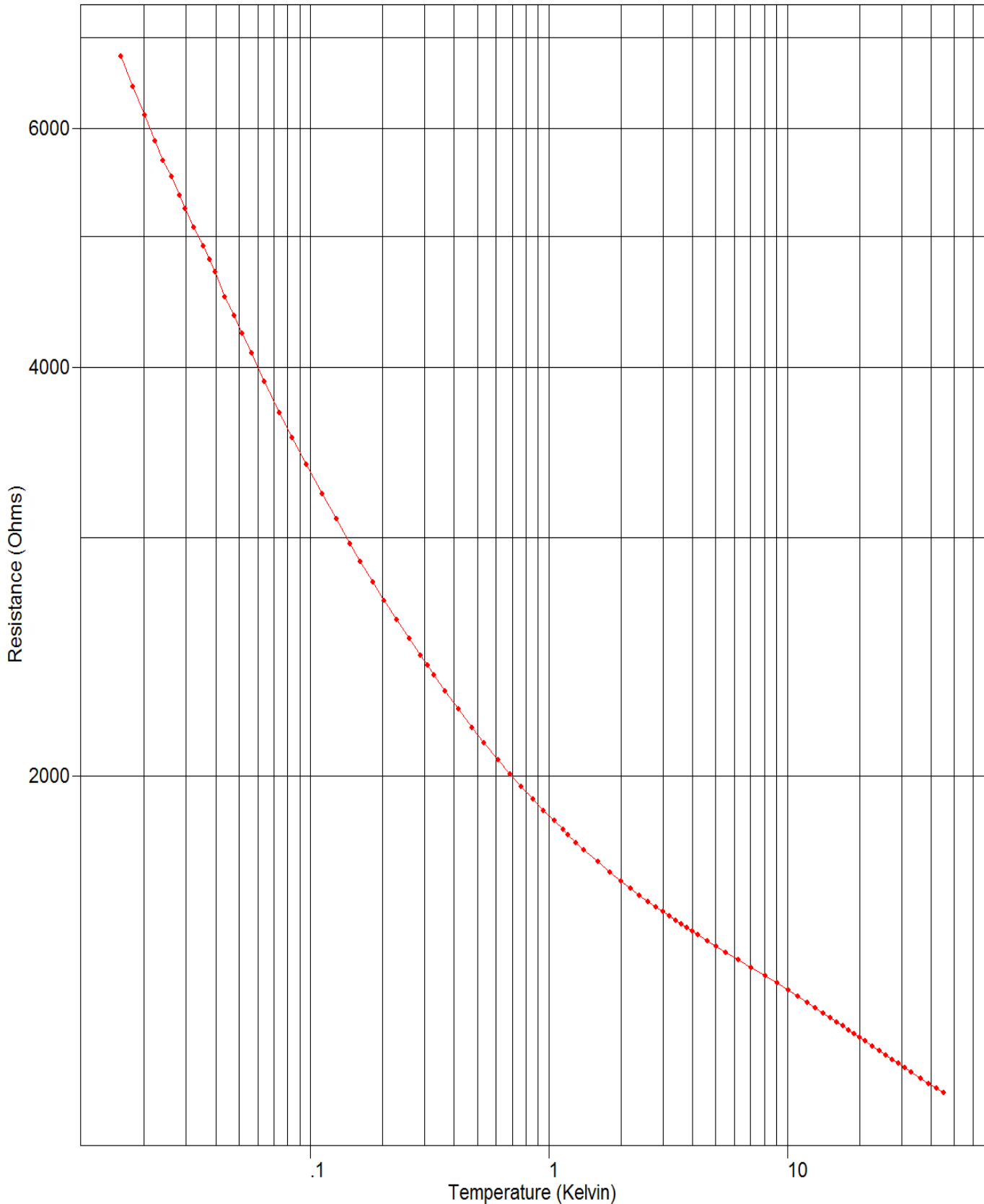


DATA PLOT

Calibration Report: 555108
Sensor Model: RX-102B-CB-0.02B
Sensor Type: Rox Resistor

