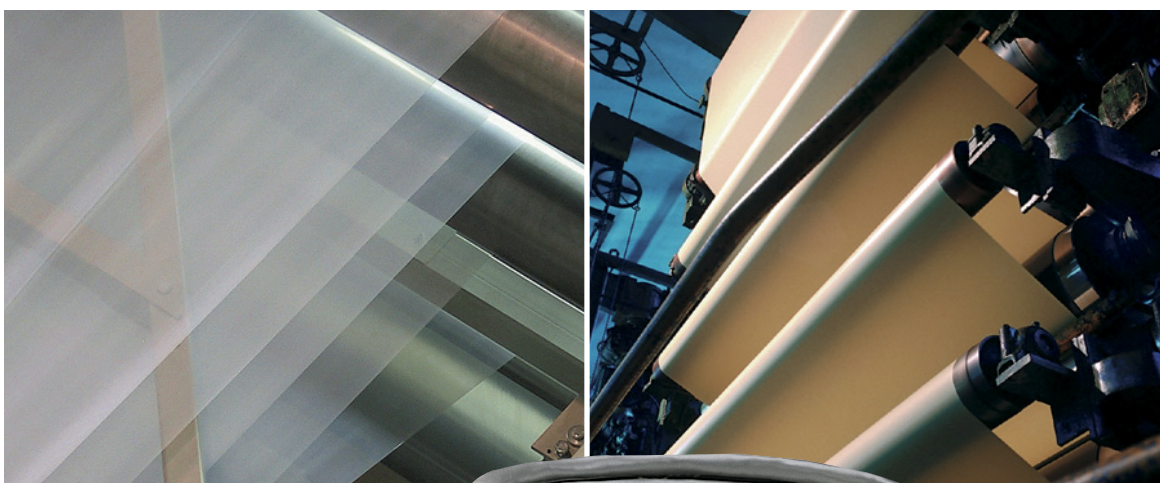


CI



## Noncontact Temperature Measurement for Industrial Applications



## CI Highlights

- Type J or K, or 0-5 V output
- Two models cover temperature ranges from 0°C to 500°C (32°F to 932°F)
- IP 65 (NEMA-4) stainless steel electronics housing
- 4:1 optics at 90% energy
- 350 mSec (95%) response time
- Powered by 12–24 VDC at 20 mA
- Accessories for cooling and air purging

The Raytek CI model provides the advantages of infrared temperature measurement in a compact, low cost, integrated sensor. Designed for easy integration into a standard 4-wire system, the CI sensor can easily replace traditional contact probes with a J-type or K-type thermocouple output, or with a 0-5 volt output if your application is susceptible to noise or requires a longer cable run.

The CI sensor is designed to measure target temperatures ranging from 0°C to 500°C (32°F to 932°F). The CI unit's onboard electronics are protected by a rugged IP 65 (NEMA-4) stainless steel housing, allowing the sensor to function in ambient temperatures to 70°C (160°F) without cooling. With water cooling, the CI sensor can withstand ambient temperatures to 260°C (500°F).

Because the CI unit has the same 50 Ohm output impedance as a thermocouple, it functions accurately—without offset errors—when used in conjunction with the thermocouple break protection circuitry in most controllers, displays, and transmitters.

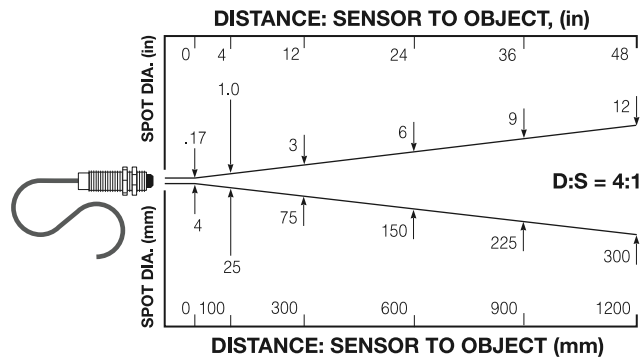
Compact. Easy to install. Affordable. The Raytek CI sensor is ideal for both OEM and end-user applications.

