

2. REFERENCE

This section contains tables, equations and general reference information frequently required by data acquisition engineers and in particular those in the aerospace industry.

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PHYSICAL UNITS AND CONVERSIONS

Decimal prefixes

10^1	deca	da
10^2	hecto	h
10^3	kilo	k
10^6	mega	M
10^9	giga	G
10^{12}	tera	T
10^{15}	peta	P
10^{18}	exa	E

10^{-1}	deci	d
10^{-2}	centi	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

Note: ACRA CONTROL use an upper case K for 1024 (for example KBytes). Unless otherwise stated MByte means 1048576 Bytes.

Units of length

The metric or International System (SI) unit of length is a meter (m)

1 kilometer	1km	= 1000m
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Some conversions from Anglo-American units are

1 foot	1ft	= 30.48cm	
1 inch	1in or 1"	= 2.54cm	= 25.4mm
1 English mile	1M	= 1609m	= 1.6km
1 Nautical mile	1knot	= 1852m	= 1.9km
1 mil	10^{-3} in	= 25.4mm	

Units of temperature

There are four popular units of temperature Celsius, Fahrenheit, Kelvin and Rankine. The conversion formulae to and from Celsius (sometimes called centigrade) are:

Kelvin	Celsius + 273.15	Celsius = Kelvin - 273.15
Rankine	(Celsius + 273.15) x 9/5	Celsius = (Rankine x 5/9) - 273.15
Fahrenheit	(Celsius x 9/5) + 32	Celsius = (Fahrenheit-32) x 5/9

Some examples are:

	Celsius	Fahrenheit	Kelvin	Rankine
Absolute zero	-273.15°C	-459.67°F	0K	0 Rank
Melting point of water	0°C	32°F	273.15K	491.67 Rank
Boiling point of water	100°C	212°F	373.15K	671.67 Rank

BITS, COUNTS, AND NOISE

An analog to digital converter (A/D) with one bit can count 0 to 1. In general the number of counts of an n -bit A/D is given by:

$$\text{Counts} = 2^n$$

For the 1-bit A/D, each count value represents 50% of the span of the A/D. In general for an n -bit A/D, each count represents the following percentage of the span:

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$$\% = \frac{100}{\text{Counts}} = 100 \cdot 2^{-n}$$

Similarly the resolution of an A/D, in parts per million (ppm), can be calculated using:

$$\text{ppm} = 10^6 \cdot 2^{-n}$$

The dynamic range of an A/D can be calculated using the following formula:

$$\text{Range}_{\text{dB}} = 20 \cdot \log_{10}\left(\frac{\text{resolution}}{\text{span}}\right) = 20 \cdot \log_{10}(2^{-n}) \approx -6.02 \cdot n$$

Assuming every value is equally likely to appear at the input to the A/D, the quantization error is between $\pm r/2$. The square of the error is between 0 and $r^2/4$, the average value of which is $r^2/12$. The root of the average value of the error squared is $r/\text{square root } 12$.

For example, a 12-bit A/D with an input range of $\pm 10\text{V}$ has a resolution of 4.882mv and a quantization noise of 1.407Vrms. The maximum signal to the A/D is $\pm 10\text{V}$, so the signal-to-noise ratio for the 12-bit A/D is:

$$-20 \cdot \log\left(\frac{10}{1.407}\right) = -77.03 \text{ dB}$$

Bits	Counts	%	Ppm	Dynamic range (dB)	Signal/Noise (dB)
1	2	50.00	500,000.0	-6.02	10.79
2	4	25.00	250,000.0	-12.04	16.81
3	8	12.50	125,000.0	-18.06	22.83
4	16	6.25	62,500.0	-24.08	28.85
5	32	3.13	31,250.0	-30.10	34.87
6	64	1.56	15,625.0	-36.12	40.89
7	128	0.78	7,812.5	-42.14	46.91
8	256	0.39	3,906.2	-48.16	52.93
9	512	0.20	1,953.1	-54.19	58.95
10	1024	0.10	976.6	-60.21	64.97
11	2048	0.05	488.3	-66.23	70.99
12	4096	0.02	244.1	-72.25	77.01
13	8192	0.01	122.1	-78.27	83.03
14	16384	0.01	61.0	-84.29	89.05
15	32768		30.5	-90.31	95.07
16	65536		15.3	-96.33	101.09
17	131072		7.6	-102.35	107.11
18	262144		3.8	-108.37	113.13
19	524288		1.9	-114.39	119.15
20	1048576		1.0	-120.41	125.17
21	2097152		0.5	-126.43	131.19
22	4194304		0.2	-132.45	137.21
23	8388608		0.1	-138.47	143.23
24	16777216		0.1	-144.49	149.25

Reference: "INFORMATION TRANSMISSION MODULATION AND NOISE"

Mischa Schwartz; McGraw-Hill International Editions

NUMBERS AND FORMATS

The table below illustrates how hexadecimal, octal and binary coded decimal digits are represented in binary. It also lists (for completeness only) the first 16 Gray codes.

Binary (Bin)	Hexadecimal (Hex)	Binary Coded Decimal (BCD)	Octal (Oct)	Gray code
0	0	0	0	0000
1	1	1	1	0001
10	2	2	2	0011
11	3	3	3	0010
100	4	4	4	0110
101	5	5	5	0111
110	6	6	6	0101
111	7	7	7	0100
1000	8	8		1100
1001	9	9		1101
1010	A			1111
1011	B			1110
1100	C			1010
1101	D			1011
1110	E			1001
1111	F			1000

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For example, the number 365 (decimal) can be written in the following ways:

BCD	365	⇒	11	0110	0101
HEX	16D	⇒	1	0110	1101
OCT	555	⇒	101	101	101

Note: For large numbers BCD requires more bits.

To convert Hex or Oct to binary convert each digit using the table above.

To convert from binary to Hex (Oct) start at the least significant bits (LSBs) to the left and arrange them in groups of four (three) and use the table above.

There are three popular ways of representing negative numbers as illustrated below for a four-bit analog-to-digital converter with a $\pm 8V$ input range:

Voltage In	Sign plus magnitude	Offset Binary	2's complement
+7	+ 111	1111	0111
+6	+ 110	1110	0110
+5	+ 101	1101	0101
+4	+ 100	1100	0100
+3	+ 011	1011	0011
+2	+ 010	1010	0010
+1	+ 001	1001	0001
+0	\pm 000	1000	0000
-1	- 001	0111	1111
-2	- 010	0110	1110
-3	- 011	0101	1101
-4	- 100	0100	1100
-5	- 101	0011	1011
-6	- 110	0010	1010
-7	- 111	0001	1001
-8	N/A	0000	1000

Note: Offset Binary starts at the lower end of the range and counts from there. As such it can readily be used for non-symmetrical ranges.
 To convert from offset binary to 2's complement (or vice versa), invert the most significant bit (MSB).
 To convert from binary to 1's complement invert each bit.

PCM CODES

At first glance it may appear that representing a logic 1 with one level and a logic 0 with another would be as good a way as any to transmit data (this is called NRZ-L and is illustrated below). However unless a clock is also transmitted there may be problems with transmitting long patterns of 1s (or 0s).

For example, if due to Doppler effects or oscillator drift there is a 10% uncertainty, the receiver cannot be sure if it has received 9, 10 or 11 consecutive bits. Also long patterns of 1s (or 0s) may appear as a dc signal, which may be difficult to retrieve from a tape recorder.

One popular solution is to ensure a transition in the center of each bit (such as with BI ϕ -L below). However this requires extra bandwidth in the data channel.

Another popular method is to try to ensure a continuous pattern is unlikely to occur using a "randomizer" circuit as illustrated for RNRZ-L below. However this means that one bit received incorrectly may cause three bits to be decoded incorrectly

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RZ	Return to Zero 1 \Rightarrow level 1 for the first half of the bit only 0 \Rightarrow level 0 throughout the bit	
RNRZ-L x 4	Random Non-Return to Zero-Level 	
BI ϕ -L	Bi-Phase-Level 1 \Rightarrow change from level 1 to level 0 at the center of a bit 0 \Rightarrow change from level 0 to level 1 at the center of a bit	
BI ϕ -M (before 1996)	Bi-phase - Mark 1 \Rightarrow change of level at the start and in the center of the bit 0 \Rightarrow change of level at the start of the bit only	
BI ϕ -S (before 1996)*	Bi-phase - Space 1 \Rightarrow change of level at the start of the bit only 0 \Rightarrow change of level at the start and in the center of the bit	
DBI ϕ -M (before 1996) BI ϕ -S (after 1996)*	Differential Bi-phase - Mark (before 1996) Bi-phase - Space (after 1996) 1 \Rightarrow change of level at the center of the bit only 0 \Rightarrow change of level at the center and at the start of the bit	
DBI ϕ -S (before 1996) BI ϕ -M (after 1996)*	Differential Bi-phase - Space (before 1996) Bi-phase - Mark (after 1996) 1 \Rightarrow change of level at the center and at the start of the bit 0 \Rightarrow change of level at the center of the bit only	
DM-M	Delay modulation - Mark** 1 \Rightarrow change of level at the center of the bit 0 \Rightarrow change of level at the start of the bit if the previous bit was 0	
DM-S	Delay Modulation - Space** 1 \Rightarrow change of level at the start of the bit if the previous bit was 1 0 \Rightarrow change of level at the center of the bit	

*Care must be taken with BI ϕ -M(S) and DBI ϕ -S(M). In the 1996 and 1993 versions of IRIG-106 both pairs of codes were included. However after 1996 DBI ϕ -M is to be referred to as BI ϕ -S and DBI ϕ -S is to be referred to as BI ϕ -M.

**Delay modulation is sometimes referred to as Miller Code

FRAME SYNCHRONIZATION PATTERNS

In Pulse Code Modulation (PCM) systems a pattern is often used to identify the occurrence of a frame.

In particular with IRIG-106-Ch. 4, a SYNCWORD appears at the start of every MINOR frame.

At first glance, it may appear that for a given number of bits one pattern is as likely to occur as any other. However if the link is open all 1s (or 0s) might be received or in the presence of oscillations or "non-zero memory" patterns may repeat for example "00110011" or "00010001".

The problem of finding optimum patterns in noisy "non-zero memory" systems was addressed by Barker and the following patterns are sometimes referred to as "Barker Codes".

LENGTH	CODE (Bin)	CODE (Hex)
7	101 1000	58
8	1011 1000	B8
9	1 0111 0000	170
10	11 0111 0000	370
11	101 1011 1000	5B8
12	1101 0110 0000	D60
13	1 1101 0110 0000	1D60
14	11 1001 1010 0000	39A0
15	111 0110 0101 0000	7650
16	1110 1011 1001 0000	EB90
17	1 1110 0110 1010 0000	1 E6A0
18	11 1100 1101 0100 0000	3 CD40
19	111 1100 1100 1010 0000	7 CCA0
20	1110 1101 1110 0010 0000	E DE20
21	1 1101 1101 0010 1100 0000	1D D2C0
22	11 1100 1101 1010 1000 0000	3C DA80
23	111 1010 1110 0110 1000 0000	7A E680
24	1111 1010 1111 0011 0010 0000	FA F320
25	1 1111 0010 1101 1100 0100 0000	1F2 DC40
26	11 1110 1001 1010 1100 1100 0000	3E9 ACC0
27	111 1101 0110 1001 1001 1000 0000	7D6 9980
28	1111 0101 1110 0101 1001 1000 0000	F5E 5980
29	1 1110 1011 1100 1100 1101 0000 0000	1EBC CD00
30	11 1101 1011 1100 1100 1101 0000 0000	3DBC CD00
31	111 1111 0011 0111 1101 0100 0010 0000	7F37 D420
32	1111 1110 0110 1011 0010 1000 0100 0000	F E6B2 840
33	1 1111 0111 0100 1110 1001 0100 1001 1000	1 F74E 9498

Note: The convention followed by ACRA CONTROL as default is that the leftmost bit is the first transmitted bit.

100Ω SHUNT RESISTOR TABLE (TRADITIONAL VALUES)

The shunt values in this table are those most commonly used for strain gage calibration. However the output voltage versus $\mu\Omega/\Omega$ response is non-linear. With today's acquisition systems (better than 10-bit resolution) pseudo errors appear. The values are given here for completeness only. The linear-response values on the next page are those recommended by ACRA CONTROL (see *TEC/NOT/002*).

How to use the table: 90809.10Ω is the shunt resistance required to produce a 1100 $\mu\Omega/\Omega$ deflection.

$\mu\Omega/\Omega$	+0	+100	+200	+300	+400	+500	+600	+700	+800	+900
0	*open*	999900.00	499900.00	333233.00	249900.00	199900.00	166567.00	142757.00	124900.00	111011.00
1000	99900.00	90809.10	83233.30	76823.10	71328.60	66566.70	62400.00	58723.50	55455.60	52531.60
2000	49900.00	47519.00	45354.50	43378.30	41566.70	39900.00	38361.50	36937.00	35614.30	34382.80
3000	33233.30	32158.10	31150.00	30203.00	29311.80	28471.40	27677.80	26927.00	26215.80	25541.00
4000	24900.00	24290.20	23709.50	23155.80	22627.30	22122.20	21639.10	21176.60	20733.30	20308.20
5000	19900.00	19507.80	19130.80	18767.90	18418.50	18081.80	17757.10	17443.90	17141.40	16849.20
6000	16566.70	16293.40	16029.00	15773.00	15525.00	15284.60	15051.50	14825.40	14605.90	14392.80
7000	14185.70	13984.50	13788.90	13598.60	13413.50	13233.30	13057.90	12887.00	12720.50	12558.20
8000	12400.00	12245.70	12095.10	11948.20	11804.80	11664.70	11527.90	11394.30	11263.60	11136.00
9000	11011.10	10889.00	10769.60	10652.70	10538.30	10426.30	10316.70	10209.30	10104.10	10001.00
10000	9900.00	9800.99	9703.92	9608.74	9515.38	9423.81	9333.96	9245.79	9159.26	9074.31
11000	8990.91	8909.01	8828.57	8749.56	8671.93	8595.65	8520.69	8447.01	8374.58	8303.36
12000	8233.33	8164.46	8096.72	8030.08	7964.52	7900.00	7836.51	7774.02	7712.50	7651.94
13000	7592.31	7533.59	7475.76	7418.80	7362.69	7307.41	7252.94	7199.27	7146.38	7094.24
14000	7042.86	6992.20	6942.25	6893.01	6844.44	6796.55	6749.32	6702.72	6656.76	6611.41
15000	6566.67	6522.52	6478.95	6435.95	6393.51	6351.61	6310.26	6269.43	6229.11	6189.31
16000	6150.00	6111.18	6072.84	6034.97	5997.56	5960.61	5924.10	5888.02	5852.38	5817.16
17000	5782.35	5747.95	5713.95	5680.35	5647.13	5614.29	5581.82	5549.72	5517.98	5486.59
18000	5455.56	5424.86	5394.51	5364.48	5334.78	5305.41	5276.34	5247.59	5219.15	5191.01
19000	5163.16	5135.60	5108.33	5081.35	5054.64	5028.21	5002.04	4976.14	4950.51	4925.13
20000	4900.00	4875.12	4850.50	4826.11	4801.96	4778.05	4754.37	4730.92	4707.69	4684.69
21000	4661.90	4639.34	4616.98	4594.84	4572.90	4551.16	4529.63	4508.29	4487.16	4466.21
22000	4445.45	4424.89	4404.50	4384.30	4364.29	4344.44	4324.78	4305.29	4285.96	4266.81
23000	4247.83	4229.00	4210.34	4191.85	4173.50	4155.32	4137.29	4119.41	4101.68	4084.10
24000	4066.67	4049.38	4032.23	4015.23	3998.36	3981.63	3965.04	3948.58	3932.26	3916.06
25000	3900.00	3884.06	3868.25	3852.57	3837.01	3821.57	3806.25	3791.05	3775.97	3761.00
26000	3746.15	3731.42	3716.79	3702.28	3687.88	3673.58	3659.40	3645.32	3631.34	3617.47
27000	3603.70	3590.04	3576.47	3563.00	3549.64	3536.36	3523.19	3510.11	3497.12	3484.23
28000	3471.43	3458.72	3446.10	3433.57	3421.13	3408.77	3396.50	3384.32	3372.22	3360.21
29000	3348.28	3336.43	3324.66	3312.97	3301.36	3289.83	3278.38	3267.00	3255.70	3244.48
30000	3233.33	3222.26	3211.26	3200.33	3189.47	3178.69	3167.97	3157.33	3146.75	3136.25
31000	3125.81	3115.43	3105.13	3094.89	3084.71	3074.60	3064.56	3054.57	3044.65	3034.80
32000	3025.00	3015.26	3005.59	2995.98	2986.42	2976.92	2967.48	2958.10	2948.78	2939.51
33000	2930.30	2921.15	2912.05	2903.00	2894.01	2885.07	2876.19	2867.36	2858.58	2849.85
34000	2841.18	2832.55	2823.98	2815.45	2806.98	2798.55	2790.17	2781.84	2773.56	2765.33
35000	2757.14	2749.00	2740.91	2732.86	2724.86	2716.90	2708.99	2701.12	2693.30	2685.52
36000	2677.78	2670.08	2662.43	2654.82	2647.25	2639.73	2632.24	2624.80	2617.39	2610.03
37000	2602.70	2595.42	2588.17	2580.97	2573.80	2566.67	2559.57	2552.52	2545.50	2538.52
38000	2531.58	2524.67	2517.80	2510.97	2504.17	2497.40	2490.67	2483.98	2477.32	2470.69
39000	2464.10	2457.54	2451.02	2444.53	2438.07	2431.65	2425.25	2418.89	2412.56	2406.27
40000	2400.00	2393.77	2387.56	2381.39	2375.25	2369.14	2363.05	2357.00	2350.98	2344.99
41000	2339.02	2333.09	2327.18	2321.31	2315.46	2309.64	2303.85	2298.08	2292.34	2286.63
42000	2280.95	2275.30	2269.67	2264.07	2258.49	2252.94	2247.42	2241.92	2236.45	2231.00
43000	2225.58	2220.19	2214.81	2209.47	2204.15	2198.85	2193.58	2188.33	2183.11	2177.90
44000	2172.73	2167.57	2162.44	2157.34	2152.25	2147.19	2142.15	2137.14	2132.14	2127.17
45000	2122.22	2117.29	2112.39	2107.51	2102.64	2097.80	2092.98	2088.18	2083.41	2078.65
46000	2073.91	2069.20	2064.50	2059.83	2055.17	2050.54	2045.92	2041.33	2036.75	2032.20
47000	2027.66	2023.14	2018.64	2014.16	2009.70	2005.26	2000.84	1996.44	1992.05	1987.68
48000	1983.33	1979.00	1974.69	1970.39	1966.12	1961.86	1957.61	1953.39	1949.18	1944.99
49000	1940.82	1936.66	1932.52	1928.40	1924.29	1920.20	1916.13	1912.07	1908.03	1904.01
50000	1900.00	1896.01	1892.03	1888.07	1884.13	1880.20	1876.28	1872.39	1868.50	1864.64
51000	1860.78	1856.95	1853.13	1849.32	1845.53	1841.75	1837.98	1834.24	1830.50	1826.78
52000	1823.08	1819.39	1815.71	1812.05	1808.40	1804.76	1801.14	1797.53	1793.94	1790.36
53000	1786.79	1783.24	1779.70	1776.17	1772.66	1769.16	1765.67	1762.20	1758.74	1755.29
54000	1751.85	1748.43	1745.02	1741.62	1738.24	1734.86	1731.50	1728.15	1724.82	1721.49
55000	1718.18	1714.88	1711.59	1708.32	1705.05	1701.80	1698.56	1695.33	1692.11	1688.91
56000	1685.71	1682.53	1679.36	1676.20	1673.05	1669.91	1666.78	1663.67	1660.56	1657.47
57000	1654.39	1651.31	1648.25	1645.20	1642.16	1639.13	1636.11	1633.10	1630.10	1627.12
58000	1624.14	1621.17	1618.21	1615.27	1612.33	1609.40	1606.48	1603.58	1600.68	1597.79
59000	1594.92	1592.05	1589.19	1586.34	1583.50	1580.67	1577.85	1575.04	1572.24	1569.45

100Ω SHUNT RESISTOR TABLE (LINEAR RESPONSE)

The shunt values in this table produce a linear response (output voltage versus $\mu\Omega/\Omega$) and as such are the values recommended by ACRA CONTROL (see *TEC/NOT/002*).

How to use the table: 90859.10Ω is the shunt resistance required to produce a 1100 $\mu\Omega/\Omega$ deflection.

$\mu\Omega/\Omega$	+0	+100	+200	+300	+400	+500	+600	+700	+800	+900
0	*open*	999950.00	499950.00	333283.00	249950.00	199950.00	166617.00	142807.00	124950.00	111061.00
1000	99950.00	90859.10	83283.30	76873.10	71378.60	66616.70	62450.00	58773.50	55505.60	52581.60
2000	49950.00	47569.00	45404.50	43428.30	41616.70	39950.00	38411.50	36987.00	35664.30	34432.80
3000	33283.30	32208.10	31200.00	30253.00	29361.80	28521.40	27727.80	26977.00	26265.80	25591.00
4000	24950.00	24340.20	23759.50	23205.80	22677.30	22172.20	21689.10	21226.60	20783.30	20358.20
5000	19950.00	19557.80	19180.80	18817.90	18468.50	18131.80	17807.10	17493.90	17191.40	16899.20
6000	16616.70	16343.40	16079.00	15823.00	15575.00	15334.60	15101.50	14875.40	14655.90	14442.80
7000	14235.70	14034.50	13838.90	13648.60	13463.50	13283.30	13107.90	12937.00	12770.50	12608.20
8000	12450.00	12295.70	12145.10	11998.20	11854.80	11714.70	11577.90	11444.30	11313.60	11186.00
9000	11061.10	10939.00	10819.60	10702.70	10588.30	10476.30	10366.70	10259.30	10154.10	10051.00
10000	9950.00	9850.99	9753.92	9658.74	9565.38	9473.81	9383.96	9295.79	9209.26	9124.31
11000	9040.91	8959.01	8878.57	8799.56	8721.93	8645.65	8570.69	8497.01	8424.58	8353.36
12000	8283.33	8214.46	8146.72	8080.08	8014.52	7950.00	7886.51	7824.02	7762.50	7701.94
13000	7642.31	7583.59	7525.76	7468.80	7412.69	7357.41	7302.94	7249.27	7196.38	7144.24
14000	7092.86	7042.20	6992.25	6943.01	6894.44	6846.55	6799.32	6752.72	6706.76	6661.41
15000	6616.67	6572.52	6528.95	6485.95	6443.51	6401.61	6360.26	6319.43	6279.11	6239.31
16000	6200.00	6161.18	6122.84	6084.97	6047.56	6010.61	5974.10	5938.02	5902.38	5867.16
17000	5832.35	5797.95	5763.95	5730.35	5697.13	5664.29	5631.82	5599.72	5567.98	5536.59
18000	5505.56	5474.86	5444.51	5414.48	5384.78	5355.41	5326.34	5297.59	5269.15	5241.01
19000	5213.16	5185.60	5158.33	5131.35	5104.64	5078.21	5052.04	5026.14	5000.51	4975.13
20000	4950.00	4925.12	4900.50	4876.11	4851.96	4828.05	4804.37	4780.92	4757.69	4734.69
21000	4711.90	4689.34	4666.98	4644.84	4622.90	4601.16	4579.63	4558.29	4537.16	4516.21
22000	4495.45	4474.89	4454.50	4434.30	4414.29	4394.44	4374.78	4355.29	4335.96	4316.81
23000	4297.83	4279.00	4260.34	4241.85	4223.50	4205.32	4187.29	4169.41	4151.68	4134.10
24000	4116.67	4099.38	4082.23	4065.23	4048.36	4031.63	4015.04	3998.58	3982.26	3966.06
25000	3950.00	3934.06	3918.25	3902.57	3887.01	3871.57	3856.25	3841.05	3825.97	3811.00
26000	3796.15	3781.42	3766.79	3752.28	3737.88	3723.58	3709.40	3695.32	3681.34	3667.47
27000	3653.70	3640.04	3626.47	3613.00	3599.64	3586.36	3573.19	3560.11	3547.12	3534.23
28000	3521.43	3508.72	3496.10	3483.57	3471.13	3458.77	3446.50	3434.32	3422.22	3410.21
29000	3398.28	3386.43	3374.66	3362.97	3351.36	3339.83	3328.38	3317.00	3305.70	3294.48
30000	3283.33	3272.26	3261.26	3250.33	3239.47	3228.69	3217.97	3207.33	3196.75	3186.25
31000	3175.81	3165.43	3155.13	3144.89	3134.71	3124.60	3114.56	3104.57	3094.65	3084.80
32000	3075.00	3065.26	3055.59	3045.98	3036.42	3026.92	3017.48	3008.10	2998.78	2989.51
33000	2980.30	2971.15	2962.05	2953.00	2944.01	2935.07	2926.19	2917.36	2908.58	2899.85
34000	2891.18	2882.55	2873.98	2865.45	2856.98	2848.55	2840.17	2831.84	2823.56	2815.33
35000	2807.14	2799.00	2790.91	2782.86	2774.86	2766.90	2758.99	2751.12	2743.30	2735.52
36000	2727.78	2720.08	2712.43	2704.82	2697.25	2689.73	2682.24	2674.80	2667.39	2660.03
37000	2652.70	2645.42	2638.17	2630.97	2623.80	2616.67	2609.57	2602.52	2595.50	2588.52
38000	2581.58	2574.67	2567.80	2560.97	2554.17	2547.40	2540.67	2533.98	2527.32	2520.69
39000	2514.10	2507.54	2501.02	2494.53	2488.07	2481.65	2475.25	2468.89	2462.56	2456.27
40000	2450.00	2443.77	2437.56	2431.39	2425.25	2419.14	2413.05	2407.00	2400.98	2394.99
41000	2389.02	2383.09	2377.18	2371.31	2365.46	2359.64	2353.85	2348.08	2342.34	2336.63
42000	2330.95	2325.30	2319.67	2314.07	2308.49	2302.94	2297.42	2291.92	2286.45	2281.00
43000	2275.58	2270.19	2264.81	2259.47	2254.15	2248.85	2243.58	2238.33	2233.11	2227.90
44000	2222.73	2217.57	2212.44	2207.34	2202.25	2197.19	2192.15	2187.14	2182.14	2177.17
45000	2172.22	2167.29	2162.39	2157.51	2152.64	2147.80	2142.98	2138.18	2133.41	2128.65
46000	2123.91	2119.20	2114.50	2109.83	2105.17	2100.54	2095.92	2091.33	2086.75	2082.20
47000	2077.66	2073.14	2068.64	2064.16	2059.70	2055.26	2050.84	2046.44	2042.05	2037.68
48000	2033.33	2029.00	2024.69	2020.39	2016.12	2011.86	2007.61	2003.39	1999.18	1994.99
49000	1990.82	1986.66	1982.52	1978.40	1974.29	1970.20	1966.13	1962.07	1958.03	1954.01
50000	1950.00	1946.01	1942.03	1938.07	1934.13	1930.20	1926.28	1922.39	1918.50	1914.64
51000	1910.78	1906.95	1903.13	1899.32	1895.53	1891.75	1887.98	1884.24	1880.50	1876.78
52000	1873.08	1869.39	1865.71	1862.05	1858.40	1854.76	1851.14	1847.53	1843.94	1840.36
53000	1836.79	1833.24	1829.70	1826.17	1822.66	1819.16	1815.67	1812.20	1808.74	1805.29
54000	1801.85	1798.43	1795.02	1791.62	1788.24	1784.86	1781.50	1778.15	1774.82	1771.49
55000	1768.18	1764.88	1761.59	1758.32	1755.05	1751.80	1748.56	1745.33	1742.11	1738.91
56000	1735.71	1732.53	1729.36	1726.20	1723.05	1719.91	1716.78	1713.67	1710.56	1707.47
57000	1704.39	1701.31	1698.25	1695.20	1692.16	1689.13	1686.11	1683.10	1680.10	1677.12
58000	1674.14	1671.17	1668.21	1665.27	1662.33	1659.40	1656.48	1653.58	1650.68	1647.79
59000	1644.92	1642.05	1639.19	1636.34	1633.50	1630.67	1627.85	1625.04	1622.24	1619.45

120Ω SHUNT RESISTOR TABLE (TRADITIONAL VALUES)

The shunt values in this table are those most commonly used for strain gage calibration. However the output voltage versus $\mu\Omega/\Omega$ response is non-linear. With today's acquisition systems (better than 10-bit resolution) pseudo errors appear. The values are given here for completeness only. The linear-response values on the next page are those recommended by ACRA CONTROL (see TEC/NO7/002).

