

# BBS1700

## HIGH TEMPERATURE BLACKBODY CALIBRATION RADIANCE SOURCE



### OVERVIEW

Delivering a temperature range from 300°C to 1700°C (572°F to 3092°F), the **BBS1700 Blackbody Calibration Source** provides a large 1-inch aperture with high accuracy, emissivity (+0.99), uniformity, and long-term stability. With use of a precision digital self-tuning PID controller, a thermostatically controlled fan cooled enclosure and an emissivity greater than 0.99, this blackbody is ideal for calibration in laboratories, universities, and manufacturing facilities.

Process Sensors IR provides two types of Blackbody Radiation Sources:

1. **Cavity blackbody:** For high temperature applications up to 1700°C (3092°F)
2. **Extended area black body:** Temperature applications up to 500°C (932°F)

The BBS1700 precision blackbody radiation source is used for the calibration and calibration verification of non-contact infrared pyrometers, IR sensing detectors, thermal imaging cameras, focal plane array detectors, radiometers, spectrometers, and heat flux meters.

This precision blackbody source is also ideal for use with collimators and for automated calibration test stations.

### ABOUT BLACKBODY CALIBRATION RADIANCE SOURCES

**Blackbody Calibration Radiances Sources** are designed for high-performance testing of infrared systems, IR detectors, and thermal imaging camera systems.

Testing Includes:

- Non-uniformity correction (NUC)
- Bad pixel detection
- Noise equivalent temperature difference (NETD) measurement
- Thermal contrast curve (MRTD)

### APPLICATIONS

- Military/aerospace
- Research institutions & universities
- Electro-optical
- Scientific & department of energy laboratories
- Manufacturing facilities that use thermal imaging cameras and pyrometers
- Laser systems



### BBS1700 FEATURES

- Wide temperature ranges to simulate various scenarios: 300°C to 1700°C / 572°F to 3092°F
- Excellent surface uniformity for sensor testing consistency
- Thermometric or radiometric calibration with certified accuracy
- High stability and uniformity for precise IR Calibration
- Display of actual and set point temperature
- 25 mm (1 in) aperture



## BLACKBODY SOURCE OPERATION

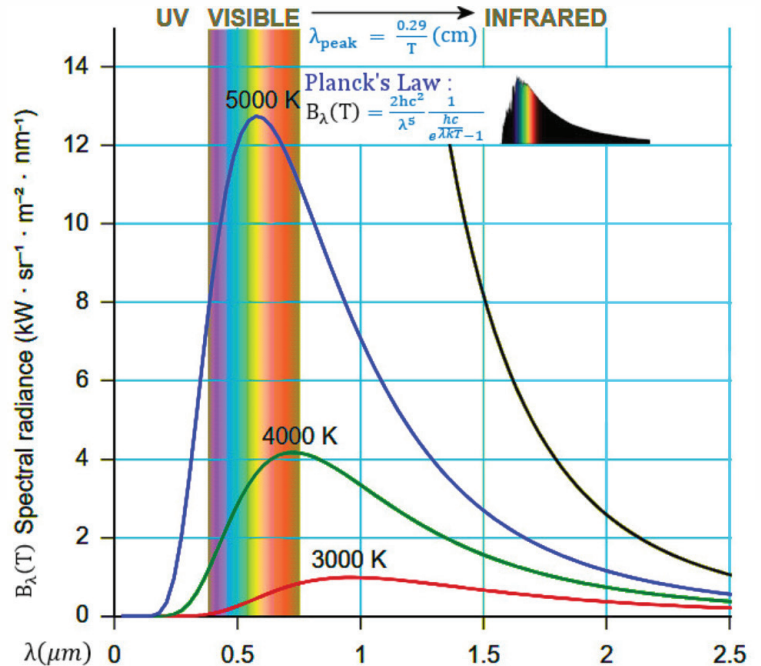
Simply adjust the set point temperature on the precision digital PID controller to any temperature within the specified temperature range and the model BBS1700 will stabilize and produce a temperature reading within 0.5°C, assuring high accuracy calibration.

## BLACKBODY RADIANCE EMISSION THEORY

Blackbody radiation is electromagnetic radiation that is emitted by an object that is in thermodynamic equilibrium. An object is considered a perfect black body when it absorbs all the incoming light and does not reflect any light.

It appears perfectly black at room temperature. At any given temperature, the amount of radiation a black body emits is the maximum amount possible at that temperature.

In theory, a black body emits energy in the full spectrum of wavelengths, whether in the ultraviolet, visible, infrared spectrums as well as other wavelengths. Essentially, the black body emits a known amount of energy for an infinite number of wavelengths. This creates the expected black body radiation curve (Planck's Law) for a given temperature.



## BBS1700 TECHNICAL SPECIFICATIONS

Temperature Range (Scalable)	300°C to 1700°C (572°F to 3092°F)
Accuracy*	± 0.25% of reading ± 1°C
Temperature Resolution	1 degree
Stability	1°C per 8 hour period
Emitter Diameter	25 mm (1 in)
Emissivity (Effective)	+ 0.99
Sensor	Precision platinum thermocouple
Method of Control	Digital self-tuning PID controller
Warm-up Time	1 hour from room temperature to 1000°C (1832°F)
Operating Ambient Temperature	0°C to 44°C (32°F to 110°F)
Cooling	Fan cooled, air inlet on rear panel
Power Requirements	220 to 240 VAC ± 10% 50/60 Hz / 3.0 kw max.
Dimensions	487 mm x 635mm x 533 mm (19 in x 25 in x 21 in)
Weight	80 kg (175 lbs)

\* for temperatures above 600°C (1112°F)

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