

MIKRON M315X-HT

Two-piece, high temperature blackbody calibration source with a large surface area.
Ambient 30 to 600°C (86 to 1112°F).



The Mikron® M315X-HT blackbody 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 with available aperture sizes from 4" x 4" (101 mm x 101 mm) up to 12" x 12" (305 mm x 305 mm). Emitter source temperature control is carried out by a precision digital PID controller, mounted in a 7" (180 mm) high enclosure. An exceptionally stable RTD ensures long-term temperature stability of the system.

PRODUCT HIGHLIGHTS

- High effective emissivity
- Excellent general purpose calibration
- Large aperture sizes
- High accuracy, high resolution
- Manufactured and tested to meet rigid quality control standards

TYPICAL APPLICATIONS

- Infrared focal plane detectors
- Infrared thermal imaging systems
- FLIR systems testing

AT A GLANCE

Temperature Range

30 to 600°C (86 to 1112°F)

Measurement Uncertainty

±1°C @ T < 100°C to ± 2°C @
T = 600°C

Emissivity

~1.00 effective emissivity @ 8 to
14 μm

Heated Emitter Shape

Flat plate

Aperture Diameter

M315X4HT
101 mm x 101 mm (4" x 4")

M315X6HT
152 mm x 152 mm (6" x 6")

M315X8HT
203 mm x 203 mm (8" x 8")

M315X12HT
305 mm x 305 mm (12" x 12")

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.

The M315X-HT blackbody calibration sources are designed to satisfy the exacting parameters of infrared focal plane array detectors, thermal imaging, and FLIR systems testing in projection scene and field applications where higher temperatures are required.

These calibration sources combine high emissivity along with unchallenged stability and uniformity.

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	30 to 600°C (86 to 1112°F)
Temperature Uncertainty ¹	±1°C @ T < 100°C to ±2°C @ T = 600°C
Display Accuracy vs. NIST Calibration	See supplied NIST calibration report
Temperature Resolution	0.1°C
Stability ²	±0.2°C in still air environment
Source Non-Uniformity	M315X4-HT: (in 3.5" x 3.5" region); M315X6-HT: (in 4" x 4" region); M315X8-HT: (in 6" x 6" region); M315X12-HT: (in 10" x 10" region)
	±1.5°C @ 200°C
	±2°C @ 400°C
	±3°C @ 500°C
	±6°C @ 600°C
Heated Cavity Shape	Flat plate
Exit Port Diameter	M315X4HT: 101 mm x 101 mm (4" x 4")
	M315X6HT: 152 mm x 152 mm (6" x 6")
	M315X8HT: 203 mm x 203 mm (8" x 8")
	M315X12HT: 305 mm x 305 mm (12" x 12")
Emissivity ε	~1.00 effective emissivity @ 8 to 14 μm (A spectral emissivity graph is provided in the instruction manual)
Standard Calibration Method	Radiometric
Temperature Sensor	Precision platinum RTD
Warm-up Time	~30 minutes from ambient to 500°C

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)

Measurement Specifications		
Slew Rate to 1°C Stability ¹	M315X4-HT	~20° per min T < 300°C
		~10° per min T > 300°C
	M315X6-HT	~30° per min T < 300°C
		~15° per min T > 300°C
	M315X8-HT	~20° per min T < 300°C
		~10° per min T > 300°C
	M315X12-HT	~14° per min T < 300°C
		~7° per min T > 300°C
Slew Rate to 0.1°C Stability	Approximately 30 minutes between Δ 100°C setpoints	

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	
Blackbody Dimensions (H x W x D)	M315X4-HT	269 mm x 285 mm x 267 mm (10.6" x 11.22" x 10.5")
	M315X6-HT	417.6 mm x 406.4 mm x 371.4 mm (16.44" x 16" x 14.62")
	M315X8-HT	417.6 mm x 406.4 mm x 389.2 mm (16.44" x 16" x 15.32")
	M315X12-HT	646.4 mm x 490.2 mm x 602 mm (25.45" x 19.3" x 23.7")
Controller Dim (H x W x D)	195 mm x 432 mm x 576 mm (7.67" x 17" x 22.66")	
Blackbody Weight	M315X4-HT	~9.6 kg (21 lbs)
	M315X6-HT	~21.3 kg (47 lbs)
	M315X8-HT	~38.1 kg (84 lbs)
	M315X12-HT	~86.2 kg (190 lbs)
Controller Weight	~7.3 kg (16 lbs)	
CE Certified	Yes	

Communication and Electrical Specifications		
Remote Set Point	Via RS232 (standard) or RS485 (optional)	
Method of Control	Digital PID controller	
Power Requirements	M315X4-HT	PN 19230-1: 220 to 240 VAC @ 50 and 60 Hz 1050 VA
		PN 19230-3: 115 VAC @ 50 and 60 Hz 1050 VA
	M315X6-HT	PN 19100-4: 220 to 240 VAC @ 50 and 60 Hz 4050 VA
	M315X8-HT (EU)	PN 19200-5: 220 to 240 VAC @ 50 and 60 Hz 4050 VA
	M315X12-HT (EU and NA)	PN 18769-3: 220 to 240 VAC @ 50 and 60 Hz 9000 VA
	M315X12-HT (NA)	PN 18769-4: 208 VAC @ 50 and 60 Hz 9000 VA

¹ Typical. Can vary from unit to unit.

REFERENCE NUMBERS

PN	Description
19230-1	M315X4-HT, Ambient 30 to 600 °C, 101 mm x 101 mm, RS232, 220 to 240 VAC @ 50 and 60 Hz
19230-3	M315X4-HT, Ambient 30 to 600 °C, 101 mm x 101 mm, RS232, 115 VAC @ 50 and 60 Hz
19100-4	M315X6-HT, Ambient 30 to 600 °C, 152 mm x 152 mm, RS232, 220 to 240 VAC @ 50 and 60 Hz
19200-5	M315X8-HT, Ambient 30 to 600 °C, 203 mm x 203 mm, RS232, 220 to 240 VAC @ 50 and 60 Hz, (EU and NA)
18769-3	M315X12-HT, Ambient 30 to 600 °C, 305 mm x 305 mm, RS232, 220 to 240 VAC @ 50 and 60 Hz, (EU and NA)
18769-4	M315X12-HT, Ambient 30 to 600 °C, 305 mm x 305 mm, RS232, 208 VAC @ 50 and 60 Hz, (North America)

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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