

SPRT's, Frequently Asked Questions

There are 6 calibration ranges, each has different uncertainties, why?

As the thermometer is cycled away from ambient temperature the SPRT is stretched or compressed due to the thermal properties of the Platinum and Quartz. The further it is cycled, the more it is strained and so the larger the uncertainties.

Why are your fixed point uncertainties smaller than the SPRT uncertainties you offer?

This is because of something called non-uniqueness. Put simply each piece of platinum changes its resistance in a slightly different way. So for instance two thermometers that were the same at water triple point and gallium (0°C and 30°C) could be different by as much as 0.5mK at 15°C. a graph showing non-uniqueness and how to allow for it is published by NIST.

If I break an SPRT can it be repaired?

No. During production the sheath is vacuumed and back-filled with a very exact amount of dry inert gas and oxygen. Once the sheath breaks this mixture escapes and is replaced by air and moisture. You can slip a new sheath over the SPRT and provided you use it about 0° it will give useful results.

Why do calibration certificates tabulate W values and not resistance Vs temperature?

In every SPRT, the water triple point resistance changes with use. This would mean reprinting the resistance Vs temperature table every time a change occurred. With a W table, the W value is multiplied by the new water triple point value. The W table remains valid between calibrations.

How often should I recalibrate my SPRT?

A useful criteria is when the TPW resistance has changed by half the uncertainty the lab is claiming at WTP.

What about transporting SPRT's to and from calibration?

Very carefully, ideally hand transport. Isotech has a specially designed transportation crate you can buy if you cannot hand carry. We have had customers spend £2,000.00 on the SPRT, £1,500.00 on calibration and the SPRT arrives broken! Make sure you are well insured and check the SPRT before the carrier leaves!

Why are SPRT's so fragile and why not put them in metal sheaths?

It is the windings or coil of platinum that is fragile. To obtain the stability required from an SPRT the coil of platinum must be unsupported and free to expand and contract without hindrance. It is often said that if you can hear that you have put an SPRT down on a hard surface you have probably damaged it! If you put such a fragile sensor in a metal sheath it is human nature to consider it more robust and so more likely to be badly handled. Putting the winding in quartz ensures the user handles the SPRT with care. 90% of SPRT's returned with damaged sensors are metal sheathed!

I've heard that it's better to store SPRT's vertically?

Yes, the platinum coil is so soft it should be stored vertically if it is used vertically.

What about cleaning SPRT's?

The quartz glass that covers the SPRT is a glass. Finger prints for example will burn into the quartz at high temperatures and cause damage to the glass. Always wipe the sheath with an alcohol or acetone before use and remove grease and other unwanted surface contamination.