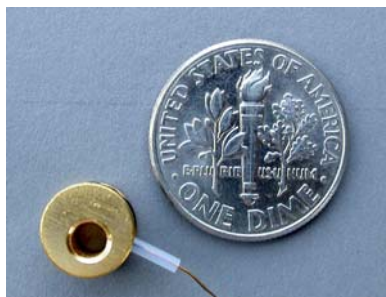


Series S700 Silicon Diode Temperature Sensor

- ❑ **Wide temperature range: 1.4K to 380K.**
- ❑ **High sensitivity, interchangeability and reproducibility. Conforms to Cryocon S700 standard curve.**
- ❑ **Available as uncalibrated and with 2 or 3 critical-point calibrations.**
- ❑ **Industry standard small bobbin package. Simple to install.**

Cryo-Con Silicon Diode Sensors offer high sensitivity over a wide temperature range. Close conformance to a standard response curve ensures reliable and repeatable measurements with a high degree of interchangeability.



Accuracy: Cryo-con Silicon Diode Sensors conform to a standard response curve over the temperature range from 1.4K to 475K. Uncalibrated sensors suit most applications. For higher accuracy, sensors can be ordered with two or three point calibrations.

Stability: These sensors are not only highly stable and free from drift during experimental measurements, but they are also repeatable upon thermal cycling between room temperature and cryogenic temperatures. In addition, they exhibit minimum long-term drift.

Calibration Options: Uncalibrated sensors conform to the Cryocon S700 standard curve to within 1.5K over the temperature range of 1.5 to 380K.

Cryo-con's CalGen™ generates high accuracy sensor calibration curves by fitting standard curves to selected critical temperature reference points. Options are:

3C - Three points: 300K, 77K and 4.2K. Two points above 30K are fit as in the selection above. Then, a third point is used to fit a single point in the high-sensitivity region below 20K.

2C - Two points: 300K and 77K. Here, two points are taken to fit the diode curve region above 30K. The entire curve is offset to match the 77K point, then, the >30K region is fit to the two points.

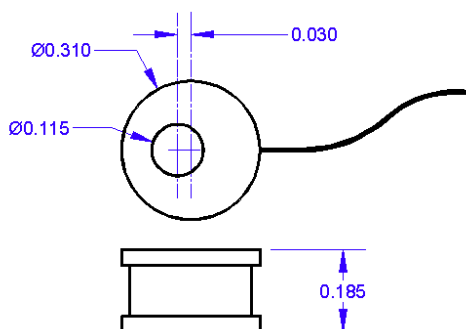
U - Uncalibrated. Conforms to the S700 standard curve to within 1.5K from 1.5K to 300K.

Temperatures are established to an accuracy of $\pm 10\text{mK}$ by using calibrated reference sensors.

When a calibration option is ordered, the sensor's calibration curve is provided on a CD and can be easily downloaded to a temperature controller

Electrical Specifications	
Temperature Range	Bare device: 1.4K to 475K BB package: 1.4K to 380K.
Standard calibration curve	Cryocon S700
Uncalibrated accuracy	$\pm 1.5\text{K}$ from 1.5K to 300K.
Excitation Current	$10\mu\text{A} \pm 0.1\%$
Maximum Reverse Voltage	60 Volts Max.
Maximum Current	1mA Max.
Reproducibility	$\pm 10\text{mK}$ @ 4.2K
Use in magnetic fields	Not recommended

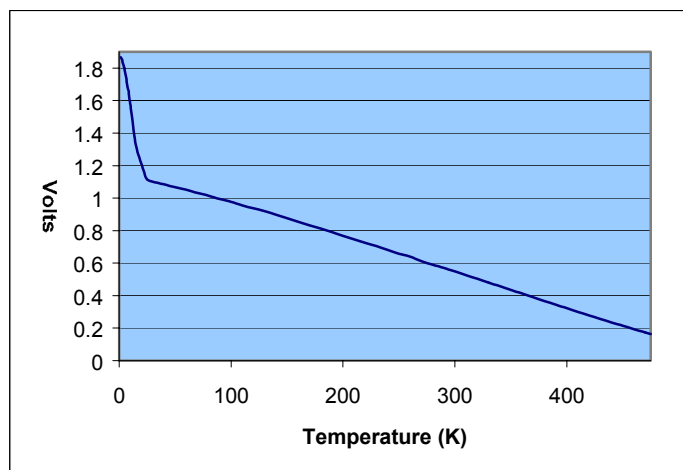
Bobbin Package: The industry standard bobbin package features excellent thermal contact to the diode junction. This ensures a rapid thermal response and minimizes thermal gradients between the sensing element and the sensor package. Mechanical integrity of the sensor assures reliable performance even in severe applications. Thermal integrity plus a single value excitation current (10 μ A) insure against self-heating and current switching errors. With the bobbin package, the lead wires are thermally anchored to the sensor mounting. This is essential for accurate sensor readings.



Bobbin Package Specifications	
Bobbin Material	Gold plated Oxygen free hard Copper.
Sensor Bonding	Stycast [®] epoxy.
Mass	1.1g excluding leads.
Leads	36 inches, 36AWG Phosphor-Bronze. Four-lead color coded cryogenic ribbon cable.
Mounting	4-40 machine screw.

S700 Temperature Response

Cryocon S700 Voltage Response		
T(K)	Volts	dV/dT (mV/K)
1.5	1.866	-19.50
4.25	1.809	-21.90
10	1.575	-21.00
20	1.207	-21.00
30	1.1011	-1.85
75	1.0241	-1.94
305	0.5373	-2.24
400	0.3222	-2.22
470	0.1733	-2.00



Installation

Connection is made using a four-wire, 36 AWG cryogenic ribbon cable.

Wires may be separated by dipping in Isopropyl Alcohol and then wiping clean.

Lead insulation is Formvar[®] which is difficult to strip. Techniques include use of a mechanical stripper, scrapping and passing the wire over a low level flame.

Mounting is easily done using a 4-40 machine screw. A thin layer of Apiezon[®] N grease is recommended to improve the thermal connection between the sensor and the mounting surface.

Cable Color Code	
V+	Clear
V-	Green
I+	Black
I-	Red

Ordering Information	
S700BB	Uncalibrated S700 series Silicon Diode sensor in the bobbin package.
S700BB-2C	S700 series Silicon Diode sensor calibrated at two points. Bobbin package.
S700BB-3C	S700 series Silicon Diode sensor calibrated at three points. Bobbin package.

Contact Information

Cryogenic Control Systems, Inc.
 PO Box 7012
 Rancho Santa Fe, CA 92067
 Tel: (858) 756-3900 Fax: (858) 759-3515
 E-mail: sales@cryocon.com Web: www.cryocon.com

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