

# MIKRON M67S

Compact two-wire infrared thermometer for non-contact temperature measurement in many different applications. Temperature ranges between 0 and 2200°C.



Completely self-contained, the Mikron® M67S infraducer can be used as true two-wire temperature transducer/transmitter which produces a standard 4 to 20 mA linear output. Powered by its current loop, each infraducer is completely compatible with any existing instrumentation for recording or process control.

## PRODUCT HIGHLIGHTS

- Analog output 4 to 20 mA for connection to standard analyzing instruments
- Through-lens sighting and high quality variable focus optical system
- Different optics for optimal match to the application
- Versions with different spectral ranges
- High accuracy of 0.5%
- Rugged stainless steel design

## TYPICAL APPLICATIONS

- Cement
- Ceramics
- Chemicals
- Food
- Glass
- Heat treating
- Metals
- Paper
- Plastics
- Power
- Printing
- Petrochemicals
- Robotics
- Rubber
- Semiconductors
- Textiles
- Vacuum systems, etc.

## AT A GLANCE

### Temperature Ranges

0 to 2200°C

### Measurement Uncertainty

±0.5% of full scale or 1°C

### Repeatability

±0.2% of full scale span

### Optics

2 focusable optics:  
350 mm to ∞  
150 to 350 mm

### Alignment

Through-lens sighting

### Output

4 to 20 mA

OVERVIEW

A rugged, stainless steel housing, miniature size, and light weight make the M67S suitable for many applications. To ensure minimum maintenance and utmost reliability, the Infraducers have absolutely no moving parts.

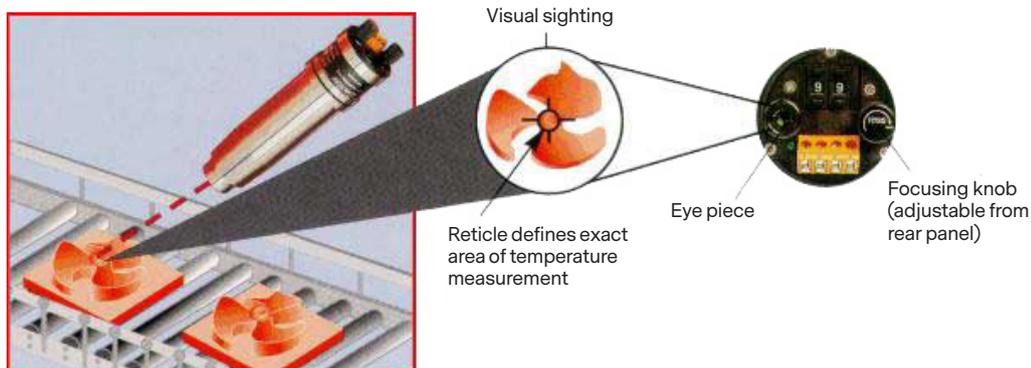
When contained within its companion cooling jacket and air purge assembly, each infraducer can withstand the harshest conditions found in industry. The Infraducers have universal application in virtually any type of industry.

The M67S is available with a variety of temperature ranges, spectral responses, and optical characteristics to meet specific applications.

Field Interchangeability

Superior design not only ensures accuracy and long term reliability, it also ensures interchangeability between Infraducers of the same model with  $\pm 0.50\%$  accuracy.

For especially demanding applications, the Infraducers have a digital emissivity control which can be set with a resolution of 0.01. This ensures that, should one of the infraducers need to be replaced, the replacement unit can be preset in every aspect before installation.