## Measurement Specifications

Model	Output	Overall Temp. Range	Accuracy
CI1A	J Thermocouple	0°C to 350°C (32°F to 662°F)	0°C to 115°C (32°F to 240°F) ±3°C (±6°F)
CI2A	K Thermocouple		116°C to 225°C (241°F to 440°F) larger of ±5%
CI3A	Voltage		226°C to 350°C (441°F to 662°F) >±5%
CI1B	J Thermocouple	30°C to 500°C (86°F to 932°F)	100°C to 500°C (212°F to 932°F) larger of ±2% or ±3°C (±6°F)
CI2B	K Thermocouple		30°C to 99°C (86°F to 211°F) ±6°C (±10°F)
CI3B	Voltage		

Spectral Response	7 to 18 microns
System Repeatability	±1% of measured value or ±1°C (2°F), whichever is greater
Temperature Resolution	<0.5°C or 1°F
Response Time (95%)	350 mSec
Emissivity	Fixed at 0.95

## Nominal Optical Specifications

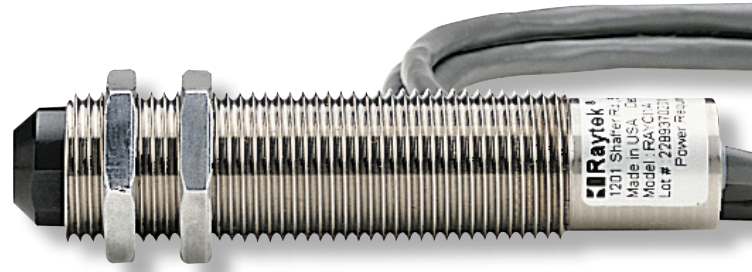


D:S is the optical resolution expressed as a ratio of the distance to the resolution spot divided by the diameter of the spot.

Optical resolution for the CI sensor is 4:1. Nominal spot size based on 90% energy.

## Electrical Specifications

Outputs	User-selectable thermocouple output (model specific, either J or K) or voltage output 10 mV/°C
Cable Length	1 m (3.2 ft) standard, longer cables optional
Output Impedance	50 ohms
Minimum Load Impedance	50K ohms
Power Supply	12–24 VDC ( $\leq$ 2.5% ripple) @ 20 mA



## Accessories Options

Each CI sensor includes two mounting nuts, 1m (3.2ft.) of cable, and an operator's manual. Longer cables up to 15m (50ft.) maximum are available and must be specified at the time of order.

## Sensor Specifications

Environmental Rating	IP 65 (NEMA-4)
Ambient Temperature Range	0°C to 70°C (32°F to 160°F)
With air cooling	0°C to 90°C (32°F to 200°F)
With water cooling	0°C to 260°C (32°F to 500°F)
Storage Temperature	-30°C to 85°C (-22°F to 185°F)
Relative Humidity	10 to 95%, non-condensing
Shock	IEC 68-2-27 (MIL STD 810D) 50 g's, 11 mSec, any axis
Vibration	IEC 68-2-27 (MIL STD 810D) 3 g's, any axis, 11–200 Hz
Weight	130 g (4.5 oz)

Adjustable or fixed mounting bracket for sensing head (XXXCIADJB or XXXCIACFB)

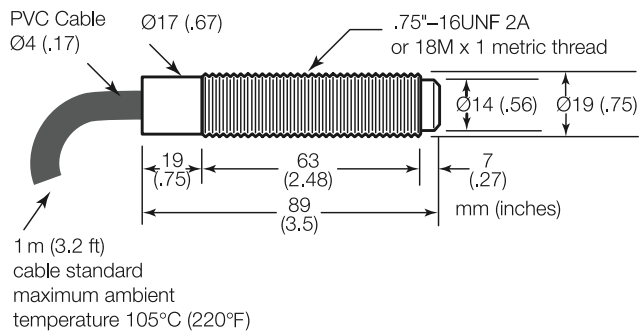


Air purge jacket to keep lens or right angle mirror clean (XXXCIAP or XXXCIACAPM for metric version)

