

Glass Capsule SPRTs



- Temperatures from $-260\text{ }^{\circ}\text{C}$ (13K) to $500\text{ }^{\circ}\text{C}$
- Stability typically $0.001\text{ }^{\circ}\text{C}$ over a $100\text{ }^{\circ}\text{C}$ range
- Miniature capsule package eliminates stem conduction

Sometimes you would like to make SPRT measurements but traditional SPRTs are too long or awkward for a particular application. Hart Scientific makes two versions of our miniature glass capsule SPRTs, which are perfect for cryogenics, calorimetry, and other metrology work requiring small SPRTs.

Both models are true SPRTs. The high-purity platinum wire is hand-wound on a glass cross frame in a strain-free design. The glass capsule is designed to match the thermal expansion of the platinum wire to ensure a true seal at all operating temperatures. The capsules are pressure sealed and come protected in their own maple cases. Both models comply completely with ITS-90 requirements for platinum purity including the following resistance ratio:

$$W(302.9146\text{K}) \geq 1.11807$$

$$\text{and}$$

$$W(234.3156\text{K}) \leq 0.844235$$

The 5686 covers temperatures from $-260\text{ }^{\circ}\text{C}$ to $232\text{ }^{\circ}\text{C}$, so it's perfect for cryogenic applications. It is 5.8 mm ($.23\text{ inches}$) in diameter and 56 mm (2.2 inches) long.

The 5695 is designed for high-temperature applications requiring a small SPRT. Its unmatched range is from $-200\text{ }^{\circ}\text{C}$ to $500\text{ }^{\circ}\text{C}$ and its size is 5.2 mm (0.2 inches) by 68 mm (2.7 inches).

These SPRTs are small but meet customary SPRT performance for reproducibility, reliability, and stability. They solve many of the problems associated with taking precision measurements in situations unsuitable for traditional-length SPRTs. These are excellent calibration instruments.

Specifications

Temperature Range	5686: $-260\text{ }^{\circ}\text{C}$ to $232\text{ }^{\circ}\text{C}$ (13K to 505K) 5695: $-200\text{ }^{\circ}\text{C}$ to $500\text{ }^{\circ}\text{C}$ (73K to 773K)
Nominal R_{TPW}	25.5Ω
Resistance Ratio	$W(302.9146\text{K}) \geq 1.11807$ $W(234.3156\text{K}) \leq 0.844235$
Drift Rate	5686: $< 0.005\text{ }^{\circ}\text{C}$ per year over the entire range 5695: $< 0.01\text{ }^{\circ}\text{C}$ per year over the entire range; typically $0.001\text{ }^{\circ}\text{C}$ per year over a range of $100\text{ }^{\circ}\text{C}$
Self-heating at TPW	$< 0.002\text{ }^{\circ}\text{C}$ under 1 mA current
Reproducibility	$\pm 0.001\text{ }^{\circ}\text{C}$ or better
R_{TPW} Drift After Thermal Cycling	$< 0.001\text{ }^{\circ}\text{C}$
Filling Gas	5686: helium 5695: argon and oxygen
Lead Wires	Four platinum wires, 30 mm long (1.18 in)
Size	5686: 5.8 mm dia. x 56 mm long ($0.23\text{ x }2.2\text{ in}$) 5695: $5.2 (\pm 0.4)\text{ mm}$ dia. x 68 mm long ($0.2 [\pm 0.016\text{ in}] \text{ x }2.7\text{ in}$)

Ordering Information

5686-B Glass Capsule SPRT, $-260\text{ }^{\circ}\text{C}$ to $232\text{ }^{\circ}\text{C}$ [†]

5695-B Glass Capsule SPRT, $-200\text{ }^{\circ}\text{C}$ to $500\text{ }^{\circ}\text{C}$ [†]

[†]Maple carrying case included

See page 164 for SPRT calibration options.

