Type J Thermocouple Table (mV vs °C)

Basis: NIST ITS 90 reference functions as adopted in IEC 60584 1. Type J is Iron vs Copper Nickel (Constantan): common in older plastics and process plants; use below 760 °C in service.

instrumentationblog.in/downloads/engineering-reference-tables/type-j-thermocouple-table/

Type J Thermocouple Table, EMF in mV (reference junction 0 °C)

°C	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
−210	−8.095	−8.076	−8.057	−8.037	−8.017	−7.996	−7.976	−7.955	−7.934	−7.912
−200	−7.890	−7.868	−7.846	−7.824	−7.801	−7.778	−7.755	−7.731	−7.707	−7.683
−190	−7.659	−7.634	−7.610	−7.585	−7.559	−7.534	−7.508	−7.482	−7.456	−7.429
−180	−7.403	−7.376	−7.348	−7.321	−7.293	−7.265	−7.237	−7.209	−7.181	−7.152
−170	−7.123	−7.094	−7.064	−7.035	−7.005	−6.975	−6.944	−6.914	−6.883	−6.853
−160	−6.821	−6.790	−6.759	−6.727	−6.695	−6.663	−6.631	−6.598	−6.566	−6.533
−150	−6.500	−6.467	−6.433	−6.400	−6.366	−6.332	−6.298	−6.263	−6.229	−6.194
−140	−6.159	−6.124	−6.089	−6.054	−6.018	−5.982	−5.946	−5.910	−5.874	−5.838
−130	−5.801	−5.764	−5.727	−5.690	−5.653	−5.616	−5.578	−5.541	−5.503	−5.465
−120	−5.426	−5.388	−5.350	−5.311	−5.272	−5.233	−5.194	−5.155	−5.116	−5.076
−110	−5.037	−4.997	−4.957	−4.917	−4.877	−4.836	−4.796	−4.755	−4.714	−4.674
−100	−4.633	−4.591	−4.550	−4.509	−4.467	−4.425	−4.384	−4.342	−4.300	−4.257
−90	−4.215	−4.173	−4.130	−4.088	−4.045	−4.002	−3.959	−3.916	−3.872	−3.829
−80	−3.786	−3.742	−3.698	−3.654	−3.610	−3.566	−3.522	−3.478	−3.434	−3.389
−70	−3.344	−3.300	−3.255	−3.210	−3.165	−3.120	−3.075	−3.029	−2.984	−2.938
−60	−2.893	−2.847	−2.801	−2.755	−2.709	−2.663	−2.617	−2.571	−2.524	−2.478
−50	−2.431	−2.385	−2.338	−2.291	−2.244	−2.197	−2.150	−2.103	−2.055	−2.008