Sales Order: 50701
Serial Number: U02453
Temperature Range: 0.02K to 40.0K



TEST DATA

Calibration Report: 555108

Sensor Model: RX-102B-CB-0.02B

Sensor Type: Rox Resistor

Sales Order: 50701

Serial Number: U02453

Temperature Range: 0.02K to 40.0K

Index	Temp. (K)	Resistance (Ω)	Excitation	Index	Temp. (K)	Resistance (Ω)	Excitation
1	1.60657e-2	6785.40	< 20 μ V	51	2.60434	1616.12	2mV \pm 25%
2	1.80331e-2	6443.20	< 20 μ V	52	2.80092	1601.35	2mV \pm 25%
3	2.01082e-2	6140.80	< 20 μ V	53	2.99924	1588.10	2mV \pm 25%
4	2.23019e-2	5871.60	< 20 μ V	54	3.19473	1576.11	2mV \pm 25%
5	2.39748e-2	5682.80	< 20 μ V	55	3.39581	1564.82	2mV \pm 25%
6	2.60867e-2	5526.00	< 20 μ V	56	3.59580	1554.45	2mV \pm 25%
7	2.82625e-2	5354.30	< 20 μ V	57	3.79422	1544.94	2mV \pm 25%
8	2.98223e-2	5238.70	< 20 μ V	58	3.99366	1536.09	2mV \pm 25%
9	3.23556e-2	5076.04	< 20 μ V	59	4.21333	1526.86	2mV \pm 25%
10	3.55591e-2	4917.10	< 20 μ V	60	4.60831	1511.88	2mV \pm 25%
11	3.76295e-2	4807.20	< 20 μ V	61	5.01106	1498.01	2mV \pm 25%
12	3.97229e-2	4701.51	< 20 μ V	62	5.51291	1482.73	2mV \pm 25%
13	4.37437e-2	4511.44	< 20 μ V	63	6.21574	1463.98	2mV \pm 25%
14	4.78947e-2	4368.44	< 20 μ V	64	7.02942	1445.06	2mV \pm 25%
15	5.16646e-2	4239.43	< 20 μ V	65	8.04027	1424.68	2mV \pm 25%
16	5.66370e-2	4100.67	< 20 μ V	66	9.04624	1406.65	2mV \pm 25%
17	6.39904e-2	3907.80	< 20 μ V	67	10.0541	1390.46	2mV \pm 25%
18	7.39776e-2	3704.12	< 20 μ V	68	11.0690	1375.64	2mV \pm 25%
19	8.35828e-2	3552.40	< 20 μ V	69	12.0820	1362.05	2mV \pm 25%
20	9.59436e-2	3393.76	< 20 μ V	70	13.0877	1349.62	2mV \pm 25%
21	0.112002	3229.07	< 63 μ V	71	14.0906	1338.11	2mV \pm 25%
22	0.127974	3093.37	< 63 μ V	72	15.0862	1327.44	2mV \pm 25%
23	0.145946	2968.17	< 63 μ V	73	16.0768	1317.60	2mV \pm 25%
24	0.162037	2875.73	< 63 μ V	74	17.0624	1308.31	2mV \pm 25%
25	0.182069	2779.99	< 63 μ V	75	18.0519	1299.56	2mV \pm 25%
26	0.203983	2692.91	< 63 μ V	76	19.0380	1291.49	2mV \pm 25%
27	0.229997	2605.67	< 63 μ V	77	20.0280	1283.69	2mV \pm 25%
28	0.260049	2522.80	< 63 μ V	78	21.1177	1275.62	2mV \pm 25%
29	0.289931	2451.82	< 63 μ V	79	22.7088	1264.69	2mV \pm 25%
30	0.309979	2411.23	< 63 μ V	80	24.3099	1254.39	2mV \pm 25%
31	0.329975	2373.03	< 63 μ V	81	25.9014	1245.16	2mV \pm 25%
32	0.367784	2309.13	< 63 μ V	82	27.5160	1236.25	2mV \pm 25%
33	0.417933	2238.08	< 63 μ V	83	29.1218	1228.04	2mV \pm 25%
34	0.476072	2170.00	< 63 μ V	84	30.9353	1219.35	2mV \pm 25%
35	0.535289	2113.01	< 63 μ V	85	33.0423	1210.05	2mV \pm 25%
36	0.609793	2054.34	< 63 μ V	86	36.0465	1197.95	2mV \pm 25%
37	0.684982	2005.91	< 63 μ V	87	39.0365	1187.05	2mV \pm 25%
38	0.764822	1963.24	< 63 μ V	88	42.0344	1177.18	2mV \pm 25%
39	0.855039	1922.46	< 63 μ V	89	45.0264	1168.19	2mV \pm 25%
40	0.949874	1885.79	< 63 μ V				
41	1.05018	1852.77	< 63 μ V				
42	1.14411	1825.27	< 63 μ V				
43	1.20144	1810.02	2mV \pm 25%				
44	1.29754	1784.88	2mV \pm 25%				
45	1.39959	1763.67	2mV \pm 25%				
46	1.59939	1728.03	2mV \pm 25%				
47	1.79891	1698.42	2mV \pm 25%				
48	1.99946	1673.35	2mV \pm 25%				
49	2.19878	1652.06	2mV \pm 25%				
50	2.39834	1633.53	2mV \pm 25%				



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UNCERTAINTY ANALYSIS

Calibration Report: 555108
Sensor Model: RX-102B-CB-0.02B
Sensor Type: Rox Resistor

Sales Order: 50701
Serial Number: U02453
Temperature Range: 0.02K to 40.0K

Calibration Data Uncertainty

The uncertainties of the measured calibration data for Lake Shore's sensors are summarized in the table below. The values given are the combined uncertainty of the temperature measurement and the resistance or voltage measurement expressed as an equivalent temperature uncertainty in millikelvin (mK). Note that the values are the calibration uncertainty only and do not include the stability of the temperature sensor. The uncertainty analysis has followed the guidelines for determining measurement uncertainty as outlined in the ISO Guide to the Expression of Uncertainty in Measurement, NIST Technical Note 1297, and ANSI/NCSL Z540-2-1997. Since the uncertainty varies with temperature due to the variation of the sensor sensitivity and excitation, the table gives typical values at several different temperatures throughout the range of the calibration. The uncertainty is based on an approximate 95% confidence level with a coverage factor $k = 2$.

