# Type T Thermocouple Table (mV vs °C)

*Basis: NIST ITS 90 reference functions as adopted in IEC 60584 1. Type T is Copper vs Copper Nickel (Constantan): the best choice for low and cryogenic temperatures.*

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

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

| °C | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **−270** | −6.258 | −6.256 | −6.255 | −6.253 | −6.251 | −6.248 | −6.245 | −6.242 | −6.239 | −6.236 |
| **−260** | −6.232 | −6.228 | −6.223 | −6.219 | −6.214 | −6.209 | −6.204 | −6.198 | −6.193 | −6.187 |
| **−250** | −6.180 | −6.174 | −6.167 | −6.160 | −6.153 | −6.146 | −6.138 | −6.130 | −6.122 | −6.114 |
| **−240** | −6.105 | −6.096 | −6.087 | −6.078 | −6.068 | −6.059 | −6.049 | −6.038 | −6.028 | −6.017 |
| **−230** | −6.007 | −5.996 | −5.985 | −5.973 | −5.962 | −5.950 | −5.938 | −5.926 | −5.914 | −5.901 |
| **−220** | −5.888 | −5.876 | −5.863 | −5.850 | −5.836 | −5.823 | −5.809 | −5.795 | −5.782 | −5.767 |
| **−210** | −5.753 | −5.739 | −5.724 | −5.710 | −5.695 | −5.680 | −5.665 | −5.650 | −5.634 | −5.619 |
| **−200** | −5.603 | −5.587 | −5.571 | −5.555 | −5.539 | −5.523 | −5.506 | −5.489 | −5.473 | −5.456 |
| **−190** | −5.439 | −5.421 | −5.404 | −5.387 | −5.369 | −5.351 | −5.334 | −5.316 | −5.297 | −5.279 |
| **−180** | −5.261 | −5.242 | −5.224 | −5.205 | −5.186 | −5.167 | −5.148 | −5.128 | −5.109 | −5.089 |
| **−170** | −5.070 | −5.050 | −5.030 | −5.010 | −4.989 | −4.969 | −4.949 | −4.928 | −4.907 | −4.886 |
| **−160** | −4.865 | −4.844 | −4.823 | −4.802 | −4.780 | −4.759 | −4.737 | −4.715 | −4.693 | −4.671 |
| **−150** | −4.648 | −4.626 | −4.604 | −4.581 | −4.558 | −4.535 | −4.512 | −4.489 | −4.466 | −4.443 |
| **−140** | −4.419 | −4.395 | −4.372 | −4.348 | −4.324 | −4.300 | −4.275 | −4.251 | −4.226 | −4.202 |
| **−130** | −4.177 | −4.152 | −4.127 | −4.102 | −4.077 | −4.052 | −4.026 | −4.000 | −3.975 | −3.949 |
| **−120** | −3.923 | −3.897 | −3.871 | −3.844 | −3.818 | −3.791 | −3.765 | −3.738 | −3.711 | −3.684 |
| **−110** | −3.657 | −3.629 | −3.602 | −3.574 | −3.547 | −3.519 | −3.491 | −3.463 | −3.435 | −3.407 |
| **−100** | −3.379 | −3.350 | −3.322 | −3.293 | −3.264 | −3.235 | −3.206 | −3.177 | −3.148 | −3.118 |
| **−90** | −3.089 | −3.059 | −3.030 | −3.000 | −2.970 | −2.940 | −2.910 | −2.879 | −2.849 | −2.818 |
