



MIKRON[®]

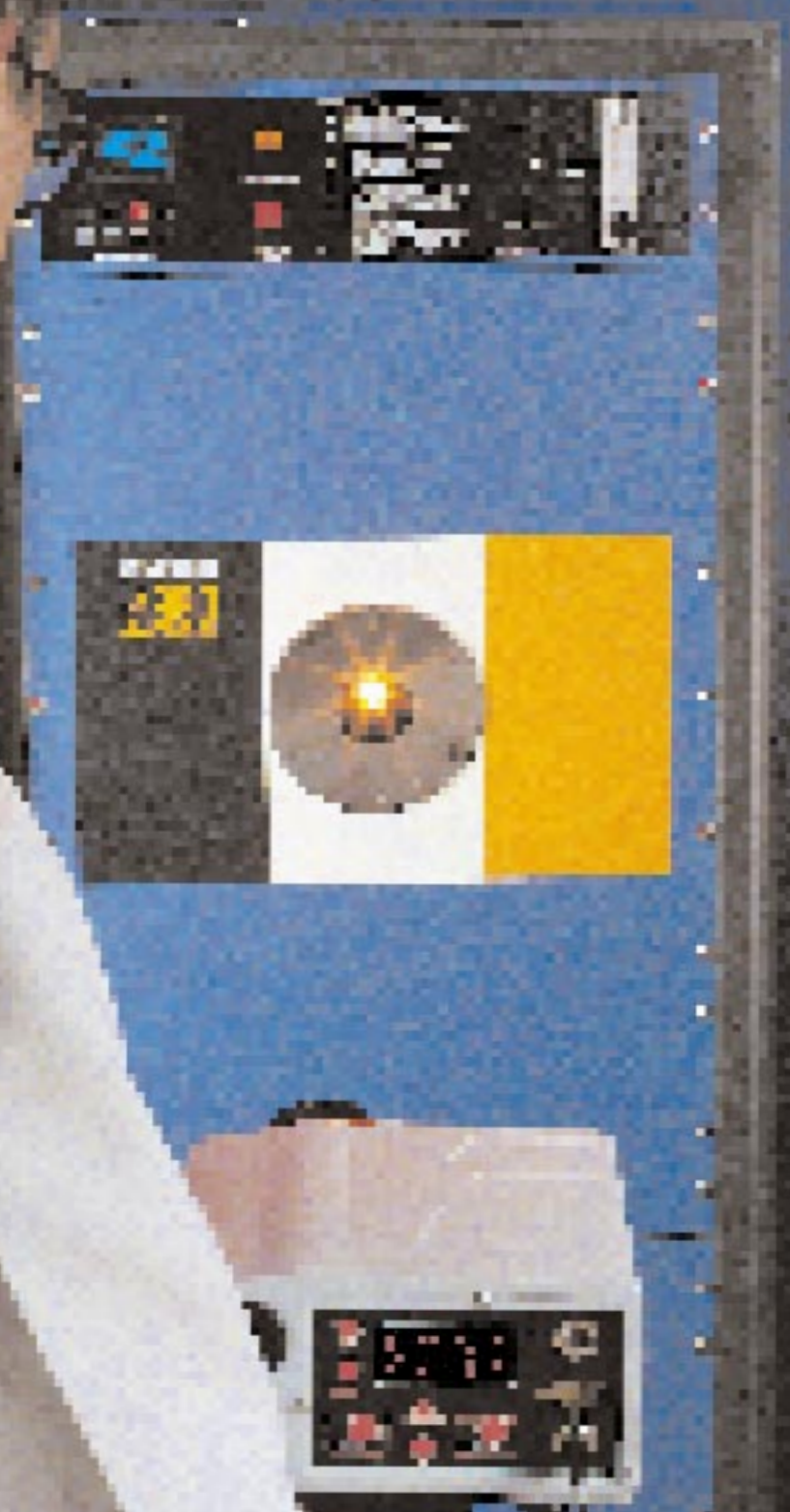
M300 SERIES

Blackbody Radiation Calibration Sources
From -20°C to 3000°C traceable to NIST

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Mikron Blackbody Radiation Calibration Sources

Mikron has been designing and building blackbody calibration sources since 1970. These precision instruments have been installed in several national standards institutions, and are used across industry and research for the calibration of infrared thermometers, radiometers, heat flux meters, thermal imaging systems and spectrographic analyzers. Our parallel manufacture of infrared thermometers, and the application of these instruments and thermal imaging systems has contributed much to Mikron's knowledge and expertise in the field of infrared, radiometric measurement. This expertise is embodied in the ground-breaking innovation and breadth of product performance described in the following pages.

