MIKRON M330

High temperature blackbody calibration source with temperature range of 300 to 1700°C (572 to 3092°F).

The Mikron® M330 is a blackbody calibration source utilizing a digital indicating temperature controller that may be set to any temperature between 300 and 1700°C (572 and 3092°F). A precision thermocouple controls the blackbody cavity providing high accuracy and repeatability. A closed-end tube with a 25 mm (1") aperture diameter is heated by specially manufactured elements. The temperature controller uses the industry standard PID algorithms to control the emitter temperature to within ±0.5°C

PRODUCT HIGHLIGHTS

- High effective emissivity 1.0 @ 0.65 to 1.8 µm
- High accuracy
- Excellent stability +/-1°C per 8-hour period
- Fast slew rate (limited to 20°C per min)
- Wide temperature range
- Manufactured and tested to meet rigid quality control standards
- Furnished with certificate of calibration traceable to NIST
- RS232 (standard) or RS485 serial communication output

TYPICAL APPLICATIONS

- Infrared temperature sensors
- Infrared thermal imaging systems
- Spectroradiometers
- High energy photon generators
- Solar radiance simulation
- Optical pyrometer

AT A GLANCE

Temperature Range

300 to 1700°C (572 to 3092°F)

Measurement Uncertainty

±0.25% of reading ±1°C

Emissivity

1.0 (effective from 0.65 to 1.8 µm)

Heated Cavity Shape

Closed end tube 41 mm ID X 255 mm long with ≈ 125 mm heated length (field replaceable)

Exit Port Diameter

25 mm (1")

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 M330 blackbody uses a resistive heater that provide long life. (Running at temperatures greater than 1600°C for long periods will shorten heater life.) An independent over-temperature power cutout system is an added safety feature. An internal fan keeps the cabinet surfaces at a safe, comfortable temperature.

TECHNICAL DATA

Measurement Specifications	
Temperature Range	300 to 1700°C (572 to 3092°F)
Temperature Uncertainty[1]	±0.25% of reading ±1°C
Temperature Resolution	0.1°C
Stability[2]	±1°C per 8-hour period
Source Non-Uniformity	±1°C within center 1/3 of ID
Heated Cavity Shape	Closed end tube 41 mm ID x 255 mm long with ≈ 125 mm heated length (field replaceable)
Exit Port Diameter	25 mm (1")
Emissivity ε	1.0 @ 0.65 to 1.8 µm (lower at longer wavelengths - a correction table is supplied in the manual)
Calibration Method	Standard: Radiometric (pyrometric)
Temperature Sensor	Type B thermocouple
Warm-up Time	45 to 50 min. from ambient to 300°C
	65 to 80 min. from 300 to 1600°C
Slew Rate to 1°C Stability	~ 20°C per minute
Slew Rate to 0.1°C Stability[3]	~ 30 min for T < 500°C
	~ 20 min T > 500°C

Communication and Electrical Specifications	
Remote Set Point	Via serial port
Method of Control	Digital PID controller
Power Requirements	208 to 240 VAC, 50 and 60 Hz, 3000 VA Maximum (US)
	230 V AC, 50 Hz (EU)

1 Accuracy calibration performed radiometrically, the uncertainty of emissivity and transfer standard are already included.

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

3 For 100°C setpoint change, typ.

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
Dimensions (H x W x D)	648 x 500 x 551 mm (25.52 x 19.7 x 21.7 in)
Weight	80 kg (175 lb)
CE Certified	Yes

REFERENCE NUMBERS

PN	Description
18670-1	M330-US, 300 to 1700°C, 25 mm, 208 to 240 VAC, 50 and 60 Hz, (North America)
3801200	M330-EU, 300 to 1700°C, 25 mm, RS232, 230 VAC, 50 Hz (Manufactured in Germany)

ACCESSORIES

PN	Description
14002-1	Cold aperture wheel assembly, 6 apertures 25.4 to 2.54 mm, for M300, M305, M330, M335, M39
14002	Cold aperture wheel assembly, 6 apertures 50 to 1.56 mm, for M300, M305, M330, M335, M390
19140-485	Serial Communication Output RS485 (built-in ex works) for M300, M305, M315X, M335, M345X, M360, M360A, M390
3840820	IGA 12-TSP, 1570 nm, 250" 1400°C, through lens sighting, laser targeting, focusable Optics 2
3840760	IS 12-TSP, 940 nm, 530 to 1900°C, through lens sighting, laser targeting, focusable Optics 2

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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