How to use the table: 108971.00Ω is the shunt resistance required to produce a 1100 $\mu\Omega/\Omega$ deflection.

$\mu\Omega/\Omega$	+0	+100	+200	+300	+400	+500	+600	+700	+800	+900
0	"open"	1199880.00	599880.00	399880.00	299880.00	239880.00	199880.00	171309.00	149880.00	133213.00
1000	119880.00	108971.00	99880.00	92187.70	85594.30	79880.00	74880.00	70468.20	66546.70	63037.90
2000	59880.00	57022.90	54425.50	52053.90	49880.00	47880.00	46033.80	44324.40	42737.10	41259.30
3000	39880.00	38589.70	37380.00	36243.60	35174.10	34165.70	33213.30	32312.40	31458.90	30649.20
4000	29880.00	29148.30	28451.40	27787.00	27152.70	26546.70	25967.00	25411.90	24880.00	24369.80
5000	23880.00	23409.40	22956.90	22521.50	22102.20	21698.20	21308.60	20932.60	20569.70	20219.00
6000	19880.00	19552.10	19234.80	18927.60	18630.00	18341.50	18061.80	17790.40	17527.10	17271.30
7000	17022.90	16781.40	16546.70	16318.40	16096.20	15880.00	15669.50	15464.40	15264.60	15069.90
8000	14880.00	14694.80	14514.10	14337.80	14165.70	13997.60	13833.50	13673.10	13516.40	13363.10
9000	13213.30	13066.80	12923.50	12783.20	12646.00	12511.60	12380.00	12251.10	12124.90	12001.20
10000	11880.00	11761.20	11644.70	11530.50	11418.50	11308.60	11200.80	11095.00	10991.10	10889.20
11000	10789.10	10690.80	10594.30	10499.50	10406.30	10314.80	10224.80	10136.40	10049.50	9964.03
12000	9880.00	9797.36	9716.07	9636.10	9557.42	9480.00	9403.81	9328.82	9255.00	9182.33
13000	9110.77	9040.31	8970.91	8902.56	8835.22	8768.89	8703.53	8639.12	8575.65	8513.09
14000	8451.43	8390.64	8330.70	8271.61	8213.33	8155.86	8099.18	8043.27	7988.11	7933.69
15000	7880.00	7827.02	7774.74	7723.14	7672.21	7621.94	7572.31	7523.31	7474.94	7427.17
16000	7380.00	7333.42	7287.41	7241.96	7197.07	7152.73	7108.92	7065.63	7022.86	6980.59
17000	6938.82	6897.54	6856.74	6816.42	6776.55	6737.14	6698.18	6659.66	6621.57	6583.91
18000	6546.67	6509.83	6473.41	6437.38	6401.74	6366.49	6331.61	6297.11	6262.98	6229.21
19000	6195.79	6162.72	6130.00	6097.62	6065.57	6033.85	6002.45	5971.37	5940.61	5910.15
20000	5880.00	5850.15	5820.59	5791.33	5762.35	5733.66	5705.24	5677.10	5649.23	5621.63
21000	5594.29	5567.20	5540.38	5513.80	5487.48	5461.40	5435.56	5409.95	5384.59	5359.45
22000	5334.55	5309.86	5285.41	5261.17	5237.14	5213.33	5189.73	5166.34	5143.16	5120.17
23000	5097.39	5074.81	5052.41	5030.21	5008.21	4986.38	4964.75	4943.29	4922.02	4900.92
24000	4880.00	4859.25	4838.68	4818.27	4798.03	4777.96	4758.05	4738.30	4718.71	4699.28
25000	4680.00	4660.88	4641.90	4623.08	4604.41	4585.88	4567.50	4549.26	4531.16	4513.20
26000	4495.38	4477.70	4460.15	4442.74	4425.45	4408.30	4391.28	4374.38	4357.61	4340.97
27000	4324.44	4308.04	4291.76	4275.60	4259.56	4243.64	4227.83	4212.13	4196.55	4181.08
28000	4165.71	4150.46	4135.32	4120.28	4105.35	4090.53	4075.80	4061.18	4046.67	4032.25
29000	4017.93	4003.71	3989.59	3975.56	3961.63	3947.80	3934.05	3920.40	3906.85	3893.38
30000	3880.00	3866.71	3853.51	3840.40	3827.37	3814.43	3801.57	3788.79	3776.10	3763.50
31000	3750.97	3738.52	3726.15	3713.87	3701.66	3689.52	3677.47	3665.49	3653.58	3641.76
32000	3630.00	3618.32	3606.71	3595.17	3583.70	3572.31	3560.98	3549.72	3538.54	3527.42
33000	3516.36	3505.38	3494.46	3483.60	3472.81	3462.09	3451.43	3440.83	3430.30	3419.82
34000	3409.41	3399.06	3388.77	3378.54	3368.37	3358.26	3348.21	3338.21	3328.28	3318.40
35000	3308.57	3298.80	3289.09	3279.43	3269.83	3260.28	3250.79	3241.34	3231.96	3222.62
36000	3213.33	3204.10	3194.92	3185.79	3176.70	3167.67	3158.69	3149.75	3140.87	3132.03
37000	3123.24	3114.50	3105.81	3097.16	3088.56	3080.00	3071.49	3063.02	3054.60	3046.23
38000	3037.89	3029.61	3021.36	3013.16	3005.00	2996.88	2988.81	2980.78	2972.78	2964.83
39000	2956.92	2949.05	2941.22	2933.44	2925.69	2917.97	2910.30	2902.67	2895.08	2887.52
40000	2880.00	2872.52	2865.07	2857.67	2850.30	2842.96	2835.67	2828.40	2821.18	2813.99
41000	2806.83	2799.71	2792.62	2785.57	2778.55	2771.57	2764.62	2757.70	2750.81	2743.96
42000	2737.14	2730.36	2723.60	2716.88	2710.19	2703.53	2696.90	2690.30	2683.74	2677.20
43000	2670.70	2664.22	2657.78	2651.36	2644.98	2638.62	2632.29	2626.00	2619.73	2613.49
44000	2607.27	2601.09	2594.93	2588.80	2582.70	2576.63	2570.58	2564.56	2558.57	2552.61
45000	2546.67	2540.75	2534.87	2529.01	2523.17	2517.36	2511.58	2505.82	2500.09	2494.38
46000	2488.70	2483.04	2477.40	2471.79	2466.21	2460.65	2455.11	2449.59	2444.10	2438.64
47000	2433.19	2427.77	2422.37	2417.00	2411.65	2406.32	2401.01	2395.72	2390.46	2385.22
48000	2380.00	2374.80	2369.63	2364.47	2359.34	2354.23	2349.14	2344.07	2339.02	2333.99
49000	2328.98	2323.99	2319.02	2314.08	2309.15	2304.24	2299.35	2294.49	2289.64	2284.81
50000	2280.00	2275.21	2270.44	2265.69	2260.95	2256.24	2251.54	2246.86	2242.20	2237.56
51000	2232.94	2228.34	2223.75	2219.18	2214.63	2210.10	2205.58	2201.08	2196.60	2192.14
52000	2187.69	2183.26	2178.85	2174.46	2170.08	2165.71	2161.37	2157.04	2152.73	2148.43
53000	2144.15	2139.89	2135.64	2131.41	2127.19	2122.99	2118.81	2114.64	2110.48	2106.35
54000	2102.22	2098.11	2094.02	2089.94	2085.88	2081.83	2077.80	2073.78	2069.78	2065.79
55000	2061.82	2057.86	2053.91	2049.98	2046.06	2042.16	2038.27	2034.40	2030.54	2026.69
56000	2022.86	2019.04	2015.23	2011.44	2007.66	2003.89	2000.14	1996.40	1992.68	1988.96
57000	1985.26	1981.58	1977.90	1974.24	1970.59	1966.96	1963.33	1959.72	1956.12	1952.54
58000	1948.97	1945.40	1941.86	1938.32	1934.79	1931.28	1927.78	1924.29	1920.82	1917.35
59000	1913.90	1910.46	1907.03	1903.61	1900.20	1896.81	1893.42	1890.05	1886.69	1883.34

120Ω SHUNT RESISTOR TABLE (LINEAR RESPONSE)

The shunt values in this table produce a linear response (output voltage versus $\mu\Omega/\Omega$) and as such are the values recommended by ACRA CONTROL (see *TEC/NOT/002*).

How to use the table: 109031.00Ω is the shunt resistance required to produce a 1100 $\mu\Omega/\Omega$ deflection.

$\mu\Omega/\Omega$	+0	+100	+200	+300	+400	+500	+600	+700	+800	+900
0	*open*	1199940.00	599940.00	399940.00	299940.00	239940.00	199940.00	171369.00	149940.00	133273.00
1000	119940.00	109031.00	99940.00	92247.70	85654.30	79940.00	74940.00	70528.20	66606.70	63097.90
2000	59940.00	57082.90	54485.50	52113.90	49940.00	47940.00	46093.80	44384.40	42797.10	41319.30
3000	39940.00	38649.70	37440.00	36303.60	35234.10	34225.70	33273.30	32372.40	31518.90	30709.20
4000	29940.00	29208.30	28511.40	27847.00	27212.70	26606.70	26027.00	25471.90	24940.00	24429.80
5000	23940.00	23469.40	23016.90	22581.50	22162.20	21758.20	21368.60	20992.60	20629.70	20279.00
6000	19940.00	19612.10	19294.80	18987.60	18690.00	18401.50	18121.80	17850.40	17587.10	17331.30
7000	17082.90	16841.40	16606.70	16378.40	16156.20	15940.00	15729.50	15524.40	15324.60	15129.90
8000	14940.00	14754.80	14574.10	14397.80	14225.70	14057.60	13893.50	13733.10	13576.40	13423.10
9000	13273.30	13126.80	12983.50	12843.20	12706.00	12571.60	12440.00	12311.10	12184.90	12061.20
10000	11940.00	11821.20	11704.70	11590.50	11478.50	11368.60	11260.80	11155.00	11051.10	10949.20
11000	10849.10	10750.80	10654.30	10559.50	10466.30	10374.80	10284.80	10196.40	10109.50	10024.00
12000	9940.00	9857.36	9776.07	9696.10	9617.42	9540.00	9463.81	9388.82	9315.00	9242.33
13000	9170.77	9100.31	9030.91	8962.56	8895.22	8828.89	8763.53	8699.12	8635.65	8573.09
14000	8511.43	8450.64	8390.70	8331.61	8273.33	8215.86	8159.18	8103.27	8048.11	7993.69
15000	7940.00	7887.02	7834.74	7783.14	7732.21	7681.94	7632.31	7583.31	7534.94	7487.17
16000	7440.00	7393.42	7347.41	7301.96	7257.07	7212.73	7168.92	7125.63	7082.86	7040.59
17000	6998.82	6957.54	6916.74	6876.42	6836.55	6797.14	6758.18	6719.66	6681.57	6643.91
18000	6606.67	6569.83	6533.41	6497.38	6461.74	6426.49	6391.61	6357.11	6322.98	6289.21
19000	6255.79	6222.72	6190.00	6157.62	6125.57	6093.85	6062.45	6031.37	6000.61	5970.15
20000	5940.00	5910.15	5880.59	5851.33	5822.35	5793.66	5765.24	5737.10	5709.23	5681.63
21000	5654.29	5627.20	5600.38	5573.80	5547.48	5521.40	5495.56	5469.95	5444.59	5419.45
22000	5394.55	5369.86	5345.41	5321.17	5297.14	5273.33	5249.73	5226.34	5203.16	5180.17
23000	5157.39	5134.81	5112.41	5090.21	5068.21	5046.38	5024.75	5003.29	4982.02	4960.92
24000	4940.00	4919.25	4898.68	4878.27	4858.03	4837.96	4818.05	4798.30	4778.71	4759.28
25000	4740.00	4720.88	4701.90	4683.08	4664.41	4645.88	4627.50	4609.26	4591.16	4573.20
26000	4555.38	4537.70	4520.15	4502.74	4485.45	4468.30	4451.28	4434.38	4417.61	4400.97
27000	4384.44	4368.04	4351.76	4335.60	4319.56	4303.64	4287.83	4272.13	4256.55	4241.08
28000	4225.71	4210.46	4195.32	4180.28	4165.35	4150.53	4135.80	4121.18	4106.67	4092.25
29000	4077.93	4063.71	4049.59	4035.56	4021.63	4007.80	3994.05	3980.40	3966.85	3953.38
30000	3940.00	3926.71	3913.51	3900.40	3887.37	3874.43	3861.57	3848.79	3836.10	3823.50
31000	3810.97	3798.52	3786.15	3773.87	3761.66	3749.52	3737.47	3725.49	3713.58	3701.76
32000	3690.00	3678.32	3666.71	3655.17	3643.70	3632.31	3620.98	3609.72	3598.54	3587.42
33000	3576.36	3565.38	3554.46	3543.60	3532.81	3522.09	3511.43	3500.83	3490.30	3479.82
34000	3469.41	3459.06	3448.77	3438.54	3428.37	3418.26	3408.21	3398.21	3388.28	3378.40
35000	3368.57	3358.80	3349.09	3339.43	3329.83	3320.28	3310.79	3301.34	3291.96	3282.62
36000	3273.33	3264.10	3254.92	3245.79	3236.70	3227.67	3218.69	3209.75	3200.87	3192.03
37000	3183.24	3174.50	3165.81	3157.16	3148.56	3140.00	3131.49	3123.02	3114.60	3106.23
38000	3097.89	3089.61	3081.36	3073.16	3065.00	3056.88	3048.81	3040.78	3032.78	3024.83
39000	3016.92	3009.05	3001.22	2993.44	2985.69	2977.97	2970.30	2962.67	2955.08	2947.52
40000	2940.00	2932.52	2925.07	2917.67	2910.30	2902.96	2895.67	2888.40	2881.18	2873.99
41000	2866.83	2859.71	2852.62	2845.57	2838.55	2831.57	2824.62	2817.70	2810.81	2803.96
42000	2797.14	2790.36	2783.60	2776.88	2770.19	2763.53	2756.90	2750.30	2743.74	2737.20
43000	2730.70	2724.22	2717.78	2711.36	2704.98	2698.62	2692.29	2686.00	2679.73	2673.49
44000	2667.27	2661.09	2654.93	2648.80	2642.70	2636.63	2630.58	2624.56	2618.57	2612.61
45000	2606.67	2600.75	2594.87	2589.01	2583.17	2577.36	2571.58	2565.82	2560.09	2554.38
46000	2548.70	2543.04	2537.40	2531.79	2526.21	2520.65	2515.11	2509.59	2504.10	2498.64
47000	2493.19	2487.77	2482.37	2477.00	2471.65	2466.32	2461.01	2455.72	2450.46	2445.22
48000	2440.00	2434.80	2429.63	2424.47	2419.34	2414.23	2409.14	2404.07	2399.02	2393.99
49000	2388.98	2383.99	2379.02	2374.08	2369.15	2364.24	2359.35	2354.49	2349.64	2344.81
50000	2340.00	2335.21	2330.44	2325.69	2320.95	2316.24	2311.54	2306.86	2302.20	2297.56
51000	2292.94	2288.34	2283.75	2279.18	2274.63	2270.10	2265.58	2261.08	2256.60	2252.14
52000	2247.69	2243.26	2238.85	2234.46	2230.08	2225.71	2221.37	2217.04	2212.73	2208.43
53000	2204.15	2199.89	2195.64	2191.41	2187.19	2182.99	2178.81	2174.64	2170.48	2166.35
54000	2162.22	2158.11	2154.02	2149.94	2145.88	2141.83	2137.80	2133.78	2129.78	2125.79
55000	2121.82	2117.86	2113.91	2109.98	2106.06	2102.16	2098.27	2094.40	2090.54	2086.69
56000	2082.86	2079.04	2075.23	2071.44	2067.66	2063.89	2060.14	2056.40	2052.68	2048.96
57000	2045.26	2041.58	2037.90	2034.24	2030.59	2026.96	2023.33	2019.72	2016.12	2012.54
58000	2008.97	2005.40	2001.86	1998.32	1994.79	1991.28	1987.78	1984.29	1980.82	1977.35
59000	1973.90	1970.46	1967.03	1963.61	1960.20	1956.81	1953.42	1950.05	1946.69	1943.34

350Ω SHUNT RESISTOR TABLE (TRADITIONAL VALUES)

The shunt values in this table are those most commonly used for strain gage calibration. However the output voltage versus $\mu\Omega/\Omega$ response is non-linear. With today's acquisition systems (better than 10-bit resolution) pseudo errors appear. The values are given here for completeness only. The linear-response values on the next page are those recommended by ACRA CONTROL (see *TEC/NOT/002*).
How to use the table: 317832.00Ω is the shunt resistance required to produce a 1100 $\mu\Omega/\Omega$ deflection.

$\mu\Omega/\Omega$	+0	+100	+200	+300	+400	+500	+600	+700	+800	+900
0	*open*	3499650.00	1749650.00	1166317.00	874650.00	699650.00	582983.00	499650.00	437150.00	388539.00
1000	349650.00	317832.00	291317.00	268881.00	249650.00	232983.00	218400.00	205532.00	194094.00	183861.00
2000	174650.00	166317.00	158741.00	151824.00	145483.00	139650.00	134265.00	129280.00	124650.00	120340.00
3000	116317.00	112553.00	109025.00	105711.00	102591.00	99650.00	96872.20	94244.60	91755.30	89393.60
4000	87150.00	85015.90	82983.30	81045.30	79195.50	77427.80	75737.00	74118.10	72566.70	71078.60
5000	69650.00	68277.50	66957.70	65687.70	64464.80	63286.40	62150.00	61053.50	59994.80	58972.00
6000	57983.30	57027.00	56101.60	55205.60	54337.50	53496.20	52680.30	51888.80	51120.60	50374.60
7000	49650.00	48945.80	48261.10	47595.20	46947.30	46316.70	45702.60	45104.50	44521.80	43953.80
8000	43400.00	42859.90	42332.90	41818.70	41316.70	40826.50	40347.70	39879.90	39422.70	38975.80
9000	38538.90	38111.50	37693.50	37284.40	36884.00	36492.10	36108.30	35732.50	35364.30	35003.50
10000	34650.00	34303.50	33963.70	33630.60	33303.80	32983.30	32668.90	32360.30	32057.40	31760.10
11000	31468.20	31181.50	30900.00	30623.50	30351.80	30084.80	29822.40	29564.50	29311.00	29061.80
12000	28816.70	28575.60	28338.50	28105.30	27875.80	27650.00	27427.80	27209.10	26993.80	26781.80
13000	26573.10	26367.60	26165.20	25965.80	25769.40	25575.90	25385.30	25197.40	25012.30	24829.90
14000	24650.00	24472.70	24297.90	24125.50	23955.60	23787.90	23622.60	23459.50	23298.60	23139.90
15000	22983.30	22828.80	22676.30	22525.80	22377.30	22230.60	22085.90	21943.00	21801.90	21662.60
16000	21525.00	21389.10	21254.90	21122.40	20991.50	20862.10	20734.30	20608.10	20483.30	20360.10
17000	20238.20	20117.80	19998.80	19881.20	19764.90	19650.00	19536.40	19424.00	19312.90	19203.10
18000	19094.40	18987.00	18880.80	18775.70	18671.70	18568.90	18467.20	18366.60	18267.00	18168.50
19000	18071.10	17974.60	17879.20	17784.70	17691.20	17598.70	17507.10	17416.50	17326.80	17237.90
20000	17150.00	17062.90	16976.70	16891.40	16806.90	16723.20	16640.30	16558.20	16476.90	16396.40
21000	16316.70	16237.70	16159.40	16081.90	16005.10	15929.10	15853.70	15779.00	15705.00	15631.70
22000	15559.10	15487.10	15415.80	15345.10	15275.00	15205.60	15136.70	15068.50	15000.90	14933.80
23000	14867.40	14801.50	14736.20	14671.50	14607.30	14543.60	14480.50	14417.90	14355.90	14294.40
24000	14233.30	14172.80	14112.80	14053.30	13994.30	13935.70	13877.60	13820.00	13762.90	13706.20
25000	13650.00	13594.20	13538.90	13484.00	13429.50	13375.50	13321.90	13268.70	13215.90	13163.50
26000	13111.50	13060.00	13008.80	12958.00	12907.60	12857.50	12807.90	12758.60	12709.70	12661.20
27000	12613.00	12565.10	12517.60	12470.50	12423.70	12377.30	12331.20	12285.40	12239.90	12194.80
28000	12150.00	12105.50	12061.30	12017.50	11973.90	11930.70	11887.80	11845.10	11802.80	11760.70
29000	11719.00	11677.50	11636.30	11595.40	11554.80	11514.40	11474.30	11434.50	11395.00	11355.70
30000	11316.70	11277.90	11239.40	11201.20	11163.20	11125.40	11087.90	11050.70	11013.60	10976.90
31000	10940.30	10904.00	10867.90	10832.10	10796.50	10761.10	10725.90	10691.00	10656.30	10621.80
32000	10587.50	10553.40	10519.60	10485.90	10452.50	10419.20	10386.20	10353.40	10320.70	10288.30
33000	10256.10	10224.00	10192.20	10160.50	10129.00	10097.80	10066.70	10035.80	10005.00	9974.48
34000	9944.12	9913.93	9883.92	9854.08	9824.42	9794.93	9765.61	9736.46	9707.47	9678.65
35000	9650.00	9621.51	9593.18	9565.01	9537.01	9509.15	9481.46	9453.92	9426.54	9399.30
36000	9372.22	9345.29	9318.51	9291.87	9265.38	9239.04	9212.84	9186.78	9160.87	9135.09
37000	9109.46	9083.96	9058.60	9033.38	9008.29	8983.33	8958.51	8933.82	8909.26	8884.83
38000	8860.53	8836.35	8812.30	8788.38	8764.58	8740.91	8717.36	8693.93	8670.62	8647.43
39000	8624.36	8601.41	8578.57	8555.85	8533.25	8510.76	8488.38	8466.12	8443.97	8421.93
40000	8400.00	8378.18	8356.47	8334.86	8313.37	8291.98	8270.69	8249.51	8228.43	8207.46
41000	8186.59	8165.82	8145.15	8124.58	8104.11	8083.73	8063.46	8043.29	8023.21	8003.22
42000	7983.33	7963.54	7943.84	7924.23	7904.72	7885.29	7865.96	7846.72	7827.57	7808.51
43000	7789.53	7770.65	7751.85	7733.14	7714.52	7695.98	7677.52	7659.15	7640.87	7622.67
44000	7604.55	7586.51	7568.55	7550.68	7532.88	7515.17	7497.53	7479.98	7462.50	7445.10
45000	7427.78	7410.53	7393.36	7376.27	7359.25	7342.31	7325.44	7308.64	7291.92	7275.27
46000	7258.70	7242.19	7225.76	7209.40	7193.10	7176.88	7160.73	7144.65	7128.63	7112.69
47000	7096.81	7081.00	7065.25	7049.58	7033.97	7018.42	7002.94	6987.53	6972.18	6956.89
48000	6941.67	6926.51	6911.41	6896.38	6881.40	6866.49	6851.65	6836.86	6822.13	6807.46
49000	6792.86	6778.31	6763.82	6749.39	6735.02	6720.71	6706.45	6692.25	6678.11	6664.03
50000	6650.00	6636.03	6622.11	6608.25	6594.44	6580.69	6567.00	6553.35	6539.76	6526.23
51000	6512.75	6499.32	6485.94	6472.61	6459.34	6446.12	6432.95	6419.83	6406.76	6393.74
52000	6380.77	6367.85	6354.98	6342.16	6329.39	6316.67	6303.99	6291.37	6278.79	6266.26
53000	6253.77	6241.34	6228.95	6216.60	6204.31	6192.06	6179.85	6167.69	6155.58	6143.51
54000	6131.48	6119.50	6107.56	6095.67	6083.82	6072.02	6060.26	6048.54	6036.86	6025.23
55000	6013.64	6002.09	5990.58	5979.11	5967.69	5956.31	5944.96	5933.66	5922.40	5911.18
56000	5900.00	5888.86	5877.76	5866.70	5855.67	5844.69	5833.75	5822.84	5811.97	5801.14
57000	5790.35	5779.60	5768.88	5758.20	5747.56	5736.96	5726.39	5715.86	5705.36	5694.91
58000	5684.48	5674.10	5663.75	5653.43	5643.15	5632.91	5622.70	5612.52	5602.38	5592.28
59000	5582.20	5572.17	5562.16	5552.19	5542.26	5532.35	5522.48	5512.65	5502.84	5493.07

350Ω SHUNT RESISTOR TABLE (LINEAR RESPONSE)

The shunt values in this table produce a linear response (output voltage versus $\mu\Omega/\Omega$) and as such are the values recommended by ACRA CONTROL (see *TEC/NOT/002*).