The sequence of products in this catalog is broadly arranged in ascending order of maximum source temperature, with overall capability from -20°C to 3000°C , but also includes models which are distinguished by their portability or some unique feature, other than temperature range. In addition, we have included descriptions of special purpose, custom designed models for which Mikron is noted, such as large area sources, sources for airborne application and for use in vacuum environments. All our blackbody calibration sources, whether standard or custom, are designed for the highest emissivity possible, commensurate with aperture size and target configuration; excellent target surface uniformity; and superior accuracy. After testing and a burn-in period, accuracy is determined radiometrically, with NIST traceable certification where applicable.

In a separate, but related, blackbody calibration source category, the catalog also describes Mikron's unique family of fixed temperature, Freezing Point of Metal sources. These high precision instruments provide calibration assurance hitherto only obtainable from National Standards Institutes. In combination with our M190 series of Calibration Transfer Standards, also described, Mikron is able to provide the industrial user and researcher with a complete hierarchy of calibration traceability, from working units in the field, through secondary and transfer standards to primary, Freezing Point Standards.

MIKRON M340

-20°C to 150°C

The M340 is a portable blackbody calibration source covering the range from sub-zero to 100°C with 0.1°C 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 in a digital readout.



Precision Low Temperature

Specifications:

Temperature Range: -20 to 150°C or -4°F to 300°F

Accuracy: $\pm 0.3^{\circ}\text{C}$

Temperature Resolution: 0.1 degree

Stability: 0.1°C per 8 hour period

Aperture Diameter: 51mm ($2.0''$)

Source Non-uniformity: $\pm 0.1^{\circ}\text{C}$ for 45mm ($1.8''$) of center diameter

Emissivity: $0.99 + 0.005 - 0.000$

Temperature Sensor: Precision platinum RTD

Method of Control: Digital self-tuning PID controller

Warm-up Time: 6 minutes from ambient to -15°C or 100°C

Operating Ambient Temperature: 5 to 40°C
(40 to 104°F)

Power Requirements: $115\text{VAC} \pm 5\%$ $50/60\text{Hz}$
 300w max. (220VAC optional)

Dimensions: $167\text{mm H} \times 280\text{mm W} \times 280\text{mm D}$

Weight: 6.5kg (14.5 lbs.)

Optional Features:

RS232C or RS485 serial communication output

MIKRON M310, M315

Ambient $+10^{\circ}\text{C}$ to 300°C

The M310 is a highly compact portable blackbody calibration source with a built-in digital indicating controller that can be set at any temperature between ambient $+10^{\circ}\text{C}$ and 300°C . Once set, the source temperature is controlled to within $\pm 0.2^{\circ}\text{C}$ by an internal RTD sensor. The unit has an emissivity of $+0.99$. The M310 is easy to transport to a calibration location, either in laboratory or in the plant. It has a dedicated PID controller with 0.1°C resolution.



General Purpose



M315

General Purpose

The M315 is a higher temperature 2-piece version of the M310. The calibration source and the digital indicating controller are contained in separate housings to allow greater flexibility in positioning the instrument within an installation, e.g. long path calibration.