−40	−1.961	−1.913	−1.865	−1.818	−1.770	−1.722	−1.674	−1.626	−1.578	−1.530
−30	−1.482	−1.433	−1.385	−1.336	−1.288	−1.239	−1.190	−1.142	−1.093	−1.044
−20	−0.995	−0.946	−0.896	−0.847	−0.798	−0.749	−0.699	−0.650	−0.600	−0.550
−10	−0.501	−0.451	−0.401	−0.351	−0.301	−0.251	−0.201	−0.151	−0.101	−0.050
0	0.000	0.050	0.101	0.151	0.202	0.253	0.303	0.354	0.405	0.456
10	0.507	0.558	0.609	0.660	0.711	0.762	0.814	0.865	0.916	0.968
20	1.019	1.071	1.122	1.174	1.226	1.277	1.329	1.381	1.433	1.485
30	1.537	1.589	1.641	1.693	1.745	1.797	1.849	1.902	1.954	2.006
40	2.059	2.111	2.164	2.216	2.269	2.322	2.374	2.427	2.480	2.532
50	2.585	2.638	2.691	2.744	2.797	2.850	2.903	2.956	3.009	3.062
60	3.116	3.169	3.222	3.275	3.329	3.382	3.436	3.489	3.543	3.596
70	3.650	3.703	3.757	3.810	3.864	3.918	3.971	4.025	4.079	4.133
80	4.187	4.240	4.294	4.348	4.402	4.456	4.510	4.564	4.618	4.672
90	4.726	4.781	4.835	4.889	4.943	4.997	5.052	5.106	5.160	5.215
100	5.269	5.323	5.378	5.432	5.487	5.541	5.595	5.650	5.705	5.759
110	5.814	5.868	5.923	5.977	6.032	6.087	6.141	6.196	6.251	6.306
120	6.360	6.415	6.470	6.525	6.579	6.634	6.689	6.744	6.799	6.854
130	6.909	6.964	7.019	7.074	7.129	7.184	7.239	7.294	7.349	7.404
140	7.459	7.514	7.569	7.624	7.679	7.734	7.789	7.844	7.900	7.955
150	8.010	8.065	8.120	8.175	8.231	8.286	8.341	8.396	8.452	8.507
160	8.562	8.618	8.673	8.728	8.783	8.839	8.894	8.949	9.005	9.060
170	9.115	9.171	9.226	9.282	9.337	9.392	9.448	9.503	9.559	9.614
180	9.669	9.725	9.780	9.836	9.891	9.947	10.002	10.057	10.113	10.168
190	10.224	10.279	10.335	10.390	10.446	10.501	10.557	10.612	10.668	10.723
200	10.779	10.834	10.890	10.945	11.001	11.056	11.112	11.167	11.223	11.278
210	11.334	11.389	11.445	11.501	11.556	11.612	11.667	11.723	11.778	11.834