TECHNICAL DATA

Measurement Specifications	
Resolution	$\pm 0.1\%$ of full scale span (FSS)
Emissivity $\epsilon$	Digital setting 0.10 to 0.99 with 0.01 step
Measurement Uncertainty	$\pm 0.50\%$ of full scale or $1^\circ\text{C}$ , whichever is greater
Repeatability	$\pm 0.2\%$ of full scale span

Optical Specifications	
Sighting	Eyepiece: Diopter type
Optics	Non-parralax refractive optics focusable from rear panel

Communication	
Analog Output	4 to 20 mA linear standard
Response Time $t_{95}$	50 ms for spectral response 0.78 to 1.06 $\mu\text{m}$ and 1.0 to 1.6 $\mu\text{m}$ , for all others: 120 ms
Maximum/Minimum Value Storage	None

**TECHNICAL DATA (CONTINUED)**

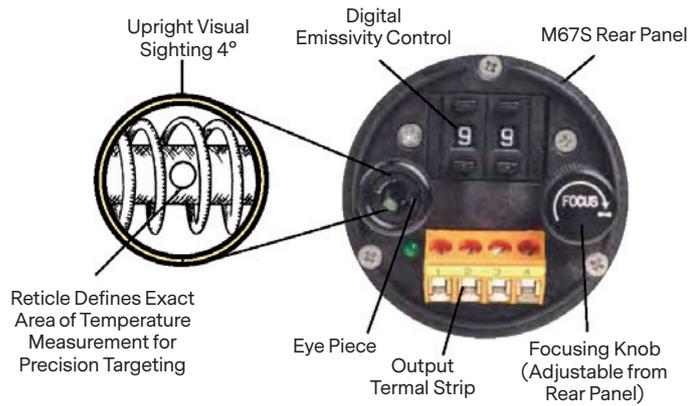
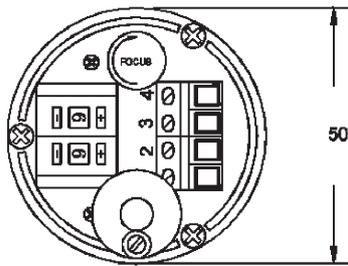
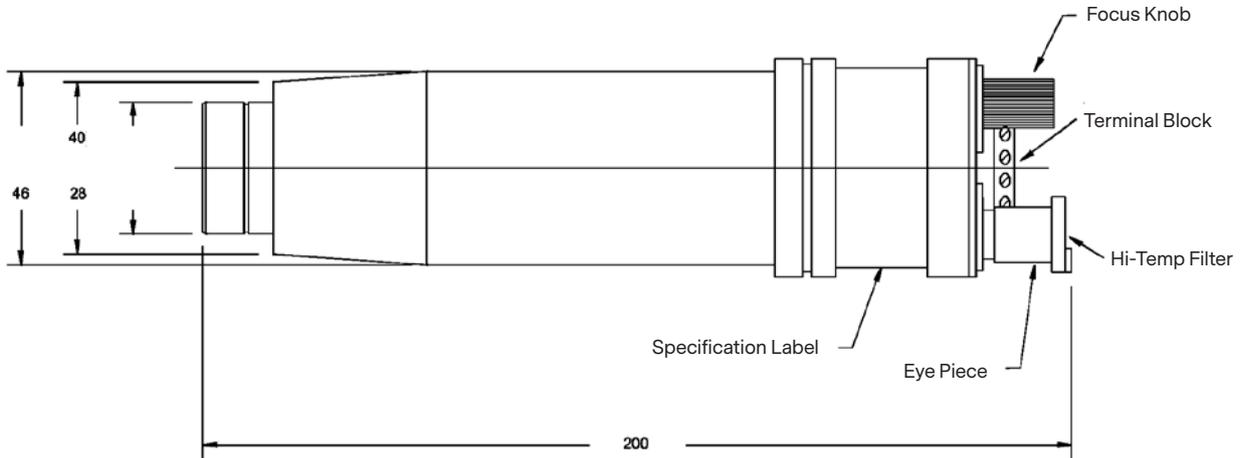
Electrical	
Power Supply	24 VDC (18 to 40 VDC) nominal
Power Consumption	~0.4 W at 20 mA
Load Resistance Max	400 ohms for 24 VDC input voltage
	1200 ohms for 40 VDC input voltage
Hysteresis	None
Switch Contact	None
Isolation	None

