MIKRON M315X (X4, X6)

Two-piece medium temperature blackbody calibration source with a large surface area. Ambient +5 to 400°C (+9 to 752°F).

The Mikron® M315X series blackbody calibration sources are resistively heated by precision heating elements to provide uniform temperature distributions. The two-piece system is comprised of controller module and a separate enclosure for the emitter source. Emitter source temperature control is carried out by a precision digital PID controller. Designed to satisfy the exacting parameters of infrared focal plane array detectors, thermal imaging, and FLIR systems testing in projection scene and field application, the M315X series blackbody calibration sources combine high emissivity and unchallenged stability and uniformity.

PRODUCT HIGHLIGHTS

- High emissivity and uniformity
- Excellent general purpose calibration
- Large aperture sizes
- High accuracy, high resolution
- Manufactured and tested to meet rigid quality control standards
- RS232 (standard) or RS485 (option) serial communication output

TYPICAL APPLICATIONS

- Infrared thermal imaging systems
- Spectrophotometers
- Aerial mapping
- Surveillance equipment

AT A GLANCE

Temperature Range

Ambient +5 to 400°C (+9 to 752°F)

Measurement Uncertainty

±1°C @ T < 100 °C to ±1.3°C
@ T = 400°C @ 8 to 14 µm

Emissivity

@ 8 to 14 µm: 1.00

Heated Emitter Shape

Flate plate

Aperture Diameter

M315X4:
101 mm x 101 mm (4"x 4")

M315X6:
152 mm x 152 mm (6"x 6")

Average Warm-Up Time

~30 min from ambient (to 300°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	Ambient +5 to 400°C (+9 to 752°F)	
Temperature Uncertainty[1]	±1°C @ T < 100°C to ±1.3°C @ T = 400°C @ 8 to 14 µm	
Display Accuracy vs. NIST Calibration	See supplied NIST calibration report	
Temperature Resolution	0.01°C	
Stability[2]	±0.1°C per 8-hour period if in still air environment	
Source Non-Uniformity	M315X4	±0.4°C (in 3.5" x 3.5" region) @ 100°C
		±0.6°C (in 3.5" x 3.5" region) @ 200°C
		±1.5°C (in 3.5" x 3.5" region) @ 400°C
	M315X6	±0.4°C (in 5" x 5" region) @ 100°C
		±0.6°C (in 5" x 5" region) @ 200°C
		±1.5°C (in 5" x 5" region) @ 400°C
Heated Cavity Shape	Flat plate	
Exit Port Diameter	M315X4: 101 mm x 101 mm (4"x 4")	
	M315X6: 152 mm x 152 mm (6"x 6")	
Emissivity ε	Effective @ 8 to 14 µm: 1.00 (Spectral Emissivity graph is provided in the instruction manual)	
Standard Calibration Method	Radiometric	
Temperature Sensor	Precision platinum RTD 1/3 DIN	
Warm-up Time	~30 minutes from ambient to 300°C	
Slew Rate Typical	M315X4	~15° per min T < 300°C
		~5° per min T > 300°C
	M315X6	~10° per min T < 350°C
		~5° per min T > 350°C
Slew Rate to 0.1°C Stability	M315X4: ~12 to 30 min between setpoints (longest near end of temperature range)	
	M315X6: ~30 to 40 min between setpoints (longest near end of temperature range)	

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.

TECHNICAL DATA (CONTINUED)

Communication and Electrical Specifications	
Remote Set Point	Via RS232 (standard) or RS485 (optional)
Method of Control	Digital PID controller
Power Requirements	M315X4: 115 VAC @ 50 & 60 Hz, 500 VA
	M315X6: 115 VAC @ 50 & 60 Hz, 2000 VA

Environmental Specifications		
Operating Ambient Temp	10 to 40°C (50 to 104°F)	
Cooling	Fan cooled, air inlet on rear panel	
Operating Humidity	<90% non-condensing	
Dimensions (H x W x D)	M315X4	269 mm x 285 mm x 267 mm (10.6" x 11.22" x 10.5")
	M315X6	417.6 mm x 406.4 mm x 371.4 mm (16.44" x 16" x 14.62")
	Controller	195 mm x 432 mm x 576 mm (7.67" x 17" x 22.66")
Weight	M315X4	~7.3 kg (16 lbs)
	M315X6	~10.4 kg (23 lbs)
	Controller	~9 kg (20 lbs)
CE Certified	Yes	

REFERENCE NUMBERS

PN	Description
19180-4	M315X4, Ambient +5 to 400°C, 101 mm x 101 mm, RS232, 115 VAC @ 50 and 60 Hz
19100-3	M315X6, Ambient +5 to 400°C, 152 mm x 152 mm, RS232, 115 VAC @ 50 and 60 Hz

ACCESSORIES

PN	Description
19140-485	Optional: Serial Communication Output RS485 (built-in ex works) for M300, M305, M315X, M335, M345X, M360, M360A, M390

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