℃	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
220	11.889	11.945	12.000	12.056	12.111	12.167	12.222	12.278	12.334	12.389
230	12.445	12.500	12.556	12.611	12.667	12.722	12.778	12.833	12.889	12.944
240	13.000	13.056	13.111	13.167	13.222	13.278	13.333	13.389	13.444	13.500
250	13.555	13.611	13.666	13.722	13.777	13.833	13.888	13.944	13.999	14.055
260	14.110	14.166	14.221	14.277	14.332	14.388	14.443	14.499	14.554	14.609
270	14.665	14.720	14.776	14.831	14.887	14.942	14.998	15.053	15.109	15.164
280	15.219	15.275	15.330	15.386	15.441	15.496	15.552	15.607	15.663	15.718
290	15.773	15.829	15.884	15.940	15.995	16.050	16.106	16.161	16.216	16.272
300	16.327	16.383	16.438	16.493	16.549	16.604	16.659	16.715	16.770	16.825
310	16.881	16.936	16.991	17.046	17.102	17.157	17.212	17.268	17.323	17.378
320	17.434	17.489	17.544	17.599	17.655	17.710	17.765	17.820	17.876	17.931
330	17.986	18.041	18.097	18.152	18.207	18.262	18.318	18.373	18.428	18.483
340	18.538	18.594	18.649	18.704	18.759	18.814	18.870	18.925	18.980	19.035
350	19.090	19.146	19.201	19.256	19.311	19.366	19.422	19.477	19.532	19.587
360	19.642	19.697	19.753	19.808	19.863	19.918	19.973	20.028	20.083	20.139
370	20.194	20.249	20.304	20.359	20.414	20.469	20.525	20.580	20.635	20.690
380	20.745	20.800	20.855	20.911	20.966	21.021	21.076	21.131	21.186	21.241
390	21.297	21.352	21.407	21.462	21.517	21.572	21.627	21.683	21.738	21.793
400	21.848	21.903	21.958	22.014	22.069	22.124	22.179	22.234	22.289	22.345
410	22.400	22.455	22.510	22.565	22.620	22.676	22.731	22.786	22.841	22.896
420	22.952	23.007	23.062	23.117	23.172	23.228	23.283	23.338	23.393	23.449
430	23.504	23.559	23.614	23.670	23.725	23.780	23.835	23.891	23.946	24.001
440	24.057	24.112	24.167	24.223	24.278	24.333	24.389	24.444	24.499	24.555
450	24.610	24.665	24.721	24.776	24.832	24.887	24.943	24.998	25.053	25.109
460	25.164	25.220	25.275	25.331	25.386	25.442	25.497	25.553	25.608	25.664
470	25.720	25.775	25.831	25.886	25.942	25.998	26.053	26.109	26.165	26.220
480	26.276	26.332	26.387	26.443	26.499	26.555	26.610	26.666	26.722	26.778
490	26.834	26.889	26.945	27.001	27.057	27.113	27.169	27.225	27.281	27.337
500	27.393	27.449	27.505	27.561	27.617	27.673	27.729	27.785	27.841	27.897
510	27.953	28.010	28.066	28.122	28.178	28.234	28.291	28.347	28.403	28.460
520	28.516	28.572	28.629	28.685	28.741	28.798	28.854	28.911	28.967	29.024
530	29.080	29.137	29.194	29.250	29.307	29.363	29.420	29.477	29.534	29.590
540	29.647	29.704	29.761	29.818	29.874	29.931	29.988	30.045	30.102	30.159
550	30.216	30.273	30.330	30.387	30.444	30.502	30.559	30.616	30.673	30.730
560	30.788	30.845	30.902	30.960	31.017	31.074	31.132	31.189	31.247	31.304
570	31.362	31.419	31.477	31.535	31.592	31.650	31.708	31.766	31.823	31.881
580	31.939	31.997	32.055	32.113	32.171	32.229	32.287	32.345	32.403	32.461
590	32.519	32.577	32.636	32.694	32.752	32.810	32.869	32.927	32.985	33.044
600	33.102	33.161	33.219	33.278	33.337	33.395	33.454	33.513	33.571	33.630
610	33.689	33.748	33.807	33.866	33.925	33.984	34.043	34.102	34.161	34.220
620	34.279	34.338	34.397	34.457	34.516	34.575	34.635	34.694	34.754	34.813
630	34.873	34.932	34.992	35.051	35.111	35.171	35.230	35.290	35.350	35.410
640	35.470	35.530	35.590	35.650	35.710	35.770	35.830	35.890	35.950	36.010
650	36.071	36.131	36.191	36.252	36.312	36.373	36.433	36.494	36.554	36.615
660	36.675	36.736	36.797	36.858	36.918	36.979	37.040	37.101	37.162	37.223
670	37.284	37.345	37.406	37.467	37.528	37.590	37.651	37.712	37.773	37.835
680	37.896	37.958	38.019	38.081	38.142	38.204	38.265	38.327	38.389	38.450
690	38.512	38.574	38.636	38.698	38.760	38.822	38.884	38.946	39.008	39.070
700	39.132	39.194	39.256	39.318	39.381	39.443	39.505	39.568	39.630	39.693
710	39.755	39.818	39.880	39.943	40.005	40.068	40.131	40.193	40.256	40.319