| **−80** | −2.788 | −2.757 | −2.726 | −2.695 | −2.664 | −2.633 | −2.602 | −2.571 | −2.539 | −2.507 |
| **−70** | −2.476 | −2.444 | −2.412 | −2.380 | −2.348 | −2.316 | −2.283 | −2.251 | −2.218 | −2.186 |
| **−60** | −2.153 | −2.120 | −2.087 | −2.054 | −2.021 | −1.987 | −1.954 | −1.920 | −1.887 | −1.853 |
| **−50** | −1.819 | −1.785 | −1.751 | −1.717 | −1.683 | −1.648 | −1.614 | −1.579 | −1.545 | −1.510 |
| **−40** | −1.475 | −1.440 | −1.405 | −1.370 | −1.335 | −1.299 | −1.264 | −1.228 | −1.192 | −1.157 |
| **−30** | −1.121 | −1.085 | −1.049 | −1.013 | −0.976 | −0.940 | −0.904 | −0.867 | −0.830 | −0.794 |
| **−20** | −0.757 | −0.720 | −0.683 | −0.646 | −0.608 | −0.571 | −0.534 | −0.496 | −0.459 | −0.421 |
| **−10** | −0.383 | −0.345 | −0.307 | −0.269 | −0.231 | −0.193 | −0.154 | −0.116 | −0.077 | −0.039 |
| **0** | 0.000 | 0.039 | 0.078 | 0.117 | 0.156 | 0.195 | 0.234 | 0.273 | 0.312 | 0.352 |
| **10** | 0.391 | 0.431 | 0.470 | 0.510 | 0.549 | 0.589 | 0.629 | 0.669 | 0.709 | 0.749 |
| **20** | 0.790 | 0.830 | 0.870 | 0.911 | 0.951 | 0.992 | 1.033 | 1.074 | 1.114 | 1.155 |
| **30** | 1.196 | 1.238 | 1.279 | 1.320 | 1.362 | 1.403 | 1.445 | 1.486 | 1.528 | 1.570 |
| **40** | 1.612 | 1.654 | 1.696 | 1.738 | 1.780 | 1.823 | 1.865 | 1.908 | 1.950 | 1.993 |
| **50** | 2.036 | 2.079 | 2.122 | 2.165 | 2.208 | 2.251 | 2.294 | 2.338 | 2.381 | 2.425 |
| **60** | 2.468 | 2.512 | 2.556 | 2.600 | 2.643 | 2.687 | 2.732 | 2.776 | 2.820 | 2.864 |
| **70** | 2.909 | 2.953 | 2.998 | 3.043 | 3.087 | 3.132 | 3.177 | 3.222 | 3.267 | 3.312 |
| **80** | 3.358 | 3.403 | 3.448 | 3.494 | 3.539 | 3.585 | 3.631 | 3.677 | 3.722 | 3.768 |
| **90** | 3.814 | 3.860 | 3.907 | 3.953 | 3.999 | 4.046 | 4.092 | 4.138 | 4.185 | 4.232 |
| **100** | 4.279 | 4.325 | 4.372 | 4.419 | 4.466 | 4.513 | 4.561 | 4.608 | 4.655 | 4.702 |
| **110** | 4.750 | 4.798 | 4.845 | 4.893 | 4.941 | 4.988 | 5.036 | 5.084 | 5.132 | 5.180 |
| **120** | 5.228 | 5.277 | 5.325 | 5.373 | 5.422 | 5.470 | 5.519 | 5.567 | 5.616 | 5.665 |
| **130** | 5.714 | 5.763 | 5.812 | 5.861 | 5.910 | 5.959 | 6.008 | 6.057 | 6.107 | 6.156 |
| **140** | 6.206 | 6.255 | 6.305 | 6.355 | 6.404 | 6.454 | 6.504 | 6.554 | 6.604 | 6.654 |
| **150** | 6.704 | 6.754 | 6.805 | 6.855 | 6.905 | 6.956 | 7.006 | 7.057 | 7.107 | 7.158 |

