

What is a typical Siberian / Artic temperature ramp?

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I am a designer of detector that uses infra red pyroelectric sensors to detect fires. One 'feature' of pyroelectric devices is they are sensitive to temperature changes as they introduces a DC offset onto the sensor output. If this DC component is too great it saturates the sensor and it is effectively blinded.

This effect is more pronounced the lower the temperature. Since our product is rated at minus 40 to +80 DegC, the danger areas are changes between -20 and -40 DegC.

Now, Tests show the sensor will not saturate at ramps of 1/8th of a degree per minute between -20 to -40 (that's 7.5 degrees per hour) Although I can't do anything about the sensor saturation, I can put in schemes that give notification of sensor saturation and suppress any false alarms.

I don't want to do this extra work if it never occurs in real life situations. Of course there will be warnings mentioned in supporting documentation about artificially creating temperature ramps.

My question is as follows:

What sort of temperature ramps are experienced in locations where the temperatures vary between 0 DegC and -40 DegC.

The following random musings may help..

I must discount locations where temperatures drop below -40 on a regular basis as the detector is operating outside its rated temperature.

This detector will be outdoors and protected from direct sunlight by a weather shield.

Due to the low position of the sun, I guess there is a less extreme difference in day / night temperatures than is seen outside the arctic circle.

If you are kind enough to respond to this posting, these are the sort of things that would be useful

Temperature charts (excel?)

Links to relevant information

Your Opinions (please give me some clue as to where you gained your experiences from)

I will check back on this posting now and again for the next six months.

sci.geo.meteorology: What is a typical Siberian / Artic temperature ramp?

Many thanks in advance

Jon.

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