℃	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
720	40.382	40.445	40.508	40.570	40.633	40.696	40.759	40.822	40.886	40.949
730	41.012	41.075	41.138	41.201	41.265	41.328	41.391	41.455	41.518	41.581
740	41.645	41.708	41.772	41.835	41.899	41.962	42.026	42.090	42.153	42.217
750	42.281	42.344	42.408	42.472	42.536	42.599	42.663	42.727	42.791	42.855
760	42.919	42.983	43.047	43.111	43.175	43.239	43.303	43.367	43.431	43.495
770	43.559	43.624	43.688	43.752	43.817	43.881	43.945	44.010	44.074	44.139
780	44.203	44.267	44.332	44.396	44.461	44.525	44.590	44.655	44.719	44.784
790	44.848	44.913	44.977	45.042	45.107	45.171	45.236	45.301	45.365	45.430
800	45.494	45.559	45.624	45.688	45.753	45.818	45.882	45.947	46.011	46.076
810	46.141	46.205	46.270	46.334	46.399	46.464	46.528	46.593	46.657	46.722
820	46.786	46.851	46.915	46.980	47.044	47.109	47.173	47.238	47.302	47.367
830	47.431	47.495	47.560	47.624	47.688	47.753	47.817	47.881	47.946	48.010
840	48.074	48.138	48.202	48.267	48.331	48.395	48.459	48.523	48.587	48.651
850	48.715	48.779	48.843	48.907	48.971	49.034	49.098	49.162	49.226	49.290
860	49.353	49.417	49.481	49.544	49.608	49.672	49.735	49.799	49.862	49.926
870	49.989	50.052	50.116	50.179	50.243	50.306	50.369	50.432	50.495	50.559
880	50.622	50.685	50.748	50.811	50.874	50.937	51.000	51.063	51.126	51.188
890	51.251	51.314	51.377	51.439	51.502	51.565	51.627	51.690	51.752	51.815
900	51.877	51.940	52.002	52.064	52.127	52.189	52.251	52.314	52.376	52.438
910	52.500	52.562	52.624	52.686	52.748	52.810	52.872	52.934	52.996	53.057
920	53.119	53.181	53.243	53.304	53.366	53.427	53.489	53.550	53.612	53.673
930	53.735	53.796	53.857	53.919	53.980	54.041	54.102	54.164	54.225	54.286
940	54.347	54.408	54.469	54.530	54.591	54.652	54.713	54.773	54.834	54.895
950	54.956	55.016	55.077	55.138	55.198	55.259	55.319	55.380	55.440	55.501
960	55.561	55.622	55.682	55.742	55.803	55.863	55.923	55.983	56.043	56.104
970	56.164	56.224	56.284	56.344	56.404	56.464	56.524	56.584	56.643	56.703
980	56.763	56.823	56.883	56.942	57.002	57.062	57.121	57.181	57.240	57.300
990	57.360	57.419	57.479	57.538	57.597	57.657	57.716	57.776	57.835	57.894
1000	57.953	58.013	58.072	58.131	58.190	58.249	58.309	58.368	58.427	58.486
1010	58.545	58.604	58.663	58.722	58.781	58.840	58.899	58.957	59.016	59.075
1020	59.134	59.193	59.252	59.310	59.369	59.428	59.487	59.545	59.604	59.663
1030	59.721	59.780	59.838	59.897	59.956	60.014	60.073	60.131	60.190	60.248
1040	60.307	60.365	60.423	60.482	60.540	60.599	60.657	60.715	60.774	60.832
1050	60.890	60.949	61.007	61.065	61.123	61.182	61.240	61.298	61.356	61.415
1060	61.473	61.531	61.589	61.647	61.705	61.763	61.822	61.880	61.938	61.996
1070	62.054	62.112	62.170	62.228	62.286	62.344	62.402	62.460	62.518	62.576
1080	62.634	62.692	62.750	62.808	62.866	62.924	62.982	63.040	63.098	63.156
1090	63.214	63.271	63.329	63.387	63.445	63.503	63.561	63.619	63.677	63.734
1100	63.792	63.850	63.908	63.966	64.024	64.081	64.139	64.197	64.255	64.313
1110	64.370	64.428	64.486	64.544	64.602	64.659	64.717	64.775	64.833	64.890
1120	64.948	65.006	65.064	65.121	65.179	65.237	65.295	65.352	65.410	65.468
1130	65.525	65.583	65.641	65.699	65.756	65.814	65.872	65.929	65.987	66.045
1140	66.102	66.160	66.218	66.275	66.333	66.391	66.448	66.506	66.564	66.621
1150	66.679	66.737	66.794	66.852	66.910	66.967	67.025	67.082	67.140	67.198
1160	67.255	67.313	67.370	67.428	67.486	67.543	67.601	67.658	67.716	67.773
1170	67.831	67.888	67.946	68.003	68.061	68.119	68.176	68.234	68.291	68.348
1180	68.406	68.463	68.521	68.578	68.636	68.693	68.751	68.808	68.865	68.923
1190	68.980	69.037	69.095	69.152	69.209	69.267	69.324	69.381	69.439	69.496
1200	69.553									

°C	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9

Notes

- IEC colour code: black positive wire with white negative. ANSI MC96.1: black jacket.
- Values are reference values; real sensors have a tolerance class (see the thermocouple tolerance table).

Free download from instrumentationblog.in. Check values against the current edition of the standard for design work.