

TECHNICAL DATA

5686-B Glass Capsule SPRT



Key features

- Miniature glass capsule SPRT designed for metrology work that requires small SPRTs.
- Temperatures range: $-260\text{ }^{\circ}\text{C}$ (13 K) to $232\text{ }^{\circ}\text{C}$ and offers stability typically of $0.001\text{ }^{\circ}\text{C}$ over a $100\text{ }^{\circ}\text{C}$ range.
- Ideal for applications such as cryogenics, calorimetry, and other metrology work where traditional SPRTs may be too long or awkward.
- True SPRT, with high-purity platinum wire hand-wound on a glass cross frame in a strain-free design.

Product overview: 5686-B Glass Capsule SPRT

Precision, Stability, and Reliability for Extreme Temperature Measurement

Primary Standard SPRT for Cryogenic and Immersion Applications

The Fluke 5686-B Glass Capsule Standard Platinum Resistance Thermometer (SPRT) is designed as a primary standard instrument for converting temperature to resistance with uncompromising accuracy. Fully compliant with ITS-90, the 5686-B is part of the trusted Fluke Calibration SPRT family, delivering outstanding performance in both laboratory and demanding field environments.

Key Features and Specifications

- **ITS-90 Compliance** – The 5686-B meets the requirements of the International Temperature Scale of 1990 (ITS-90),

with resistance ratios:

- $W(302.9146\text{ K}) \geq 1.11807$
- $W(234.3156\text{ K}) \leq 0.844235$

- **Exceptional Temperature Range** – Covers $-260\text{ }^{\circ}\text{C}$ (13 K) to $232\text{ }^{\circ}\text{C}$ (505 K), making it ideal for cryogenic applications and high-precision temperature measurement across a wide spectrum.
- **Compact Design** – With a diameter of just 5.8 mm and a length of 56 mm, the 5686-B is well-suited for applications requiring a totally immersed probe or where space is limited.
- **Fixed-Point Calibration Ready** – Fixed-point calibrations are available from $-200\text{ }^{\circ}\text{C}$ to $232\text{ }^{\circ}\text{C}$, ensuring accuracy for critical measurement points.
- **Superior Construction** – The sensing element is made from high-purity platinum wire wound strain-free on a fused silica cross frame, and the special glass capsule is pressure-sealed with 5N pure helium to maintain integrity and performance.

Designed for Demanding Measurement Environments

- **Low Temperature Excellence** – Engineered for operation down to 13 K ($-260\text{ }^{\circ}\text{C}$), the 5686-B is the standard of choice for cryogenic temperature measurement.
- **Minimized Heat Flow** – The glass capsule design supports full immersion, reducing heat flow from or to the sensor and improving measurement stability.
- **Alternative to Long-Stem SPRTs** – When traditional long-stem SPRTs are not suitable, the compact 5686-B Glass Capsule SPRT fits into vessels and setups where complete encasement is needed.
- **Proven Reproducibility, Reliability, and Stability** – Each thermometer is carefully annealed and tested for stability, delivering consistent, accurate results in both standard and challenging scenarios.

Why Choose the Fluke 5686-B Glass Capsule SPRT?

- Wide temperature coverage for both cryogenic and calibration applications
- Compact, fully immersible probe design for versatile use
- High-purity platinum element and strain-free construction for unmatched stability
- Pressure-sealed capsule maintains sensor protection and performance
- Meets rigorous international standards (ITS-90) for trustworthy measurement

For laboratories and industries where precise, stable, and reproducible temperature measurement is essential, the Fluke 5686-B Glass Capsule SPRT sets the benchmark for performance and reliability.

Specifications: 5686-B Glass Capsule SPRT

Specifications	
Temperature Range	5686: $-260\text{ }^{\circ}\text{C}$ to $232\text{ }^{\circ}\text{C}$ (13 K to 505 K)
Nominal R_{TPW}	$25.5\text{ }\Omega$
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
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
Lead Wires	Four platinum wires, 30 mm long (1.18 in)
Size	5686: 5.8 mm dia. x 56 mm long (0.23 x 2.2 in)

Ordering information



5686-B

Glass Capsule SPRT, -260 °C to 232 °C with Maple carrying case.

Calibration not included. Contact your Fluke Calibration representative for additional calibration options.

Part#: 1656362

1911-4-9

PRT Calibration, -200 °C to 232 °C, NVLAP Accredited

Part#: 3796129

Fluke. *Keeping your world up and running.®*

Fluke Corporation
PO Box 9090, Everett, WA 98206 U.S.A.

For more information call:
In the U.S.A. (800) 443-5853
In Canada (800) 36-FLUKE
From other countries +1 (425) 446-5500
www.fluke.com

©2026 Fluke Corporation.
Specifications subject to change without notice.
10/2026

**Modification of this document is not permitted
without written permission from Fluke
Corporation.**