Right angle mirror to ease installation into tight locations (XXXCIACRA)



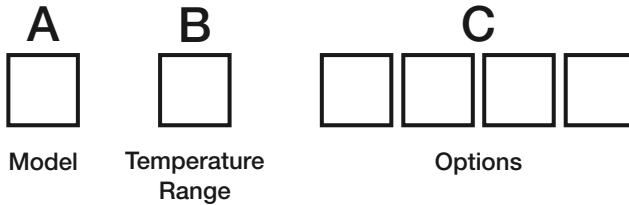
## Sensor Dimensions



Optional water/air cooling/purging system for high temperature environments up to 260°C (500°F)

Optional cooling jacket must be specified at the time of order.

# RAYCI



Model	Description
RAYCI	Raytek infrared temperature sensor
Code A	Response
1	Type J Thermocouple Output
2	Type K Thermocouple Output
3	Voltage Output (Linear 10 mV / °C, scaled 0-5V)
Code B	Temperature Range
A	±2% or ±3°C accuracy between 0°C and 115°C (32°F to 240°F)
B	±2% or ±3°C accuracy between 100°C and 500°C (212°F to 932°F)
Code C	Options
M	18Mx1 metric thread on sensor in place of standard thread
W	Water cooled jacket with built-in air purging and 1m (3') high temperature cable
Typical Model Number	RAYCI1AW

## Fluke Process Instruments

### Americas

Santa Cruz, CA USA  
Tel: +1 800 227 8074 (USA and Canada, only)  
+1 831 458 3900  
[solutions@flukeprocessinstruments.com](mailto:solutions@flukeprocessinstruments.com)

### EMEA

Berlin, Germany  
Tel: +49 30 4 78 00 80  
[info@flukeprocessinstruments.de](mailto:info@flukeprocessinstruments.de)

### China

Beijing, China  
Tel: +8610 6438 4691  
[info@flukeprocessinstruments.cn](mailto:info@flukeprocessinstruments.cn)

### Japan

Tokyo, Japan  
Tel: +81 03 6714 3114  
[info@flukeprocessinstruments.jp](mailto:info@flukeprocessinstruments.jp)

### Asia East and South

India Tel: ++91 22 2920 7691  
Singapore Tel: +65 6799 5578  
[sales.asia@flukeprocessinstruments.com](mailto:sales.asia@flukeprocessinstruments.com)

### Worldwide Service

Fluke Process Instruments offers services, including repair and calibration.  
For more information, contact your local office.

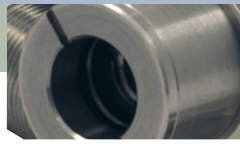
[www.flukeprocessinstruments.com](http://www.flukeprocessinstruments.com)

© 2016 Fluke Process Instruments  
Specifications subject to change without notice.  
11/2016 3111440G



Raytek is an ISO 9001 certified company

CM



Noncontact Temperature Measurement for Industrial Applications & OEMs



## CM Highlights

- Scaleable 0-5 V, type J or K output
- Wide -20°C to 500°C (-4°F to 932°F) temperature range
- Rugged IP 65 (NEMA-4) stainless steel housing
- Rugged 13:1 optics at 90% energy
- 150 mSec (95%) response time
- Alarm output
- Sensor status/self diagnostic indicator LED
- RS232 digital communications for sensor set-up and monitoring
- Adjustable signal processing
- DataTemp® Multidrop software compatible
- Accessories for air purging and lens protection

The Raytek® CM sensor provides the advantages of infrared temperature measurement in a powerful, compact, integrated sensor. Designed for easy integration, the CM sensor can easily replace traditional contact probes with a J-type or K-type thermocouple output, or with a user scaleable 0-5 volt output, if your application is susceptible to noise.

