



BBS-200 Blackbody Source



TESTING

Testing of optics and electro-optical imaging systems



PRODUCTS

Precision optical metrology equipment



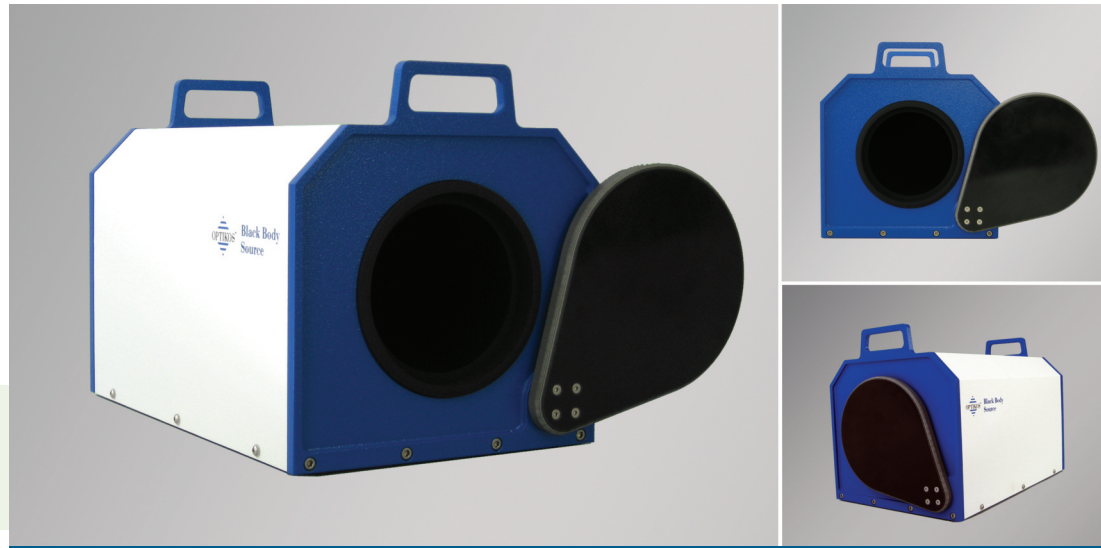
ENGINEERING

System engineering for optical and metrology products



MANUFACTURING

Prototyping and production of electro-optical systems



The **BBS-200 Blackbody Source** is a reference source of infrared radiation similar in geometry to the primary standard of the National Physical Laboratory (UK). The blackbody is designed to emit the maximum possible flux at any given temperature. It is used to make a range of important measurements in the 2-14 μm thermal wavebands and is particularly useful for calibrating thermal imagers and radiometers.

The BBS-200 Blackbody is heated and cooled by a recirculating water bath connected to it with insulated hoses with self-sealing quick-disconnect connectors. In an improvement over similar designs, the BBS-200 features a double-helix water jacket in which water is circulated in the cylindrical heat exchanger from the front to the back and from the back to the front simultaneously so as to minimize thermal gradients along the cavity. Additionally, the BBS-200 features for the first time a separate water jacket for heating and cooling the reentrant cone at the base of the cavity, thereby improving both the uniformity and ramping rate of the source over similar designs.

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Applications

- ◆ Used to calibrate thermal imagers, infrared radiometers, and infrared detectors.
- ◆ May be used with suitable infrared radiometer or thermal camera to measure atmospheric transmission, lens and window transmission and mirror reflectivity.



Benefits

Provides an absolute radiometric reference to the International Temperature Scale.

Supplies a primary point calibration standard for traceability to national laboratories.

Maintains calibration of the RAD-900 Radiometer. Compatible with the ACCURad facility in the RAD-900 ScanIRR software.

Features

- ♦ Very high effective emissivity from re-entrant cone geometry with high emissivity coating
- ♦ Double-helix water jacket for high uniformity and stability
- ♦ Closed loop control system
- ♦ Minimum central hot spot design
- ♦ Precision platinum resistance thermometer
- ♦ Removable motorized aperture shutter with manual override



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Specifications

Main Unit	
Thermal emissivity	0.994 (theoretical)
Temperature range	5 °C to 80°C (Non-condensing)
Cavity length (Cone vertex to aperture)	200 mm
Aperture	ø120 mm
Insulated Shutter	Stepper motor driven with integral driver board for USB control. Cables and external power supply included. Driven through scan base connector when used in conjunction with RAD-900.
Storage	Hard flight case with custom cut foam included.
Digital Thermometer	
Temperature range	-200°C to +850°C (Thermometer only)
Temperature resolution	0.001 °C
Temperature accuracy	Thermometer: < ±10mK over full range Thermometer + Probe < ±25mK (-50°C to +250°C)
Probe type	Pt 100
Computer Interface	RS232
Recirculating Water Bath	
Temperature range	-25 to +150 °C
Working volume	7 liters
Temperature stability	20 °C water, +/- 0.01 °C
Heater capacity	2000/800 watts for 220/115V model
Pump flow (external)	9 liters per minute @2.4m head pressure
Power	110/220 VAC 50/60 Hz (specify when ordering)
Physical	W 235 mm x H 600 mm x D 485 mm (27 kg)
Computer Interface	RS232 and RS485

One of the most important features of the BBS-200 is the incorporation of a motorized shutter into the design. The shutter closes off the cavity while the blackbody is changing temperature, thereby shortening the settling time and minimizing proximity heating of the instrument being calibrated. Although the shutter may be opened and closed by hand, using the motorized control allows lengthy calibrations to be carried out automatically. When used to calibrate the RAD-900 Infrared Radiometer, the ACCURad (Automated Calibration Control Utility) facility in the ScanIRR software application takes full advantage of this feature as well interfacing to the digital reference thermometer and the recirculating waterbath.

