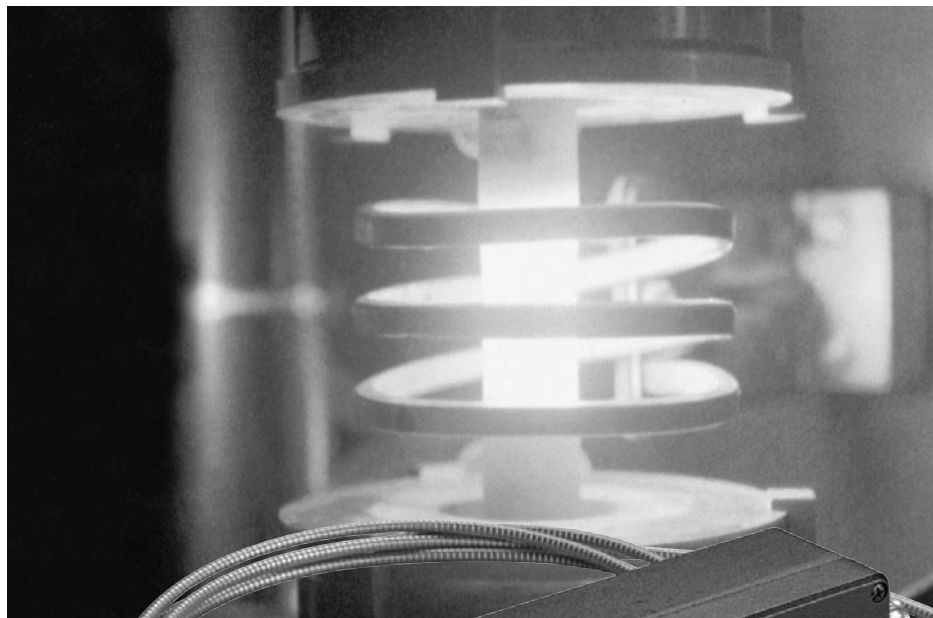


# FA1/FA2

Raytek MARATHON SERIES

## Fiber Optic Noncontact Thermometers



*FA model shown with optional adjustable mounting bracket*

**Raytek**<sup>®</sup>  
A Fluke Company

# FA1/FA2 Highlights

- Rugged fiber optic measurement systems
- Laser aiming available on selected models
- Fiber cable rated to 315°C (600°F) available on selected models
- Programmable relay output (dual temperature setpoints or “fail-safe”)
- Simultaneous analog and digital outputs
- Bi-directional RS485 communications
- Supports up to 32 Marathon Series sensors on a multipoint network
- Windows® DataTemp® software for data acquisition, display, and analysis (operates under WIN 3.1/95/98/NT4 Windows 2000, XP)
- Field Calibration Software

Marathon fiber optic infrared thermometers (FA1/FA2) consist of a rugged fiber optic cable plus optical head assembly connected to an electronics housing containing the detector, processing electronics, internal user interface/LED display, and termination connections for field wiring. FA1/FA2 thermometers permit measurement of targets in harsh industrial environments that are otherwise inaccessible by non-fiber optic thermometers.

FA1/FA2 thermometers maintain high accuracy over the ambient operating temperature range from 0° to 60°C (32° to 140°F).

The fixed-focus optical head consists of a small stainless steel cylindrical housing and lens assembly. The optical head accommodates an air-purge accessory to prevent lens contamination and the fiber optic cable is protected by metal armor. The assembly accommodates a small bend radius for threading through tight spaces.

The Marathon FA1G sensor, specifically designed for measuring glass temperature from 750° to 1675°C (1382° to 3047°F), permits measurement of melter, refiner, regenerator, and forehearth temperatures.

# Specifications

## Measurement

Models	Temperature Range
FA1A	475° to 900°C (887° to 1652°F)
FA1B	800° to 1900°C (1472° to 3452°F)
FA1C	1200° to 3000°C (2192° to 5432°F)
FA1G	750° to 1675°C (1384° to 3047°F)
FA2A	250° to 800°C (482° to 1472°F)
FA2B	400° to 1700°C (752° to 3092°F)
Spectral Response/Detector	
FA1	1.0 μm (Si detector)
FA2	1.6 μm (InGaAs detector)
Fiber Cable Lengths	
	1m (3'), 3m (10'), 6m (19'), and 10m (32')
Accuracy	
FA1/FA2	±(0.3%T <sub>meas</sub> + 2°C); T <sub>meas</sub> in °C
FA1G	±3°C (±5.4°F)
Repeatability	±1°C
Temperature Resolution	±0.05°C (±0.1°F)
Response Time	10 mSec; averaging selectable to 10 sec
Emissivity	0.1 to 1.0 in 0.01 increments
Signal Processing	Peak Hold, Valley Hold, Averaging

## Optical

Models	Focus Distance			
	D:S*	CF1	CF2	SFO
**FA1A 20	4mm@102mm (0.17"@4")	15mm@305mm (0.60"@12")	76mm@1524mm (3"@60")	
FA1B 100	1mm@102mm (0.04"@4")	2.08mm@305mm (0.11"@12")	160mm@1524mm (0.62"@60")	
FA1C 100	1mm@102mm (0.04"@4")	2.08mm@305mm (0.11"@12")	160mm@1524mm (0.62"@60")	
FA1G 100	NA	NA	∞	
**FA2A 20	4mm@102mm (0.17"@4")	15mm@305mm (0.60"@12")	76mm@1524mm (3"@60")	
FA2B 40	2.5mm@102mm (0.1"@4")	7mm@305mm (0.26"@12")	38mm@1524mm (1.5"@60")	