| °C | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **160** | 7.209 | 7.260 | 7.310 | 7.361 | 7.412 | 7.463 | 7.515 | 7.566 | 7.617 | 7.668 |
| **170** | 7.720 | 7.771 | 7.823 | 7.874 | 7.926 | 7.977 | 8.029 | 8.081 | 8.133 | 8.185 |
| **180** | 8.237 | 8.289 | 8.341 | 8.393 | 8.445 | 8.497 | 8.550 | 8.602 | 8.654 | 8.707 |
| **190** | 8.759 | 8.812 | 8.865 | 8.917 | 8.970 | 9.023 | 9.076 | 9.129 | 9.182 | 9.235 |
| **200** | 9.288 | 9.341 | 9.395 | 9.448 | 9.501 | 9.555 | 9.608 | 9.662 | 9.715 | 9.769 |
| **210** | 9.822 | 9.876 | 9.930 | 9.984 | 10.038 | 10.092 | 10.146 | 10.200 | 10.254 | 10.308 |
| **220** | 10.362 | 10.417 | 10.471 | 10.525 | 10.580 | 10.634 | 10.689 | 10.743 | 10.798 | 10.853 |
| **230** | 10.907 | 10.962 | 11.017 | 11.072 | 11.127 | 11.182 | 11.237 | 11.292 | 11.347 | 11.403 |
| **240** | 11.458 | 11.513 | 11.569 | 11.624 | 11.680 | 11.735 | 11.791 | 11.846 | 11.902 | 11.958 |
| **250** | 12.013 | 12.069 | 12.125 | 12.181 | 12.237 | 12.293 | 12.349 | 12.405 | 12.461 | 12.518 |
| **260** | 12.574 | 12.630 | 12.687 | 12.743 | 12.799 | 12.856 | 12.912 | 12.969 | 13.026 | 13.082 |
| **270** | 13.139 | 13.196 | 13.253 | 13.310 | 13.366 | 13.423 | 13.480 | 13.537 | 13.595 | 13.652 |
| **280** | 13.709 | 13.766 | 13.823 | 13.881 | 13.938 | 13.995 | 14.053 | 14.110 | 14.168 | 14.226 |
| **290** | 14.283 | 14.341 | 14.399 | 14.456 | 14.514 | 14.572 | 14.630 | 14.688 | 14.746 | 14.804 |
| **300** | 14.862 | 14.920 | 14.978 | 15.036 | 15.095 | 15.153 | 15.211 | 15.270 | 15.328 | 15.386 |
| **310** | 15.445 | 15.503 | 15.562 | 15.621 | 15.679 | 15.738 | 15.797 | 15.856 | 15.914 | 15.973 |
| **320** | 16.032 | 16.091 | 16.150 | 16.209 | 16.268 | 16.327 | 16.387 | 16.446 | 16.505 | 16.564 |
| **330** | 16.624 | 16.683 | 16.742 | 16.802 | 16.861 | 16.921 | 16.980 | 17.040 | 17.100 | 17.159 |
| **340** | 17.219 | 17.279 | 17.339 | 17.399 | 17.458 | 17.518 | 17.578 | 17.638 | 17.698 | 17.759 |
| **350** | 17.819 | 17.879 | 17.939 | 17.999 | 18.060 | 18.120 | 18.180 | 18.241 | 18.301 | 18.362 |
| **360** | 18.422 | 18.483 | 18.543 | 18.604 | 18.665 | 18.725 | 18.786 | 18.847 | 18.908 | 18.969 |
| **370** | 19.030 | 19.091 | 19.152 | 19.213 | 19.274 | 19.335 | 19.396 | 19.457 | 19.518 | 19.579 |
| **380** | 19.641 | 19.702 | 19.763 | 19.825 | 19.886 | 19.947 | 20.009 | 20.070 | 20.132 | 20.193 |
| **390** | 20.255 | 20.317 | 20.378 | 20.440 | 20.502 | 20.563 | 20.625 | 20.687 | 20.748 | 20.810 |
| **400** | 20.872 | | | | | | | | | |

### Notes

- IEC colour code: brown positive wire with white negative. ANSI MC96.1: blue 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.*