

# MIKRON M310-HT

Portable, compact low temperature blackbody calibration source with a large surface area. Ambient 5 to 450°C (9 to 842°F).



The Mikron® M310-HT is a portable blackbody calibration source utilizing a digital indicating temperature controller that may be set to any temperature between ambient 5 to 450°C (9 to 842°F). A precision platinum RTD temperature sensor is embedded in the blackbody emitter, providing high accuracy and repeatability. The temperature controller uses the industry standard PID algorithms to control the emitter temperature to within 0.3°C of the set points. The blackbody emitter mechanism uses a resistive heating device that provides a long life, short stabilization times, and stable temperature control.

## PRODUCT HIGHLIGHTS

- Excellent general purpose calibration
- High effective emissivity 1.00 @ 8 to 14  $\mu\text{m}$
- High accuracy, high resolution
- Excellent stability  $\pm 0.3^\circ\text{C}$  per 8 hour period
- Manufactured and tested to meet rigid quality control standards
- Furnished with certificate of calibration traceable to NIST
- RS232 serial communication included

## TYPICAL APPLICATIONS

- Infrared temperature sensors
- Infrared thermal imaging systems
- Spectrographic analyzers
- Radiometers
- Flux meters

## AT A GLANCE

### Temperature Range

5 to 450°C (9 to 842°F)

### Measurement Uncertainty

0.25% of reading  $\pm 1^\circ\text{C}$

### Emissivity

1.00 effective emissivity @ 8 to 14  $\mu\text{m}$

### Heated Emitter Shape

Flate plate

### Aperture Diameter

76 mm (3.00 in)

### Average Warm-Up Time

< 30 min from ambient (to 400°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                     | 5 to 450°C (9 to 842°F)                    |
| Temperature Uncertainty <sup>1</sup>  | 0.25% of reading ±1°C                      |
| Display Accuracy vs. NIST Calibration | See supplied NIST calibration report       |
| Temperature Resolution                | 0.1°C                                      |
| Stability <sup>2</sup>                | 0.3°C per 8-hour period                    |
| Source Non-Uniformity                 | Approximately ±1°C @ 250°C or ±2°C @ 400°C |
| Heated Cavity Shape                   | Flat plate                                 |
| Exit Port Diameter                    | 76 mm (3.00 in)                            |
| Emissivity ε                          | 1.00 effective emissivity @ 8 to 14 μm     |
| Standard Calibration Method           | Radiometric at 8 to 14 μm                  |
| Temperature Sensor                    | Precision platinum RTD                     |
| Warm-up Time                          | < 30 minutes from ambient to 400°C         |
| Slew Rate to 1°C Stability            | Approximately 6 min for a + 50°C change    |
| Slew Rate to 0.1°C Stability          | Approximately 10 min for a +50°C change    |

| Environmental Specifications |   |
|------------------------------|---|
| Operating Ambient Temp       | 0 to 44°C (30 to 110°F)                           |
| Cooling                      | Fan cooled, air inlet on rear panel               |
| Operating Humidity           | 90% RH max, non-condensing                        |
| Dimensions (H x W x D)       | 207.3 mm x 280.4 mm x 266 mm (8.2" x 11" x 10.5") |
| Weight                       | 5.6 kg (12.4 lbs)                                 |
| CE Certified                 | Yes   |

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

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

**TECHNICAL DATA (CONTINUED)**

| Communication and Electrical Specifications |  |
|---|--|
| Remote Set Point                            | Via RS232  |
| Method of Control                           | Digital PID controller   |
| Power Requirements                          | 115 VAC ± 10% 50 and 60 Hz 920 VA fused max, 600 W heater (230 VAC Optional) |

**REFERENCE NUMBERS**

| PN                | Description   |
|-------------------|---|
| 14760-1-1-1-2-0-2 | M310-HT, Ambient 5 to 450°C, 76 mm, 115 VAC @ 50 and 60 Hz, RS232, North American cable |
| 14760-2-2-1-2-1-2 | M310-HT, Ambient 5 to 450°C, 76 mm, 230 VAC @ 50 and 60 Hz, RS232, German cable         |



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## 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

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