How to use the table: 318007.00Ω is the shunt resistance required to produce a 1100 $\mu\Omega/\Omega$ deflection.

$\mu\Omega/\Omega$	+0	+100	+200	+300	+400	+500	+600	+700	+800	+900
0	*open*	3499825.00	174985.00	1166492.00	874825.00	699825.00	583158.00	499825.00	437325.00	388714.00
1000	349825.00	318007.00	291492.00	269056.00	249825.00	233158.00	218575.00	205707.00	194269.00	184036.00
2000	174825.00	166492.00	158916.00	151999.00	145658.00	139825.00	134440.00	129455.00	124825.00	120515.00
3000	116492.00	112728.00	109200.00	105886.00	102766.00	99825.00	97047.20	94419.60	91930.30	89568.60
4000	87325.00	85190.90	83158.30	81220.30	79370.50	77602.80	75912.00	74293.10	72741.70	71253.60
5000	69825.00	68452.50	67132.70	65862.70	64639.80	63461.40	62325.00	61228.50	60169.80	59147.00
6000	58158.30	57202.00	56276.60	55380.60	54512.50	53671.20	52855.30	52063.80	51295.60	50549.60
7000	49825.00	49120.80	48436.10	47770.20	47122.30	46491.70	45877.60	45279.50	44696.80	44128.80
8000	43575.00	43034.90	42507.90	41993.70	41491.70	41001.50	40522.70	40054.90	39597.70	39150.80
9000	38713.90	38286.50	37868.50	37459.40	37059.00	36667.10	36283.30	35907.50	35539.30	35178.50
10000	34825.00	34478.50	34138.70	33805.60	33478.80	33158.30	32843.90	32535.30	32232.40	31935.10
11000	31643.20	31356.50	31075.00	30798.50	30526.80	30259.80	29997.40	29739.50	29486.00	29236.80
12000	28991.70	28750.60	28513.50	28280.30	28050.80	27825.00	27602.80	27384.10	27168.80	26956.80
13000	26748.10	26542.60	26340.20	26140.80	25944.40	25750.90	25560.30	25372.40	25187.30	25004.90
14000	24825.00	24647.70	24472.90	24300.50	24130.60	23962.90	23797.60	23634.50	23473.60	23314.90
15000	23158.30	23003.80	22851.30	22700.80	22552.30	22405.60	22260.90	22118.00	21976.90	21837.60
16000	21700.00	21564.10	21429.90	21297.40	21166.50	21037.10	20909.30	20783.10	20658.30	20535.10
17000	20413.20	20292.80	20173.80	20056.20	19939.90	19825.00	19711.40	19599.00	19487.90	19378.10
18000	19269.40	19162.00	19055.80	18950.70	18846.70	18743.90	18642.20	18541.60	18442.00	18343.50
19000	18246.10	18149.60	18054.20	17959.70	17866.20	17773.70	17682.10	17591.50	17501.80	17412.90
20000	17325.00	17237.90	17151.70	17066.40	16981.90	16898.20	16815.30	16733.20	16651.90	16571.40
21000	16491.70	16412.70	16334.40	16256.90	16180.10	16104.10	16028.70	15954.00	15880.00	15806.70
22000	15734.10	15662.10	15590.80	15520.10	15450.00	15380.60	15311.70	15243.50	15175.90	15108.80
23000	15042.40	14976.50	14911.20	14846.50	14782.30	14718.60	14655.50	14592.90	14530.90	14469.40
24000	14408.30	14347.80	14287.80	14228.30	14169.30	14110.70	14052.60	13995.00	13937.90	13881.20
25000	13825.00	13769.20	13713.90	13659.00	13604.50	13550.50	13496.90	13443.70	13390.90	13338.50
26000	13286.50	13235.00	13183.80	13133.00	13082.60	13032.50	12982.90	12933.60	12884.70	12836.20
27000	12788.00	12740.10	12692.60	12645.50	12598.70	12552.30	12506.20	12460.40	12414.90	12369.80
28000	12325.00	12280.50	12236.30	12192.50	12148.90	12105.70	12062.80	12020.10	11977.80	11935.70
29000	11894.00	11852.50	11811.30	11770.40	11729.80	11689.40	11649.30	11609.50	11570.00	11530.70
30000	11491.70	11452.90	11414.40	11376.20	11338.20	11300.40	11262.90	11225.70	11188.60	11151.90
31000	11115.30	11079.00	11042.90	11007.10	10971.50	10936.10	10900.90	10866.00	10831.30	10796.80
32000	10762.50	10728.40	10694.60	10660.90	10627.50	10594.20	10561.20	10528.40	10495.70	10463.30
33000	10431.10	10399.00	10367.20	10335.50	10304.00	10272.80	10241.70	10210.80	10180.00	10149.50
34000	10119.10	10088.90	10058.90	10029.10	9999.42	9969.93	9940.61	9911.46	9882.47	9853.65
35000	9825.00	9796.51	9768.18	9740.01	9712.01	9684.15	9656.46	9628.92	9601.54	9574.30
36000	9547.22	9520.29	9493.51	9466.87	9440.38	9414.04	9387.84	9361.78	9335.87	9310.09
37000	9284.46	9258.96	9233.60	9208.38	9183.29	9158.33	9133.51	9108.82	9084.26	9059.83
38000	9035.53	9011.35	8987.30	8963.38	8939.58	8915.91	8892.36	8868.93	8845.62	8822.43
39000	8799.36	8776.41	8753.57	8730.85	8708.25	8685.76	8663.38	8641.12	8618.97	8596.93
40000	8575.00	8553.18	8531.47	8509.86	8488.37	8466.98	8445.69	8424.51	8403.43	8382.46
41000	8361.59	8340.82	8320.15	8299.58	8279.11	8258.73	8238.46	8218.29	8198.21	8178.22
42000	8158.33	8138.54	8118.84	8099.23	8079.72	8060.29	8040.96	8021.72	8002.57	7983.51
43000	7964.53	7945.65	7926.85	7908.14	7889.52	7870.98	7852.52	7834.15	7815.87	7797.67
44000	7779.55	7761.51	7743.55	7725.68	7707.88	7690.17	7672.53	7654.98	7637.50	7620.10
45000	7602.78	7585.53	7568.36	7551.27	7534.25	7517.31	7500.44	7483.64	7466.92	7450.27
46000	7433.70	7417.19	7400.76	7384.40	7368.10	7351.88	7335.73	7319.65	7303.63	7287.69
47000	7271.81	7256.00	7240.25	7224.58	7208.97	7193.42	7177.94	7162.53	7147.18	7131.89
48000	7116.67	7101.51	7086.41	7071.38	7056.40	7041.49	7026.65	7011.86	6997.13	6982.46
49000	6967.86	6953.31	6938.82	6924.39	6910.02	6895.71	6881.45	6867.25	6853.11	6839.03
50000	6825.00	6811.03	6797.11	6783.25	6769.44	6755.69	6742	6728.35	6714.76	6701.23
51000	6687.75	6674.32	6660.94	6647.61	6634.34	6621.12	6607.95	6594.83	6581.76	6568.74
52000	6555.77	6542.85	6529.98	6517.16	6504.39	6491.67	6478.99	6466.37	6453.79	6441.26
53000	6428.77	6416.34	6403.95	6391.60	6379.31	6367.06	6354.85	6342.69	6330.58	6318.51
54000	6306.48	6294.50	6282.56	6270.67	6258.82	6247.02	6235.26	6223.54	6211.86	6200.23
55000	6188.64	6177.09	6165.58	6154.11	6142.69	6131.31	6119.96	6108.66	6097.40	6086.18
56000	6075.00	6063.86	6052.76	6041.70	6030.67	6019.69	6008.75	5997.84	5986.97	5976.14
57000	5965.35	5954.60	5943.88	5933.20	5922.56	5911.96	5901.39	5890.86	5880.36	5869.91
58000	5859.48	5849.10	5838.75	5828.43	5818.15	5807.91	5797.70	5787.52	5777.38	5767.28
59000	5757.20	5747.17	5737.16	5727.19	5717.26	5707.35	5697.48	5687.65	5677.84	5668.07

1KΩ SHUNT RESISTOR TABLE (TRADITIONAL VALUES)

The shunt values in this table are those most commonly used for strain gage calibration. However the output voltage versus $\mu\Omega/\Omega$ response is non-linear. With today's acquisition systems (better than 10-bit resolution) pseudo errors appear. The values are given here for completeness only. The linear-response values on the next page are those recommended by ACRA CONTROL (see *TEC/NOT/002*).
How to use the table: 908091.00Ω is the shunt resistance required to produce a 1100 $\mu\Omega/\Omega$ deflection.

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$\mu\Omega/\Omega$	+0	+100	+200	+300	+400	+500	+600	+700	+800	+900
0	*open*	9999000.00	4999000.00	3332333.00	2499000.00	1999000.00	1665667.00	1427571.00	1249000.00	1110111.00
1000	999000.00	908091.00	832333.00	768231.00	713286.00	665667.00	624000.00	587235.00	554556.00	525316.00
2000	499000.00	475190.00	453545.00	433783.00	415667.00	399000.00	383615.00	369370.00	356143.00	343828.00
3000	332333.00	321581.00	311500.00	302030.00	293118.00	284714.00	276778.00	269270.00	262158.00	255410.00
4000	249000.00	242902.00	237095.00	231558.00	226273.00	221222.00	216391.00	211766.00	207333.00	203082.00
5000	199000.00	195078.00	191308.00	187679.00	184185.00	180818.00	177571.00	174439.00	171414.00	168492.00
6000	165667.00	162934.00	160290.00	157730.00	155250.00	152846.00	150515.00	148254.00	146059.00	143928.00
7000	141857.00	139845.00	137889.00	135986.00	134135.00	132333.00	130579.00	128870.00	127205.00	125582.00
8000	124000.00	122457.00	120951.00	119482.00	118048.00	116647.00	115279.00	113943.00	112636.00	111360.00
9000	110111.00	108890.00	107696.00	106527.00	105383.00	104263.00	103167.00	102093.00	101041.00	100010.00
10000	99000.00	98009.90	97039.20	96087.40	95153.80	94238.10	93339.60	92457.90	91592.60	90743.10
11000	89909.10	89090.10	88285.70	87495.60	86719.30	85956.50	85206.90	84470.10	83745.80	83033.60
12000	82333.30	81644.60	80967.20	80300.80	79645.20	79000.00	78365.10	77740.20	77125.00	76519.40
13000	75923.10	75335.90	74757.60	74188.00	73626.90	73074.10	72529.40	71992.70	71463.80	70942.40
14000	70428.60	69922.00	69422.50	68930.10	68444.40	67965.50	67493.20	67027.20	66567.60	66114.10
15000	65666.70	65225.20	64789.50	64359.50	63935.10	63516.10	63102.60	62694.30	62291.10	61893.10
16000	61500.00	61111.80	60728.40	60349.70	59975.60	59606.10	59241.00	58880.20	58523.80	58171.60
17000	57823.50	57479.50	57139.50	56803.50	56471.30	56142.90	55818.20	55497.20	55179.80	54865.90
18000	54555.60	54248.60	53945.10	53644.80	53347.80	53054.10	52763.40	52475.90	52191.50	51910.10
19000	51631.60	51356.00	51083.30	50813.50	50546.40	50282.10	50020.40	49761.40	49505.10	49251.30
20000	49000.00	48751.20	48505.00	48261.10	48019.60	47780.50	47543.70	47309.20	47076.90	46846.90
21000	46619.00	46393.40	46169.80	45948.40	45729.00	45511.60	45296.30	45082.90	44871.60	44662.10
22000	44454.50	44248.90	44045.00	43843.00	43642.90	43444.40	43247.80	43052.90	42859.60	42668.10
23000	42478.30	42290.00	42103.40	41918.50	41735.00	41553.20	41372.90	41194.10	41016.80	40841.00
24000	40666.70	40493.80	40322.30	40152.30	39983.60	39816.30	39650.40	39485.80	39322.60	39160.60
25000	39000.00	38840.60	38682.50	38525.70	38370.10	38215.70	38062.50	37910.50	37759.70	37610.00
26000	37461.50	37314.20	37167.90	37022.80	36878.80	36735.80	36594.00	36453.20	36313.40	36174.70
27000	36037.00	35900.40	35764.70	35630.00	35496.40	35363.60	35231.90	35101.10	34971.20	34842.30
28000	34714.30	34587.20	34461.00	34335.70	34211.30	34087.70	33965.00	33843.20	33722.20	33602.10
29000	33482.80	33364.30	33246.60	33129.70	33013.60	32898.30	32783.80	32670.00	32557.00	32444.80
30000	32333.30	32222.60	32112.60	32003.30	31894.70	31786.90	31679.70	31573.30	31467.50	31362.50
31000	31258.10	31154.30	31051.30	30948.90	30847.10	30746.00	30645.60	30545.70	30446.50	30348.00
32000	30250.00	30152.60	30055.90	29959.80	29864.20	29769.20	29674.80	29581.00	29487.80	29395.10
33000	29303.00	29211.50	29120.50	29030.00	28940.10	28850.70	28761.90	28673.60	28585.80	28498.50
34000	28411.80	28325.50	28239.80	28154.50	28069.80	27985.50	27901.70	27818.40	27735.60	27653.30
35000	27571.40	27490.00	27409.10	27328.60	27248.60	27169.00	27089.90	27011.20	26933.00	26855.20
36000	26777.80	26700.80	26624.30	26548.20	26472.50	26397.30	26322.40	26248.00	26173.90	26100.30
37000	26027.00	25954.20	25881.70	25809.70	25738.00	25666.70	25595.70	25525.20	25455.00	25385.20
38000	25315.80	25246.70	25178.00	25109.70	25041.70	24974.00	24906.70	24839.80	24773.20	24706.90
39000	24641.00	24575.40	24510.20	24445.30	24380.70	24316.50	24252.50	24188.90	24125.60	24062.70
40000	24000.00	23937.70	23875.60	23813.90	23752.50	23691.40	23630.50	23570.00	23509.80	23449.90
41000	23390.20	23330.90	23271.80	23213.10	23154.60	23096.40	23038.50	22980.80	22923.40	22866.30
42000	22809.50	22753.00	22696.70	22640.70	22584.90	22529.40	22474.20	22419.20	22364.50	22310.00
43000	22255.80	22201.90	22148.10	22094.70	22041.50	21988.50	21935.80	21883.30	21831.10	21779.00
44000	21727.30	21675.70	21624.40	21573.40	21522.50	21471.90	21421.50	21371.40	21321.40	21271.70
45000	21222.20	21172.90	21123.90	21075.10	21026.40	20978.00	20929.80	20881.80	20834.10	20786.50
46000	20739.10	20692.00	20645.00	20598.30	20551.70	20505.40	20459.20	20413.30	20367.50	20322.00
47000	20276.60	20231.40	20186.40	20141.60	20097.00	20052.60	20008.40	19964.40	19920.50	19876.80
48000	19833.30	19790.00	19746.90	19703.90	19661.20	19618.60	19576.10	19533.90	19491.80	19449.90
49000	19408.20	19366.60	19325.20	19284.00	19242.90	19202.00	19161.30	19120.70	19080.30	19040.10
50000	19000.00	18960.10	18920.30	18880.70	18841.30	18802.00	18762.80	18723.90	18685.00	18646.40
51000	18607.80	18569.50	18531.30	18493.20	18455.30	18417.50	18379.80	18342.40	18305.00	18267.80
52000	18230.80	18193.90	18157.10	18120.50	18084.00	18047.60	18011.40	17975.30	17939.40	17903.60
53000	17867.90	17832.40	17797.00	17761.70	17726.60	17691.60	17656.70	17622.00	17587.40	17552.90
54000	17518.50	17484.30	17450.20	17416.20	17382.40	17348.60	17315.00	17281.50	17248.20	17214.90
55000	17181.80	17148.80	17115.90	17083.20	17050.50	17018.00	16985.60	16953.30	16921.10	16889.10
56000	16857.10	16825.30	16793.60	16762.00	16730.50	16699.10	16667.80	16636.70	16605.60	16574.70
57000	16543.90	16513.10	16482.50	16452.00	16421.60	16391.30	16361.10	16331.00	16301.00	16271.20
58000	16241.40	16211.70	16182.10	16152.70	16123.30	16094.00	16064.80	16035.80	16006.80	15977.90
59000	15949.20	15920.50	15891.90	15863.40	15835.00	15806.70	15778.50	15750.40	15722.40	15694.50

1KΩ SHUNT RESISTOR TABLE (LINEAR RESPONSE)

The shunt values in this table produce a linear response (output voltage versus $\mu\Omega/\Omega$) and as such are the values recommended by ACRA CONTROL (see *TEC/NOT/002*).

How to use the table: 908591.00Ω is the shunt resistance required to produce a 1100 $\mu\Omega/\Omega$ deflection.

$\mu\Omega/\Omega$	+0	+100	+200	+300	+400	+500	+600	+700	+800	+900
0	"open"	999950.00	4999500.00	3332833.00	2499500.00	1999500.00	1666167.00	1428071.00	1249500.00	1110611.00
1000	999500.00	908591.00	832833.00	768731.00	713786.00	666167.00	624500.00	587735.00	555056.00	525816.00
2000	499500.00	475690.00	454045.00	434283.00	416167.00	399500.00	384115.00	369870.00	356643.00	344328.00
3000	332833.00	322081.00	312000.00	302530.00	293618.00	285214.00	277278.00	269770.00	262658.00	255910.00
4000	249500.00	243402.00	237595.00	232058.00	226773.00	221722.00	216891.00	212266.00	207833.00	203582.00
5000	199500.00	195578.00	191808.00	188179.00	184685.00	181318.00	178071.00	174939.00	171914.00	168992.00
6000	166167.00	163434.00	160790.00	158230.00	155750.00	153346.00	151015.00	148754.00	146559.00	144428.00
7000	142357.00	140345.00	138389.00	136486.00	134635.00	132833.00	131079.00	129370.00	127705.00	126082.00
8000	124500.00	122957.00	121451.00	119982.00	118548.00	117147.00	115779.00	114443.00	113136.00	111860.00
9000	110611.00	109390.00	108196.00	107027.00	105883.00	104763.00	103667.00	102593.00	101541.00	100510.00
10000	99500.00	98509.90	97539.20	96587.40	95653.80	94738.10	93839.60	92957.90	92092.60	91243.10
11000	90409.10	89590.10	88785.70	87995.60	87219.30	86456.50	85706.90	84970.10	84245.80	83533.60
12000	82833.30	82144.60	81467.20	80800.80	80145.20	79500.00	78865.10	78240.20	77625.00	77019.40
13000	76423.10	75835.90	75257.60	74688.00	74126.90	73574.10	73029.40	72492.70	71963.80	71442.40
14000	70928.60	70422.00	69922.50	69430.10	68944.40	68465.50	67993.20	67527.20	67067.60	66614.10
15000	66166.70	65725.20	65289.50	64859.50	64435.10	64016.10	63602.60	63194.30	62791.10	62393.10
16000	62000.00	61611.80	61228.40	60849.70	60475.60	60106.10	59741.00	59380.20	59023.80	58671.60
17000	58323.50	57979.50	57639.50	57303.50	56971.30	56642.90	56318.20	55997.20	55679.80	55365.90
18000	55055.60	54748.60	54445.10	54144.80	53847.80	53554.10	53263.40	52975.90	52691.50	52410.10
19000	52131.60	51856.00	51583.30	51313.50	51046.40	50782.10	50520.40	50261.40	50005.10	49751.30
20000	49500.00	49251.20	49005.00	48761.10	48519.60	48280.50	48043.70	47809.20	47576.90	47346.90
21000	47119.00	46893.40	46669.80	46448.40	46229.00	46011.60	45796.30	45582.90	45371.60	45162.10
22000	44954.50	44748.90	44545.00	44343.00	44142.90	43944.40	43747.80	43552.90	43359.60	43168.10
23000	42978.30	42790.00	42603.40	42418.50	42235.00	42053.20	41872.90	41694.10	41516.80	41341.00
24000	41166.70	40993.80	40822.30	40652.30	40483.60	40316.30	40150.40	39985.80	39822.60	39660.60
25000	39500.00	39340.60	39182.50	39025.70	38870.10	38715.70	38562.50	38410.50	38259.70	38110.00
26000	37961.50	37814.20	37667.90	37522.80	37378.80	37235.80	37094.00	36953.20	36813.40	36674.70
27000	36537.00	36400.40	36264.70	36130.00	35996.40	35863.60	35731.90	35601.10	35471.20	35342.30
28000	35214.30	35087.20	34961.00	34835.70	34711.30	34587.70	34465.00	34343.20	34222.20	34102.10
29000	33982.80	33864.30	33746.60	33629.70	33513.60	33398.30	33283.80	33170.00	33057.00	32944.80
30000	32833.30	32722.60	32612.60	32503.30	32394.70	32286.90	32179.70	32073.30	31967.50	31862.50
31000	31758.10	31654.30	31551.30	31448.90	31347.10	31246.00	31145.60	31045.70	30946.50	30848.00
32000	30750.00	30652.60	30555.90	30459.80	30364.20	30269.20	30174.80	30081.00	29987.80	29895.10
33000	29803.00	29711.50	29620.50	29530.00	29440.10	29350.70	29261.90	29173.60	29085.80	28998.50
34000	28911.80	28825.50	28739.80	28654.50	28569.80	28485.50	28401.70	28318.40	28235.60	28153.30
35000	28071.40	27990.00	27909.10	27828.60	27748.60	27669.00	27589.90	27511.20	27433.00	27355.20
36000	27277.80	27200.80	27124.30	27048.20	26972.50	26897.30	26822.40	26748.00	26673.90	26600.30
37000	26527.00	26454.20	26381.70	26309.70	26238.00	26166.70	26095.70	26025.20	25955.00	25885.20
38000	25815.80	25746.70	25678.00	25609.70	25541.70	25474.00	25406.70	25339.80	25273.20	25206.90
39000	25141.00	25075.40	25010.20	24945.30	24880.70	24816.50	24752.50	24688.90	24625.60	24562.70
40000	24500.00	24437.70	24375.60	24313.90	24252.50	24191.40	24130.50	24070.00	24009.80	23949.90
41000	23890.20	23830.90	23771.80	23713.10	23654.60	23596.40	23538.50	23480.80	23423.40	23366.30
42000	23309.50	23253.00	23196.70	23140.70	23084.90	23029.40	22974.20	22919.20	22864.50	22810.00
43000	22755.80	22701.90	22648.10	22594.70	22541.50	22488.50	22435.80	22383.30	22331.10	22279.00
44000	22227.30	22175.70	22124.40	22073.40	22022.50	21971.90	21921.50	21871.40	21821.40	21771.70
45000	21722.20	21672.90	21623.90	21575.10	21526.40	21478.00	21429.80	21381.80	21334.10	21286.50
46000	21239.10	21192.00	21145.00	21098.30	21051.70	21005.40	20959.20	20913.30	20867.50	20822.00
47000	20776.60	20731.40	20686.40	20641.60	20597.00	20552.60	20508.40	20464.40	20420.50	20376.80
48000	20333.30	20290.00	20246.90	20203.90	20161.20	20118.60	20076.10	20033.90	19991.80	19949.90
49000	19908.20	19866.60	19825.20	19784.00	19742.90	19702.00	19661.30	19620.70	19580.30	19540.10
50000	19500.00	19460.10	19420.30	19380.70	19341.30	19302.00	19262.80	19223.90	19185.00	19146.40
51000	19107.80	19069.50	19031.30	18993.20	18955.30	18917.50	18879.80	18842.40	18805.00	18767.80
52000	18730.80	18693.90	18657.10	18620.50	18584.00	18547.60	18511.40	18475.30	18439.40	18403.60
53000	18367.90	18332.40	18297.00	18261.70	18226.60	18191.60	18156.70	18122.00	18087.40	18052.90
54000	18018.50	17984.30	17950.20	17916.20	17882.40	17848.60	17815.00	17781.50	17748.20	17714.90
55000	17681.80	17648.80	17615.90	17583.20	17550.50	17518.00	17485.60	17453.30	17421.10	17389.10
56000	17357.10	17325.30	17293.60	17262.00	17230.50	17199.10	17167.80	17136.70	17105.60	17074.70
57000	17043.90	17013.10	16982.50	16952.00	16921.60	16891.30	16861.10	16831.00	16801.00	16771.20
58000	16741.40	16711.70	16682.10	16652.70	16623.30	16594.00	16564.80	16535.80	16506.80	16477.90
59000	16449.20	16420.50	16391.90	16363.40	16335.00	16306.70	16278.50	16250.40	16222.40	16194.50

J-TYPE THERMOCOUPLE TABLES

The table below is as compiled by the National Institute of Standards and Technology (NIST) in the US for a metal pair of Iron-Copper and Nickel referenced to a cold junction at 0°C. J is the letter designation approved by the American Institute for Standards (ANSI). The column to the left is temperature in °C. The columns to the right are the μV produced in intervals of 1°C. For example -8076.34 in the emf produced at -209°C.