T (K)	Uncertainty (+/- mK)											
	Ge (GR-200-X)		Cernox (CX-Y)		CGR	RX		Pt		RhFe		Diode
	$X \leq 100$	$X \geq 250$	$Y \leq 1030$	$Y \geq 1050$		-102	-103	100 Ω	25 Ω	27 Ω	100 Ω	
1.4	4	4	4	4	4	4	4			4	4	7
4.2	4	4	4	4	4	4	6			4	4	5
10	4	4	5	4	4	10	15			4	5	6
20	8	7	9	8	8	34	34	8	10	8	9	9
30	9	8	11	9	9	72	60	8	8	9	9	28
50	12	11	16	12	13			10	10	10	10	34
100	32	18	24	16	27			11	11	11	11	30
300			72	40	100			22	22	22	22	33
400			120	67				43	43	42		47
500								48	48			52

Polynomial Fit Uncertainty

When a sensor is used to measure temperature, a polynomial fit to the measured calibration data is often used to convert the sensor resistance (R) or voltage (V) to a temperature (T). How well the polynomial represents the sensor calibration data is another source of uncertainty when using the sensor. In the polynomials provided with this set of calibration data, the standard deviation of the fit can be used as an estimate of this additional temperature uncertainty. The standard deviation of fit is determined from the following equation:

$$\sigma_{fit}^2 = \frac{\sum_{i=1}^N (T_i - T_{i,calc})^2}{N - n} = \frac{N}{N - n} (\Delta T_{RMS})^2$$

where σ_{fit} = standard deviation of the fit

T_i = measured temperature for point i

$T_{i,calc}$ = the temperature calculated from the polynomial equation for point i

N = number of data points in fit range

n = number of fit coefficients

ΔT_{RMS} = root mean square deviation of fit

A value of ΔT_{RMS} is given for each range of fit.

F008-04-00 (08/06/04)



POLYNOMIAL EQUATION

Calibration Report: 555108
Sensor Model: RX-102B-CB-0.02B
Sensor Type: Rox Resistor

Sales Order: 50701
Serial Number: U02453
Temperature Range: 0.02K to 40.0K

Polynomial Type: Chebychev
Useful Range of Fit:

2.00e-2 K to 0.330 K
6144. Ohms to 2373. Ohms

Lower and Upper limits of Log(Resistance) used in computing Chebychev coefficients:
ZL = 3.34987560629 ZU = 3.83157545445

Order	Coefficient	Std. Deviation of Coefficient	Ratio (Coeff./Std Dev.)
0	0.131724	4.4088E-05	2987.75
1	-0.170454	7.2023E-05	-2366.66
2	0.075643	6.7125E-05	1126.89
3	-0.027979	6.0571E-05	-461.92
4	0.009206	5.7989E-05	158.75
5	-0.002380	5.5900E-05	-42.57
6	0.000560	5.4181E-05	10.33
7	-0.000083	5.2821E-05	-1.57
8	-0.000211	5.4077E-05	-3.90

$Z = \text{Log}(\text{Resistance})$

$k = ((Z-ZL)-(ZU-Z))/(ZU-ZL)$

Temp. (K) = $\sum A_i \cdot \text{COS}(i \cdot \text{ARCCOS}(k))$, where $0 \leq i \leq 8$
and the A_i 's are the coefficients in the table above.



POLYNOMIAL EQUATION

Calibration Report: 555108
Sensor Model: RX-102B-CB-0.02B
Sensor Type: Rox Resistor

Sales Order: 50701
Serial Number: U02453
Temperature Range: 0.02K to 40.0K

Polynomial Type: Chebychev
Temp. (K) vs. Log(Resistance)

	R Meas. (Ω)	T Meas. (K)	T Eq. (K)	T diff. (mK)
1	6785.400	0.01607	0.01603	0.04
2	6443.200	0.01803	0.01818	-0.14
3	6140.800	0.02011	0.02002	0.09
4	5871.600	0.02230	0.02218	0.12
5	5682.800	0.02397	0.02409	-0.12
6	5526.000	0.02609	0.02595	0.14
7	5354.300	0.02826	0.02825	0.01
8	5238.700	0.02982	0.02996	-0.14
9	5076.040	0.03236	0.03258	-0.23
10	4917.100	0.03556	0.03540	0.16
11	4807.200	0.03763	0.03752	0.11
12	4701.510	0.03972	0.03970	0.03
13	4511.440	0.04374	0.04405	-0.31
14	4368.440	0.04789	0.04779	0.10
15	4239.430	0.05166	0.05160	0.07
16	4100.670	0.05664	0.05627	0.37
17	3907.800	0.06399	0.06403	-0.04
18	3704.120	0.07398	0.07431	-0.34
19	3552.400	0.08358	0.08382	-0.23
20	3393.760	0.09594	0.09594	0.00
21	3229.070	0.11200	0.11163	0.37
22	3093.370	0.12797	0.12773	0.24
23	2968.170	0.14595	0.14600	-0.05
24	2875.730	0.16204	0.16224	-0.20
25	2779.990	0.18207	0.18224	-0.17
26	2692.910	0.20398	0.20399	0.00
27	2605.670	0.23000	0.23006	-0.06
28	2522.800	0.26005	0.25981	0.24
29	2451.820	0.28993	0.29007	-0.14
30	2411.230	0.30998	0.30970	0.28
31	2373.030	0.32998	0.32995	0.03
32	2309.130	0.36778	0.36811	-0.33
33	2238.080	0.41793	0.41782	0.12