Specifications:

Temperature Range: Ambient +10°C to 500°C or 932°F

†**Accuracy:** ±0.25% of reading ±1°C

Temperature Resolution: 1 degree

Stability: 0.5°C per 8 hour period

Aperture Diameter: 76mm (3.0")

Emissivity: 0.99 + 0.005 – 0.000

Temperature Sensor: Precision platinum RTD

Method of Control: Digital PID controller

Warm-up Time: 30 minutes from ambient to 300°C

Operating Ambient Temperature: 0° to 44°C (30° to 110°F)

Power Requirements: 115VAC ±10% 50/60Hz 300w max. (220VAC optional)

Dimensions:

Blackbody Module (M310):

167mm H x 280mm W x 280mm D

Blackbody Source or Control Module (M315):

167mm H x 210mm W x 280mm D

Weight:

Blackbody Module: 4.5kg (9.5 lbs.)

Control Module (M315 only): 2.5kg (5.5 lbs.)

Optional Accessories:

RS232C or RS485 serial communication output

MIKRON M316

Ambient +10°C to 300°C

The 2-piece M316 features maximum portability and flexibility for field calibration or verification without need to remove the sensor from its location. The calibration source is contained within a compact, lightweight, hand-held housing, permitting the operator to position the source more easily in hard to reach locations. The indicating controller is carried via handle or a convenient shoulder strap.

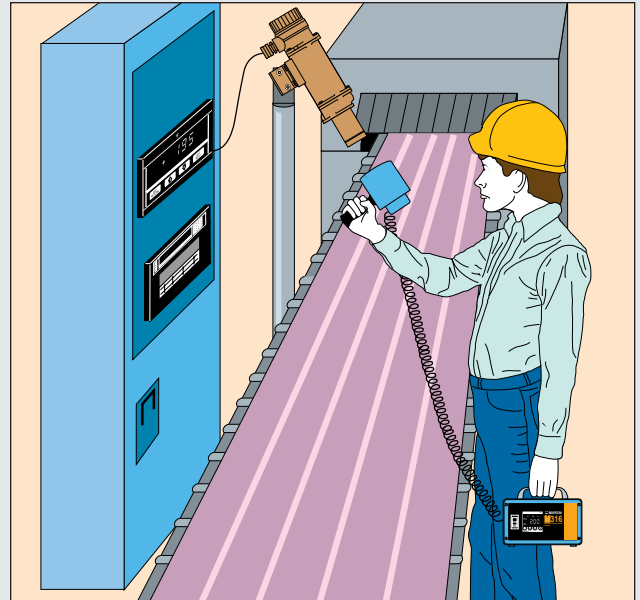
Specifications:

Temperature Range: Ambient +10°C to 300°C or 570°F



M316

Portable



†**Accuracy:** ±0.5% of reading ±1°C

Temperature Resolution: 1 degree

Stability: 0.5°C per 8 hour period

Aperture Diameter: 57mm (2.25")

Emissivity: +0.99 + 0.005 – 0.000

Temperature Sensor: Precision platinum RTD

Method of Control: Digital PID controller

Warm-up Time: 10 minutes from room temperature to 200°C

Operating Ambient Temperature: 0° to 50°C (32° to 122°F)

Method of Mounting:

- Blackbody Module:**
- a. handle grip
 - b. 1/4 – 20 tapped hole for tripod mount

Control Module: Bench mount or shoulder strap for field use

Power Requirements: 115VAC ± 10% 50/60Hz 300 watts max (220VAC optional)

Dimensions:

Blackbody Module:

203mm H x 89mm W x 98mm D

Control Module:

102mm H x 178mm W x 127mm D

Weight:

Blackbody Module: 0.9kg (2.0 lbs.)

Control Module: 0.70kg (1.5 lbs.)

MIKRON M320

Ambient +10°C to 300°C

This unique unit features dual cavities providing calibration sources for 2 temperature points within the calibration range, thus eliminating the waiting period between temperature measurements encountered with single cavity units.

Specifications:

Temperature Range Each Cavity: Ambient +10°C to 300°C or 570°F

†**Accuracy:** ±0.25% of reading ± 1°C

Temperature Resolution: 1 degree

Stability: 0.5°C per 8 hour period

Aperture Diameter: 76mm (3.0")

Emissivity: +0.99 + 0.005 – 0.000

Temperature Sensor: Precision platinum RTD

Method of Control: 2 independent digital PID controllers

Warm-up Time: 30 minutes from ambient to 200°C