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-210	-8095.61	-8076.34	-8056.79	-8036.96	-8016.85	-7996.47	-7975.81	-7954.88	-7933.67	-7912.20
-200	-7890.46	-7868.45	-7846.19	-7823.65	-7800.86	-7777.81	-7754.51	-7730.94	-7707.13	-7683.06
-190	-7658.75	-7634.18	-7609.37	-7584.31	-7559.01	-7533.47	-7507.69	-7481.67	-7455.41	-7428.92
-180	-7402.19	-7375.24	-7348.05	-7320.63	-7292.99	-7265.12	-7237.02	-7208.71	-7180.17	-7151.41
-170	-7122.43	-7093.24	-7063.83	-7034.21	-7004.38	-6974.33	-6944.08	-6913.62	-6882.95	-6852.07
-160	-6821.00	-6789.72	-6758.24	-6726.56	-6694.68	-6662.60	-6630.33	-6597.87	-6565.21	-6532.36
-150	-6499.32	-6466.10	-6432.68	-6399.08	-6365.29	-6331.32	-6297.17	-6262.84	-6228.33	-6193.64
-140	-6158.77	-6123.72	-6088.51	-6053.11	-6017.55	-5981.81	-5945.91	-5909.83	-5873.59	-5837.18
-130	-5800.61	-5763.87	-5726.97	-5689.91	-5652.68	-5615.30	-5577.76	-5540.06	-5502.21	-5464.20
-120	-5426.04	-5387.72	-5349.25	-5310.63	-5271.87	-5232.95	-5193.89	-5154.68	-5115.32	-5075.82
-110	-5036.18	-4996.39	-4956.47	-4916.40	-4876.20	-4835.85	-4795.37	-4754.75	-4714.00	-4673.12
-100	-4632.10	-4590.94	-4549.66	-4508.25	-4466.70	-4425.03	-4383.23	-4341.31	-4299.25	-4257.08
-90	-4214.78	-4172.35	-4129.81	-4087.14	-4044.35	-4001.45	-3958.42	-3915.28	-3872.02	-3828.65
-80	-3785.16	-3741.55	-3697.83	-3654.00	-3610.06	-3566.01	-3521.84	-3477.57	-3433.19	-3388.70
-70	-3344.11	-3299.41	-3254.60	-3209.69	-3164.68	-3119.56	-3074.34	-3029.02	-2983.60	-2938.08
-60	-2892.46	-2846.74	-2800.92	-2755.01	-2709.00	-2662.90	-2616.70	-2570.41	-2524.02	-2477.54
-50	-2430.97	-2384.31	-2337.56	-2290.72	-2243.79	-2196.78	-2149.67	-2102.48	-2055.20	-2007.84
-40	-1960.39	-1912.85	-1865.24	-1817.54	-1769.76	-1721.89	-1673.95	-1625.92	-1577.82	-1529.64
-30	-1481.37	-1433.03	-1384.62	-1336.12	-1287.56	-1238.91	-1190.19	-1141.4	-1092.53	-1043.59
-20	-994.58	-945.49	-896.34	-847.11	-797.82	-748.45	-699.01	-649.51	-599.94	-550.30
-10	-500.60	-450.83	-400.99	-351.09	-301.12	-251.09	-201.00	-150.84	-100.62	-50.34
0	0.00	50.40	100.87	151.39	201.97	252.61	303.31	354.07	404.89	455.76
10	506.69	557.67	608.71	659.80	710.95	762.15	813.41	864.72	916.08	967.50
20	1018.96	1070.48	1122.04	1173.66	1225.33	1277.05	1328.81	1380.63	1432.49	1484.40
30	1536.36	1588.36	1640.41	1692.51	1744.65	1796.84	1849.07	1901.34	1953.66	2006.03
40	2058.43	2110.88	2163.37	2215.91	2268.48	2321.10	2373.75	2426.45	2479.19	2531.96
50	2584.78	2637.63	2690.52	2743.45	2796.42	2849.43	2902.47	2955.55	3008.66	3061.81
60	3115.00	3168.22	3221.48	3274.77	3328.09	3381.45	3434.84	3488.27	3541.72	3595.21
70	3648.73	3702.29	3755.87	3809.49	3863.13	3916.81	3970.52	4024.25	4078.02	4131.82
80	4185.64	4239.49	4293.37	4347.28	4401.22	4455.18	4509.17	4563.19	4617.23	4671.30
90	4725.39	4779.51	4833.66	4887.83	4942.02	4996.24	5050.49	5104.75	5159.04	5213.36
100	5267.69	5322.05	5376.43	5430.83	5485.26	5539.71	5594.17	5648.66	5703.17	5757.70
110	5812.25	5866.82	5921.41	5976.02	6030.65	6085.30	6139.96	6194.65	6249.35	6304.07
120	6358.81	6413.57	6468.34	6523.13	6577.94	6632.76	6687.60	6742.45	6797.32	6852.21
130	6907.11	6962.03	7016.96	7071.91	7126.87	7181.85	7236.84	7291.84	7346.86	7401.89
140	7456.93	7511.99	7567.06	7622.14	7677.24	7732.34	7787.46	7842.59	7897.73	7952.89
150	8008.05	8063.23	8118.41	8173.61	8228.81	8284.03	8339.26	8394.49	8449.74	8505.00
160	8560.26	8615.54	8670.82	8726.11	8781.41	8836.72	8892.04	8947.36	9002.69	9058.03
170	9113.38	9168.74	9224.10	9279.47	9334.84	9390.23	9445.62	9501.01	9556.41	9611.82
180	9667.23	9722.65	9778.08	9833.51	9888.95	9944.39	9999.83	10055.30	10110.70	10166.20
190	10221.70	10277.10	10332.60	10388.10	10443.60	10499.00	10554.50	10610.00	10665.50	10721.00
200	10776.50	10832.00	10887.50	10943.00	10998.50	11054.10	11109.60	11165.10	11220.60	11276.10
210	11331.70	11387.20	11442.70	11498.20	11553.80	11609.30	11664.80	11720.40	11775.90	11831.40
220	11887.00	11942.50	11998.10	12053.60	12109.10	12164.70	12220.20	12275.70	12331.30	12386.80
230	12442.40	12497.90	12553.40	12609.00	12664.50	12720.00	12775.60	12831.10	12886.60	12942.20
240	12997.70	13053.20	13108.80	13164.30	13219.80	13275.30	13330.90	13386.40	13441.90	13497.40
250	13552.90	13608.40	13663.90	13719.50	13775.00	13830.50	13886.00	13941.50	13997.00	14052.50
260	14107.90	14163.40	14218.90	14274.40	14329.90	14385.40	14440.80	14496.30	14551.80	14607.30
270	14662.70	14718.20	14773.60	14829.10	14884.60	14940.00	14995.50	15050.90	15106.30	15161.80
280	15217.20	15272.60	15328.10	15383.50	15438.90	15494.30	15549.70	15605.10	15660.50	15715.90
290	15771.30	15826.70	15882.10	15937.50	15992.90	16048.30	16103.60	16159.00	16214.40	16269.80
300	16325.10	16380.50	16435.80	16491.20	16546.50	16601.90	16657.20	16712.50	16767.90	16823.20
310	16878.50	16933.80	16989.10	17044.50	17099.80	17155.10	17210.40	17265.70	17321.00	17376.30
320	17431.50	17486.80	17542.10	17597.40	17652.60	17707.90	17763.20	17818.40	17873.70	17928.90
330	17984.20	18039.40	18094.70	18149.90	18205.20	18260.40	18315.60	18370.80	18426.10	18481.30
340	18536.50	18591.70	18646.90	18702.10	18757.30	18812.50	18867.70	18922.90	18978.10	19033.30
350	19088.50	19143.70	19198.90	19254.10	19309.20	19364.40	19419.60	19474.80	19529.90	19585.10
360	19640.30	19695.40	19750.60	19805.70	19860.90	19916.00	19971.20	20026.30	20081.50	20136.60
370	20191.80	20246.90	20302.10	20357.20	20412.40	20467.50	20522.60	20577.80	20632.90	20688.00
380	20743.20	20798.30	20853.40	20908.60	20963.70	21018.80	21074.00	21129.10	21184.20	21239.40
390	21294.50	21349.60	21404.80	21459.90	21515.10	21570.20	21625.30	21680.50	21735.60	21790.70
400	21845.90	21901.00	21956.20	22011.30	22066.50	22121.60	22176.80	22231.90	22287.10	22342.20
410	22397.40	22452.50	22507.70	22562.90	22618.00	22673.20	22728.40	22783.60	22838.70	22893.90
420	22949.10	23004.30	23059.50	23114.70	23169.90	23225.10	23280.30	23335.60	23390.80	23446.00
430	23501.20	23556.50	23611.70	23667.00	23722.20	23777.50	23832.70	23888.00	23943.30	23998.50
440	24053.80	24109.10	24164.40	24219.70	24275.00	24330.40	24385.70	24441.00	24496.40	24551.70
450	24607.10	24662.40	24717.80	24773.20	24828.60	24884.00	24939.40	24994.80	25050.20	25105.70
460	25161.10	25216.50	25272.00	25327.50	25383.00	25438.40	25493.90	25549.50	25605.00	25660.50
470	25716.10	25771.60	25827.20	25882.80	25938.30	25993.90	26049.60	26105.20	26160.80	26216.50

480	26272.10	26327.80	26383.50	26439.20	26494.90	26550.60	26606.40	26662.10	26717.90	26773.70
490	26829.50	26885.30	26941.10	26996.90	27052.80	27108.70	27164.60	27220.50	27276.40	27332.30
500	27388.30	27444.20	27500.20	27556.20	27612.20	27668.20	27724.30	27780.40	27836.40	27892.60
510	27948.70	28004.80	28061.00	28117.10	28173.30	28229.50	28285.80	28342.00	28398.30	28454.60
520	28510.90	28567.20	28623.60	28680.00	28736.30	28792.80	28849.20	28905.60	28962.10	29018.60
530	29075.10	29131.70	29188.20	29244.80	29301.40	29358.00	29414.70	29471.40	29528.10	29584.80
540	29641.50	29698.30	29755.10	29811.90	29868.80	29925.60	29982.50	30039.40	30096.40	30153.30
550	30210.30	30267.30	30324.40	30381.40	30438.50	30495.70	30552.80	30610.00	30667.20	30724.40
560	30781.70	30838.90	30896.20	30953.60	31010.90	31068.30	31125.80	31183.20	31240.70	31298.20
570	31355.70	31413.30	31470.90	31528.50	31586.20	31643.80	31701.50	31759.30	31817.10	31874.90
580	31932.70	31990.60	32048.50	32106.40	32164.30	32222.30	32280.40	32338.40	32396.50	32454.60
590	32512.80	32570.90	32629.10	32687.40	32745.70	32804.00	32862.30	32920.70	32979.10	33037.60
600	33096.00	33154.60	33213.10	33271.70	33330.30	33388.90	33447.60	33506.30	33565.10	33623.90
610	33682.70	33741.60	33800.50	33859.40	33918.40	33977.40	34036.40	34095.50	34154.60	34213.70
620	34272.90	34332.10	34391.40	34450.70	34510.00	34569.30	34628.70	34688.20	34747.70	34807.20
630	34866.70	34926.30	34985.90	35045.60	35105.30	35165.00	35224.80	35284.60	35344.40	35404.30
640	35464.30	35524.20	35584.20	35644.30	35704.30	35764.50	35824.60	35884.80	35945.00	36005.30
650	36065.60	36126.00	36186.30	36246.80	36307.20	36367.70	36428.30	36488.90	36549.50	36610.10
660	36670.80	36731.60	36792.30	36853.10	36914.00	36974.90	37035.80	37096.80	37157.80	37218.80
670	37279.90	37341.00	37402.20	37463.40	37524.60	37585.90	37647.20	37708.60	37770.00	37831.40
680	37892.90	37954.40	38015.90	38077.50	38139.10	38200.80	38262.50	38324.20	38386.00	38447.80
690	38509.70	38571.60	38633.50	38695.50	38757.50	38819.50	38881.60	38943.70	39005.80	39068.00
700	39130.20	39192.50	39254.80	39317.10	39379.50	39441.90	39504.30	39566.80	39629.30	39691.80
710	39754.40	39817.00	39879.70	39942.30	40005.10	40067.80	40130.60	40193.40	40256.20	40319.10
720	40382.00	40445.00	40508.00	40571.00	40634.00	40697.10	40760.20	40823.30	40886.50	40949.70
730	41012.90	41076.20	41139.50	41202.80	41266.10	41329.50	41392.90	41456.30	41519.80	41583.30
740	41646.80	41710.30	41773.90	41837.50	41901.10	41964.70	42028.40	42092.00	42155.80	42219.50
750	42283.20	42347.00	42410.80	42474.60	42538.50	42602.40	42666.20	42730.10	42794.10	42858.00
760	42921.90	42985.90	43049.90	43114.00	43178.00	43242.20	43306.30	43370.50	43434.70	43498.90
770	43563.10	43627.40	43691.70	43756.00	43820.40	43884.80	43949.10	44013.60	44078.00	44142.40
780	44206.90	44271.40	44335.80	44400.30	44464.90	44529.40	44593.90	44658.50	44723.00	44787.60
790	44852.20	44916.80	44981.40	45045.90	45110.50	45175.20	45239.80	45304.40	45369.00	45433.60
800	45498.20	45562.80	45627.50	45692.10	45756.70	45821.30	45885.90	45950.50	46015.10	46079.70
810	46144.30	46208.80	46273.40	46338.00	46402.50	46467.10	46531.60	46596.10	46660.70	46725.20
820	46789.70	46854.10	46918.60	46983.10	47047.50	47111.90	47176.30	47240.70	47305.10	47369.50
830	47433.80	47498.10	47562.40	47626.70	47691.00	47755.30	47819.50	47883.70	47947.90	48012.10
840	48076.20	48140.40	48204.50	48268.50	48332.60	48396.60	48460.70	48524.60	48588.60	48652.60
850	48716.50	48780.40	48844.20	48908.10	48971.90	49035.70	49099.40	49163.20	49226.90	49290.50
860	49354.20	49417.80	49481.40	49545.00	49608.50	49672.00	49735.50	49798.90	49862.30	49925.70
870	49989.10	50052.40	50115.70	50179.00	50242.20	50305.40	50368.50	50431.70	50494.80	50557.80
880	50620.90	50683.90	50746.90	50809.80	50872.70	50935.60	50998.40	51061.20	51124.00	51186.70
890	51249.40	51312.10	51374.70	51437.30	51499.90	51562.50	51625.00	51687.40	51749.90	51812.20
900	51874.60	51936.90	51999.20	52061.50	52123.70	52185.90	52248.10	52310.20	52372.30	52434.30
910	52496.30	52558.30	52620.20	52682.20	52744.00	52805.90	52867.70	52929.40	52991.20	53052.90
920	53114.50	53176.20	53237.80	53299.30	53360.80	53422.30	53483.80	53545.20	53606.60	53667.90
930	53729.30	53790.50	53851.80	53913.00	53974.20	54035.30	54096.40	54157.50	54218.50	54279.60
940	54340.50	54401.50	54462.40	54523.20	54584.10	54644.90	54705.70	54766.40	54827.10	54887.80
950	54948.40	55009.00	55069.60	55130.20	55190.70	55251.10	55311.60	55372.00	55432.40	55492.80
960	55553.10	55613.40	55673.60	55733.80	55794.00	55854.20	55914.30	55974.50	56034.50	56094.60
970	56154.60	56214.60	56274.50	56334.50	56394.40	56454.20	56514.10	56573.90	56633.70	56693.40
980	56753.10	56812.80	56872.50	56932.20	56991.80	57051.40	57110.90	57170.50	57230.00	57289.50
990	57348.90	57408.40	57467.80	57527.10	57586.50	57645.80	57705.10	57764.40	57823.70	57882.90
1000	57942.10	58001.30	58060.40	58119.60	58178.70	58237.80	58296.80	58355.90	58414.90	58473.90
1010	58532.90	58591.80	58650.80	58709.70	58768.60	58827.40	58886.30	58945.10	59003.90	59062.70
1020	59121.50	59180.20	59239.00	59297.70	59356.40	59415.10	59473.70	59532.30	59591.00	59649.60
1030	59708.20	59766.70	59825.30	59883.80	59942.30	60000.80	60059.30	60117.80	60176.20	60234.60
1040	60293.10	60351.50	60409.90	60468.20	60526.60	60584.90	60643.30	60701.60	60759.90	60818.20
1050	60876.50	60934.70	60993.00	61051.20	61109.40	61167.60	61225.80	61284.00	61342.20	61400.40
1060	61458.50	61516.70	61574.80	61632.90	61691.00	61749.10	61807.20	61865.30	61923.40	61981.40
1070	62039.50	62097.50	62155.50	62213.60	62271.60	62329.60	62387.60	62445.60	62503.50	62561.50
1080	62619.50	62677.40	62735.40	62793.30	62851.20	62909.20	62967.10	63025.00	63082.90	63140.80
1090	63198.70	63256.60	63314.50	63372.30	63430.20	63488.10	63545.90	63603.80	63661.60	63719.50
1100	63777.30	63835.10	63892.90	63950.80	64008.60	64066.40	64124.20	64182.00	64239.80	64297.60
1110	64355.40	64413.10	64470.90	64528.70	64586.50	64644.20	64702.00	64759.70	64817.50	64875.20
1120	64933.00	64990.70	65048.50	65106.20	65163.90	65221.70	65279.40	65337.10	65394.80	65452.50
1130	65510.20	65567.90	65625.60	65683.30	65741.00	65798.70	65856.40	65914.10	65971.80	66029.50
1140	66087.10	66144.80	66202.50	66260.10	66317.80	66375.40	66433.10	66490.70	66548.40	66606.00
1150	66663.60	66721.20	66778.90	66836.50	66894.10	66951.70	67009.30	67066.90	67124.50	67182.10
1160	67239.60	67297.20	67354.80	67412.40	67469.90	67527.50	67585.00	67642.50	67700.10	67757.60
1170	67815.10	67872.60	67930.10	67987.60	68045.10	68102.60	68160.00	68217.50	68274.90	68332.40
1180	68389.80	68447.20	68504.60	68562.00	68619.40	68676.80	68734.20	68791.50	68848.90	68906.20
1190	68963.50	69020.90	69078.10	69135.40	69192.70	69250.00	69307.20	69364.40	69421.60	69478.80



K-TYPE THERMOCOUPLE TABLES

The table below is as compiled by the National Institute of Standards and Technology (NIST) in the US for a metal pair of Nickel-Chromium vs. Nickel-Aluminum referenced to a cold junction at 0°C. K is the letter designation approved by the American Institute for Standards (ANSI). The column to the left is temperature in °C. The columns to the right are the μV produced in intervals of 1°C. For example -6456.99 μV is produced at -269°C.

-270	-6457.82	-6456.99	-6455.99	-6454.81	-6453.45	-6451.90	-6450.15	-6448.20	-6446.06	-6443.71
-260	-6441.15	-6438.38	-6435.40	-6432.20	-6428.79	-6425.15	-6421.30	-6417.23	-6412.94	-6408.42
-250	-6403.68	-6398.71	-6393.53	-6388.11	-6382.47	-6376.61	-6370.52	-6364.21	-6357.67	-6350.91
-240	-6343.92	-6336.72	-6329.29	-6321.63	-6313.76	-6305.67	-6297.36	-6288.83	-6280.08	-6271.12
-230	-6261.93	-6252.54	-6242.93	-6233.11	-6223.08	-6212.83	-6202.38	-6191.72	-6180.85	-6169.77
-220	-6158.49	-6147.01	-6135.32	-6123.43	-6111.34	-6099.05	-6086.56	-6073.87	-6060.98	-6047.90
-210	-6034.63	-6021.16	-6007.49	-5993.64	-5979.59	-5965.36	-5950.93	-5936.32	-5921.52	-5906.53
-200	-5891.36	-5876.00	-5860.46	-5844.74	-5828.84	-5812.75	-5796.48	-5780.03	-5763.41	-5746.61
-190	-5729.62	-5712.47	-5695.13	-5677.62	-5659.94	-5642.08	-5624.05	-5605.85	-5587.47	-5568.92
-180	-5550.21	-5531.32	-5512.27	-5493.04	-5473.65	-5454.09	-5434.36	-5414.47	-5394.41	-5374.19
-170	-5353.80	-5333.25	-5312.54	-5291.66	-5270.63	-5249.43	-5228.07	-5206.55	-5184.87	-5163.03
-160	-5141.03	-5118.88	-5096.57	-5074.10	-5051.47	-5028.69	-5005.76	-4982.67	-4959.42	-4936.03
-150	-4912.48	-4888.77	-4864.92	-4840.92	-4816.76	-4792.46	-4768.00	-4743.40	-4718.65	-4693.75
-140	-4668.71	-4643.52	-4618.18	-4592.70	-4567.07	-4541.30	-4515.38	-4489.33	-4463.13	-4436.78
-130	-4410.30	-4383.68	-4356.92	-4330.02	-4302.97	-4275.80	-4248.48	-4221.03	-4193.44	-4165.71
-120	-4137.85	-4109.86	-4081.73	-4053.47	-4025.08	-3996.55	-3967.89	-3939.10	-3910.19	-3881.14
-110	-3851.96	-3822.66	-3793.22	-3763.66	-3733.98	-3704.16	-3674.23	-3644.16	-3613.98	-3583.67
-100	-3553.23	-3522.68	-3492.00	-3461.21	-3430.29	-3399.25	-3368.10	-3336.82	-3305.43	-3273.92
-90	-3242.30	-3210.55	-3178.70	-3146.73	-3114.64	-3082.44	-3050.13	-3017.71	-2985.17	-2952.53
-80	-2919.77	-2886.91	-2853.93	-2820.85	-2787.66	-2754.36	-2720.96	-2687.45	-2653.84	-2620.12
-70	-2586.30	-2552.37	-2518.34	-2484.21	-2449.98	-2415.65	-2381.22	-2346.69	-2312.06	-2277.34
-60	-2242.51	-2207.59	-2172.58	-2137.47	-2102.26	-2066.96	-2031.57	-1996.08	-1960.50	-1924.83
-50	-1889.07	-1853.23	-1817.29	-1781.26	-1745.14	-1708.94	-1672.65	-1636.27	-1599.81	-1563.27
-40	-1526.64	-1489.92	-1453.13	-1416.25	-1379.29	-1342.25	-1305.13	-1267.93	-1230.65	-1193.29
-30	-1155.85	-1118.34	-1080.75	-1043.09	-1005.35	-967.54	-929.65	-891.69	-853.66	-815.55
-20	-777.38	-739.13	-700.81	-662.43	-623.97	-585.45	-546.87	-508.21	-469.49	-430.70
-10	-391.86	-352.94	-313.97	-274.93	-235.83	-196.67	-157.45	-118.17	-78.84	-39.45
0	0.00	39.50	79.04	118.63	158.26	197.94	237.66	277.43	317.23	357.08
10	396.98	436.91	476.89	516.90	556.96	597.06	637.20	677.38	717.59	757.85
20	798.14	838.48	878.85	919.25	959.70	1000.18	1040.69	1081.24	1121.83	1162.45
30	1203.10	1243.79	1284.51	1325.26	1366.04	1406.86	1447.70	1488.58	1529.49	1570.42
40	1611.38	1652.37	1693.39	1734.44	1775.51	1816.61	1857.73	1898.87	1940.04	1981.24
50	2022.45	2063.69	2104.94	2146.22	2187.52	2228.83	2270.17	2311.52	2352.89	2394.27
60	2435.67	2477.08	2518.51	2559.95	2601.40	2642.87	2684.34	2725.83	2767.32	2808.82
70	2850.33	2891.85	2933.37	2974.90	3016.43	3057.97	3099.51	3141.05	3182.59	3224.13
80	3265.67	3307.21	3348.75	3390.29	3431.82	3473.35	3514.87	3556.39	3597.90	3639.41
90	3680.90	3722.39	3763.87	3805.33	3846.79	3888.24	3929.67	3971.09	4012.50	4053.89
100	4095.27	4136.63	4177.98	4219.31	4260.63	4301.92	4343.20	4384.46	4425.70	4466.92
110	4508.13	4549.31	4590.47	4631.61	4672.72	4713.82	4754.89	4795.94	4836.97	4877.97
120	4918.96	4959.91	5000.85	5041.76	5082.64	5123.50	5164.34	5205.15	5245.94	5286.71
130	5327.44	5368.16	5408.85	5449.51	5490.15	5530.77	5571.36	5611.93	5652.48	5693.00
140	5733.49	5773.97	5814.42	5854.84	5895.25	5935.63	5975.99	6016.33	6056.65	6096.94
150	6137.22	6177.48	6217.71	6257.93	6298.13	6338.31	6378.47	6418.61	6458.74	6498.85
160	6538.95	6579.03	6619.09	6659.14	6699.18	6739.20	6779.22	6819.22	6859.20	6899.18
170	6939.15	6979.11	7019.06	7059.00	7098.93	7138.86	7178.78	7218.69	7258.60	7298.51
180	7338.41	7378.31	7418.20	7458.10	7497.99	7537.88	7577.77	7617.66	7657.55	7697.45
190	7737.34	7777.24	7817.15	7857.05	7896.96	7936.88	7976.80	8016.73	8056.66	8096.61
200	8136.55	8176.51	8216.48	8256.45	8296.44	8336.43	8376.44	8416.46	8456.48	8496.52
210	8536.57	8576.64	8616.72	8656.81	8696.91	8737.03	8777.16	8817.30	8857.46	8897.64
220	8937.83	8978.04	9018.26	9058.50	9098.75	9139.02	9179.31	9219.62	9259.94	9300.27
230	9340.63	9381.00	9421.39	9461.80	9502.23	9542.67	9583.13	9623.61	9664.11	9704.62
240	9745.15	9785.71	9826.27	9866.86	9907.47	9948.09	9988.73	10029.40	10070.10	10110.80
250	10151.50	10192.20	10233.00	10273.70	10314.50	10355.30	10396.10	10437.00	10477.80	10518.70
260	10559.60	10600.50	10641.40	10682.30	10723.30	10764.30	10805.20	10846.30	10887.30	10928.30
270	10969.40	11010.40	11051.50	11092.60	11133.70	11174.80	11216.00	11257.10	11298.30	11339.50
280	11380.70	11421.90	11463.10	11504.40	11545.60	11586.90	11628.20	11669.50	11710.80	11752.10
290	11793.40	11834.80	11876.10	11917.50	11958.90	12000.30	12041.70	12083.10	12124.50	12166.00
300	12207.40	12248.90	12290.40	12331.90	12373.40	12414.90	12456.40	12497.90	12539.50	12581.00
310	12622.60	12664.10	12705.70	12747.30	12788.90	12830.50	12872.10	12913.80	12955.40	12997.10
320	13038.70	13080.40	13122.00	13163.70	13205.40	13247.10	13288.80	13330.50	13372.30	13414.00
330	13455.70	13497.50	13539.30	13581.00	13622.80	13664.60	13706.40	13748.20	13790.00	13831.80

