

# Extended range metal-sheath SPRT



- Measures temperatures as high as 670 °C
- Inconel and platinum sheaths guard against contamination
- Less than 8 mK/year drift
- Fifth wire provides shielded ground

SPRTs designed by Hart Scientific are known for their outstanding reliability and minimal long-term drift. They have been calibrated by national (and other primary) laboratories and proven repeatedly to outperform competitive models. Now Hart's 5699 Extended Range Metal-Sheath SPRT combines all the advantages of a Hart-designed sensor with the protective sheathing materials that allow your SPRT to be used in virtually any furnace or bath with temperatures as high as 670 °C.

Designed and manufactured by our primary standards metrologists, the strain-free sensing element in the 5699 meets all ITS-90 requirements for SPRTs and minimizes long-term drift.

After one year of regular usage, drift is less than 0.008 °C (< 0.003 °C is typical). Even lower drift rates are possible depending on care and handling. A fifth wire for grounding is added to the four-wire sensor to help reduce electrical noise, particularly for ac measurements. Finally, you can get an improved version of an old industry-standard Inconel-sheathed SPRT.

The 5699 is constructed with a 0.219-inch-diameter Inconel sheath for high durability and fast response times. Inside the sheath, the sensing element is protected by a thin platinum housing that shields the sensor from contamination from free-floating metal ions found within metal

environments at high temperatures. Reduced contamination means a low drift rate—even after hours of use in metal-block furnaces at high temperatures.

If you choose not to calibrate the 5699 yourself, a wide variety of options is conveniently available from Hart's own primary standards laboratory, including fixed-point calibrations covering any range between -200 °C and 661 °C.

At Hart, we use SPRTs every day. We design them, build them, calibrate them, use them as standards, and know what it takes to make a reliably performing instrument. Why buy from anyone else?

## Specifications

<b>Temperature Range</b>	-200 °C to 670 °C
<b>Nominal R<sub>TPW</sub></b>	25.5 Ω (± 0.5 Ω)
<b>Current</b>	1 mA
<b>Resistance Ratio</b>	W(302.9146 K) ≥ 1.11807 W(234.3156 K) ≤ 0.844235
<b>Sensitivity</b>	0.1Ω/ °C
<b>Drift Rate</b>	< 0.008 °C/year (< 0.003 °C/year typical)
<b>Repeatability</b>	< 1 mK
<b>Self-heating at TPW</b>	< 0.001 °C under 1 mA current
<b>Reproducibility</b>	± 0.001 °C or better
<b>R<sub>TPW</sub> Drift After Thermal Cycling</b>	< 0.001 °C
<b>Diameter of Pt Sensor Wire</b>	0.07 mm (0.003 in)
<b>Lead Wires</b>	Four sensor wires plus grounding wire
<b>Protective Sheath</b>	Inconel Diameter: 5.56 mm ± 0.13 mm (0.219 in ± 0.005 in) Length: 482 mm (19 in)
<b>Insulation Resistance</b>	> 100 MΩ at 661 °C > 1000 MΩ at 20 °C

## Ordering Information

**5699-S** Extended Range Metal-Sheath SPRT<sup>†</sup>

<sup>†</sup>Maple carrying case included

See page 186 for SPRT calibration options.  
See page 38 for optional readouts.