Environmental Specifications	
Protection Class	NEMA 4 with protective/cooling jacket
Operating Position	Any
Ambient Temperature	0 to 60°C without cooling
Storage Temperature	-30 to 80°C
Relative Humidity	90%, Non-condensing conditions
Weight	0.90 kg
Housing	Stainless steel
Dimensions	50 mm diameter x 203 mm long
CE Label	According to EU directives about electromagnetic immunity

Interface	
Connection	Four terminal screws: two for signal, one for GND, and one spare
Parameters	Emissivity from rear panel with digital push button switch

Communication	
Analog Output	4 to 20 mA linear standard
Response Time $t_{95}$	50 ms for spectral response 0.78 to 1.06 $\mu\text{m}$ and 1.0 to 1.6 $\mu\text{m}$ , for all others: 120 ms
Maximum/Minimum Value Storage	None

PRODUCT SCHEMATIC



Dimensions in mm

SPECIFICATIONS

The M67S is available with a variety of temperature ranges, spectral responses, and optical characteristics to meet specific applications. The following chart will give you an overview over the available instrument versions.

Typical Application	Temperature range in °C	Spectral response in μm (spectral code)	Field of view ratio	Output response time (field adjustable)
General purpose applications including textiles, printing, paper, food, laminating, rubber, thick plastics, paints, etc. Rejects energy from high intensity radiant heating sources.	0 to 100	8 to 14 (B)	15:1	100 ms
	0 to 300	8 to 14 (B)	30:1	300 ms
	0 to 500			1 sec
	100 to 1000			3 sec 10 sec
Thin plastic films such as polyester, fluoroocarbons, etc., and very thin glass.	0 to 300	7.9 (F)	15:1	100 ms
	100 to 400	7.9 (F)	30:1	300 ms
	150 to 600			1 sec 3 sec 10 sec
Glass surface measurement applications including bending, forming, tempering, annealing, sealing, laminating, etc.	100 to 600	4.8 to 5.2 (E)	15:1	100 ms
	300 to 1300	4.8 to 5.2 (E)	30:1	300 ms 1 sec 3 sec 10 sec
Sees through clean flames & hot combustion gases. Applications including reformer tubes, chemical reactors, kilns, etc.	300 to 1000 450 to 450 600 to 1750	Narrowband centered at 3.86 (D)	30:1	100 ms 300 ms 1 sec 3 sec 10 sec
Temperature of flame for combustion and pollution industries, incinerators, utility boilers, kilns, chemical reactors, etc.	320 to 1200 400 to 1400 450 to 1900 800 to 2200	CO <sub>2</sub> Absorption Band (L)	30:1	100 ms 300 ms 1 sec 3 sec 10 sec
Most common for high temperature applications such as metals, toundries, hardening, forging, annealing, glass melting tanks, glass gobs, and semiconductor processes.	525 to 800 600 to 900 650 to 1000	0.78 to 1.06 (H)	90:1	50 ms 300 ms 1 sec
	800 to 1300 900 to 1600 1100 to 2000 1500 to 3000	0.78 to 1.06 (H)	180:1	3 sec 10 sec
Medium to high temperature applications for ferrous and non ferrous metals; sees through glass and fast response.	220 to 400 300 to 600	1.0 to 1.6 (Q)	30:1	50 ms 300 ms
	400 to 800 500 to 1100	1.0 to 1.6 (Q)	90:1	1 sec 3 sec 10 sec

For instrument Reference Numbers, please contact your local sales partner.

OPTICS

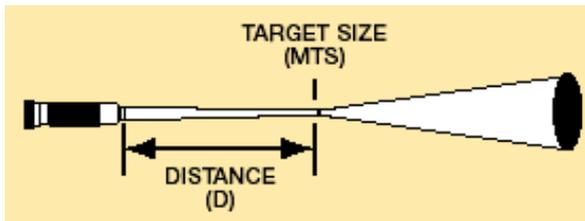
**Optical Resolution – Variable Focus M67S**

Three different lenses are available for the M67S. The one you should choose depends on the desired working distance of the unit.