340	13873.60	13915.40	13957.30	13999.10	14041.00	14082.80	14124.70	14166.60	14208.50	14250.30
350	14292.20	14334.10	14376.10	14418.00	14459.90	14501.80	14543.80	14585.70	14627.70	14669.60
360	14711.60	14753.60	14795.50	14837.50	14879.50	14921.50	14963.50	15005.50	15047.50	15089.60
370	15131.60	15173.60	15215.70	15257.70	15299.80	15341.90	15383.90	15426.00	15468.10	15510.20
380	15552.30	15594.40	15636.50	15678.60	15720.70	15762.80	15805.00	15847.10	15889.30	15931.40
390	15973.60	16015.70	16057.90	16100.10	16142.30	16184.40	16226.60	16268.80	16311.00	16353.20
400	16395.50	16437.70	16479.90	16522.10	16564.40	16606.60	16648.90	16691.10	16733.40	16775.60
410	16817.90	16860.20	16902.50	16944.80	16987.00	17029.30	17071.60	17113.90	17156.30	17198.60
420	17240.90	17283.20	17325.60	17367.90	17410.20	17452.60	17494.90	17537.30	17579.70	17622.00
430	17664.40	17706.80	17749.20	17791.60	17833.90	17876.30	17918.70	17961.10	18003.60	18046.00
440	18088.40	18130.80	18173.20	18215.70	18258.10	18300.50	18343.00	18385.40	18427.90	18470.40
450	18512.80	18555.30	18597.80	18640.20	18682.70	18725.20	18767.70	18810.20	18852.70	18895.10
460	18937.60	18980.20	19022.70	19065.20	19107.70	19150.20	19192.70	19235.20	19277.80	19320.30
470	19362.80	19405.40	19447.90	19490.50	19533.00	19575.60	19618.10	19660.70	19703.20	19745.80
480	19788.40	19830.90	19873.50	19916.10	19958.60	20001.20	20043.80	20086.40	20129.00	20171.60
490	20214.20	20256.70	20299.30	20341.90	20384.50	20427.10	20469.70	20512.30	20555.00	20597.60
500	20640.20	20682.80	20725.40	20768.00	20810.60	20853.30	20895.90	20938.50	20981.10	21023.80
510	21066.40	21109.00	21151.60	21194.30	21236.90	21279.50	21322.20	21364.80	21407.40	21450.10
520	21492.70	21535.30	21578.00	21620.60	21663.30	21705.90	21748.60	21791.20	21833.80	21876.50
530	21919.10	21961.80	22004.40	22047.00	22089.70	22132.30	22175.00	22217.60	22260.30	22302.90
540	22345.60	22388.20	22430.80	22473.50	22516.10	22558.80	22601.40	22644.00	22686.70	22729.30
550	22772.00	22814.60	22857.20	22899.90	22942.50	22985.10	23027.80	23070.40	23113.00	23155.60
560	23198.30	23240.90	23283.50	23326.10	23368.80	23411.40	23454.00	23496.60	23539.20	23581.80
570	23624.50	23667.10	23709.70	23752.30	23794.90	23837.50	23880.10	23922.70	23965.30	24007.80
580	24050.40	24093.00	24135.60	24178.20	24220.80	24263.30	24305.90	24348.50	24391.00	24433.60
590	24476.20	24518.70	24561.30	24603.80	24646.40	24688.90	24731.50	24774.00	24816.50	24859.10
600	24901.60	24944.10	24986.70	25029.20	25071.70	25114.20	25156.70	25199.20	25241.70	25284.20
610	25326.70	25369.20	25411.70	25454.20	25496.70	25539.20	25581.70	25624.20	25666.70	25709.20
620	25751.40	25793.80	25836.20	25878.70	25921.10	25963.50	26006.00	26048.40	26090.80	26133.20
630	26175.60	26218.00	26260.40	26302.70	26345.10	26387.50	26429.90	26472.20	26514.60	26556.90
640	26599.30	26641.60	26684.00	26726.30	26768.60	26810.90	26853.20	26895.60	26937.90	26980.20
650	27022.40	27064.70	27107.00	27149.30	27191.50	27233.80	27276.00	27318.30	27360.50	27402.80
660	27445.00	27487.20	27529.40	27571.60	27613.80	27656.00	27698.20	27740.40	27782.60	27824.70
670	27866.90	27909.00	27951.20	27993.30	28035.50	28077.60	28119.70	28161.80	28203.90	28246.00
680	28288.10	28330.20	28372.30	28414.30	28456.40	28498.40	28540.50	28582.50	28624.60	28666.60
690	28708.60	28750.60	28792.60	28834.60	28876.60	28918.60	28960.50	29002.50	29044.40	29086.40
700	29128.30	29170.30	29212.20	29254.10	29296.00	29337.90	29379.80	29421.70	29463.50	29505.40
710	29547.20	29589.10	29630.90	29672.80	29714.60	29756.40	29798.20	29840.00	29881.80	29923.60
720	29965.30	30007.10	30048.80	30090.60	30132.30	30174.00	30215.80	30257.50	30299.20	30340.90
730	30382.50	30424.20	30465.90	30507.50	30549.20	30590.80	30632.40	30674.10	30715.70	30757.30
740	30798.90	30840.50	30882.00	30923.60	30965.10	31006.70	31048.20	31089.80	31131.30	31172.80
750	31214.30	31255.80	31297.20	31338.70	31380.20	31421.60	31463.10	31504.50	31545.90	31587.30
760	31628.70	31670.10	31711.50	31752.90	31794.30	31835.60	31877.00	31918.30	31959.60	32000.90
770	32042.20	32083.50	32124.80	32166.10	32207.40	32248.60	32289.90	32331.10	32372.30	32413.50
780	32454.80	32495.90	32537.10	32578.30	32619.50	32660.60	32701.80	32742.90	32784.00	32825.20
790	32866.30	32907.40	32948.50	32989.50	33030.60	33071.70	33112.70	33153.70	33194.80	33235.80
800	33276.80	33317.80	33358.80	33399.70	33440.70	33481.60	33522.60	33563.50	33604.40	33645.40
810	33686.30	33727.20	33768.00	33808.90	33849.80	33890.60	33931.50	33972.30	34013.10	34053.90
820	34094.70	34135.50	34176.30	34217.10	34257.80	34298.60	34339.30	34380.00	34420.70	34461.40
830	34502.10	34542.80	34583.50	34624.20	34664.80	34705.50	34746.10	34786.70	34827.30	34867.90
840	34908.50	34949.10	34989.70	35030.20	35070.80	35111.30	35151.80	35192.30	35232.90	35273.30
850	35313.80	35354.30	35394.80	35435.20	35475.70	35516.10	35556.50	35596.90	35637.30	35677.70
860	35718.10	35758.50	35798.80	35839.20	35879.50	35919.90	35960.20	36000.50	36040.80	36081.10
870	36121.30	36161.60	36201.90	36242.10	36282.30	36322.60	36362.80	36403.00	36443.20	36483.30
880	36523.50	36563.70	36603.80	36644.00	36684.10	36724.20	36764.30	36804.40	36844.50	36884.60
890	36924.60	36964.70	37004.70	37044.80	37084.80	37124.80	37164.80	37204.80	37244.80	37284.80
900	37324.70	37364.70	37404.60	37444.50	37484.50	37524.40	37564.30	37604.20	37644.00	37683.90
910	37723.80	37763.60	37803.40	37843.30	37883.10	37922.90	37962.70	38002.50	38042.20	38082.00
920	38121.80	38161.50	38201.20	38241.00	38280.70	38320.40	38360.10	38399.80	38439.40	38479.10
930	38518.70	38558.40	38598.00	38637.60	38677.20	38716.80	38756.40	38796.00	38835.60	38875.10
940	38914.70	38954.20	38993.70	39033.20	39072.80	39112.20	39151.70	39191.20	39230.70	39270.10
950	39309.60	39349.00	39388.40	39427.80	39467.20	39506.60	39546.00	39585.40	39624.80	39664.10
960	39703.50	39742.80	39782.10	39821.40	39860.70	39900.00	39939.30	39978.60	40017.80	40057.10
970	40096.30	40135.50	40174.80	40214.00	40253.20	40292.30	40331.50	40370.70	40409.90	40449.00
980	40488.10	40527.30	40566.40	40605.50	40644.60	40683.70	40722.70	40761.80	40800.90	40839.90
990	40878.90	40918.00	40957.00	40996.00	41035.00	41074.00	41112.90	41151.90	41190.80	41229.80
1000	41268.70	41307.60	41346.50	41385.40	41424.30	41463.20	41502.10	41540.90	41579.80	41618.60

1010	41657.50	41696.30	41735.10	41773.90	41812.70	41851.50	41890.20	41929.00	41967.70	42006.50
1020	42045.20	42083.90	42122.60	42161.30	42200.00	42238.60	42277.30	42316.00	42354.60	42393.20
1030	42431.80	42470.50	42509.10	42547.60	42586.20	42624.80	42663.30	42701.90	42740.40	42778.90
1040	42817.50	42856.00	42894.50	42932.90	42971.40	43009.90	43048.30	43086.80	43125.20	43163.60
1050	43202.00	43240.40	43278.80	43317.20	43355.50	43393.90	43432.20	43470.60	43508.90	43547.20
1060	43585.50	43623.80	43662.10	43700.30	43738.60	43776.80	43815.10	43853.30	43891.50	43929.70
1070	43967.90	44006.10	44044.20	44082.40	44120.50	44158.70	44196.80	44234.90	44273.00	44311.10
1080	44349.10	44387.20	44425.30	44463.30	44501.30	44539.40	44577.40	44615.40	44653.40	44691.30
1090	44729.30	44767.20	44805.20	44843.10	44881.00	44918.90	44956.80	44994.70	45032.60	45070.40
1100	45108.30	45146.10	45183.90	45221.70	45259.50	45297.30	45335.10	45372.90	45410.60	45448.30
1110	45486.10	45523.80	45561.50	45599.20	45636.90	45674.50	45712.20	45749.80	45787.40	45825.10
1120	45862.70	45900.30	45937.80	45975.40	46013.00	46050.50	46088.00	46125.60	46163.10	46200.50
1130	46238.00	46275.50	46312.90	46350.40	46387.80	46425.20	46462.60	46500.00	46537.40	46574.80
1140	46612.10	46649.40	46686.80	46724.10	46761.40	46798.70	46835.90	46873.20	46910.40	46947.70
1150	46984.90	47022.10	47059.30	47096.50	47133.60	47170.80	47207.90	47245.00	47282.20	47319.30
1160	47356.30	47393.40	47430.50	47467.50	47504.50	47541.60	47578.60	47615.50	47652.50	47689.50
1170	47726.40	47763.30	47800.30	47837.20	47874.10	47910.90	47947.80	47984.60	48021.50	48058.30
1180	48095.10	48131.90	48168.60	48205.40	48242.10	48278.90	48315.60	48352.30	48389.00	48425.60
1190	48462.30	48498.90	48535.60	48572.20	48608.80	48645.40	48681.90	48718.50	48755.00	48791.50
1200	48828.00	48864.50	48901.00	48937.50	48973.90	49010.30	49046.80	49083.20	49119.50	49155.90
1210	49192.30	49228.60	49264.90	49301.20	49337.50	49373.80	49410.10	49446.30	49482.50	49518.80
1220	49555.00	49591.10	49627.30	49663.50	49699.60	49735.70	49771.80	49807.90	49844.00	49880.00
1230	49916.10	49952.10	49988.10	50024.10	50060.10	50096.00	50132.00	50167.90	50203.80	50239.70
1240	50275.60	50311.40	50347.30	50383.10	50418.90	50454.70	50490.50	50526.30	50562.00	50597.80
1250	50633.50	50669.20	50704.90	50740.50	50776.20	50811.80	50847.40	50883.00	50918.60	50954.20
1260	50989.80	51025.30	51060.80	51096.30	51131.80	51167.30	51202.70	51238.20	51273.60	51309.00
1270	51344.40	51379.80	51415.10	51450.40	51485.80	51521.10	51556.40	51591.60	51626.90	51662.10
1280	51697.40	51732.60	51767.80	51802.90	51838.10	51873.30	51908.40	51943.50	51978.60	52013.70
1290	52048.70	52083.80	52118.80	52153.80	52188.80	52223.80	52258.80	52293.70	52328.70	52363.60
1300	52398.50	52433.40	52468.30	52503.10	52537.90	52572.80	52607.60	52642.40	52677.20	52711.90
1310	52746.70	52781.40	52816.10	52850.80	52885.50	52920.20	52954.90	52989.50	53024.10	53058.70
1320	53093.30	53127.90	53162.50	53197.10	53231.60	53266.10	53300.60	53335.10	53369.60	53404.10
1330	53438.60	53473.00	53507.40	53541.80	53576.30	53610.60	53645.00	53679.40	53713.70	53748.10
1340	53782.40	53816.70	53851.00	53885.30	53919.60	53953.80	53988.10	54022.30	54056.60	54090.80
1350	54125.00	54159.20	54193.40	54227.50	54261.70	54295.80	54330.00	54364.10	54398.20	54432.30
1360	54466.40	54500.50	54534.60	54568.70	54602.70	54636.80	54670.80	54704.90	54738.90	54772.90

E-TYPE THERMOCOUPLE TABLES

The table below is as compiled by the National Institute of Standards and Technology (NIST) in the US for a metal pair of Nickel-Chromium vs. Copper-Nickel referenced to a cold junction at 0°C. E is the letter designation approved by the American Institute of Standards (ANSI). The column to the left is temperature in °C. The columns to the right are the μV produced in intervals of 1°C. For example -9833.22 μV is produced at -269°C.

-270	-9835.03	-9833.22	-9830.93	-9828.16	-9824.93	-9821.27	-9817.17	-9812.65	-9807.72	-9802.39
-260	-9796.66	-9790.54	-9784.04	-9777.15	-9769.89	-9762.25	-9754.25	-9745.87	-9737.13	-9728.02
-250	-9718.55	-9708.71	-9698.52	-9687.96	-9677.05	-9665.78	-9654.16	-9642.18	-9629.85	-9617.18
-240	-9604.15	-9590.78	-9577.06	-9563.00	-9548.61	-9533.87	-9518.80	-9503.39	-9487.65	-9471.59
-230	-9455.19	-9438.48	-9421.44	-9404.09	-9386.41	-9368.43	-9350.13	-9331.53	-9312.62	-9293.41
-220	-9273.90	-9254.09	-9233.99	-9213.59	-9192.91	-9171.94	-9150.68	-9129.14	-9107.32	-9085.23
-210	-9062.86	-9040.21	-9017.30	-8994.12	-8970.67	-8946.96	-8922.98	-8898.75	-8874.25	-8849.50
-200	-8824.50	-8799.24	-8773.73	-8747.97	-8721.96	-8695.70	-8669.20	-8642.46	-8615.47	-8588.25
-190	-8560.78	-8533.08	-8505.14	-8476.96	-8448.55	-8419.90	-8391.03	-8361.92	-8332.59	-8303.02
-180	-8273.23	-8243.21	-8212.97	-8182.50	-8151.81	-8120.90	-8089.77	-8058.42	-8026.84	-7995.06
-170	-7963.05	-7930.83	-7898.39	-7865.74	-7832.88	-7799.81	-7766.52	-7733.03	-7699.32	-7665.41
-160	-7631.29	-7596.97	-7562.44	-7527.70	-7492.77	-7457.63	-7422.29	-7386.75	-7351.00	-7315.06
-150	-7278.93	-7242.59	-7206.06	-7169.34	-7132.42	-7095.30	-7058.00	-7020.50	-6982.81	-6944.93
-140	-6906.86	-6868.60	-6830.15	-6791.52	-6752.70	-6713.70	-6674.50	-6635.13	-6595.57	-6555.83
-130	-6515.91	-6475.80	-6435.52	-6395.05	-6354.40	-6313.58	-6272.58	-6231.40	-6190.04	-6148.51
-120	-6106.80	-6064.91	-6022.85	-5980.62	-5938.21	-5895.64	-5852.88	-5809.96	-5766.87	-5723.61
-110	-5680.17	-5636.57	-5592.80	-5548.86	-5504.76	-5460.49	-5416.05	-5371.45	-5326.68	-5281.74
-100	-5236.65	-5191.39	-5145.97	-5100.39	-5054.64	-5008.74	-4962.67	-4916.45	-4870.07	-4823.53
-90	-4776.83	-4729.97	-4682.96	-4635.80	-4588.48	-4541.00	-4493.37	-4445.59	-4397.65	-4349.57
-80	-4301.33	-4252.94	-4204.40	-4155.72	-4106.88	-4057.90	-4008.77	-3959.49	-3910.06	-3860.49
-70	-3810.78	-3760.92	-3710.91	-3660.76	-3610.47	-3560.04	-3509.46	-3458.75	-3407.89	-3356.89
-60	-3305.75	-3254.48	-3203.06	-3151.51	-3099.82	-3047.99	-2996.02	-2943.92	-2891.69	-2839.31
-50	-2786.81	-2734.17	-2681.39	-2628.48	-2575.44	-2522.27	-2468.97	-2415.53	-2361.96	-2308.27
-40	-2254.44	-2200.48	-2146.40	-2092.18	-2037.84	-1983.37	-1928.78	-1874.05	-1819.20	-1764.23
-30	-1709.13	-1663.91	-1598.56	-1543.09	-1487.49	-1431.77	-1375.93	-1319.97	-1263.88	-1207.67
-20	-1151.34	-1094.90	-1038.33	-981.64	-924.83	-867.90	-810.85	-753.68	-696.40	-639.00
-10	-581.48	-523.84	-466.09	-408.22	-350.24	-292.14	-233.93	-175.61	-117.18	-58.64
0	0.00	58.74	117.56	176.48	235.48	294.56	353.74	413.00	472.35	531.79
10	591.32	650.94	710.65	770.44	830.33	890.30	950.37	1010.53	1070.77	1131.11
20	1191.54	1252.06	1312.66	1373.37	1434.16	1495.04	1556.01	1617.08	1678.23	1739.48
30	1800.82	1862.25	1923.77	1985.38	2047.09	2108.89	2170.77	2232.75	2294.82	2356.99
40	2419.24	2481.58	2544.02	2606.55	2669.17	2731.88	2794.68	2857.57	2920.55	2983.63
50	3046.79	3110.05	3173.39	3236.83	3300.35	3363.97	3427.68	3491.47	3555.36	3619.33
60	3683.40	3747.55	3811.80	3876.13	3940.55	4005.06	4069.66	4134.34	4199.12	4263.98
70	4328.93	4393.97	4459.09	4524.30	4589.60	4654.98	4720.46	4786.01	4851.66	4917.38
80	4983.20	5049.10	5115.08	5181.15	5247.31	5313.54	5379.87	5446.27	5512.76	5579.34
90	5645.99	5712.73	5779.55	5846.45	5913.44	5980.51	6047.66	6114.89	6182.22	6249.59
100	6317.06	6384.61	6452.24	6519.95	6587.74	6655.61	6723.56	6791.58	6859.69	6927.87
110	6996.13	7064.46	7132.88	7201.37	7269.93	7338.57	7407.29	7476.08	7544.95	7613.90
120	7682.91	7752.00	7821.17	7890.41	7959.72	8029.11	8098.56	8168.09	8237.7	8307.37
130	8377.11	8446.93	8516.82	8586.78	8656.80	8726.90	8797.07	8867.31	8937.61	9007.99
140	9078.43	9148.94	9219.52	9290.16	9360.88	9431.66	9502.50	9573.42	9644.40	9715.44
150	9786.55	9857.72	9928.96	10000.30	10071.60	10143.10	10214.60	10286.10	10357.70	10429.40
160	10501.20	10573.00	10644.80	10716.80	10788.8	10860.80	10932.90	11005.10	11077.30	11149.60
170	11222.00	11294.40	11366.90	11439.40	11512.00	11584.60	11657.30	11730.10	11802.90	11875.80
180	11948.70	12021.70	12094.70	12167.80	12241.00	12314.20	12387.40	12460.70	12534.10	12607.50
190	12681.00	12754.50	12828.10	12901.80	12975.40	13049.20	13123.00	13196.80	13270.70	13344.70
200	13418.60	13492.70	13566.80	13640.90	13715.10	13789.40	13863.70	13938.00	14012.40	14086.80
210	14161.30	14235.90	14310.50	14385.10	14459.80	14534.50	14609.30	14684.10	14759.00	14833.90
220	14908.80	14983.80	15058.90	15134.00	15209.10	15284.30	15359.50	15434.80	15510.10	15585.40
230	15660.80	15736.30	15811.80	15887.30	15962.90	16038.50	16114.10	16189.80	16265.60	16341.30
240	16417.20	16493.00	16568.90	16644.90	16720.80	16796.90	16872.90	16949.00	17025.10	17101.30
250	17177.50	17253.80	17330.10	17406.40	17482.80	17559.20	17635.60	17712.10	17788.60	17865.20
260	17941.80	18018.40	18095.10	18171.80	18248.50	18325.30	18402.10	18478.90	18555.80	18632.70
270	18709.60	18786.60	18863.60	18940.70	19017.80	19094.90	19172.00	19249.20	19326.40	19403.70
280	19481.00	19558.30	19635.60	19713.00	19790.40	19867.80	19945.30	20022.80	20100.30	20177.90
290	20255.50	20333.10	20410.80	20488.50	20566.20	20644.00	20721.70	20799.50	20877.40	20955.20
300	21033.10	21111.10	21189.00	21267.00	21345.00	21423.00	21501.10	21579.20	21657.30	21735.50
310	21813.70	21891.90	21970.10	22048.30	22126.60	22204.90	22283.30	22361.60	22440.00	22518.40
320	22596.90	22675.40	22753.80	22832.40	22910.90	22989.50	23068.10	23146.70	23225.30	23304.00
330	23382.70	23461.40	23540.10	23618.90	23697.70	23776.50	23855.30	23934.20	24013.10	24092.00

340	24170.90	24249.90	24328.80	24407.80	24486.80	24565.90	24644.90	24724.00	24803.10	24882.20
350	24961.40	25040.50	25119.70	25198.90	25278.20	25357.40	25436.70	25516.00	25595.30	25674.60
360	25754.00	25833.30	25912.70	25992.10	26071.60	26151.00	26230.50	26310.00	26389.50	26469.00
370	26548.50	26628.10	26707.70	26787.30	26866.90	26946.50	27026.20	27105.80	27185.50	27265.20
380	27344.90	27424.70	27504.40	27584.20	27664.00	27743.80	27823.60	27903.40	27983.30	28063.20
390	28143.00	28222.90	28302.90	28382.80	28462.70	28542.70	28622.70	28702.70	28782.70	28862.70
400	28942.70	29022.80	29102.80	29182.90	29263.00	29343.10	29423.20	29503.40	29583.50	29663.70
410	29743.90	29824.00	29904.20	29984.50	30064.70	30144.90	30225.20	30305.40	30385.70	30466.00
420	30546.30	30626.60	30706.90	30787.30	30867.60	30948.00	31028.40	31108.70	31189.10	31269.50
430	31350.00	31430.40	31510.80	31591.30	31671.70	31752.20	31832.70	31913.20	31993.60	32074.20
440	32154.70	32235.20	32315.70	32396.30	32476.80	32557.40	32638.00	32718.60	32799.10	32879.70
450	32960.40	33041.00	33121.60	33202.20	33282.90	33363.50	33444.20	33524.80	33605.50	33686.20
460	33766.90	33847.60	33928.30	34009.00	34089.70	34170.40	34251.10	34331.90	34412.60	34493.30
470	34574.10	34654.90	34735.60	34816.40	34897.20	34977.90	35058.70	35139.50	35220.30	35301.10
480	35381.90	35462.70	35543.60	35624.40	35705.20	35786.00	35866.90	35947.70	36028.60	36109.40
490	36190.30	36271.10	36352.00	36432.80	36513.70	36594.60	36675.50	36756.30	36837.20	36918.10
500	36999.00	37079.90	37160.80	37241.70	37322.50	37403.40	37484.30	37565.20	37646.20	37727.10
510	37808.00	37888.90	37969.80	38050.70	38131.60	38212.50	38293.40	38374.40	38455.30	38536.20
520	38617.10	38698.00	38779.00	38859.90	38940.80	39021.70	39102.60	39183.60	39264.50	39345.40
530	39426.30	39507.30	39588.20	39669.10	39750.00	39830.90	39911.90	39992.80	40073.70	40154.60
540	40235.50	40316.40	40397.30	40478.30	40559.20	40640.10	40721.00	40801.90	40882.80	40963.70
550	41044.60	41125.50	41206.40	41287.20	41368.10	41449.00	41529.90	41610.80	41691.70	41772.50
560	41853.40	41934.30	42015.10	42096.00	42176.80	42257.70	42338.50	42419.40	42500.20	42581.10
570	42661.90	42742.70	42823.60	42904.40	42985.20	43066.00	43146.80	43227.60	43308.40	43389.20
580	43470.00	43550.80	43631.60	43712.40	43793.10	43873.90	43954.60	44035.40	44116.20	44196.90
590	44277.60	44358.40	44439.10	44519.80	44600.50	44681.20	44761.90	44842.60	44923.30	45004.00
600	45084.70	45165.40	45246.00	45326.70	45407.30	45488.00	45568.60	45649.30	45729.90	45810.50
610	45891.10	45971.70	46052.30	46132.90	46213.50	46294.10	46374.60	46455.20	46535.80	46616.30
620	46696.80	46777.40	46857.90	46938.40	47018.90	47099.40	47179.90	47260.40	47340.90	47421.30
630	47501.80	47582.30	47662.70	47743.10	47823.60	47904.00	47984.40	48064.80	48145.20	48225.60
640	48305.90	48386.30	48466.60	48547.00	48627.30	48707.70	48788.00	48868.30	48948.60	49028.90
650	49109.20	49189.40	49269.70	49349.90	49430.20	49510.40	49590.70	49670.90	49751.10	49831.30
660	49911.50	49991.60	50071.80	50152.00	50232.10	50312.20	50392.40	50472.50	50552.60	50632.70
670	50712.80	50792.80	50872.90	50953.00	51033.00	51113.00	51193.10	51273.10	51353.10	51433.10
680	51513.00	51593.00	51673.00	51752.90	51832.80	51912.80	51992.70	52072.60	52152.50	52232.40
690	52312.20	52392.10	52471.90	52551.80	52631.60	52711.40	52791.20	52871.00	52950.80	53030.60
700	53110.30	53190.10	53269.80	53349.50	53429.20	53508.90	53588.60	53668.30	53748.00	53827.60
710	53907.20	53986.90	54066.50	54146.10	54225.70	54305.30	54384.80	54464.40	54543.90	54623.50
720	54703.00	54782.50	54862.00	54941.50	55020.90	55100.40	55179.80	55259.30	55338.70	55418.10
730	55497.50	55576.90	55656.30	55735.60	55815.00	55894.30	55973.60	56052.90	56132.20	56211.50
740	56290.80	56370.00	56449.30	56528.50	56607.70	56686.90	56766.10	56845.30	56924.50	57003.60
750	57082.80	57161.90	57241.00	57320.10	57399.20	57478.30	57557.30	57636.40	57715.40	57794.40
760	57873.40	57952.40	58031.40	58110.40	58189.30	58268.30	58347.20	58426.10	58505.00	58583.90
770	58662.80	58741.60	58820.50	58899.30	58978.10	59056.90	59135.70	59214.50	59293.20	59372.00
780	59450.70	59529.40	59608.10	59686.80	59765.50	59844.10	59922.80	60001.40	60080.00	60158.60
790	60237.20	60315.80	60394.30	60472.90	60551.40	60629.90	60708.40	60786.90	60865.40	60943.80
800	61022.30	61100.70	61179.10	61257.50	61335.90	61414.30	61492.60	61570.90	61649.30	61727.60
810	61805.80	61884.10	61962.40	62040.60	62118.80	62197.10	62275.30	62353.40	62431.60	62509.70
820	62587.90	62666.00	62744.10	62822.20	62900.30	62978.30	63056.30	63134.40	63212.40	63290.40
830	63368.30	63446.30	63524.20	63602.10	63680.10	63757.90	63835.80	63913.70	63991.50	64069.30
840	64147.20	64224.90	64302.70	64380.50	64458.20	64535.90	64613.60	64691.30	64769.00	64846.70
850	64924.30	65001.90	65079.50	65157.10	65234.70	65312.20	65389.80	65467.30	65544.80	65622.30
860	65699.70	65777.10	65854.60	65932.00	66009.40	66086.80	66164.10	66241.40	66318.80	66396.10
870	66473.40	66550.60	66627.90	66705.10	66782.30	66859.50	66936.60	67013.80	67090.90	67168.10
880	67245.10	67322.20	67399.30	67476.30	67553.40	67630.40	67707.30	67784.30	67861.30	67938.20
890	68015.10	68092.00	68168.80	68245.70	68322.50	68399.30	68476.10	68552.90	68629.60	68706.40
900	68783.10	68859.80	68936.50	69013.10	69089.80	69166.40	69243.00	69319.50	69396.10	69472.60
910	69549.10	69625.60	69702.10	69778.60	69855.00	69931.40	70007.80	70084.20	70160.60	70236.90
920	70313.20	70389.50	70465.80	70542.00	70618.30	70694.50	70770.70	70846.90	70923.00	70999.20
930	71075.30	71151.40	71227.40	71303.50	71379.50	71455.60	71531.60	71607.50	71683.50	71759.40
940	71835.30	71911.20	71987.10	72063.00	72138.80	72214.60	72290.40	72366.20	72442.00	72517.70
950	72593.40	72669.10	72744.80	72820.50	72896.10	72971.80	73047.40	73122.90	73198.50	73274.10
960	73349.60	73425.10	73500.60	73576.10	73651.60	73727.00	73802.40	73877.80	73953.20	74028.60
970	74103.90	74179.30	74254.60	74329.90	74405.20	74480.50	74555.70	74631.00	74706.20	74781.40
980	74856.60	74931.80	75006.90	75082.10	75157.20	75232.30	75307.40	75382.50	75457.60	75532.60
990	75607.7	75682.70	75757.80	75832.80	75907.80	75982.70	76057.70	76132.70	76207.60	76282.60

B-TYPE THERMOCOUPLE TABLES

The table below is as compiled by the National Institute of Standards and Technology (NIST) in the US for a metal pair of Pt-30% Rh and Pt-6% Rh referenced to a cold junction at 0°C. B is the letter designation approved by the American Institute for Standards (ANSI). The column to the left is temperature in °C. The columns to the right are the μV produced in intervals of 1°C. For example -0.24 is the emf produced at +1°C.