The CM sensor is designed to measure target temperatures ranging from -20°C to 500°C (-4°F to 932°F). The CM's onboard electronics are protected by a rugged IP 65 (NEMA-4) stainless steel housing, allowing the sensor to function in ambient temperatures to 70°C (160°F) without cooling.

Although small in size, the CM is loaded with advanced features. An RS232 digital interface allows the user to configure all programmable sensor variables with the powerful DataTemp Multidrop software included with each sensor. These include a 24 volt DC alarm output triggered by target temperature or head ambient temperature, peak hold, valley hold or variable averaging signal processing, adjustable target emissivity settings and adjustable window transmissivity setting. The built-in sensor health LED provides a convenient on-line indicator of the sensor's operating status and aids in troubleshooting initial sensor set up.

*Compact. Powerful. Easy to install. Affordable.* The Raytek CM sensor is the ideal solution for both OEM and end-user applications.

## Measurement Specifications

Temperature Range	-20°C to 500°C (-4°F to 932°F)
Accuracy (mV)	± 1.5% of reading or ± 2°C, whichever is greater <sup>1,2</sup>
Accuracy (t/c)	± 1.5% of reading ± 2°C or ± 4°C, whichever is greater <sup>1,2,3</sup>
Spectral Response	8 to 14 microns
Repeatability (digital and voltage)	± 0.5% of reading or ± 2°C, whichever is greater
Repeatability (t/c)	± 0.5% of reading ± 1°C or ± 2°C, whichever is greater
Temperature Resolution	0.1°C
Response Time (95%)	150 mSec
Emissivity	0.10 to 1.10 (adjustable)
Transmissivity	0.10 to 1.00 (adjustable)
Signal Processing	Peak hold, valley hold, variable averaging
Self diagnostics/sensor status	Normal operation, alarm, out of range, unstable, sensor fault
Bore-Sight tolerance <sup>4</sup>	3° @ focal point

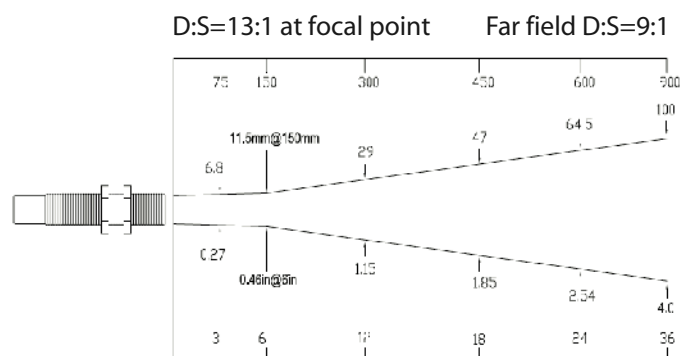
<sup>1</sup> Accuracy from -20 to 0°C is ±3.5°C (Digital and voltage), ± 5.5°C (t/c)

<sup>2</sup> Accuracy and resolution specifications are valid for ambient temperature 23°C ± 5°C, e = 0.95 and calibration geometry

<sup>3</sup> Accuracy measured on the 0-5 VDC output or RS232 for t/c models is ± 1.5% of reading or ± 2°C, whichever is greater

<sup>4</sup> Typical values measured at focal distance

## Nominal Optical Specifications



D:S is the optical resolution expressed as a ratio of the distance to the target spot divided by the diameter of the spot.

Nominal spot size based on 90% energy.

