Working standard SPRT

- Fully conforms to ITS-90 SPRT guidelines
- Drift rate typically less than 0.003 °C
- Multiple calibration options by fixed point
- Unmatched performance-to-price-ratio

SPRTs. Art or science? It takes, in fact, quite a bit of both. The one thing *not* involved is mystery. That's why Hart SPRTs always include detailed published specifications, including drift rates.

Our newest SPRT is no exception. It was designed by the same Hart metrologists who have created a dozen different SPRT designs used in national labs around the world. And it performs just like we say it does.

The 5698 Working Standard SPRT is a true SPRT. It meets the ITS-90 ratio requirements for SPRTs and includes a Hart-designed, completely strain-free platinum sensor. With a 485-mm quartz sheath, this 25-ohm SPRT covers a temperature range from –200 °C to 670 °C. Long-term drift, which we define as the change in output resistance at the triple point of water after 100 hours at 670 °C, is (after converting to temperature) less than 6 mK—typically less than 3 mK.

The 5698 is the perfect companion to a Hart Super-Thermometer such as the 1590, which reads 25-ohm SPRTs to within 1 mK at 0 °C and includes a number of convenient features for working with SPRTs. Requiring 1 mA of excitation current, the 5698 can also be used easily with a Hart *Black Stack,* or even a Chub-E4 Thermometer.

If you need your SPRT calibrated by a reputable calibration lab, we offer appropriate calibration options by fixed-point in our NVLAP-accredited lab. Our calibration prices are as reasonable as our instrument prices, so you get maximum value from your SPRT.

Why buy critical temperature standards from companies unwilling to publish complete specifications? At Hart, we not only provide excellent post-purchase support so you have the best possible ownership experience, we also provide you all the information we can *before* you purchase—including detailed performance specifications.

Specifications

Temperature Range	–200 °C to 670 °C
Nominal R_{TPW}	25.5Ω (± 0.5Ω)
Current	1.0 mA
Resistance Ratios	W(234.315K) ≤ 0.844235 W(302.9146K) ≥ 1.11807
Sensitivity	0.1Ω/ °C
Drift Rate	< 0.006 °C/100 hours at max temperature (typically < 0.003 °C)
Self-heating at TPW	< 0.002 °C under 1 mA current
Reproducibility	± 0.0015 °C or better
R_{TPW} Drift After Thermal Cycling	< 0.001 °C
Diameter of Pt Sensor Wire	0.07 mm (0.003 in)
Protective Sheath	Quartz Glass Diameter: 7 mm (0.28 in) Length: 485 mm (19.1 in)
Lead Wires	Four sensor wires

Ordering Information

5698-25 25Ω Working Standard SPRT†

†Maple carrying case included

See page 186 for SPRT calibration options.

Maybe there is some art mixed with our science. But that doesn't mean we keep secrets. Trust your lab standards to Hart Scientific.

Not all platinum is the same

Platinum resistance thermometers (PRTs) are made from a variety of platinum sensor wire. The differences in the wire affect the thermometers' performance. The two most important variations are purity and thickness.

According to IPTS-68 requirements, platinum purity was measured by its "alpha," or average change of resistance per degree. Alpha 0.00385 was common for industrial thermometers, and alpha 0.003925 was common for SPRTs. ITS-90, in contrast, measures platinum quality with ratios (W) of their resistance at certain fixed points (gallium, mercury, and/or silver) to their resistance at the triple point of water (R_{TPW}). Those meeting the ITS-90-specified ratios are considered SPRT quality.

The thickness of the platinum wire affects its resistance and is indicated by a nominal resistance value at the triple point of water. The thicker the wire, the lower its nominal resistance. 100 ohms at R_{TPW} is common for industrial sensors, and 25 ohms at R_{TPW} is typical for SPRTs.

Which is best for your application? All things equal, lower resistance PRTs are generally more stable because of their thicker sensor wire. However, low-resistance PRTs require higher resolution readout devices to handle the small changes in resistance per degree. The advantages gained by using low-resistance PRTs are not significant in most applications. If they're needed, however, be sure you have the right device to read them. (See Hart readouts on page 38.)