0	0.00	-0.24	-0.47	-0.69	-0.89	-1.09	-1.27	-1.44	-1.60	-1.74
10	-1.88	-2.00	-2.11	-2.21	-2.30	-2.38	-2.44	-2.49	-2.53	-2.56
20	-2.58	-2.59	-2.58	-2.57	-2.54	-2.50	-2.44	-2.38	-2.31	-2.22
30	-2.12	-2.01	-1.89	-1.76	-1.61	-1.45	-1.29	-1.11	-0.92	-0.71
40	-0.50	-0.27	-0.04	0.21	0.47	0.74	1.03	1.32	1.63	1.94
50	2.27	2.61	2.96	3.33	3.70	4.09	4.48	4.89	5.31	5.75
60	6.19	6.64	7.11	7.59	8.07	8.57	9.09	9.61	10.14	10.69
70	11.24	11.81	12.39	12.98	13.58	14.20	14.82	15.46	16.10	16.76
80	17.43	18.11	18.80	19.51	20.22	20.95	21.69	22.43	23.19	23.96
90	24.75	25.54	26.34	27.16	27.99	28.82	29.67	30.53	31.41	32.29
100	33.18	34.09	35.00	35.93	36.87	37.82	38.78	39.75	40.74	41.73
110	42.74	43.75	44.78	45.82	46.87	47.93	49.00	50.08	51.18	52.28
120	53.40	54.53	55.66	56.81	57.97	59.15	60.33	61.52	62.73	63.94
130	65.17	66.41	67.66	68.92	70.19	71.47	72.76	74.07	75.38	76.71
140	78.04	79.39	80.75	82.12	83.50	84.89	86.29	87.71	89.13	90.57
150	92.01	93.47	94.94	96.42	97.91	99.41	100.92	102.44	103.98	105.52
160	107.08	108.64	110.22	111.81	113.41	115.02	116.64	118.27	119.91	121.56
170	123.23	124.90	126.59	128.29	129.99	131.71	133.44	135.18	136.93	138.69
180	140.47	142.25	144.04	145.85	147.66	149.49	151.33	153.18	155.04	156.91
190	158.79	160.68	162.58	164.49	166.41	168.35	170.29	172.25	174.22	176.19
200	178.18	180.18	182.19	184.21	186.24	188.28	190.33	192.40	194.47	196.55
210	198.65	200.76	202.87	205.00	207.14	209.29	211.44	213.61	215.80	217.99
220	220.19	222.40	224.62	226.86	229.10	231.36	233.62	235.90	238.19	240.48
230	242.79	245.11	247.44	249.78	252.13	254.49	256.86	259.25	261.64	264.04
240	266.46	268.88	271.32	273.76	276.22	278.69	281.16	283.65	286.15	288.66
250	291.18	293.71	296.25	298.80	301.36	303.94	306.52	309.11	311.72	314.33
260	316.96	319.59	322.24	324.90	327.56	330.24	332.93	335.63	338.34	341.06
270	343.79	346.53	349.28	352.04	354.81	357.59	360.38	363.19	366.00	368.82
280	371.66	374.50	377.36	380.22	383.10	385.99	388.88	391.79	394.71	397.64
290	400.58	403.52	406.48	409.45	412.43	415.42	418.42	421.44	424.46	427.49
300	430.53	433.58	436.65	439.72	442.80	445.90	449.00	452.12	455.24	458.38
310	461.52	464.68	467.84	471.02	474.21	477.40	480.61	483.83	487.06	490.29
320	493.54	496.80	500.07	503.35	506.64	509.94	513.25	516.57	519.90	523.24
330	526.59	529.95	533.32	536.71	540.10	543.50	546.91	550.33	553.77	557.21
340	560.66	564.13	567.60	571.08	574.58	578.08	581.60	585.12	588.65	592.20
350	595.75	599.32	602.89	606.48	610.07	613.68	617.30	620.92	624.56	628.20
360	631.86	635.53	639.20	642.89	646.58	650.29	654.01	657.73	661.47	665.22
370	668.98	672.74	676.52	680.31	684.10	687.91	691.73	695.56	699.39	703.24
380	707.10	710.97	714.84	718.73	722.63	726.54	730.45	734.38	738.32	742.27
390	746.22	750.19	754.17	758.15	762.15	766.16	770.18	774.20	778.24	782.29
400	786.35	790.41	794.49	798.58	802.67	806.78	810.90	815.02	819.16	823.31
410	827.46	831.63	835.80	839.99	844.18	848.39	852.61	856.83	861.07	865.31
420	869.57	873.83	878.11	882.39	886.68	890.99	895.30	899.63	903.96	908.30
430	912.66	917.02	921.39	925.77	930.17	934.57	938.98	943.40	947.83	952.27
440	956.73	961.19	965.66	970.14	974.63	979.13	983.64	988.16	992.68	997.22
450	1001.77	1006.33	1010.90	1015.47	1020.06	1024.66	1029.26	1033.88	1038.51	1043.14
460	1047.79	1052.44	1057.11	1061.78	1066.46	1071.16	1075.86	1080.57	1085.29	1090.03
470	1094.77	1099.52	1104.28	1109.05	1113.83	1118.62	1123.42	1128.23	1133.05	1137.87
480	1142.71	1147.56	1152.41	1157.28	1162.16	1167.04	1171.94	1176.84	1181.75	1186.68
490	1191.61	1196.55	1201.50	1206.47	1211.44	1216.42	1221.41	1226.41	1231.42	1236.43
500	1241.46	1246.50	1251.55	1256.60	1261.67	1266.74	1271.83	1276.92	1282.02	1287.14
510	1292.26	1297.39	1302.53	1307.68	1312.84	1318.01	1323.19	1328.38	1333.58	1338.78
520	1344.00	1349.22	1354.46	1359.70	1364.96	1370.22	1375.49	1380.77	1386.06	1391.37
530	1396.67	1401.99	1407.32	1412.66	1418.01	1423.36	1428.73	1434.10	1439.49	1444.88
540	1450.28	1455.69	1461.12	1466.55	1471.99	1477.43	1482.89	1488.36	1493.84	1499.32
550	1504.82	1510.32	1515.83	1521.36	1526.89	1532.43	1537.98	1543.54	1549.11	1554.69
560	1560.27	1565.87	1571.47	1577.09	1582.71	1588.34	1593.99	1599.64	1605.30	1610.97
570	1616.64	1622.33	1628.03	1633.73	1639.45	1645.17	1650.91	1656.65	1662.40	1668.16
580	1673.93	1679.71	1685.49	1691.29	1697.09	1702.91	1708.73	1714.57	1720.41	1726.26
590	1732.12	1737.99	1743.86	1749.75	1755.65	1761.55	1767.46	1773.39	1779.32	1785.26
600	1791.21	1797.17	1803.13	1809.11	1815.09	1821.09	1827.09	1833.10	1839.12	1845.15

610	1851.19	1857.24	1863.30	1869.36	1875.44	1881.52	1887.61	1893.71	1899.82	1905.94
620	1912.07	1918.20	1924.35	1930.50	1936.67	1942.84	1949.02	1955.21	1961.41	1967.61
630	1973.83	1980.05	1986.29	1992.53	1998.78	2005.04	2011.31	2017.59	2023.87	2030.17
640	2036.47	2042.78	2049.10	2055.43	2061.77	2068.12	2074.47	2080.84	2087.21	2093.59
650	2099.99	2106.38	2112.79	2119.21	2125.63	2132.07	2138.51	2144.96	2151.42	2157.89
660	2164.37	2170.86	2177.35	2183.85	2190.37	2196.89	2203.41	2209.95	2216.50	2223.05
670	2229.62	2236.19	2242.77	2249.36	2255.96	2262.56	2269.18	2275.80	2282.43	2289.07
680	2295.72	2302.38	2309.05	2315.72	2322.41	2329.10	2335.80	2342.51	2349.22	2355.95
690	2362.68	2369.43	2376.18	2382.94	2389.71	2396.48	2403.27	2410.06	2416.86	2423.67
700	2430.49	2437.32	2444.15	2451.00	2457.85	2464.71	2471.58	2478.46	2485.34	2492.24
710	2499.14	2506.05	2512.97	2519.90	2526.84	2533.78	2540.73	2547.70	2554.66	2561.64
720	2568.63	2575.62	2582.63	2589.64	2596.66	2603.68	2610.72	2617.77	2624.82	2631.88
730	2638.95	2646.03	2653.11	2660.21	2667.31	2674.42	2681.54	2688.66	2695.80	2702.94
740	2710.09	2717.25	2724.42	2731.60	2738.78	2745.98	2753.18	2760.38	2767.60	2774.83
750	2782.06	2789.30	2796.55	2803.81	2811.08	2818.35	2825.63	2832.92	2840.22	2847.53
760	2854.84	2862.17	2869.50	2876.84	2884.18	2891.54	2898.90	2906.27	2913.65	2921.04
770	2928.44	2935.84	2943.25	2950.67	2958.10	2965.54	2972.98	2980.43	2987.89	2995.36
780	3002.84	3010.32	3017.81	3025.31	3032.82	3040.34	3047.86	3055.39	3062.93	3070.48
790	3078.04	3085.60	3093.17	3100.75	3108.34	3115.93	3123.54	3131.15	3138.77	3146.39
800	3154.03	3161.67	3169.32	3176.98	3184.65	3192.32	3200.00	3207.69	3215.39	3223.10
810	3230.81	3238.53	3246.26	3254.00	3261.74	3269.50	3277.26	3285.03	3292.8	3300.59
820	3308.38	3316.18	3323.99	3331.80	3339.62	3347.46	3355.29	3363.14	3370.99	3378.86
830	3386.73	3394.60	3402.49	3410.38	3418.28	3426.19	3434.10	3442.03	3449.96	3457.9
840	3465.84	3473.80	3481.76	3489.73	3497.71	3505.69	3513.69	3521.69	3529.69	3537.71
850	3545.73	3553.76	3561.80	3569.85	3577.90	3585.96	3594.03	3602.11	3610.19	3618.28
860	3626.38	3634.49	3642.60	3650.73	3658.86	3666.99	3675.14	3683.29	3691.45	3699.62
870	3707.79	3715.97	3724.16	3732.36	3740.57	3748.78	3757.00	3765.23	3773.46	3781.70
880	3789.95	3798.21	3806.48	3814.75	3823.03	3831.31	3839.61	3847.91	3856.22	3864.54
890	3872.86	3881.19	3889.53	3897.88	3906.23	3914.59	3922.96	3931.34	3939.72	3948.11
900	3956.51	3964.92	3973.33	3981.75	3990.18	3998.61	4007.06	4015.51	4023.96	4032.43
910	4040.90	4049.38	4057.86	4066.36	4074.86	4083.37	4091.88	4100.40	4108.93	4117.47
920	4126.02	4134.57	4143.13	4151.69	4160.27	4168.85	4177.44	4186.03	4194.63	4203.24
930	4211.86	4220.48	4229.12	4237.75	4246.40	4255.05	4263.71	4272.38	4281.05	4289.74
940	4298.43	4307.12	4315.82	4324.53	4333.25	4341.98	4350.71	4359.45	4368.19	4376.94
950	4385.70	4394.47	4403.25	4412.03	4420.82	4429.61	4438.41	4447.22	4456.04	4464.86
960	4473.69	4482.53	4491.38	4500.23	4509.09	4517.95	4526.83	4535.71	4544.59	4553.49
970	4562.39	4571.30	4580.21	4589.13	4598.06	4607.00	4615.94	4624.89	4633.85	4642.81
980	4651.78	4660.76	4669.74	4678.73	4687.73	4696.74	4705.75	4714.77	4723.79	4732.83
990	4741.86	4750.91	4759.96	4769.02	4778.09	4787.17	4796.25	4805.33	4814.43	4823.53
1000	4832.64	4841.75	4850.87	4860.00	4869.14	4878.28	4887.43	4896.59	4905.75	4914.92
1010	4924.09	4933.28	4942.47	4951.66	4960.86	4970.07	4979.29	4988.51	4997.74	5006.98
1020	5016.22	5025.47	5034.73	5044.00	5053.27	5062.54	5071.83	5081.12	5090.41	5099.72
1030	5109.03	5118.34	5127.67	5137	5146.33	5155.68	5165.03	5174.38	5183.75	5193.12
1040	5202.49	5211.88	5221.27	5230.66	5240.07	5249.47	5258.89	5268.31	5277.74	5287.18
1050	5296.62	5306.07	5315.52	5324.99	5334.45	5343.93	5353.41	5362.90	5372.39	5381.89
1060	5391.40	5400.91	5410.43	5419.96	5429.49	5439.03	5448.58	5458.13	5467.69	5477.25
1070	5486.82	5496.40	5505.99	5515.58	5525.18	5534.78	5544.39	5554.00	5563.63	5573.26
1080	5582.89	5592.53	5602.18	5611.84	5621.50	5631.16	5640.84	5650.52	5660.20	5669.89
1090	5679.59	5689.30	5699.01	5708.73	5718.45	5728.18	5737.92	5747.66	5757.41	5767.16
1100	5776.92	5786.69	5796.46	5806.24	5816.03	5825.82	5835.62	5845.42	5855.24	5865.05
1110	5874.87	5884.70	5894.54	5904.38	5914.23	5924.08	5933.94	5943.81	5953.68	5963.56
1120	5973.44	5983.33	5993.23	6003.13	6013.04	6022.95	6032.88	6042.80	6052.73	6062.67
1130	6072.62	6082.57	6092.53	6102.49	6112.46	6122.43	6132.41	6142.4	6152.39	6162.39
1140	6172.40	6182.41	6192.42	6202.45	6212.47	6222.51	6232.55	6242.60	6252.65	6262.71
1150	6272.77	6282.84	6292.91	6303.00	6313.08	6323.18	6333.28	6343.38	6353.49	6363.61
1160	6373.73	6383.86	6393.99	6404.13	6414.28	6424.43	6434.59	6444.75	6454.92	6465.09
1170	6475.27	6485.46	6495.65	6505.85	6516.05	6526.26	6536.47	6546.69	6556.92	6567.15
1180	6577.39	6587.63	6597.88	6608.13	6618.39	6628.66	6638.93	6649.21	6659.49	6669.78
1190	6680.07	6690.37	6700.67	6710.98	6721.30	6731.62	6741.95	6752.28	6762.62	6772.96
1200	6783.31	6793.66	6804.02	6814.39	6824.76	6835.14	6845.52	6855.91	6866.30	6876.70
1210	6887.10	6897.51	6907.92	6918.34	6928.77	6939.20	6949.64	6960.08	6970.52	6980.98
1220	6991.43	7001.90	7012.36	7022.84	7033.32	7043.80	7054.29	7064.79	7075.29	7085.79
1230	7096.30	7106.82	7117.34	7127.86	7138.40	7148.93	7159.48	7170.02	7180.57	7191.13
1240	7201.70	7212.26	7222.84	7233.41	7244.00	7254.59	7265.18	7275.78	7286.38	7296.99
1250	7307.61	7318.23	7328.85	7339.48	7350.11	7360.75	7371.40	7382.05	7392.70	7403.36
1260	7414.03	7424.70	7435.37	7446.05	7456.74	7467.42	7478.12	7488.82	7499.52	7510.23
1270	7520.95	7531.67	7542.39	7553.12	7563.85	7574.59	7585.33	7596.08	7606.84	7617.59

1280	7628.36	7639.12	7649.90	7660.67	7671.46	7682.24	7693.03	7703.83	7714.63	7725.44
1290	7736.25	7747.06	7757.88	7768.71	7779.54	7790.37	7801.21	7812.05	7822.90	7833.75
1300	7844.61	7855.47	7866.34	7877.21	7888.09	7898.97	7909.85	7920.74	7931.64	7942.53
1310	7953.44	7964.34	7975.26	7986.17	7997.09	8008.02	8018.95	8029.88	8040.82	8051.77
1320	8062.71	8073.67	8084.62	8095.58	8106.55	8117.52	8128.49	8139.47	8150.45	8161.44
1330	8172.43	8183.43	8194.43	8205.43	8216.44	8227.45	8238.47	8249.49	8260.52	8271.55
1340	8282.58	8293.62	8304.66	8315.71	8326.76	8337.81	8348.87	8359.94	8371.00	8382.08
1350	8393.15	8404.23	8415.31	8426.40	8437.49	8448.59	8459.69	8470.79	8481.90	8493.01
1360	8504.13	8515.25	8526.37	8537.50	8548.63	8559.77	8570.91	8582.05	8593.20	8604.35
1370	8615.51	8626.67	8637.83	8648.99	8660.17	8671.34	8682.52	8693.7	8704.89	8716.08
1380	8727.27	8738.47	8749.67	8760.87	8772.08	8783.29	8794.51	8805.73	8816.95	8828.18
1390	8839.41	8850.64	8861.88	8873.12	8884.36	8895.61	8906.86	8918.12	8929.38	8940.64
1400	8951.91	8963.18	8974.45	8985.73	8997.01	9008.29	9019.58	9030.87	9042.16	9053.46
1410	9064.76	9076.06	9087.37	9098.68	9109.99	9121.31	9132.63	9143.95	9155.28	9166.61
1420	9177.95	9189.28	9200.62	9211.97	9223.31	9234.66	9246.02	9257.37	9268.73	9280.09
1430	9291.46	9302.83	9314.20	9325.57	9336.95	9348.33	9359.72	9371.10	9382.49	9393.89
1440	9405.28	9416.68	9428.09	9439.49	9450.90	9462.31	9473.72	9485.14	9496.56	9507.98
1450	9519.41	9530.84	9542.27	9553.70	9565.14	9576.58	9588.02	9599.47	9610.91	9622.36
1460	9633.82	9645.27	9656.73	9668.19	9679.66	9691.13	9702.59	9714.07	9725.54	9737.02
1470	9748.50	9759.98	9771.47	9782.95	9794.44	9805.94	9817.43	9828.93	9840.43	9851.93
1480	9863.44	9874.94	9886.45	9897.97	9909.48	9921.00	9932.52	9944.04	9955.56	9967.09
1490	9978.62	9990.15	10001.70	10013.20	10024.80	10036.30	10047.80	10059.40	10070.90	10082.50
1500	10094.00	10105.60	10117.10	10128.70	10140.30	10151.80	10163.40	10174.90	10186.50	10198.10
1510	10209.70	10221.20	10232.80	10244.40	10256.00	10267.50	10279.10	10290.70	10302.30	10313.90
1520	10325.50	10337.10	10348.70	10360.30	10371.90	10383.50	10395.10	10406.70	10418.30	10429.90
1530	10441.50	10453.10	10464.70	10476.30	10487.90	10499.60	10511.20	10522.80	10534.40	10546.00
1540	10557.70	10569.30	10580.90	10592.60	10604.20	10615.80	10627.40	10639.10	10650.70	10662.40
1550	10674.00	10685.60	10697.30	10708.90	10720.60	10732.20	10743.90	10755.50	10767.20	10778.80
1560	10790.50	10802.10	10813.80	10825.40	10837.10	10848.70	10860.40	10872.10	10883.70	10895.40
1570	10907.10	10918.70	10930.40	10942.10	10953.70	10965.40	10977.10	10988.70	11000.40	11012.10
1580	11023.70	11035.40	11047.10	11058.80	11070.50	11082.10	11093.80	11105.50	11117.20	11128.90
1590	11140.50	11152.20	11163.90	11175.60	11187.30	11199.00	11210.60	11222.30	11234.00	11245.70
1600	11257.40	11269.10	11280.80	11292.50	11304.10	11315.80	11327.50	11339.20	11350.90	11362.60
1610	11374.30	11386.00	11397.70	11409.40	11421.10	11432.80	11444.50	11456.20	11467.90	11479.60
1620	11491.30	11503.00	11514.70	11526.40	11538.00	11549.70	11561.40	11573.10	11584.80	11596.50
1630	11608.20	11619.90	11631.60	11643.30	11655.00	11666.70	11678.40	11690.10	11701.80	11713.50
1640	11725.20	11736.90	11748.60	11760.30	11772.00	11783.70	11795.40	11807.10	11818.80	11830.50
1650	11842.20	11853.90	11865.60	11877.30	11889.00	11900.70	11912.40	11924.10	11935.80	11947.50
1660	11959.10	11970.80	11982.50	11994.20	12005.90	12017.60	12029.30	12041.00	12052.70	12064.40
1670	12076.10	12087.70	12099.40	12111.10	12122.80	12134.50	12146.20	12157.90	12169.50	12181.20
1680	12192.90	12204.60	12216.30	12227.90	12239.60	12251.30	12263.00	12274.60	12286.30	12298.00
1690	12309.70	12321.30	12333.00	12344.70	12356.40	12368.00	12379.70	12391.40	12403.00	12414.70
1700	12426.30	12438.00	12449.70	12461.30	12473.00	12484.60	12496.30	12508.00	12519.60	12531.30
1710	12542.90	12554.60	12566.20	12577.90	12589.50	12601.20	12612.80	12624.40	12636.10	12647.70
1720	12659.40	12671.00	12682.60	12694.30	12705.90	12717.50	12729.20	12740.80	12752.40	12764.00
1730	12775.70	12787.30	12798.90	12810.50	12822.10	12833.80	12845.40	12857.00	12868.60	12880.20
1740	12891.80	12903.40	12915.00	12926.60	12938.20	12949.80	12961.40	12973.00	12984.60	12996.20
1750	13007.80	13019.40	13030.90	13042.50	13054.10	13065.70	13077.30	13088.80	13100.40	13112.00
1760	13123.60	13135.10	13146.70	13158.30	13169.80	13181.40	13192.90	13204.50	13216.00	13227.60
1770	13239.10	13250.70	13262.20	13273.80	13285.30	13296.80	13308.40	13319.90	13331.40	13343.00
1780	13354.50	13366.00	13377.50	13389.10	13400.60	13412.10	13423.60	13435.10	13446.60	13458.10
1790	13469.60	13481.10	13492.60	13504.10	13515.60	13527.10	13538.60	13550.10	13561.60	13573.00
1800	13584.50	13596.00	13607.50	13618.90	13630.40	13641.90	13653.30	13664.80	13676.20	13687.70
1810	13699.10	13710.60	13722.00	13733.50	13744.90	13756.40	13767.80	13779.20	13790.70	13802.10

R-TYPE THERMOCOUPLE TABLES

The table below is as compiled by the National Institute of Standards and Technology of (NIST) in the US for a metal pair of Pt-13% Rh vs. Pt referenced to a cold junction at 0°C. R is the letter designation approved by the American Institute for Standards (ANSI). The column to the left is temperature in °C. The columns to the right are the μV produced in intervals of 1°C. For example $-222.72\mu\text{V}$ is produced at -49°C .