Order of Fit = 8 RMS error of fit = 0.19 mK
Largest absolute error = 0.37 mK at data point no. 16



POLYNOMIAL EQUATION

Calibration Report: 555108
Sensor Model: RX-102B-CB-0.02B
Sensor Type: Rox Resistor

Sales Order: 50701
Serial Number: U02453
Temperature Range: 0.02K to 40.0K

Polynomial Type: Chebychev
Useful Range of Fit:

0.330 K to 4.21 K
2373. Ohms to 1527. Ohms

Lower and Upper limits of Log(Resistance) used in computing Chebychev coefficients:
ZL = 3.17551397063 ZU = 3.38948858335

Order	Coefficient	Std. Deviation of Coefficient	Ratio (Coeff./Std Dev.)
0	1.647120	4.4848E-04	3672.66
1	-1.992065	6.9766E-04	-2855.34
2	0.885108	6.5086E-04	1359.91
3	-0.336273	6.5057E-04	-516.89
4	0.113052	6.2435E-04	181.07
5	-0.032739	5.9458E-04	-55.06
6	0.005671	5.7199E-04	9.92

$Z = \text{Log}(\text{Resistance})$

$k = ((Z - ZL) - (ZU - Z)) / (ZU - ZL)$

$\text{Temp. (K)} = \sum A_i \cdot \text{COS}(i \cdot \text{ARCCOS}(k))$, where $0 \leq i \leq 6$
and the A_i 's are the coefficients in the table above.



POLYNOMIAL EQUATION

Calibration Report: 555108

Sensor Model: RX-102B-CB-0.02B

Sensor Type: Rox Resistor

Sales Order: 50701

Serial Number: U02453

Temperature Range: 0.02K to 40.0K

Polynomial Type: Chebychev

Temp. (K) vs. Log(Resistance)

	R Meas. (Ω)	T Meas. (K)	T Eq. (K)	T diff. (mK)
29	2451.820	0.29007	0.28987	0.19
30	2411.230	0.30970	0.30983	-0.13
31	2373.030	0.32995	0.33020	-0.25
32	2309.130	0.36778	0.36803	-0.24
33	2238.080	0.41793	0.41742	0.51
34	2170.000	0.47607	0.47537	0.70
35	2113.010	0.53529	0.53507	0.22
36	2054.340	0.60979	0.61060	-0.80
37	2005.910	0.68498	0.68646	-1.48
38	1963.240	0.76482	0.76581	-0.99
39	1922.460	0.85504	0.85501	0.03
40	1885.790	0.94987	0.94888	0.99
41	1852.770	1.05018	1.04702	3.16
42	1825.270	1.14411	1.14079	3.32
43	1810.020	1.20144	1.19836	3.08
44	1784.875	1.29754	1.30346	-5.92
45	1763.671	1.39959	1.40354	-3.96
46	1728.033	1.59939	1.60085	-1.47
47	1698.417	1.79891	1.79970	-0.80
48	1673.352	1.99946	1.99944	0.02
49	1652.064	2.19878	2.19688	1.91
50	1633.533	2.39834	2.39356	4.78
51	1616.121	2.60434	2.60296	1.38
52	1601.351	2.80092	2.80207	-1.15
53	1588.097	2.99924	2.99974	-0.50
54	1576.106	3.19473	3.19585	-1.13
55	1564.818	3.39581	3.39705	-1.23
56	1554.446	3.59580	3.59744	-1.63
57	1544.940	3.79422	3.79530	-1.08
58	1536.090	3.99366	3.99272	0.94
59	1526.864	4.21333	4.21315	0.18
60	1511.876	4.60831	4.60601	2.30
61	1498.007	5.01106	5.01203	-0.97

Order of Fit = 6

RMS error of fit = 2.01 mK

Largest absolute error = -5.92 mK at data point no. 44



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POLYNOMIAL EQUATION

Calibration Report: 555108
Sensor Model: RX-102B-CB-0.02B
Sensor Type: Rox Resistor

Sales Order: 50701
Serial Number: U02453
Temperature Range: 0.02K to 40.0K

Polynomial Type: Chebychev
Useful Range of Fit:

4.22 K to 40.0 K
1527. Ohms to 1184. Ohms

Lower and Upper limits of Log(Resistance) used in computing Chebychev coefficients:

ZL = 3.06751515602 ZU = 3.18891164814

Order	Coefficient	Std. Deviation of Coefficient	Ratio (Coeff./Std Dev.)
0	18.744547	9.8537E-04	19022.86
1	-19.474411	1.5739E-03	-12372.96
2	5.393362	1.4357E-03	3756.69
3	-1.085942	1.4013E-03	-774.93
4	0.267525	1.3531E-03	197.72
5	-0.047507	1.3326E-03	-35.65
6	0.002563	1.3010E-03	1.97
7	-0.008110	1.2609E-03	-6.43

$Z = \text{Log}(\text{Resistance})$

$k = ((Z - Z_L) - (Z_U - Z)) / (Z_U - Z_L)$

$\text{Temp. (K)} = \sum A_i \cdot \text{COS}(i \cdot \text{ARCCOS}(k))$, where $0 \leq i \leq 7$
and the A_i 's are the coefficients in the table above.



POLYNOMIAL EQUATION

Calibration Report: 555108
Sensor Model: RX-102B-CB-0.02B
Sensor Type: Rox Resistor

Sales Order: 50701
Serial Number: U02453
Temperature Range: 0.02K to 40.0K

Polynomial Type: Chebychev
Temp. (K) vs. Log(Resistance)

	R Meas. (Ω)	T Meas. (K)	T Eq. (K)	T diff. (mK)
57	1544.940	3.79530	3.79203	3.27
58	1536.090	3.99272	3.99540	-2.69
59	1526.864	4.21315	4.21689	-3.73
60	1511.876	4.60831	4.60684	1.47
61	1498.007	5.01106	5.01027	0.79
62	1482.733	5.51291	5.51064	2.27
63	1463.979	6.21574	6.21437	1.36
64	1445.064	7.02942	7.03141	-1.99
65	1424.677	8.04027	8.03986	0.42
66	1406.652	9.04624	9.04872	-2.48
67	1390.463	10.05406	10.05567	-1.61
68	1375.635	11.06904	11.06913	-0.09
69	1362.054	12.08198	12.08131	0.67
70	1349.616	13.08770	13.08597	1.73
71	1338.106	14.09062	14.08863	1.99
72	1327.444	15.08616	15.08643	-0.27
73	1317.604	16.07681	16.07168	5.13
74	1308.310	17.06237	17.06447	-2.10
75	1299.561	18.05192	18.05907	-7.15
76	1291.489	19.03799	19.03247	5.53
77	1283.690	20.02804	20.02807	-0.03
78	1275.618	21.11767	21.11959	-1.92
79	1264.690	22.70883	22.70570	3.13
80	1254.387	24.30995	24.32617	-16.22
81	1245.162	25.90139	25.89106	10.33
82	1236.249	27.51601	27.51527	0.74
83	1228.042	29.12184	29.11807	3.78
84	1219.346	30.93531	30.93897	-3.66
85	1210.048	33.04235	33.04005	2.30
86	1197.947	36.04654	36.04219	4.35
87	1187.045	39.03650	39.04263	-6.13
88	1177.179	42.03443	42.03598	-1.55
89	1168.194	45.02635	45.02397	2.38

Order of Fit = 7 RMS error of fit = 4.46 mK
Largest absolute error = -16.22 mK at data point no. 80



INTERPOLATION TABLE

Calibration Report: 555108
Sensor Model: RX-102B-CB-0.02B
Sensor Type: Rox Resistor