- Optics Version 1 is designed to measure temperature at distances of 350 mm to infinity.
- Optics Version 2 has a working distance of 150 mm to 350 mm.
- Optics Version 3 is fixed to measure temperatures at about 25 mm distance.

Proper focusing is achieved by mounting the unit at the desired distance and adjusting the focusing knob on the rear panel of the instrument until the target comes into clear view in the reticle. When the target is in focus to the eye, it is also in focus to the detector. Should you wish to move the instrument, remember to stay within the prescribed working distance, and simply refocus upon the target after mounting the instrument in its new location.

**Formula to Determine Minimum Target Size (MTS)**



$$MTS = \frac{\text{Focused Distance (D) (M67S to target)}}{\text{Field of View Ratio}}$$

Example: M67S, version 1 with 30:1 FOV focused at 380 mm  
 $MTS = D/FOV = 380 \text{ mm} / 30 = 12.7 \text{ mm}$

Minimum target sizes are shown in the table below:

Field of View FOV	Optics Version 1 Focus 350 mm to ∞	Optics Version 2 <sup>1</sup> Focus 150 to 350 mm	Optics Version 3 <sup>1</sup> Focus at 50 mm
15:1	Min target of 23.6 mm at 350 mm	Min target of 10.2 mm @ 150 mm	Min target of 3.3 mm @ 25 mm
30:1	Min target of 11.9 mm at 350 mm	Min target of 1.8 mm @ 150 mm	Min target of 1.5 mm @ 25 mm
90:1	Min target of 4.1 mm at 350 mm	Min target of 1.8 mm @ 150 mm	Not available
180:1	Min target of 1.8 mm at 350 mm	Not available	Not available

<sup>1</sup> Only for versions with spectral code L, H, or Q.

ACCESSORIES

PN	Description
6 870 010	Protective Jacket J (With Cooling)
6 870 020	Protective Jacket I (Without Cooling)
6 870 030	Air Purge Assembly (Requires Jacket J or I)
6 870 040	6" Aiming Flange P (Requires Jacket J or I)
3 890 640	DA 4000-N, Digital display, with integrated 2-wire power supply
3 890 650	DA 4000, Digital display, with 2-wire-power-supply, dual limit switch

ACCESSORY OVERVIEW

**DA 4000**

Modern 4-digit microprocessor controlled mounting instruments with an integrated sensor supply to connect 2-wire systems.

DA 4000 is equipped with two separately adjustable potential-free limit switches with positive switch hysteresis.

- 4 mm LED, 4-digits
- Input adjustable to 0 to 20 or 4 to 20mA
- Integrated 2-wire supply voltage
- Two programmable limit contacts



**Protective Jacket (J or I)**

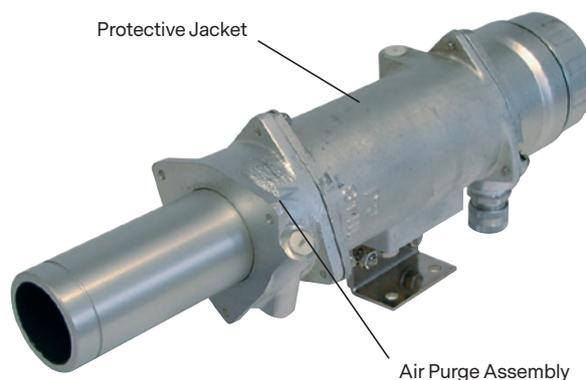
Protective jacket available with cooling (J) or without cooling (I).

**Air Purge Assembly**

Requires protective jacket (J or I).

**6" Aiming Flange**

Requires protective jacket (J or I).





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## ABOUT ADVANCED ENERGY

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AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

PRECISION | POWER | PERFORMANCE

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