

MIKRON M390S

Ultra-fast high temperature two piece calibration source with temperature range of 600 to 3000°C (1112 to 5432°F).



The Mikron® M390S ultra-fast high temperature blackbody calibrator is without parallel in its capability to produce very high temperature, high emissivity targets, and at the same time stabilize at the required temperature within a few minutes. The cavity is a graphite tube target with a 25 mm (1") diameter with an effective emissivity of 1.0 from 0.65 to 1.8 μm . Target temperature is sensed by a rapid response Impac® infrared thermometer which drives a PID controller to regulate the target temperature precisely to the desired value.

PRODUCT HIGHLIGHTS

- Exceptional accuracy at high temperatures
- $\pm 0.25\%$ of reading $\pm 1^\circ\text{C}$
- High effective emissivity 1.0 between 0.65 to 1.8 μm
- Rapid warm-up/cool-down time—only 5 minutes from ambient to 2300°C
- Manufactured and tested to meet rigid quality control standards
- Furnished with certificate of calibration traceable to NIST
- Remote calibration set point control via RS232

TYPICAL APPLICATIONS

- Infrared temperature sensors
- Infrared thermal imaging systems
- Spectroradiometers
- High energy photon generators
- Heat flux gauges and colorimeters
- Solar radiance simulation
- Optical pyrometer

AT A GLANCE

Temperature Range

600 to 3000°C (1112 to 5432°F)
Custom split design

Measurement Uncertainty

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

Emissivity

Effective 1.0 @ 0.6 to 1.8 μm
Effective ~ 0.96 @ 3 to 15 μm

Heated Cavity Shape

Closed end graphite tube 292 mm (11.5") long with approximately 127 mm (5") 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.

TECHNICAL DATA

Measurement Specifications	
Temperature Range ¹	600 to 3000 °C (1112 to 5432 °F) Custom split design
Temperature Uncertainty ²	±0.25% of reading ±1°C
Temperature Resolution	1°C
Stability ³	±1°C
Source Non-Uniformity	Non-uniformity: ±0.1% ± 1°C of reading within the center ½ of diameter
Heated Cavity Shape	Closed end graphite tube 292 mm (11.5”) long with approximately 127 mm (5”) heated length (field replaceable)
Exit Port Diameter	25 mm (1”)
Emissivity ε	1.0 (effective from 0.6 to 1.8 μm) ~0.96 (effective from 3 to 15 μm)
Calibration Method	Standard: Radiometric
Temperature Sensor	Custom infrared thermometer Impac IGA 6
Warm-up Time	5 minutes from 600 to 2300°C, typical
Slew Rate to 1°C Stability	~325°C / min 600 to 1100°C ~700°C / min T > 1100°C

¹ NIST traceable calibration up to 2700°C. Temperatures > 2700°C are provided on a 'best effort' basis only.
² Accuracy calibration performed radiometrically, the uncertainty of emissivity and transfer standard are already included
³ 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	RS232 serial communication output standard, RS485 optional
Method of Control	Digital PID controller
Power Requirements	208 to 240 VAC @ 50 and 60 Hz, 24 KVA, 1 Phase
Power Connector (Customer Supplied) ¹	Must use plug that complies with IEC-309 @ 110 Amps

Environmental Specifications	
Operating Ambient Temp	0 to 44°C (32 to 110°F)
Cooling	Water cooled. Standard (garden) hose connections on rear, 3.8 lpm (1 gpm minimum, 2 gpm recommended)
Cooling Inlet Pressure	90 PSI (621 kPa) maximum. Customer is responsible to provide pressure safety valves at inlet and outlet. Outlet (drain) must not be blocked
Purge Gas	Argon High Purity (99.99 % pure)
Purge Gas Inlet Pressure	25 PSI (172 kPa) maximum. Customer is responsible to provide over pressure safety valves at inlet
Heating Element Type	Graphite tube with argon gas purge, 226 L/h (8 to 10 cfh)
Operating Humidity	0 to 90% RH non-condensing
Dimensions (H x W x D)	Blackbody: 876 x 559 x 978 mm (34.5 x 22 x 38.5 in)
	Controller: 195 x 432 x 576 mm (7.67 x 17 x 22.66 in)
Weight	Main Cavity: ~177 kg (390 lb)
	Controller: ~4.6 kg (10.2 lb)
CE Certified	Yes

¹ Customer supplied direct, fuse box wiring or connectors.

REFERENCE NUMBERS

PN	Description
18519-1	M390S, 600 to 3000°C, 25 mm, 240 VAC

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
3840810	IS 12-TSP, 940 nm, 600 to 2520°C, through lens sighting, laser targeting, focusable Optics 2
3840820	IS 12-TSP, 940 nm, 600 to 3000°C, through lens sighting, laser targeting, focusable Optics 2
3840760	IS 12-TSP, 650 nm, 850 to 2520°C, through lens sighting, focusable Optics 2
14880-1SP1	Replacement cavity kit
14880-2SP2	Replacement electrodes, quartz tube, o-rings kit



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