Sales Order: 50701
Serial Number: U02453
Temperature Range: 0.02K to 40.0K

Temp (K)	Res. (Ω)	dR/dT (Ω/K)	dlogR/dlogT	Temp (K)	Res. (Ω)	dR/dT (Ω/K)	dlogR/dlogT
2.000e-2	6143.91	-1.4784e+5	-0.48126	0.5000	2145.11	-968.65	-0.22578
2.200e-2	5891.13	-1.0982e+5	-0.41011	0.5500	2100.38	-827.23	-0.21662
2.400e-2	5691.31	-91238.	-0.38475	0.6000	2061.85	-718.72	-0.20915
2.600e-2	5521.92	-79130.	-0.37259	0.6500	2028.10	-634.55	-0.20337
2.800e-2	5372.12	-71085.	-0.37050	0.7000	1998.12	-567.02	-0.19864
3.000e-2	5236.16	-65132.	-0.37317	0.7500	1971.20	-511.42	-0.19459
3.200e-2	5110.81	-60363.	-0.37795	0.8000	1946.82	-465.09	-0.19112
3.400e-2	4994.20	-56336.	-0.38353	0.8500	1924.58	-425.43	-0.18789
3.600e-2	4885.18	-52740.	-0.38865	0.9000	1904.18	-391.27	-0.18493
3.800e-2	4783.05	-49434.	-0.39274	0.9500	1885.39	-361.35	-0.18207
4.000e-2	4687.31	-46339.	-0.39544	1.000	1867.99	-334.96	-0.17931
4.200e-2	4597.57	-43427.	-0.39671	1.050	1851.84	-311.50	-0.17662
4.400e-2	4513.49	-40685.	-0.39662	1.100	1836.80	-290.52	-0.17398
4.600e-2	4434.72	-38116.	-0.39537	1.150	1822.75	-271.66	-0.17140
4.800e-2	4360.91	-35725.	-0.39323	1.200	1809.60	-254.67	-0.16888
5.000e-2	4291.70	-33512.	-0.39043	1.300	1785.65	-225.26	-0.16399
5.500e-2	4136.53	-28728.	-0.38197	1.400	1764.38	-200.93	-0.15943
6.000e-2	4002.83	-24891.	-0.37310	1.500	1745.34	-180.51	-0.15514
6.500e-2	3886.33	-21827.	-0.36507	1.600	1728.17	-163.27	-0.15116
7.000e-2	3783.62	-19340.	-0.35780	1.700	1712.59	-148.64	-0.14754
7.500e-2	3692.16	-17315.	-0.35172	1.800	1698.38	-136.06	-0.14420
8.000e-2	3609.91	-15634.	-0.34647	1.900	1685.32	-125.21	-0.14116
8.500e-2	3535.37	-14223.	-0.34196	2.000	1673.29	-115.77	-0.13838
9.000e-2	3467.35	-13014.	-0.33780	2.100	1662.13	-107.52	-0.13584
9.500e-2	3404.95	-11973.	-0.33406	2.200	1651.75	-100.25	-0.13352
0.1000	3347.38	-11072.	-0.33076	2.300	1642.05	-93.816	-0.13141
0.1100	3244.51	-9563.7	-0.32424	2.400	1632.96	-88.092	-0.12947
0.1200	3155.04	-8371.5	-0.31840	2.500	1624.42	-82.970	-0.12769
0.1300	3076.34	-7401.2	-0.31276	2.600	1616.35	-78.366	-0.12606
0.1400	3006.47	-6596.8	-0.30719	2.700	1608.73	-74.217	-0.12456
0.1500	2943.96	-5926.4	-0.30196	2.800	1601.50	-70.453	-0.12318
0.1600	2887.61	-5358.4	-0.29691	2.900	1594.62	-67.031	-0.12190
0.1700	2836.50	-4874.7	-0.29216	3.000	1588.08	-63.907	-0.12073
0.1800	2789.89	-4457.9	-0.28762	3.100	1581.83	-61.046	-0.11963
0.1900	2747.15	-4098.7	-0.28348	3.200	1575.86	-58.414	-0.11862
0.2000	2707.77	-3784.7	-0.27954	3.300	1570.14	-55.992	-0.11768
0.2100	2671.32	-3510.9	-0.27600	3.400	1564.66	-53.762	-0.11683
0.2200	2637.45	-3268.5	-0.27264	3.500	1559.39	-51.684	-0.11600
0.2300	2605.85	-3055.1	-0.26965	3.600	1554.32	-49.722	-0.11516
0.2400	2576.27	-2865.3	-0.26693	3.700	1549.44	-47.942	-0.11448
0.2500	2548.49	-2694.1	-0.26429	3.800	1544.72	-46.402	-0.11415
0.2600	2522.33	-2540.6	-0.26188	3.900	1540.16	-44.777	-0.11338
0.2700	2497.62	-2403.1	-0.25979	4.000	1535.78	-42.803	-0.11148
0.2800	2474.21	-2280.4	-0.25807	4.200	1527.54	-40.050	-0.11012
0.2900	2451.96	-2171.8	-0.25687	4.400	1519.66	-38.638	-0.11187
0.3000	2430.77	-2066.8	-0.25508	4.600	1512.13	-36.606	-0.11136
0.3200	2391.61	-1857.7	-0.24856	4.800	1505.03	-34.404	-0.10972
0.3400	2355.73	-1740.7	-0.25123	5.000	1498.34	-32.550	-0.10862
0.3600	2322.01	-1628.7	-0.25251	5.200	1491.99	-30.947	-0.10786
0.3800	2290.64	-1508.4	-0.25024	5.400	1485.95	-29.482	-0.10714
0.4000	2261.61	-1396.4	-0.24697	5.600	1480.19	-28.150	-0.10650
0.4200	2234.73	-1293.7	-0.24314	5.800	1474.69	-26.941	-0.10596
0.4400	2209.81	-1200.0	-0.23893	6.000	1469.41	-25.852	-0.10556
0.4600	2186.67	-1114.8	-0.23452	6.500	1457.07	-23.592	-0.10524
0.4800	2165.16	-1037.8	-0.23008	7.000	1445.75	-21.769	-0.10540