## Electrical Specifications

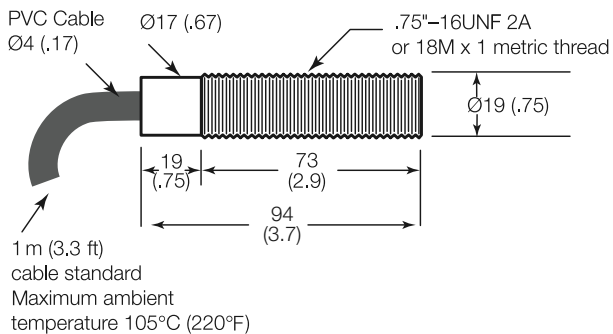
Analog Outputs	Model specific Type J, Type K or scaleable 0-5V voltage output
Cable Length	1m (3.3 ft) standard 3m (9.8 ft) cables optional
Thermocouple	
Output Impedance	100 ohms
Voltage Output	
Minimum Load Impedance	50K ohms
Power Supply	24 VDC $\pm$ 20% @ 20mA
Digital Output <sup>5</sup>	Two-way RS232 digital output
Alarm Output <sup>5</sup>	Transistor, 24VDC @ 20mA

<sup>5</sup> Digital output and alarm output share a common wire. User selects either alarm output or RS232 communication via Datatemp Multidrop software.

## Sensor Specifications

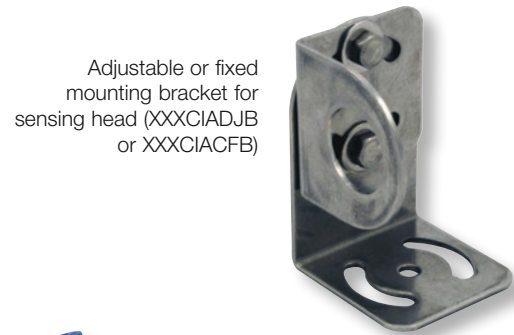
Environmental Rating	IP 65 (NEMA-4)
Ambient Temperature Range	-10°C to 70°C (14°F to 160°F)
Cable Temperature Range	-30°C to 105°C (-22°F to 220°F)
Storage Temperature	-20°C to 85°C (-4°F to 185°F)
Relative Humidity	10 to 95%, non-condensing
Shock	IEC 68-2-27 (MIL STD 810D) 50 g's, 11 mSec, any axis
Vibration	IEC 68-2-27 (MIL STD 810D) 3 g's, any axis, 11-200 Hz
Weight	1m cable model: <200 g (7 oz)

## Sensor Dimensions



## Accessories Options

Each CM sensor includes two mounting nuts, 1m (3.3ft.) of cable, and a quick start guide. 3m (9.8ft) cables are also available.



Adjustable or fixed mounting bracket for sensing head (XXXCIADJB or XXXCIACFB)



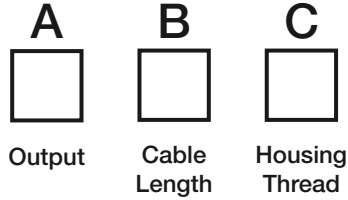
Air purge jacket to keep lens or right angle mirror clean (XXXCMAP or XXXCMAPM for metric version)

Protective lens covering (XXXCMACPW or XXXCMACPWM)



Right angle mirror to ease installation into tight locations (XXXCMACRA or XXXCMACRAM)

