

MIKRON M340

Portable, sub-zero temperature blackbody calibration source. Compact, high resolution, and high temperature stability for low temperatures of -20 to 150°C (-4 to 302°F).



The Mikron® M340 is a portable blackbody calibration source covering the range from sub-zero to 150°C with 0.1° resolution. The thermoelectric heating/cooling mechanism is utilized to achieve a compact and easy-to-use blackbody source. The M340 has unusually high temperature stability and a stabilization time of only 10 minutes. Source temperature is closely controlled by a self-tuning PID controller which displays temperature on a digital readout.

PRODUCT HIGHLIGHTS

- Compact and lightweight
- High stability, emissivity, and uniformity
- Very fast slew rates
- Manufactured and tested to meet rigid quality control standards
- Furnished with certificate of calibration traceable to NIST

TYPICAL APPLICATIONS

- Infrared temperature sensors
- Infrared thermal imaging systems
- Spectrographic analyzers
- Spectral radiometers
- Heat flux meters

AT A GLANCE

Temperature Range

-20 to 150°C

Measurement Uncertainty

Standard Radiometric Calibration:
 $\pm 1^{\circ}\text{C}$ @ 8 to 14 μm

Optional Thermometric Calibration:
 $\pm 0.1^{\circ}\text{C}$ (only on 14750-4C and 14750-5C)

Emissivity

Standard Radiometric Calibration:
1.0 @ 8 to 14 μm

Optional Thermometric Calibration:
 ~ 0.98

Heated Emitter Shape

Flat plate

Aperture Diameter

51 mm (2")

Average Warm-Up Time

~ 6 minutes from ambient to -15°C or 100°C

OVERVIEW

Blackbody calibration sources are infrared radiators used for calibrating and verifying the output signals of infrared thermometers (pyrometers), thermal imaging systems, heat flux measurement systems, or spectrographic analysis systems. Advanced Energy supplies a unique selection of very precise calibration sources that are traceable to national standards. Quotations for custom designs and variations are available upon request.

Mikron calibration sources have long been the gold standard to calibrate the instruments that keep your operations up and running. These blackbodies

are superior because of the emissivity values, homogeneous emission areas, and a wide range of different sized apertures to adapt to the desired target area. In addition, fast heat-up times and high temperature stability are guaranteed. The quality of our calibration sources is guaranteed by tests, burn-in times, and radiometric calibrations. On most models, a certificate is provided to document the traceability to the international temperature scale ITS90 and NIST.

TECHNICAL DATA

Measurement Specifications	
Temperature Range	-20 to 150°C (-4 to 302°F)
Temperature Uncertainty ¹	Standard Radiometric calibration: ±1°C @ 8 to 14 μm
	Optional Thermometric calibration: ±0.1°C (only on 14750-4C and 14750-5C)
Temperature Resolution	0.1°C
Display Accuracy vs. NIST Calibration:	See supplied NIST calibration report
Stability ²	±0.1°C per 8-hour period
Source Non-Uniformity ³	±0.2°C less than 100°C
	±1.3 °C greater than 100°C
Heated Cavity Shape	Flat plate
Exit Port Diameter	51 mm (2")
Emissivity ε	Radiometric calibration: 1.0 @ 8 to 14 μm
	Thermometric calibration: ~0.98
Calibration Method	Standard: Radiometric (pyrometric)
	Optional: Thermometric (only on 14750-4C and 14750-5C)
Temperature Sensor	Precision platinum RTD
Warm-up Time ⁴	~6 minutes from ambient to -15°C or 100°C
Slew Rate to 1°C Stability ⁴	~40° per min from ambient to 150°C
	~20° per min from 20 to 10°C
	~3° per min from -10 to -20°C
Slew Rate to 0.1°C Stability	Approximately 2 minutes between Δ 10°C setpoints (slightly longer T < -10 °C)

¹ Accuracy is defined for ambient temperature of 18 to 23°C.
² Provided stable AC mains voltage and minimum air flow across the exit port or emitter plate.
³ Emitter uniformity is defined for 40 mm (1.6") diameter of central area.
⁴ Typical. Can vary from unit to unit.

TECHNICAL DATA (CONTINUED)

Communication and Electrical Specifications	
Remote Set Point	Via RS232
Method of Control	Digital self tuning PID controller
Power Requirements	115 VAC 50 and 60 Hz, 300 W maximum (optional 100 or 230 VAC)

Environmental Specifications	
Operating Ambient Temp ¹	5 to 40°C (41 to 104°F)
Cooling	Peltier modules for heating and cooling
Operating Humidity	90% RH max, non-condensing in heating mode. Environment dew point must be less than setpoint when in cooling mode. (N ₂ purge connection available)
Dimensions (H x W x D)	167 mm x 280 mm x 280 mm (6.5" x 11.0" x 11.0")
Method of Mounting	Bench/table
Weight	7.1 kg (15.6 lbs)
CE Certified	Yes

¹ To achieve low temperature setpoint of -20°C, ambient must be ≤ 25°C (77°F).

REFERENCE NUMBERS

PN	Description
14750-4	M340, -20 to 150°C, 51 mm, 115 VAC @ 50 and 60 Hz
14750-5	M340, -20 to 150°C, 51 mm, 220 to 240 VAC @ 50 and 60 Hz
14750-4J	M340, -20 to 150°C, 51 mm, 100 VAC @ 50 and 60 Hz, (Japan)
14750-4C	M340, -20 to 150°C, 51 mm, 115 VAC @ 50 and 60 Hz, with calibration port
14750-5C	M340, -20 to 150°C, 51 mm, 220 to 240 VAC @ 50 and 60 Hz, with calibration port



For international contact information,
visit advancedenergy.com.

sales.support@aei.com
+1 970 221 0108

ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

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