-50	-226.44	-222.72	-218.97	-215.18	-211.36	-207.50	-203.60	-199.67	-195.71	-191.71
-40	-187.67	-183.61	-179.50	-175.37	-171.20	-166.99	-162.76	-158.48	-154.18	-149.84
-30	-145.48	-141.07	-136.64	-132.17	-127.67	-123.14	-118.58	-113.99	-109.36	-104.71
-20	-100.02	-95.30	-90.55	-85.77	-80.96	-76.12	-71.25	-66.35	-61.42	-56.46
-10	-51.48	-46.46	-41.41	-36.33	-31.23	-26.09	-20.93	-15.74	-10.52	-5.28
0	0.00	5.30	10.63	15.99	21.38	26.79	32.23	37.70	43.19	48.71
10	54.26	59.83	65.43	71.06	76.71	82.39	88.09	93.82	99.58	105.36
20	111.16	116.99	122.85	128.73	134.63	140.56	146.52	152.49	158.50	164.52
30	170.57	176.65	182.75	188.87	195.01	201.18	207.38	213.59	219.83	226.09
40	232.38	238.68	245.01	251.36	257.74	264.13	270.55	276.99	283.46	289.94
50	296.45	302.97	309.52	316.09	322.69	329.30	335.93	342.59	349.27	355.96
60	362.68	369.42	376.18	382.95	389.75	396.57	403.41	410.27	417.15	424.05
70	430.97	437.91	444.87	451.84	458.84	465.85	472.89	479.94	487.02	494.11
80	501.22	508.35	515.49	522.66	529.85	537.05	544.27	551.51	558.77	566.04
90	573.33	580.64	587.97	595.32	602.68	610.06	617.46	624.88	632.31	639.76
100	647.23	654.71	662.22	669.73	677.27	684.82	692.39	699.97	707.57	715.19
110	722.83	730.48	738.14	745.82	753.52	761.24	768.96	776.71	784.47	792.25
120	800.04	807.85	815.67	823.51	831.36	839.23	847.12	855.02	862.93	870.86
130	878.80	886.76	894.74	902.72	910.73	918.74	926.78	934.82	942.88	950.96
140	959.05	967.15	975.27	983.40	991.54	999.70	1007.87	1016.06	1024.26	1032.47
150	1040.70	1048.94	1057.20	1065.47	1073.75	1082.04	1090.35	1098.67	1107.00	1115.35
160	1123.71	1132.08	1140.47	1148.87	1157.28	1165.70	1174.14	1182.59	1191.05	1199.52
170	1208.01	1216.51	1225.02	1233.54	1242.08	1250.63	1259.19	1267.76	1276.34	1284.94
180	1293.55	1302.17	1310.80	1319.44	1328.10	1336.77	1345.44	1354.13	1362.84	1371.55
190	1380.27	1389.01	1397.76	1406.51	1415.28	1424.06	1432.86	1441.66	1450.47	1459.30
200	1468.13	1476.98	1485.84	1494.71	1503.59	1512.47	1521.38	1530.29	1539.21	1548.14
210	1557.08	1566.04	1575	1583.97	1592.96	1601.95	1610.96	1619.97	1629.00	1638.03
220	1647.08	1656.13	1665.20	1674.27	1683.36	1692.45	1701.56	1710.67	1719.80	1728.93
230	1738.08	1747.23	1756.39	1765.56	1774.75	1783.94	1793.14	1802.35	1811.57	1820.80
240	1830.04	1839.28	1848.54	1857.81	1867.08	1876.36	1885.66	1894.96	1904.27	1913.59
250	1922.92	1932.26	1941.61	1950.96	1960.33	1969.70	1979.08	1988.47	1997.87	2007.28
260	2016.70	2026.12	2035.56	2045	2054.45	2063.91	2073.37	2082.85	2092.33	2101.83
270	2111.33	2120.84	2130.35	2139.88	2149.41	2158.95	2168.50	2178.06	2187.63	2197.20
280	2206.78	2216.37	2225.97	2235.58	2245.19	2254.81	2264.44	2274.08	2283.72	2293.37
290	2303.03	2312.70	2322.37	2332.06	2341.75	2351.45	2361.15	2370.86	2380.58	2390.31
300	2400.05	2409.79	2419.54	2429.30	2439.06	2448.83	2458.61	2468.40	2478.19	2487.99
310	2497.80	2507.62	2517.44	2527.27	2537.10	2546.95	2556.80	2566.65	2576.52	2586.39
320	2596.27	2606.15	2616.05	2625.94	2635.85	2645.76	2655.68	2665.61	2675.54	2685.48
330	2695.43	2705.38	2715.34	2725.31	2735.28	2745.26	2755.24	2765.24	2775.24	2785.24
340	2795.25	2805.27	2815.30	2825.33	2835.37	2845.41	2855.46	2865.52	2875.58	2885.65
350	2895.73	2905.81	2915.90	2925.99	2936.09	2946.20	2956.31	2966.43	2976.56	2986.69
360	2996.83	3006.97	3017.12	3027.28	3037.44	3047.61	3057.79	3067.97	3078.15	3088.34
370	3098.54	3108.75	3118.96	3129.17	3139.40	3149.62	3159.86	3170.10	3180.34	3190.59
380	3200.85	3211.11	3221.38	3231.66	3241.94	3252.22	3262.51	3272.81	3283.11	3293.42
390	3303.74	3314.06	3324.38	3334.71	3345.05	3355.39	3365.74	3376.10	3386.45	3396.82
400	3407.19	3417.57	3427.95	3438.33	3448.73	3459.12	3469.53	3479.94	3490.35	3500.77
410	3511.19	3521.62	3532.06	3542.50	3552.95	3563.40	3573.86	3584.32	3594.79	3605.26
420	3615.74	3626.22	3636.71	3647.21	3657.71	3668.21	3678.72	3689.24	3699.76	3710.29
430	3720.82	3731.35	3741.89	3752.44	3762.99	3773.55	3784.11	3794.68	3805.25	3815.83
440	3826.41	3837.00	3847.60	3858.19	3868.80	3879.41	3890.02	3900.64	3911.26	3921.89
450	3932.53	3943.17	3953.81	3964.46	3975.11	3985.77	3996.44	4007.11	4017.78	4028.46
460	4039.14	4049.83	4060.53	4071.23	4081.93	4092.64	4103.35	4114.07	4124.80	4135.53
470	4146.26	4157	4167.74	4178.49	4189.24	4200	4210.77	4221.54	4232.31	4243.09
480	4253.87	4264.66	4275.45	4286.25	4297.05	4307.86	4318.67	4329.49	4340.31	4351.14
490	4361.97	4372.80	4383.65	4394.49	4405.34	4416.20	4427.06	4437.93	4448.80	4459.67
500	4470.55	4481.44	4492.33	4503.22	4514.12	4525.02	4535.93	4546.85	4557.76	4568.69
510	4579.62	4590.55	4601.49	4612.43	4623.37	4634.33	4645.28	4656.24	4667.21	4678.18
520	4689.16	4700.14	4711.12	4722.11	4733.10	4744.10	4755.11	4766.12	4777.13	4788.15
530	4799.17	4810.20	4821.23	4832.27	4843.31	4854.35	4865.41	4876.46	4887.52	4898.59
540	4909.66	4920.73	4931.81	4942.89	4953.98	4965.07	4976.17	4987.27	4998.38	5009.49
550	5020.61	5031.73	5042.86	5053.99	5065.12	5076.26	5087.40	5098.55	5109.71	5120.87
560	5132.03	5143.20	5154.37	5165.54	5176.72	5187.91	5199.10	5210.30	5221.49	5232.70

570	5243.91	5255.12	5266.34	5277.56	5288.79	5300.02	5311.26	5322.50	5333.74	5344.99
580	5356.24	5367.50	5378.77	5390.03	5401.31	5412.58	5423.86	5435.15	5446.44	5457.74
590	5469.03	5480.34	5491.65	5502.96	5514.28	5525.60	5536.92	5548.25	5559.59	5570.93
600	5582.27	5593.62	5604.97	5616.33	5627.69	5639.05	5650.42	5661.80	5673.18	5684.56
610	5695.95	5707.34	5718.73	5730.13	5741.54	5752.95	5764.36	5775.78	5787.20	5798.62
620	5810.05	5821.49	5832.93	5844.37	5855.82	5867.27	5878.72	5890.18	5901.64	5913.11
630	5924.58	5936.06	5947.57	5959.07	5970.58	5982.10	5993.62	6005.14	6016.67	6028.21
640	6039.75	6051.30	6062.85	6074.40	6085.96	6097.53	6109.10	6120.67	6132.25	6143.84
650	6155.43	6167.02	6178.62	6190.22	6201.83	6213.45	6225.07	6236.69	6248.32	6259.95
660	6271.59	6283.24	6294.89	6306.54	6318.20	6329.86	6341.53	6353.20	6364.88	6376.57
670	6388.25	6399.95	6411.64	6423.35	6435.05	6446.77	6458.48	6470.21	6481.93	6493.67
680	6505.40	6517.14	6528.89	6540.64	6552.40	6564.16	6575.93	6587.70	6599.47	6611.26
690	6623.04	6634.83	6646.63	6658.43	6670.23	6682.04	6693.86	6705.68	6717.50	6729.33
700	6741.17	6753.00	6764.85	6776.70	6788.55	6800.41	6812.27	6824.14	6836.01	6847.89
710	6859.77	6871.66	6883.55	6895.45	6907.35	6919.26	6931.17	6943.09	6955.01	6966.94
720	6978.87	6990.80	7002.74	7014.69	7026.64	7038.59	7050.55	7062.52	7074.49	7086.46
730	7098.44	7110.43	7122.41	7134.41	7146.41	7158.41	7170.42	7182.43	7194.45	7206.47
740	7218.50	7230.53	7242.56	7254.61	7266.65	7278.70	7290.76	7302.82	7314.88	7326.95
750	7339.03	7351.11	7363.19	7375.28	7387.38	7399.47	7411.58	7423.69	7435.80	7447.92
760	7460.04	7472.17	7484.30	7496.43	7508.58	7520.72	7532.87	7545.03	7557.19	7569.35
770	7581.52	7593.70	7605.88	7618.06	7630.25	7642.44	7654.64	7666.85	7679.05	7691.27
780	7703.48	7715.71	7727.93	7740.16	7752.40	7764.64	7776.89	7789.14	7801.39	7813.65
790	7825.91	7838.18	7850.46	7862.74	7875.02	7887.31	7899.60	7911.90	7924.20	7936.50
800	7948.82	7961.13	7973.45	7985.78	7998.11	8010.44	8022.78	8035.13	8047.47	8059.83
810	8072.19	8084.55	8096.92	8109.29	8121.67	8134.05	8146.43	8158.82	8171.22	8183.62
820	8196.02	8208.43	8220.85	8233.27	8245.69	8258.12	8270.55	8282.99	8295.43	8307.88
830	8320.33	8332.78	8345.24	8357.71	8370.18	8382.65	8395.13	8407.62	8420.10	8432.60
840	8445.09	8457.60	8470.10	8482.61	8495.13	8507.65	8520.18	8532.71	8545.24	8557.78
850	8570.32	8582.87	8595.42	8607.98	8620.54	8633.11	8645.68	8658.26	8670.84	8683.42
860	8696.01	8708.61	8721.21	8733.81	8746.42	8759.03	8771.65	8784.27	8796.90	8809.53
870	8822.16	8834.80	8847.45	8860.10	8872.75	8885.41	8898.07	8910.74	8923.41	8936.09
880	8948.77	8961.46	8974.15	8986.84	8999.54	9012.24	9024.95	9037.67	9050.38	9063.11
890	9075.83	9088.56	9101.30	9114.04	9126.79	9139.54	9152.29	9165.05	9177.81	9190.58
900	9203.35	9216.13	9228.91	9241.69	9254.48	9267.28	9280.08	9292.88	9305.69	9318.50
910	9331.32	9344.14	9356.97	9369.80	9382.63	9395.47	9408.32	9421.17	9434.02	9446.88
920	9459.74	9472.61	9485.48	9498.36	9511.24	9524.12	9537.01	9549.90	9562.80	9575.71
930	9588.61	9601.52	9614.44	9627.36	9640.29	9653.22	9666.15	9679.09	9692.03	9704.98
940	9717.93	9730.89	9743.85	9756.81	9769.78	9782.76	9795.74	9808.72	9821.71	9834.70
950	9847.70	9860.70	9873.70	9886.71	9899.73	9912.74	9925.77	9938.80	9951.83	9964.86
960	9977.90	9990.95	10004.00	10017.10	10030.10	10043.20	10056.20	10069.30	10082.40	10095.50
970	10108.60	10121.70	10134.70	10147.80	10160.90	10174.10	10187.20	10200.30	10213.40	10226.50
980	10239.70	10252.80	10265.90	10279.10	10292.20	10305.40	10318.50	10331.70	10344.80	10358.00
990	10371.20	10384.40	10397.50	10410.70	10423.90	10437.10	10450.30	10463.50	10476.70	10489.90
1000	10503.20	10516.40	10529.60	10542.80	10556.10	10569.30	10582.60	10595.80	10609.10	10622.30
1010	10635.60	10648.80	10662.10	10675.40	10688.70	10701.90	10715.20	10728.50	10741.80	10755.10
1020	10768.40	10781.70	10795.00	10808.40	10821.70	10835.00	10848.30	10861.70	10875.00	10888.30
1030	10901.70	10915.00	10928.40	10941.80	10955.10	10968.50	10981.90	10995.20	11008.60	11022.00
1040	11035.40	11048.80	11062.20	11075.60	11089.00	11102.40	11115.80	11129.30	11142.70	11156.10
1050	11169.50	11183.00	11196.40	11209.90	11223.30	11236.80	11250.20	11263.70	11277.20	11290.60
1060	11304.10	11317.60	11331.10	11344.60	11358.10	11371.50	11385.00	11398.60	11412.10	11425.60
1070	11439.10	11452.60	11466.10	11479.70	11493.20	11506.70	11520.30	11533.80	11547.40	11560.90
1080	11574.50	11588.00	11601.60	11615.10	11628.70	11642.30	11655.90	11669.40	11683.00	11696.60
1090	11710.20	11723.80	11737.40	11751.00	11764.60	11778.20	11791.80	11805.40	11819.00	11832.60
1100	11846.30	11859.90	11873.50	11887.20	11900.80	11914.40	11928.10	11941.70	11955.40	11969.00
1110	11982.70	11996.40	12010.00	12023.70	12037.40	12051.00	12064.70	12078.40	12092.10	12105.80
1120	12119.40	12133.10	12146.80	12160.50	12174.20	12187.90	12201.60	12215.40	12229.10	12242.80
1130	12256.50	12270.20	12284.00	12297.70	12311.40	12325.20	12338.90	12352.60	12366.40	12380.10
1140	12393.90	12407.60	12421.40	12435.10	12448.90	12462.70	12476.40	12490.20	12504.00	12517.80
1150	12531.50	12545.30	12559.10	12572.90	12586.70	12600.50	12614.30	12628.10	12641.90	12655.70
1160	12669.50	12683.30	12697.10	12710.90	12724.70	12738.60	12752.40	12766.20	12780.00	12793.90
1170	12807.70	12821.50	12835.40	12849.20	12863.10	12876.90	12890.80	12904.60	12918.50	12932.30
1180	12946.20	12960.00	12973.90	12987.80	13001.60	13015.50	13029.40	13043.30	13057.10	13071.00
1190	13084.90	13098.80	13112.70	13126.60	13140.50	13154.40	13168.30	13182.20	13196.10	13210.00
1200	13223.90	13237.80	13251.70	13265.60	13279.50	13293.40	13307.40	13321.30	13335.20	13349.10
1210	13363.10	13377.00	13390.90	13404.90	13418.80	13432.70	13446.70	13460.60	13474.60	13488.50
1220	13502.50	13516.40	13530.40	13544.30	13558.30	13572.20	13586.20	13600.20	13614.10	13628.10
1230	13642.10	13656.00	13670.00	13684.00	13697.90	13711.90	13725.90	13739.90	13753.90	13767.90

1240	13781.80	13795.80	13809.80	13823.80	13837.80	13851.80	13865.80	13879.80	13893.80	13907.80
1250	13921.80	13935.80	13949.80	13963.80	13977.80	13991.90	14005.90	14019.90	14033.90	14047.90
1260	14061.90	14076.00	14090.00	14104.00	14118.00	14132.10	14146.10	14160.10	14174.20	14188.20
1270	14202.20	14216.30	14230.30	14244.30	14258.40	14272.40	14286.50	14300.50	14314.60	14328.60
1280	14342.60	14356.70	14370.80	14384.80	14398.90	14412.90	14427.00	14441.00	14455.10	14469.10
1290	14483.20	14497.30	14511.30	14525.40	14539.50	14553.50	14567.60	14581.70	14595.70	14609.80
1300	14623.90	14638.00	14652.00	14666.10	14680.20	14694.30	14708.30	14722.40	14736.50	14750.60
1310	14764.70	14778.80	14792.80	14806.90	14821.00	14835.10	14849.20	14863.30	14877.40	14891.50
1320	14905.60	14919.70	14933.70	14947.80	14961.90	14976.00	14990.10	15004.20	15018.30	15032.40
1330	15046.50	15060.60	15074.70	15088.80	15102.90	15117.00	15131.10	15145.30	15159.40	15173.50
1340	15187.60	15201.70	15215.80	15229.90	15244	15258.10	15272.20	15286.30	15300.40	15314.60
1350	15328.70	15342.80	15356.90	15371.00	15385.10	15399.20	15413.40	15427.50	15441.60	15455.70
1360	15469.80	15483.90	15498.10	15512.20	15526.30	15540.40	15554.50	15568.70	15582.80	15596.90
1370	15611.00	15625.10	15639.30	15653.40	15667.50	15681.60	15695.70	15709.90	15724.00	15738.10
1380	15752.20	15766.40	15780.50	15794.60	15808.70	15822.90	15837.00	15851.10	15865.20	15879.30
1390	15893.50	15907.60	15921.70	15935.80	15950.00	15964.10	15978.20	15992.30	16006.50	16020.60
1400	16034.70	16048.80	16063.00	16077.10	16091.20	16105.30	16119.40	16133.60	16147.70	16161.80
1410	16175.90	16190.10	16204.20	16218.30	16232.40	16246.50	16260.70	16274.80	16288.90	16303.00
1420	16317.20	16331.30	16345.40	16359.50	16373.60	16387.70	16401.90	16416.00	16430.10	16444.20
1430	16458.30	16472.40	16486.60	16500.70	16514.80	16528.90	16543.00	16557.10	16571.20	16585.40
1440	16599.50	16613.60	16627.70	16641.80	16655.90	16670.00	16684.10	16698.20	16712.30	16726.40
1450	16740.50	16754.70	16768.80	16782.90	16797.00	16811.10	16825.20	16839.30	16853.40	16867.50
1460	16881.60	16895.70	16909.80	16923.90	16937.90	16952.00	16966.10	16980.20	16994.30	17008.40
1470	17022.50	17036.60	17050.70	17064.80	17078.90	17092.90	17107.00	17121.10	17135.20	17149.30
1480	17163.40	17177.40	17191.50	17205.60	17219.70	17233.70	17247.80	17261.90	17276.00	17290.00
1490	17304.10	17318.20	17332.20	17346.30	17360.40	17374.40	17388.50	17402.60	17416.60	17430.70
1500	17444.70	17458.80	17472.80	17486.90	17501.00	17515.00	17529.10	17543.10	17557.20	17571.20
1510	17585.20	17599.30	17613.30	17627.40	17641.40	17655.50	17669.50	17683.50	17697.60	17711.60
1520	17725.60	17739.70	17753.70	17767.70	17781.70	17795.80	17809.80	17823.80	17837.80	17851.80
1530	17865.90	17879.90	17893.90	17907.90	17921.90	17935.90	17949.90	17963.90	17977.90	17991.90
1540	18005.90	18019.90	18033.90	18047.90	18061.90	18075.90	18089.90	18103.90	18117.90	18131.80
1550	18145.80	18159.80	18173.80	18187.80	18201.70	18215.70	18229.70	18243.60	18257.60	18271.60
1560	18285.50	18299.50	18313.50	18327.40	18341.40	18355.30	18369.30	18383.20	18397.20	18411.10
1570	18425.10	18439.00	18452.90	18466.90	18480.80	18494.80	18508.70	18522.60	18536.50	18550.50
1580	18564.40	18578.30	18592.20	18606.10	18620.10	18634.00	18647.90	18661.80	18675.70	18689.60
1590	18703.50	18717.40	18731.30	18745.20	18759.10	18773.00	18786.80	18800.70	18814.60	18828.50
1600	18842.40	18856.20	18870.10	18884.00	18897.80	18911.70	18925.60	18939.40	18953.30	18967.10
1610	18981.00	18994.80	19008.70	19022.50	19036.40	19050.20	19064.10	19077.90	19091.70	19105.60
1620	19119.40	19133.20	19147.00	19160.80	19174.70	19188.50	19202.30	19216.10	19229.90	19243.70
1630	19257.50	19271.30	19285.10	19298.90	19312.70	19326.50	19340.20	19354.00	19367.80	19381.60
1640	19395.30	19409.10	19422.90	19436.60	19450.40	19464.20	19477.90	19491.70	19505.40	19519.20
1650	19532.90	19546.60	19560.40	19574.10	19587.80	19601.60	19615.30	19629.00	19642.70	19656.40
1660	19670.20	19683.90	19697.60	19711.30	19725.00	19738.70	19752.40	19766.10	19779.70	19793.40
1670	19807.10	19820.80	19834.50	19848.10	19861.80	19875.40	19889.10	19902.80	19916.40	19930.00
1680	19943.70	19957.30	19970.90	19984.50	19998.20	20011.80	20025.40	20039.00	20052.60	20066.10
1690	20079.70	20093.30	20106.90	20120.40	20134.00	20147.50	20161.00	20174.60	20188.10	20201.60
1700	20215.10	20228.60	20242.10	20255.60	20269.10	20282.50	20296.00	20309.40	20322.90	20336.30
1710	20349.70	20363.10	20376.50	20389.90	20403.30	20416.70	20430.10	20443.40	20456.80	20470.10
1720	20483.40	20496.70	20510.00	20523.30	20536.60	20549.90	20563.10	20576.40	20589.60	20602.90
1730	20616.10	20629.30	20642.50	20655.60	20668.80	20682.00	20695.10	20708.20	20721.30	20734.40
1740	20747.50	20760.60	20773.70	20786.70	20799.80	20812.80	20825.80	20838.80	20851.80	20864.70
1750	20877.70	20890.60	20903.50	20916.40	20929.30	20942.20	20955.10	20967.90	20980.70	20993.60

S-TYPE THERMOCOUPLE TABLES

The table below is as compiled by the National Institute of Standards and Technology (NIST) in the US for a metal pair of Platinum vs. Platinum-10% Rhodium referenced to a cold junction at 0°C. S is the letter designation approved by the American Institute for Standards (ANSI). The column to the left is temperature in °C. The columns to the right are the μV produced in intervals of 1°C. For example -231.71 μV is produced at -49°C.

-50	-235.69	-231.71	-227.69	-223.65	-219.57	-215.46	-211.32	-207.15	-202.94	-198.71
-40	-194.44	-190.14	-185.81	-181.45	-177.06	-172.64	-168.19	-163.71	-159.20	-154.66
-30	-150.09	-145.49	-140.86	-136.20	-131.52	-126.80	-122.06	-117.29	-112.49	-107.66
-20	-102.80	-97.91	-93.00	-88.06	-83.09	-78.10	-73.08	-68.03	-62.95	-57.85
-10	-52.72	-47.57	-42.38	-37.18	-31.94	-26.68	-21.40	-16.09	-10.75	-5.39
0	0.00	5.41	10.85	16.31	21.80	27.31	32.84	38.40	43.99	49.59
10	55.23	60.88	66.56	72.26	77.99	83.74	89.51	95.30	101.12	106.96
20	112.82	118.71	124.62	130.55	136.50	142.47	148.47	154.49	160.53	166.59
30	172.67	178.78	184.90	191.05	197.21	203.40	209.61	215.84	222.09	228.36
40	234.65	240.96	247.29	253.64	260.01	266.40	272.81	279.24	285.69	292.16
50	298.64	305.15	311.67	318.22	324.78	331.36	337.96	344.58	351.22	357.88
60	364.55	371.24	377.95	384.68	391.42	398.19	404.97	411.77	418.58	425.41
70	432.26	439.13	446.02	452.92	459.84	466.77	473.72	480.69	487.67	494.68
80	501.69	508.73	515.78	522.84	529.92	537.02	544.14	551.27	558.41	565.57
90	572.75	579.94	587.14	594.37	601.60	608.85	616.12	623.40	630.70	638.01
100	645.34	652.68	660.03	667.40	674.79	682.18	689.60	697.02	704.46	711.92
110	719.38	726.87	734.36	741.87	749.39	756.93	764.48	772.04	779.62	787.21
120	794.81	802.43	810.05	817.70	825.35	833.02	840.70	848.39	856.10	863.81
130	871.54	879.29	887.04	894.81	902.59	910.38	918.18	926.00	933.83	941.67
140	949.52	957.38	965.26	973.14	981.04	988.95	996.87	1004.80	1012.75	1020.70
150	1028.67	1036.64	1044.63	1052.63	1060.64	1068.66	1076.69	1084.73	1092.79	1100.85
160	1108.93	1117.01	1125.11	1133.21	1141.33	1149.46	1157.59	1165.74	1173.90	1182.07
170	1190.24	1198.43	1206.63	1214.84	1223.05	1231.28	1239.52	1247.77	1256.02	1264.29
180	1272.56	1280.85	1289.14	1297.45	1305.76	1314.08	1322.41	1330.76	1339.11	1347.47
190	1355.83	1364.21	1372.60	1380.99	1389.40	1397.81	1406.23	1414.66	1423.10	1431.55
200	1440.01	1448.47	1456.95	1465.43	1473.92	1482.42	1490.93	1499.44	1507.97	1516.50
210	1525.04	1533.59	1542.14	1550.71	1559.28	1567.86	1576.45	1585.05	1593.65	1602.27
220	1610.89	1619.51	1628.15	1636.79	1645.44	1654.10	1662.77	1671.44	1680.12	1688.81
230	1697.51	1706.21	1714.92	1723.64	1732.37	1741.10	1749.84	1758.58	1767.34	1776.10
240	1784.87	1793.64	1802.42	1811.21	1820.01	1828.81	1837.62	1846.44	1855.26	1864.09
250	1872.93	1881.77	1890.62	1899.48	1908.34	1917.21	1926.09	1934.97	1943.86	1952.76
260	1961.66	1970.57	1979.49	1988.41	1997.33	2006.27	2015.21	2024.15	2033.11	2042.07
270	2051.03	2060.00	2068.98	2077.96	2086.95	2095.95	2104.95	2113.95	2122.97	2131.98
280	2141.01	2150.04	2159.08	2168.12	2177.16	2186.22	2195.28	2204.34	2213.41	2222.49
290	2231.57	2240.66	2249.75	2258.85	2267.95	2277.06	2286.17	2295.29	2304.42	2313.55
300	2322.68	2331.82	2340.97	2350.12	2359.28	2368.44	2377.61	2386.78	2395.96	2405.14
310	2414.33	2423.52	2432.72	2441.92	2451.13	2460.34	2469.56	2478.78	2488.01	2497.25
320	2506.48	2515.73	2524.97	2534.23	2543.48	2552.74	2562.01	2571.28	2580.56	2589.84
330	2599.12	2608.41	2617.71	2627.01	2636.31	2645.62	2654.93	2664.25	2673.58	2682.90
340	2692.23	2701.57	2710.91	2720.25	2729.60	2738.96	2748.31	2757.68	2767.04	2776.41
350	2785.79	2795.17	2804.55	2813.94	2823.33	2832.73	2842.13	2851.54	2860.95	2870.36
360	2879.78	2889.20	2898.63	2908.06	2917.49	2926.93	2936.37	2945.82	2955.27	2964.72
370	2974.18	2983.64	2993.11	3002.58	3012.05	3021.53	3031.02	3040.50	3049.99	3059.49
380	3068.98	3078.48	3087.99	3097.50	3107.01	3116.53	3126.05	3135.57	3145.10	3154.64
390	3164.17	3173.71	3183.25	3192.80	3202.35	3211.90	3221.46	3231.02	3240.59	3250.16
400	3259.73	3269.31	3278.89	3288.47	3298.06	3307.65	3317.24	3326.84	3336.44	3346.04
410	3355.65	3365.26	3374.88	3384.49	3394.12	3403.74	3413.37	3423.00	3432.64	3442.28
420	3451.92	3461.56	3471.21	3480.87	3490.52	3500.18	3509.84	3519.51	3529.18	3538.85
430	3548.53	3558.21	3567.89	3577.57	3587.26	3596.95	3606.65	3616.35	3626.05	3635.76
440	3645.46	3655.18	3664.89	3674.61	3684.33	3694.05	3703.78	3713.51	3723.24	3732.98
450	3742.72	3752.46	3762.21	3771.96	3781.71	3791.47	3801.23	3810.99	3820.75	3830.52
460	3840.29	3850.07	3859.84	3869.62	3879.41	3889.19	3898.98	3908.78	3918.57	3928.37
470	3938.17	3947.98	3957.78	3967.59	3977.41	3987.22	3997.04	4006.86	4016.69	4026.52
480	4036.35	4046.18	4056.02	4065.86	4075.70	4085.55	4095.40	4105.25	4115.11	4124.96
490	4134.83	4144.69	4154.56	4164.43	4174.30	4184.17	4194.05	4203.93	4213.82	4223.70
500	4233.59	4243.49	4253.38	4263.28	4273.18	4283.09	4292.99	4302.90	4312.82	4322.73
510	4332.65	4342.57	4352.50	4362.43	4372.36	4382.29	4392.22	4402.16	4412.11	4422.05
520	4432.00	4441.95	4451.90	4461.86	4471.82	4481.78	4491.74	4501.71	4511.68	4521.65
530	4531.63	4541.61	4551.59	4561.58	4571.57	4581.56	4591.55	4601.55	4611.55	4621.55
540	4631.55	4641.56	4651.57	4661.59	4671.60	4681.62	4691.64	4701.67	4711.70	4721.73