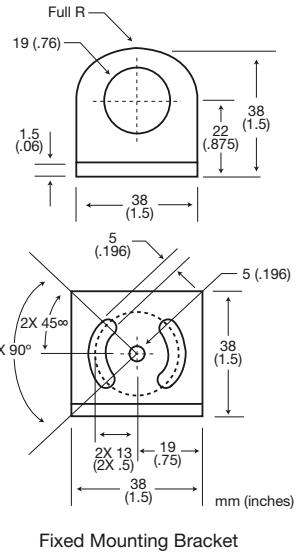
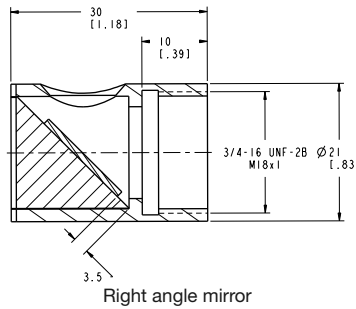
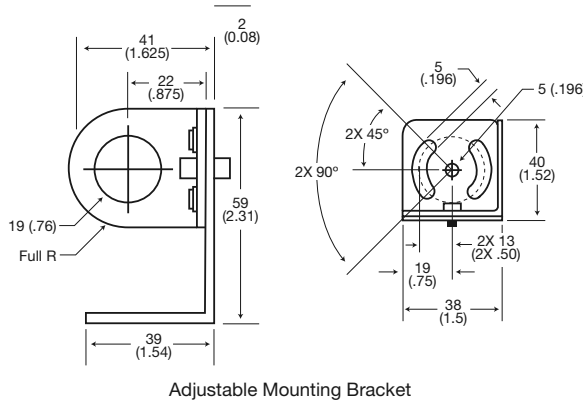
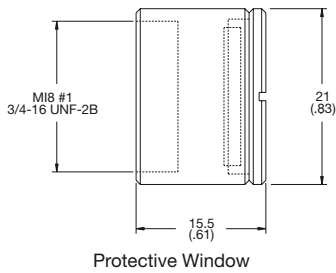
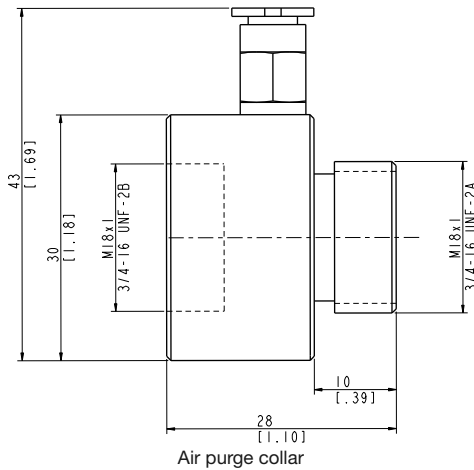
# RAYCMLT



Typical Model Number RAYCMLTV3

Model	Description
RAYCMLT	Raytek infrared temperature sensor
Code A	Output
J	Type J Thermocouple Output
K	Type K Thermocouple Output
V	Voltage Output (Linear, scaleable from 0-5V)
Code B	Cable Length
1	1M (3.3ft) Cable
3	3M (9.8ft) Cable
Code C	Housing thread
M	Standard 0.75-16 UNF 18 MX1 Metric

## Accessory Dimensions



## Fluke Process Instruments

### Americas

Santa Cruz, CA USA  
Tel: +1 800 227 8074 (USA and Canada, only)  
+1 831 458 3900

[solutions@flukeprocessinstruments.com](mailto:solutions@flukeprocessinstruments.com)

### EMEA

Berlin, Germany  
Tel: +49 30 4 78 00 80  
[info@flukeprocessinstruments.de](mailto:info@flukeprocessinstruments.de)

### China

Beijing, China  
Tel: +8610 6438 4691  
[info@flukeprocessinstruments.cn](mailto:info@flukeprocessinstruments.cn)

### Japan

Tokyo, Japan  
Tel: +81 03 6714 3114  
[info@flukeprocessinstruments.jp](mailto:info@flukeprocessinstruments.jp)

### Asia East and South

India Tel: ++91 22 2920 7691  
Singapore Tel: +65 6799 5578  
[sales.asia@flukeprocessinstruments.com](mailto:sales.asia@flukeprocessinstruments.com)

### Worldwide Service

Fluke Process Instruments offers services, including repair and calibration. For more information, contact your local office.

[www.flukeprocessinstruments.com](http://www.flukeprocessinstruments.com)

© 2016 Fluke Process Instruments  
Specifications subject to change without notice.  
11/2016 3449292C



Raytek is an ISO 9001 certified company