

M190-TS Series

Ultra Precision Infrared Thermometers As Calibration Transfer Standards

When temperature measurement accuracy is critical, routine calibration verification with a high level of assurance is essential. In the case of infrared temperature sensors and radiometers, the Blackbody Calibration Source, in conjunction with the temperature of the Freezing Point of Pure Metals as a Source and Planck's radiation law, provides the basis for this assurance. The calibration assurance linkage between working units in the field, the calibration standards laboratory, and ultimately the national standards, is accomplished by the use of Calibration Transfer Standards. It is through these transfer standards that calibration traceability is established and maintained.

Thermal radiometric Calibration Transfer Standards may be either blackbody sources or infrared thermometers, and are used as comparators to check secondary calibration standards and working sensors. Since it is implicit that transfer standards will be subject to frequent shipment, the instrument of choice is often the infrared thermometer because it is economical, durable and convenient. Mikron's M190-TS Infrared Thermometer Calibration Transfer Standards embody many unique features which especially suit them for such use. These design features are further enhanced by the scrupulous methods used in manufacture to ensure consistent performance and long-term stability.

Among the M190-TS' desirable features are very high accuracy; precise viewing through the measurement optics, allowing clear definition and alignment of the field of view; and 0.10° temperature display resolution. The M190-TS also provides a choice of digital output protocols for computer operation and data gathering; an analog output representing raw detector output, proportional to incoming radiance power, provides an extra measure of accuracy with temperature resolution of 50mK for more demanding users. Many other user-selectable features, such as a variable density optical filter to reduce eye strain when working with bright sources, result in the M190-TS being the first choice for the exacting task of radiometric calibration transfer.



Shown above is the Model M190V-TS aimed at Model M380-AU, a primary standard Gold freezing point blackbody source.

MIKRON M190-TS OPERATING SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	Temperature Range	Temperature Resolution		Spectral Response	Field of View	Minimum Measurable Target Diameter with close focus ring attachments
		Analog Output	Display			
M190Q-TS	200° – 1200°C	0.05°C	0.1°C	1.0 – 1.6 microns	60:1	4.0mm
M190H-TS	600° – 1800°C			0.78 – 1.06 microns	180:1	1.5mm
M190V-TS	1000° – 3000°C			0.65 narrow band microns	300:1	1.0mm



Absolute Accuracy/Uncertainty: See table below

Focussing Distance: Standard: 60cm to infinity;
with close focus attachment: 18cm minimum

Viewfinder: 9° sighting, adjustable eyepiece.
Electro-optical eye protection filter: built in with three selectable levels.

Digital Output: RS-232. Software selectable baud rates.
Communication formats for printer, data logger, and bi-directional computer interface.

Analog Output: A raw detector output proportional to incoming radiation power with less than 50mK temperature resolution.

Response Time: 50mS to 3 sec.,
selectable at 12 fixed intervals

Key Pads: Sealed membrane, electrostatically shielded tactile switches.
All settings are functionally indicated with LED display

Ambient Operating Temperature:
10° to 40°C , 0 to 70% R.H. non-condensing (see note 2)

Storage Temperature: 0° to 50°C

Enclosure: Machined aluminum casting,
dust and splash proof

Mounting: 3 tapped holes 1/4 – 20 thread

Dimensions: 178mm x 220mm x 97mm

Weight: 1.8kg

CLOSE FOCUS RING ATTACHMENTS

With close focus ring attachment, the focusable distance of the M190-TS Series can be reduced to 18cm. These rings can be added in the field with no change in calibration accuracy. See table above for minimum measurable target diameters.

STANDARD ACCESSORIES

- 2 close focus ring attachments
- Digital output cable
- Analog output cable with BNC connector
- Regulated DC power supply
Input Power: 100, 115, 220VAC ±10% 50/60Hz; 50 watts max.
- Communications software
- Certificate of Calibration traceable to NIST per test points shown below
- High-impact insert fitted carrying and storage case.
- Lens cap
- Instruction manual

TABLE OF TEMPERATURE UNCERTAINTY OF M190-TS SERIES

Uncertainty °C <small>See notes 1 & 2</small>	0.80	0.90	1.10	1.40	1.60	2.0	2.5	3.2	3.9	4.7	5.5	6.4	8.0	10.0
Temperature °C <small>See note 3</small>	† 231.93	† 419.53	† 660.32	† 961.78	† 1064.18	1200.0	1400.0	1600.0	1800.0	2000.0	2200.0	2400.0	2700.0	3000.0
For M190Q-TS	•	•	•	•	•	•	–	–	–	–	–	–	–	–
Standard Calibration Test Points For M190H-TS			•	•	•	•	•	•	•	•	•	–	–	–
For M190V-TS				–	•	•	•	•	•	•	•	•	•	–

Notes: 1. The maximum uncertainty experienced elsewhere is normally at the middle of two test points. This uncertainty is less than of 1.5 times of average value of uncertainty of two adjacent test points.

2. Uncertainty values are given for a specified focussed distance and ambient temperature of 23°C ±5°C.

3. † These values are assigned by ITS-90 (International Temperature State of 1990).

Unconditional Warranty

Every M190-TS is covered for a high standard of workmanship and accuracy stability for one full year after shipment.

Made in U.S.A.

The M190-TS is designed and built by Mikron, the leading innovator in infrared thermometry. Manufacturing facility is located in Oakland, New Jersey.

Ask for information on Model M300 Series of precision blackbody sources for laboratory and industrial use.



MIKRON®

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