550	4731.76	4741.80	4751.84	4761.88	4771.93	4781.98	4792.03	4802.08	4812.14	4822.20
560	4832.27	4842.33	4852.40	4862.47	4872.55	4882.63	4892.71	4902.79	4912.88	4922.97
570	4933.06	4943.16	4953.26	4963.36	4973.47	4983.58	4993.69	5003.80	5013.92	5024.04
580	5034.16	5044.29	5054.42	5064.55	5074.69	5084.83	5094.97	5105.12	5115.27	5125.42
590	5135.57	5145.73	5155.89	5166.06	5176.22	5186.40	5196.57	5206.75	5216.93	5227.11
600	5237.30	5247.49	5257.68	5267.88	5278.08	5288.28	5298.49	5308.70	5318.91	5329.13
610	5339.35	5349.57	5359.80	5370.03	5380.27	5390.50	5400.74	5410.99	5421.23	5431.49
620	5441.74	5452.00	5462.26	5472.53	5482.79	5493.07	5503.34	5513.62	5523.91	5534.19
630	5544.48	5554.78	5565.10	5575.42	5585.74	5596.06	5606.39	5616.72	5627.06	5637.40
640	5647.74	5658.09	5668.44	5678.79	5689.14	5699.50	5709.86	5720.23	5730.60	5740.97
650	5751.34	5761.72	5772.10	5782.49	5792.87	5803.27	5813.66	5824.06	5834.46	5844.86
660	5855.27	5865.68	5876.10	5886.52	5896.94	5907.36	5917.79	5928.22	5938.65	5949.09
670	5959.53	5969.98	5980.42	5990.87	6001.33	6011.78	6022.25	6032.71	6043.18	6053.65
680	6064.12	6074.60	6085.08	6095.56	6106.05	6116.54	6127.03	6137.53	6148.03	6158.53
690	6169.04	6179.55	6190.06	6200.58	6211.10	6221.62	6232.15	6242.68	6253.21	6263.74
700	6274.28	6284.83	6295.37	6305.92	6316.47	6327.03	6337.59	6348.15	6358.72	6369.29
710	6379.86	6390.43	6401.01	6411.60	6422.18	6432.77	6443.36	6453.96	6464.56	6475.16
720	6485.76	6496.37	6506.98	6517.60	6528.22	6538.84	6549.46	6560.09	6570.72	6581.36
730	6592.00	6602.64	6613.28	6623.93	6634.58	6645.24	6655.90	6666.56	6677.22	6687.89
740	6698.56	6709.23	6719.91	6730.59	6741.28	6751.97	6762.66	6773.35	6784.05	6794.75
750	6805.45	6816.16	6826.87	6837.58	6848.30	6859.02	6869.75	6880.47	6891.20	6901.94
760	6912.67	6923.41	6934.16	6944.90	6955.65	6966.41	6977.16	6987.92	6998.69	7009.45
770	7020.22	7031.00	7041.77	7052.55	7063.34	7074.12	7084.91	7095.70	7106.50	7117.30
780	7128.10	7138.91	7149.72	7160.53	7171.35	7182.17	7192.99	7203.81	7214.64	7225.47
790	7236.31	7247.15	7257.99	7268.84	7279.69	7290.54	7301.39	7312.25	7323.11	7333.98
800	7344.85	7355.72	7366.59	7377.47	7388.35	7399.24	7410.13	7421.02	7431.91	7442.81
810	7453.71	7464.62	7475.53	7486.44	7497.35	7508.27	7519.19	7530.12	7541.04	7551.98
820	7562.91	7573.85	7584.79	7595.73	7606.68	7617.63	7628.58	7639.54	7650.50	7661.47
830	7672.43	7683.40	7694.38	7705.36	7716.34	7727.32	7738.31	7749.30	7760.29	7771.29
840	7782.29	7793.29	7804.30	7815.31	7826.32	7837.34	7848.36	7859.38	7870.41	7881.44
850	7892.47	7903.51	7914.55	7925.59	7936.64	7947.68	7958.74	7969.79	7980.85	7991.92
860	8002.98	8014.05	8025.12	8036.20	8047.28	8058.36	8069.45	8080.54	8091.63	8102.72
870	8113.82	8124.92	8136.03	8147.14	8158.25	8169.37	8180.49	8191.61	8202.73	8213.86
880	8224.99	8236.13	8247.27	8258.41	8269.55	8280.70	8291.85	8303.01	8314.17	8325.33
890	8336.49	8347.66	8358.83	8370.01	8381.18	8392.36	8403.55	8414.74	8425.93	8437.12
900	8448.32	8459.52	8470.72	8481.93	8493.14	8504.36	8515.57	8526.79	8538.02	8549.25
910	8560.48	8571.71	8582.95	8594.19	8605.43	8616.68	8627.93	8639.18	8650.44	8661.70
920	8672.96	8684.23	8695.50	8706.77	8718.05	8729.33	8740.61	8751.90	8763.19	8774.48
930	8785.78	8797.08	8808.38	8819.69	8831.00	8842.31	8853.63	8864.94	8876.27	8887.59
940	8898.92	8910.25	8921.59	8932.93	8944.27	8955.62	8966.97	8978.32	8989.67	9001.03
950	9012.40	9023.76	9035.13	9046.50	9057.88	9069.26	9080.64	9092.02	9103.41	9114.80
960	9126.20	9137.60	9149.00	9160.40	9171.81	9183.22	9194.64	9206.06	9217.48	9228.90
970	9240.33	9251.76	9263.20	9274.63	9286.07	9297.52	9308.97	9320.42	9331.87	9343.33
980	9354.79	9366.25	9377.72	9389.19	9400.67	9412.14	9423.61	9435.11	9446.60	9458.09
990	9469.58	9481.08	9492.58	9504.08	9515.59	9527.10	9538.62	9550.13	9561.65	9573.17
1000	9584.70	9596.23	9607.76	9619.30	9630.84	9642.38	9653.93	9665.48	9677.03	9688.59
1010	9700.15	9711.71	9723.28	9734.85	9746.42	9757.99	9769.57	9781.16	9792.74	9804.33
1020	9815.92	9827.52	9839.12	9850.72	9862.33	9873.94	9885.55	9897.16	9908.78	9920.40
1030	9932.03	9943.66	9955.29	9966.93	9978.56	9990.21	10001.90	10013.50	10025.20	10036.80
1040	10048.50	10060.10	10071.80	10083.50	10095.10	10106.80	10118.50	10130.20	10141.90	10153.50
1050	10165.20	10176.90	10188.60	10200.30	10212.00	10223.70	10235.50	10247.20	10258.90	10270.60
1060	10282.30	10294.10	10305.80	10317.50	10329.30	10341.00	10352.70	10364.50	10376.20	10388.00
1070	10399.70	10411.50	10423.30	10435.00	10446.80	10458.60	10470.30	10482.10	10493.90	10505.60
1080	10517.40	10529.20	10541.00	10552.80	10564.60	10576.40	10588.20	10600.00	10611.80	10623.60
1090	10635.40	10647.20	10659.00	10670.80	10682.60	10694.40	10706.30	10718.10	10729.90	10741.70
1100	10753.60	10765.40	10777.20	10789.10	10800.90	10812.70	10824.60	10836.40	10848.30	10860.10
1110	10872	10883.80	10895.70	10907.60	10919.40	10931.30	10943.20	10955.00	10966.90	10978.80
1120	10990.70	11002.50	11014.40	11026.30	11038.20	11050.10	11062.00	11073.80	11085.70	11097.60
1130	11109.50	11121.40	11133.30	11145.20	11157.10	11169.10	11181.00	11192.90	11204.80	11216.70
1140	11228.60	11240.50	11252.50	11264.40	11276.30	11288.20	11300.20	11312.10	11324.00	11336.00
1150	11347.90	11359.90	11371.80	11383.70	11395.70	11407.60	11419.60	11431.50	11443.50	11455.40
1160	11467.40	11479.40	11491.30	11503.30	11515.20	11527.20	11539.20	11551.10	11563.10	11575.10
1170	11587.10	11599.00	11611.00	11623.00	11635.00	11647.00	11659.00	11670.90	11682.90	11694.90
1180	11706.90	11718.90	11730.90	11742.90	11754.90	11766.90	11778.90	11790.90	11802.90	11814.90
1190	11826.90	11838.90	11850.90	11862.90	11874.90	11887.00	11899.00	11911.00	11923.00	11935.00
1200	11947.10	11959.10	11971.10	11983.10	11995.20	12007.20	12019.20	12031.30	12043.30	12055.30
1210	12067.40	12079.40	12091.40	12103.50	12115.50	12127.60	12139.60	12151.60	12163.70	12175.70

1220	12187.80	12199.80	12211.90	12223.90	12236.00	12248.10	12260.10	12272.20	12284.20	12296.30
1230	12308.40	12320.40	12332.50	12344.50	12356.60	12368.70	12380.70	12392.80	12404.90	12417.00
1240	12429.00	12441.10	12453.20	12465.30	12477.30	12489.40	12501.50	12513.60	12525.60	12537.70
1250	12549.80	12561.90	12574.00	12586.10	12598.20	12610.20	12622.30	12634.40	12646.50	12658.60
1260	12670.70	12682.80	12694.90	12707.00	12719.10	12731.20	12743.30	12755.40	12767.50	12779.60
1270	12791.70	12803.80	12815.90	12828.00	12840.10	12852.20	12864.30	12876.40	12888.50	12900.60
1280	12912.70	12924.80	12936.90	12949.00	12961.10	12973.30	12985.40	12997.50	13009.60	13021.70
1290	13033.80	13045.90	13058.10	13070.20	13082.30	13094.40	13106.50	13118.60	13130.80	13142.90
1300	13155.00	13167.10	13179.20	13191.40	13203.50	13215.60	13227.70	13239.90	13252.00	13264.10
1310	13276.20	13288.40	13300.50	13312.60	13324.70	13336.90	13349.00	13361.10	13373.20	13385.40
1320	13397.50	13409.60	13421.80	13433.90	13446.00	13458.10	13470.30	13482.40	13494.50	13506.70
1330	13518.80	13530.90	13543.10	13555.20	13567.30	13579.40	13591.60	13603.70	13615.80	13628.00
1340	13640.10	13652.20	13664.40	13676.50	13688.60	13700.80	13712.90	13725.00	13737.20	13749.30
1350	13761.40	13773.60	13785.70	13797.80	13810.00	13822.10	13834.20	13846.40	13858.50	13870.60
1360	13882.80	13894.90	13907.00	13919.20	13931.30	13943.40	13955.60	13967.70	13979.80	13992.00
1370	14004.10	14016.20	14028.40	14040.50	14052.60	14064.80	14076.90	14089.00	14101.20	14113.30
1380	14125.40	14137.50	14149.70	14161.80	14173.90	14186.10	14198.20	14210.30	14222.50	14234.60
1390	14246.70	14258.80	14271.00	14283.10	14295.20	14307.30	14319.50	14331.60	14343.70	14355.80
1400	14368.00	14380.10	14392.20	14404.30	14416.40	14428.60	14440.70	14452.80	14464.90	14477.00
1410	14489.20	14501.30	14513.40	14525.50	14537.60	14549.80	14561.90	14574.00	14586.10	14598.20
1420	14610.30	14622.40	14634.50	14646.70	14658.80	14670.90	14683.00	14695.10	14707.20	14719.30
1430	14731.40	14743.50	14755.60	14767.70	14779.80	14791.90	14804.00	14816.10	14828.20	14840.30
1440	14852.40	14864.50	14876.60	14888.70	14900.80	14912.90	14925.00	14937.10	14949.20	14961.30
1450	14973.40	14985.50	14997.50	15009.60	15021.70	15033.80	15045.90	15058.00	15070.10	15082.10
1460	15094.20	15106.30	15118.40	15130.50	15142.50	15154.60	15166.70	15178.70	15190.80	15202.90
1470	15215.00	15227.00	15239.10	15251.20	15263.20	15275.30	15287.40	15299.40	15311.50	15323.50
1480	15335.60	15347.70	15359.70	15371.80	15383.80	15395.90	15407.90	15420.00	15432.00	15444.10
1490	15456.10	15468.20	15480.20	15492.20	15504.30	15516.30	15528.40	15540.40	15552.40	15564.50
1500	15576.50	15588.50	15600.60	15612.60	15624.60	15636.60	15648.70	15660.70	15672.70	15684.70
1510	15696.70	15708.80	15720.80	15732.80	15744.80	15756.80	15768.80	15780.80	15792.80	15804.80
1520	15816.80	15828.80	15840.80	15852.80	15864.80	15876.80	15888.80	15900.80	15912.80	15924.80
1530	15936.80	15948.80	15960.80	15972.70	15984.70	15996.70	16008.70	16020.60	16032.60	16044.60
1540	16056.60	16068.50	16080.50	16092.50	16104.40	16116.40	16128.30	16140.30	16152.30	16164.20
1550	16176.20	16188.10	16200.10	16212.00	16224.00	16235.90	16247.80	16259.80	16271.70	16283.60
1560	16295.60	16307.50	16319.40	16331.40	16343.30	16355.20	16367.10	16379.00	16391.00	16402.90
1570	16414.80	16426.70	16438.60	16450.50	16462.40	16474.30	16486.20	16498.10	16510.00	16521.90
1580	16533.80	16545.70	16557.60	16569.50	16581.40	16593.20	16605.10	16617.00	16628.90	16640.70
1590	16652.60	16664.50	16676.30	16688.20	16700.10	16711.90	16723.80	16735.60	16747.50	16759.30
1600	16771.20	16783.00	16794.90	16806.70	16818.60	16830.40	16842.20	16854.00	16865.90	16877.70
1610	16889.50	16901.30	16913.20	16925.00	16936.80	16948.60	16960.40	16972.20	16984.00	16995.80
1620	17007.60	17019.40	17031.20	17043.00	17054.80	17066.60	17078.40	17090.20	17101.90	17113.70
1630	17125.50	17137.20	17149.00	17160.80	17172.50	17184.30	17196.10	17207.80	17219.60	17231.30
1640	17243.10	17254.80	17266.60	17278.30	17290.00	17301.80	17313.50	17325.20	17336.90	17348.70
1650	17360.40	17372.10	17383.80	17395.50	17407.20	17418.90	17430.60	17442.30	17454.00	17465.70
1660	17477.40	17489.10	17500.80	17512.50	17524.20	17535.80	17547.50	17559.20	17570.80	17582.50
1670	17594.20	17605.80	17617.50	17629.10	17640.80	17652.40	17664.00	17675.70	17687.30	17698.90
1680	17710.50	17722.20	17733.80	17745.40	17757.00	17768.60	17780.10	17791.70	17803.30	17814.90
1690	17826.40	17838.00	17849.50	17861.10	17872.60	17884.10	17895.70	17907.20	17918.70	17930.20
1700	17941.70	17953.20	17964.70	17976.10	17987.60	17999.00	18010.50	18021.90	18033.30	18044.80
1710	18056.20	18067.60	18079	18090.40	18101.70	18113.10	18124.40	18135.80	18147.10	18158.40
1720	18169.80	18181.10	18192.40	18203.60	18214.90	18226.20	18237.40	18248.70	18259.90	18271.10
1730	18282.30	18293.50	18304.70	18315.90	18327.00	18338.20	18349.30	18360.40	18371.50	18382.60
1740	18393.70	18404.80	18415.80	18426.90	18437.90	18448.90	18459.90	18470.90	18481.90	18492.80
1750	18503.80	18514.70	18525.60	18536.50	18547.40	18558.30	18569.10	18580.00	18590.80	18601.60

T-TYPE THERMOCOUPLE TABLES

The table below is as compiled by the National Institute of Standards and Technology (NIST) in the US for a metal pair of Copper Vs. Copper-Nickel referenced to a cold junction at 0°C. T is the letter designation approved by the American Institute for Standards (ANSI). The column to the left is temperature in °C. The columns to the right are the μV produced in intervals of 1°C. For example -6256.38 μV is produced at -269°C.

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-270	-6257.58	-6256.38	-6254.82	-6252.94	-6250.74	-6248.25	-6245.49	-6242.46	-6239.17	-6235.62
-260	-6231.83	-6227.79	-6223.50	-6218.98	-6214.21	-6209.20	-6203.95	-6198.46	-6192.72	-6186.75
-250	-6180.53	-6174.06	-6167.36	-6160.41	-6153.22	-6145.79	-6138.13	-6130.22	-6122.08	-6113.70
-240	-6105.09	-6096.25	-6087.18	-6077.89	-6068.37	-6058.64	-6048.69	-6038.53	-6028.16	-6017.58
-230	-6006.80	-5995.82	-5984.64	-5973.27	-5961.71	-5949.97	-5938.04	-5925.93	-5913.64	-5901.18
-220	-5888.54	-5875.74	-5862.77	-5849.63	-5836.33	-5822.88	-5809.26	-5795.49	-5781.56	-5767.48
-210	-5753.25	-5738.87	-5724.34	-5709.67	-5694.85	-5679.88	-5664.77	-5649.52	-5634.13	-5618.59
-200	-5602.92	-5587.10	-5571.15	-5555.05	-5538.82	-5522.45	-5505.95	-5489.30	-5472.52	-5455.61
-190	-5438.55	-5421.37	-5404.04	-5386.59	-5368.99	-5351.27	-5333.40	-5315.41	-5297.28	-5279.02
-180	-5260.62	-5242.10	-5223.44	-5204.64	-5185.72	-5166.66	-5147.47	-5128.16	-5108.71	-5089.12
-170	-5069.41	-5049.57	-5029.60	-5009.50	-4989.27	-4968.91	-4948.43	-4927.81	-4907.07	-4886.20
-160	-4865.20	-4844.07	-4822.81	-4801.43	-4779.93	-4758.29	-4736.53	-4714.64	-4692.63	-4670.49
-150	-4648.23	-4625.84	-4603.33	-4580.69	-4557.92	-4535.03	-4512.02	-4488.88	-4465.62	-4442.23
-140	-4418.72	-4395.08	-4371.32	-4347.44	-4323.43	-4299.30	-4275.05	-4250.67	-4226.17	-4201.55
-130	-4176.81	-4151.94	-4126.95	-4101.83	-4076.60	-4051.24	-4025.76	-4000.16	-3974.43	-3948.59
-120	-3922.62	-3896.54	-3870.33	-3844.00	-3817.56	-3790.99	-3764.30	-3737.49	-3710.57	-3683.52
-110	-3656.36	-3629.07	-3601.67	-3574.15	-3546.52	-3518.76	-3490.89	-3462.90	-3434.80	-3406.58
-100	-3378.24	-3349.79	-3321.22	-3292.54	-3263.74	-3234.83	-3205.80	-3176.66	-3147.41	-3118.04
-90	-3088.56	-3058.96	-3029.26	-2999.44	-2969.50	-2939.46	-2909.30	-2879.03	-2848.65	-2818.16
-80	-2787.55	-2756.84	-2726.01	-2695.08	-2664.03	-2632.87	-2601.61	-2570.23	-2538.74	-2507.14
-70	-2475.44	-2443.62	-2411.70	-2379.67	-2347.52	-2315.27	-2282.92	-2250.45	-2217.88	-2185.20
-60	-2152.41	-2119.52	-2086.52	-2053.42	-2020.21	-1986.89	-1953.47	-1919.94	-1886.31	-1852.58
-50	-1818.74	-1784.80	-1750.75	-1716.61	-1682.36	-1648.01	-1613.55	-1579.00	-1544.34	-1509.59
-40	-1474.73	-1439.77	-1404.72	-1369.56	-1334.30	-1298.94	-1263.49	-1227.93	-1192.27	-1156.52
-30	-1120.67	-1084.71	-1048.66	-1012.51	-976.26	-939.91	-903.47	-866.92	-830.28	-793.54
-20	-756.70	-719.76	-682.73	-645.59	-608.36	-571.04	-533.62	-496.10	-458.49	-420.78
-10	-382.98	-345.09	-307.10	-269.03	-230.86	-192.61	-154.26	-115.83	-77.31	-38.70
0	0.00	38.77	77.62	116.53	155.51	194.56	233.68	272.88	312.15	351.49
10	390.91	430.41	469.98	509.64	549.37	589.18	629.06	669.03	709.09	749.22
20	789.43	829.73	870.11	910.57	951.11	991.74	1032.46	1073.25	1114.14	1155.10
30	1196.16	1237.29	1278.52	1319.82	1361.22	1402.70	1444.26	1485.92	1527.65	1569.48
40	1611.38	1653.38	1695.46	1737.63	1779.88	1822.22	1864.64	1907.15	1949.74	1992.42
50	2035.19	2078.04	2120.97	2163.99	2207.10	2250.29	2293.56	2336.92	2380.36	2423.88
60	2467.49	2511.18	2554.96	2598.81	2642.75	2686.77	2730.88	2775.06	2819.33	2863.68
70	2908.11	2952.62	2997.21	3041.88	3086.63	3131.46	3176.37	3221.36	3266.43	3311.57
80	3356.80	3402.10	3447.48	3492.94	3538.48	3584.09	3629.78	3675.55	3721.39	3767.31
90	3813.30	3859.37	3905.51	3951.73	3998.03	4044.40	4090.84	4137.35	4183.94	4230.61
100	4277.34	4324.15	4371.03	4417.99	4465.01	4512.11	4559.28	4606.52	4653.83	4701.21
110	4748.67	4796.19	4843.78	4891.45	4939.18	4986.98	5034.86	5082.80	5130.81	5178.89
120	5227.03	5275.25	5323.53	5371.89	5420.30	5468.79	5517.35	5565.97	5614.65	5663.41
130	5712.23	5761.12	5810.07	5859.09	5908.18	5957.33	6006.54	6055.83	6105.17	6154.59
140	6204.06	6253.60	6303.21	6352.88	6402.62	6452.42	6502.28	6552.21	6602.20	6652.25
150	6702.37	6752.55	6802.79	6853.10	6903.47	6953.90	7004.39	7054.95	7105.57	7156.25
160	7206.99	7257.80	7308.66	7359.59	7410.58	7461.63	7512.74	7563.92	7615.15	7666.45
170	7717.80	7769.22	7820.69	7872.23	7923.83	7975.49	8027.20	8078.98	8130.82	8182.71
180	8234.67	8286.68	8338.76	8390.89	8443.08	8495.33	8547.64	8600.01	8652.44	8704.92
190	8757.47	8810.07	8862.73	8915.44	8968.22	9021.05	9073.94	9126.89	9179.89	9232.95
200	9286.07	9339.24	9392.48	9445.76	9499.11	9552.51	9605.96	9659.48	9713.04	9766.67
210	9820.35	9874.08	9927.87	9981.71	10035.60	10089.60	10143.60	10197.60	10251.80	10305.90
220	10360.20	10414.40	10468.80	10523.20	10577.60	10632.10	10686.60	10741.20	10795.90	10850.60
230	10905.40	10960.20	11015.00	11069.90	11124.90	11179.90	11235.00	11290.10	11345.30	11400.50
240	11455.80	11511.10	11566.50	11621.90	11677.40	11732.90	11788.50	11844.10	11899.80	11955.50
250	12011.30	12067.10	12123.00	12178.90	12234.90	12290.90	12347.00	12403.10	12459.30	12515.50
260	12571.70	12628.00	12684.40	12740.80	12797.30	12853.90	12910.30	12966.90	13023.50	13080.20
270	13136.90	13193.70	13250.50	13307.40	13364.30	13421.30	13478.30	13535.40	13592.40	13649.60
280	13706.80	13764.00	13821.30	13878.60	13936.00	13993.40	14050.80	14108.30	14165.90	14223.50
290	14281.10	14338.80	14396.50	14454.30	14512.10	14569.90	14627.80	14685.70	14743.70	14801.70
300	14859.80	14917.90	14976.10	15034.30	15092.50	15150.80	15209.10	15267.50	15325.90	15384.30
310	15442.80	15501.30	15559.90	15618.50	15677.20	15735.90	15794.60	15853.40	15912.20	15971.10
320	16030.00	16089.00	16148.00	16207.00	16266.10	16325.20	16384.30	16443.50	16502.80	16562.10
330	16621.40	16680.70	16740.10	16799.60	16859.10	16918.60	16978.20	17037.80	17097.40	17157.10
340	17216.80	17276.60	17336.40	17396.30	17456.20	17516.10	17576.10	17636.10	17696.10	17756.20
350	17816.40	17876.50	17936.80	17997.00	18057.30	18117.60	18178.00	18238.40	18298.90	18359.30
360	18419.90	18480.40	18541	18601.70	18662.40	18723.10	18783.80	18844.60	18905.40	18966.30
370	19027.20	19088.10	19149.10	19210.10	19271.20	19332.20	19393.40	19454.50	19515.70	19576.90
380	19638.20	19699.40	19760.70	19822.10	19883.50	19944.90	20006.30	20067.80	20129.30	20190.80
390	20252.30	20313.90	20375.50	20437.20	20498.80	20560.50	20622.20	20683.90	20745.70	20807.40