

MIKRON M360

Medium temperature blackbody calibration source with two separate portable modules and a wide temperature range of 50 to 1100°C (122 to 2012°F).



The Mikron® M360 blackbody calibration source uniquely combines portability with wide temperature range from 50 to 1100°C (122 to 2012°F), high emissivity, and remarkable resolution. An optional precision machined aperture wheel assembly allows different sizes of aperture diameter for applications requiring specific radiating aperture or for verifying field of view of radiometers or infrared thermometers.

PRODUCT HIGHLIGHTS

- Highly mobile with weight of only 17.8 kg (39.3 lb)
- High accuracy $\pm 0.2\%$ of reading $\pm 1^\circ\text{C}$
- High resolution, high emissivity 1.0 effective @ 0.7 to 1.8 μm $T \geq 230^\circ\text{C}$, 1.0 @ 8 to 14 μm $T < 230^\circ\text{C}$
- Manufactured and tested to meet rigid quality control standards
- Furnished with certificate of calibration traceable to NIST
- RS232 (standard) or RS485 (option) serial communication output

TYPICAL APPLICATIONS

- Sapphire probe optical pyrometer calibrations
- Infrared temperature sensors
- Infrared thermal imaging systems
- Spectrographic analyzers
- Spectral radiometers
- Heat flux meters

AT A GLANCE

Temperature Range

50 to 1100°C (122 to 2012°F)

Measurement Uncertainty

$\pm 0.2\%$ of reading $\pm 1^\circ\text{C}$

Emissivity

0.995 ± 0.0005
(calculated from cavity shape)

Heated Emitter Shape

Spherical

Aperture Diameter

25 mm (1")

Average Warm-Up Time

60 minutes from ambient to 700°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.

The source and the controller are housed in separate modules, which allow the source to be positioned in a location remote from the controller such as in an environmental test chamber, or to be used in tests which involve long path lengths. Each module is fitted with a carrying handle and can be comfortably carried to manufacturing plant or field research locations.

TECHNICAL DATA

Measurement Specifications	
Temperature Range	50 to 1100°C (122 to 2012°F)
Temperature Uncertainty	±0.2% of reading ± 1°C
Temperature Resolution	0.1°C
Stability ¹	1°C per 8-hour period
Source Non-Uniformity	±0.2°C typical @ T < 230°C
	±1°C typical @ T > 230°C
Heated Cavity Shape	Spherical
Exit Port Diameter	25 mm (1")
Emissivity ε	0.995 ±0.0005 (calculated from cavity shape)
Effective Emissivity	1.00 @ 8 to 14 μm T < 230°C
	1.00 @ 0.7 to 1.8 μm T > 230°C
Calibration Method	Standard: Radiometric (pyrometric)
Temperature Sensor	Thermocouple
Warm-up Time	60 minutes from ambient to 700°C
Slew Rate to 1°C Stability	~11°C / min for Amb < T < 200°C
	~20°C / min for Amb < T < 800°C
	~10°C / min for T > 900°C
Slew Rate to 0.1°C Stability	1 hour between setpoints

Communication and Electrical Specifications	
Remote Set Point	Via serial port
Method of Control	Digital self-tuning PID controller
Power Requirements	115 VAC or 230 VAC @ 50 and 60 Hz, 1000 W

¹ Provided stable AC mains voltage and minimum air flow across the exit port or emitter plate.

TECHNICAL DATA (CONTINUED)

Environmental Specifications	
Operating Ambient Temp	0 to 44°C (32 to 110°F)
Cooling	Fan cooled, air inlet on rear panel
Operating Humidity	90% RH max, non-condensing in heating mode
Dimensions (H x W x D)	Blackbody: 345 mm x 277 mm x 425 mm (13.6" x 10.9" x 16.75")
	Controller module: 168 mm x 280 mm x 280 mm (6.6" x 11" x 11")
Weight	Blackbody: 17.8 kg (39.3 lb)
	Controller module: 4.86 kg (10.7 lb)
CE Certified	Yes

REFERENCE NUMBERS

PN	Description
14920-1	M360, 50 to 1100°C, 25 mm, RS232, 115 VAC @ 50 and 60 Hz
14920-2	M360, 50 to 1100°C, 25 mm, RS232, 230 VAC @ 50 and 60 Hz

ACCESSORIES

PN	Description
19140-485	Serial Communication Output RS485 (built-in ex works) for M300, M305, M315X, M335, M345X, M360, M360A, M390
3840810	IGA 12-TSP, 1570 nm, 200" 1020°C, through lens sighting, laser targeting, focusable Optics 2
3840820	IGA 12-TSP, 1570 nm, 250" 1400°C, through lens sighting, laser targeting, focusable Optics 2



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.

PRECISION | POWER | PERFORMANCE | TRUST

Specifications are subject to change without notice. Not responsible for errors or omissions. ©2022 Advanced Energy Industries, Inc. All rights reserved. Advanced Energy®, Mikron®, and AE® are U.S. trademarks of Advanced Energy Industries, Inc.

