Technote #35

How the IRt/c temperature selection guide works

All IRt/cs are self-powered devices, relying on incoming infrared radiation to produce a signal through thermoelectric effects. Accordingly, the signal will follow the rules of radiation thermal physics, and be subject to the non-linearities inherent in the process.

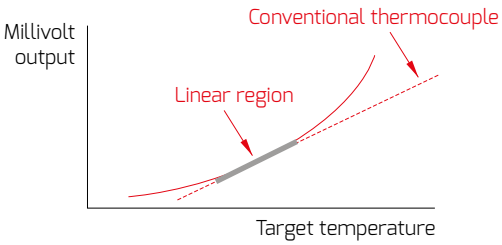
However, over a range of temperatures, the IRt/c output is sufficiently linear to produce a signal which can be interchanged directly for a conventional t/c signal. For example, specifying a 2% match to t/c linearity results in a temperature range in which the IRt/c will produce a signal within 2% of the conventional t/c operating over that range. Specifying 5% will produce a somewhat wider range, etc.

Each IRt/c model is specifically designed for optimum performance in the region of best linear fit with conventional t/cs. It can howeverbe used outside of this range by simply calibrating the readout device appropriately. The output signal is smooth and continuous over its entire rated temperature range, and maintains 0.01°C (0.02°F) repeatability over its entire range.

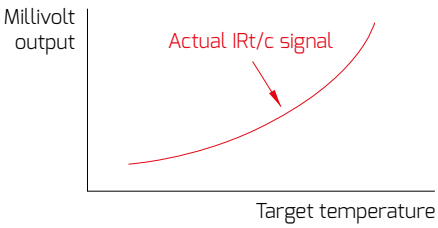
The linear region matches the conventional t/c to a specified tolerance.

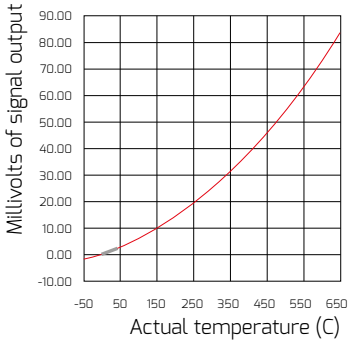
The actual signal generated by the IRt/c can be approximated with a fourth-order polynomial function of target temperature. This fourth power dependence is due to radiation physics, and not a limitation of the IRt/c.

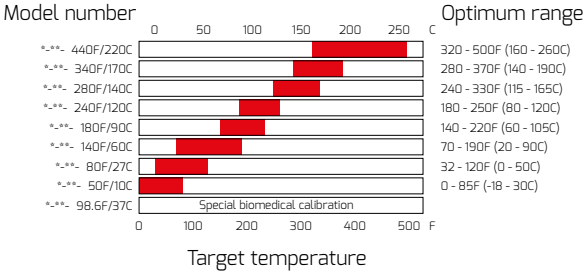
The Temperature Selection Guide is a summary of the linear range performance of each IRt/c model. Signal produced by the IRt/c-K-80F/27C has its 2% linear range centered at 27°C (80°F), but produces a repeatable signal to 650°C (1,200°F).



The linear region matches the conventional t/c to a specified tolerance







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