INTERPOLATION TABLE

Calibration Report: 555108

Sensor Model: RX-102B-CB-0.02B

Sensor Type: Rox Resistor

Sales Order: 50701

Serial Number: U02453

Temperature Range: 0.02K to 40.0K

<u>Temp (K)</u>	<u>Res. (Ω)</u>	<u>dR/dT (Ω/K)</u>	<u>dlogR/dlogT</u>	<u>Temp (K)</u>	<u>Res. (Ω)</u>	<u>dR/dT (Ω/K)</u>	<u>dlogR/dlogT</u>
7.500	1435.24	-20.275	-0.10595	20.00	1283.90	-7.6290	-0.11884
8.000	1425.43	-19.012	-0.10670	21.00	1276.48	-7.2248	-0.11886
8.500	1416.20	-17.934	-0.10764	22.00	1269.44	-6.8559	-0.11882
9.000	1407.48	-16.985	-0.10861	23.00	1262.76	-6.5184	-0.11873
9.500	1399.20	-16.146	-0.10962	24.00	1256.40	-6.2082	-0.11859
10.00	1391.32	-15.389	-0.11061	25.00	1250.33	-5.9227	-0.11842
10.50	1383.80	-14.703	-0.11156	26.00	1244.54	-5.6589	-0.11822
11.00	1376.61	-14.074	-0.11246	27.00	1239.01	-5.4145	-0.11799
11.50	1369.72	-13.494	-0.11330	28.00	1233.71	-5.1877	-0.11774
12.00	1363.10	-12.956	-0.11406	29.00	1228.63	-4.9763	-0.11746
12.50	1356.75	-12.456	-0.11476	30.00	1223.75	-4.7792	-0.11716
13.00	1350.64	-11.987	-0.11538	31.00	1219.07	-4.5947	-0.11684
13.50	1344.76	-11.549	-0.11594	32.00	1214.56	-4.4218	-0.11650
14.00	1339.09	-11.136	-0.11643	33.00	1210.22	-4.2594	-0.11615
14.50	1333.62	-10.748	-0.11686	34.00	1206.04	-4.1067	-0.11577
15.00	1328.34	-10.382	-0.11724	35.00	1202.00	-3.9624	-0.11538
15.50	1323.23	-10.036	-0.11756	36.00	1198.11	-3.8264	-0.11497
16.00	1318.30	-9.7094	-0.11784	37.00	1194.35	-3.6979	-0.11456
16.50	1313.52	-9.3999	-0.11808	38.00	1190.71	-3.5760	-0.11412
17.00	1308.90	-9.1064	-0.11827	39.00	1187.19	-3.4607	-0.11369
17.50	1304.41	-8.8281	-0.11844	40.00	1183.79	-3.3512	-0.11324
18.00	1300.07	-8.5637	-0.11857				
18.50	1295.85	-8.3125	-0.11867				
19.00	1291.75	-8.0735	-0.11875				
19.50	1287.77	-7.8459	-0.11881				



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THERMAL CYCLE TESTING

Sensor Model: RX-102B-CB-0.02B

Serial Number: U02453

Sensor Type: Rox Resistor

This sensor was tested for repeatability through rapid thermal cycles from room temperature into liquid helium. During this test, the following four lead resistance values were recorded:

Approximately 305 K:	1010 Ω
Liquid Nitrogen:	1105 Ω
Liquid Helium:	1528 Ω

The nitrogen and helium values were recorded in OPEN dewars, so precision comparisons with calibration values or other thermal cycle test values should not be made.

Recommended Operating Parameters:

For sensors calibrated by LSCI, the current to the sensor is adjusted to maintain the sensor output voltage or power at the values listed on the Test Data page.



BREAKPOINTS 340 FORMAT

Calibration Report: 555108

Sensor Model: RX-102B-CB-0.02B

Sensor Type: Rox Resistor

Sales Order: 50701

Serial Number: U02453

Temperature Range: 0.02K to 40.0K

Name: RX-102B-CB-0.02B

Serial number: U02453

Format: 4 ;Log Ohms/Kelvin

Limit: 40.0

Coefficient: 1 ;Negative

Point 1: 3.07326, 40.000
Point 2: 3.07592, 37.900
Point 3: 3.07862, 35.900
Point 4: 3.08135, 34.000
Point 5: 3.08425, 32.100

Point 6: 3.08734, 30.200
Point 7: 3.09047, 28.400
Point 8: 3.09363, 26.700
Point 9: 3.09701, 25.000
Point 10: 3.10063, 23.300

Point 11: 3.10430, 21.700
Point 12: 3.10825, 20.100
Point 13: 3.10853, 20.000
Point 14: 3.11010, 19.400
Point 15: 3.11199, 18.700

Point 16: 3.11382, 18.050
Point 17: 3.11570, 17.400
Point 18: 3.11766, 16.750
Point 19: 3.11969, 16.100
Point 20: 3.12180, 15.450

Point 21: 3.12399, 14.800
Point 22: 3.12609, 14.200
Point 23: 3.12827, 13.600
Point 24: 3.13053, 13.000
Point 25: 3.13289, 12.400

Point 26: 3.13535, 11.800
Point 27: 3.13770, 11.250
Point 28: 3.14015, 10.700
Point 29: 3.14270, 10.150
Point 30: 3.14537, 9.600

Point 31: 3.14791, 9.100
Point 32: 3.15057, 8.600
Point 33: 3.15336, 8.100
Point 34: 3.15600, 7.650
Point 35: 3.15879, 7.200

Point 36: 3.16141, 6.800
Point 37: 3.16418, 6.400
Point 38: 3.16728, 5.980
Point 39: 3.17014, 5.620
Point 40: 3.17304, 5.280

Point 41: 3.17597, 4.960
Point 42: 3.17894, 4.660
Point 43: 3.18239, 4.340
Point 44: 3.18607, 4.020
Point 45: 3.18845, 3.830

Point 46: 3.19111, 3.630
Point 47: 3.19367, 3.450
Point 48: 3.19639, 3.270
Point 49: 3.19915, 3.100
Point 50: 3.20210, 2.930

Point 51: 3.20509, 2.770
Point 52: 3.20810, 2.620
Point 53: 3.21135, 2.470
Point 54: 3.21487, 2.320
Point 55: 3.21845, 2.180

Point 56: 3.22207, 2.050
Point 57: 3.22601, 1.920
Point 58: 3.23035, 1.790
Point 59: 3.23477, 1.670
Point 60: 3.23964, 1.550

Point 61: 3.24461, 1.440
Point 62: 3.25013, 1.330
Point 63: 3.25632, 1.220
Point 64: 3.25914, 1.175
Point 65: 3.26137, 1.140

Point 66: 3.26439, 1.095
Point 67: 3.26759, 1.050
Point 68: 3.27097, 1.005
Point 69: 3.27456, 0.960
Point 70: 3.27794, 0.920

Point 71: 3.28150, 0.880
Point 72: 3.28529, 0.840
Point 73: 3.28931, 0.800
Point 74: 3.29359, 0.760
Point 75: 3.29759, 0.725

Point 76: 3.30184, 0.690
Point 77: 3.30639, 0.655
Point 78: 3.31127, 0.620
Point 79: 3.31654, 0.585
Point 80: 3.32143, 0.555

Point 81: 3.32669, 0.525
Point 82: 3.33143, 0.500
Point 83: 3.33547, 0.480
Point 84: 3.33976, 0.460
Point 85: 3.34433, 0.440

Point 86: 3.34920, 0.420
Point 87: 3.35439, 0.400
Point 88: 3.35993, 0.380
Point 89: 3.36584, 0.360
Point 90: 3.37274, 0.338

Point 91: 3.37934, 0.318
Point 92: 3.38497, 0.302
Point 93: 3.39142, 0.285
Point 94: 3.39832, 0.268
Point 95: 3.40533, 0.252

Point 96: 3.41241, 0.237
Point 97: 3.42006, 0.222
Point 98: 3.42783, 0.208
Point 99: 3.43626, 0.194
Point 100: 3.44484, 0.181

Point 101: 3.45421, 0.168
Point 102: 3.46375, 0.156
Point 103: 3.47423, 0.144
Point 104: 3.48586, 0.132
Point 105: 3.49776, 0.121

Point 106: 3.51102, 0.110
Point 107: 3.52602, 0.099
Point 108: 3.54067, 0.090
Point 109: 3.55639, 0.081
Point 110: 3.57335, 0.072

Point 111: 3.59178, 0.064
Point 112: 3.61193, 0.057
Point 113: 3.63405, 0.050
Point 114: 3.66013, 0.043
Point 115: 3.69316, 0.035

Point 116: 3.72961, 0.028
Point 117: 3.76172, 0.023
Point 118: 3.78785, 0.020



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BREAKPOINTS 234 FORMAT

Calibration Report: 555108

Sensor Model: RX-102B-CB-0.02B

Sensor Type: Rox Resistor

Sales Order: 50701

Serial Number: U02453

Temperature Range: 0.02K to 40.0K

Maximum Temperature Error:

1.4 - 10K: 0.302K

10 - 20K: 1.041K

20 - 40K: 0.747K

40 - 100K: -

> 100K: -

<u>BP #</u>	<u>Temp. (K)</u>	<u>Res. (Ω)</u>	<u>Log10 Res.</u>	<u>BP #</u>	<u>Temp. (K)</u>	<u>Res. (Ω)</u>	<u>Log10 Res.</u>
1	34.936	1202.264	3.080	11	0.138	3019.952	3.480
2	16.005	1318.257	3.120	12	0.103	3311.311	3.520
3	7.014	1445.440	3.160	13	0.079	3630.781	3.560
4	3.051	1584.893	3.200	14	0.061	3981.072	3.600
5	1.543	1737.801	3.240	15	0.048	4365.158	3.640
6	0.897	1905.461	3.280	16	0.038	4786.301	3.680
7	0.564	2089.296	3.320	17	0.030	5248.075	3.720
8	0.380	2290.868	3.360	18	0.023	5754.399	3.760
9	0.264	2511.886	3.400	19	0.019	6309.573	3.800
10	0.188	2754.229	3.440				



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