\*At 95% energy Recommend: Target diameter Spot size diameter ≥1.4 \*\*Available with laser aiming

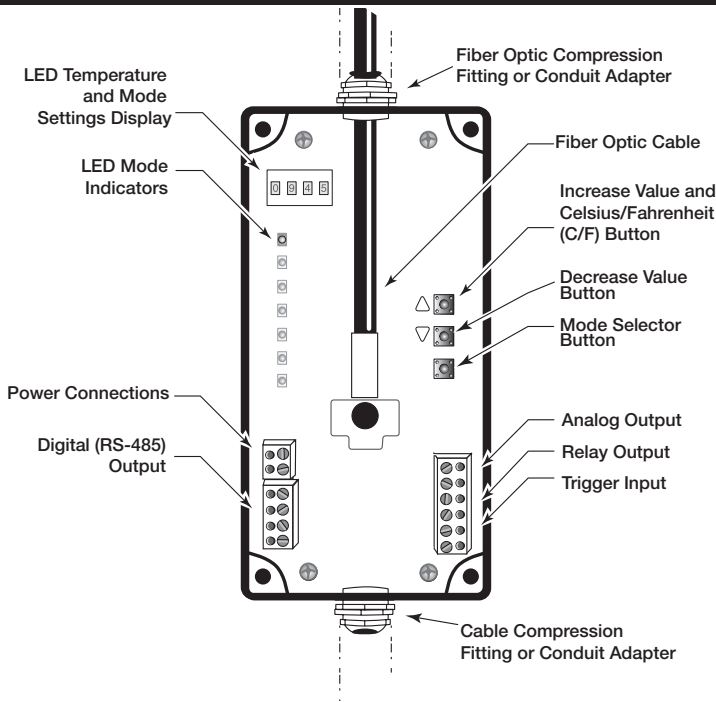
## Electrical

Outputs	0/4–20 mA; RS-485, 2-wire/4-wire, networkable to 32 sensors; Relay (SPST 48V, 300 mA, response time < 2 mSec)
Power Requirements	24 VDC, 250 mA, ±20%
Compliance	CE low voltage directive; EN 61326

## General

Environmental Rating	NEMA-4 (IEC 529, IP 65)
Ambient Temperature	
Electronics housing	0° to 60°C (32° to 140°F)
With water cooling option	0° to 150°C (32° to 300°F); 2 l (0.5 gal) per minute 16°C (62°F)
Fiber cable/Optical head	0° to 200°C (32° to 392°F); standard temperature rating 0° to 315°C (32° to 600°F); high-temperature option
Air purge	0.5 to 1.5 l/sec (1-3 CFM)
Storage Temperature	
Electronics housing	-20° to 70°C (-4° to 158°F)
Relative Humidity	10% to 95% non-condensing
Shock	
(Electronics Housing)	MIL-STD-810D (IEC 68-2-27)
Vibration	
(Electronics Housing)	MIL-STD-810D (IEC 68-2-6)
Weight	
Electronics Housing	0.71 kg (25 oz)
Optical Head	0.10 kg (3 oz)
Cable protection	Rated to 200°C; stainless steel armor; Viton coating, rubber “boot”, and NEMA-4 (not available on high temperature cable); provision for conduit to protect fiber cable

# User Interface

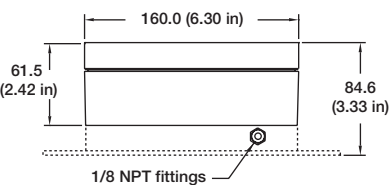
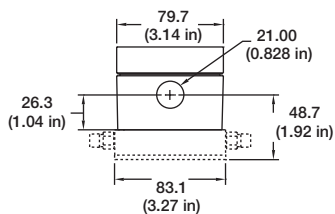
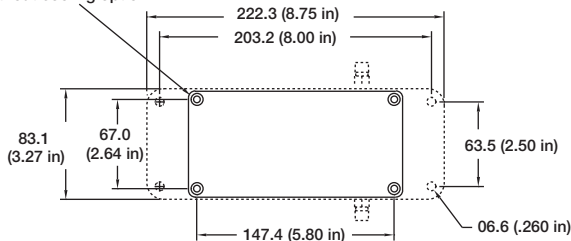


# Physical Dimensions

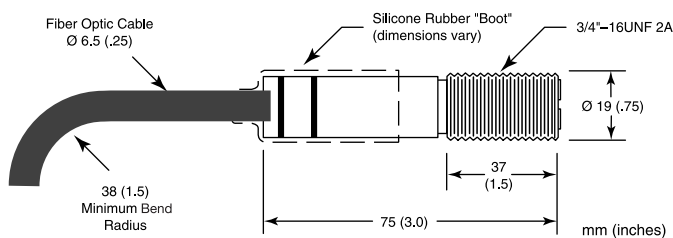
## Electronics Housing

(Cooling Platform option "W" shown as a dotted line)

Mounting hole diameter 5mm (0.188 in)  
Fastener head diameter 8mm (0.31 in) MAX  
for units without cooling option



## Optical Head



# Accessories

## Adjustable Mounting Bracket (XXXFOMB)

Adjustable mounting bracket for FA/FR optical head.

## Quick-Release/Air Purging Accessory

Rugged fiber optic stainless steel air purge collar with quick release fitting protective sapphire window: (XXXFORFQP).

## Air Purge Collar

Air purge collar and stainless steel sighting-tube, 150mm (6 in) long, 25mm (1 in) diameter: (XXXFOHAPA).

## Right Angle Mirror (XXXCIACRA)

Connects to Optical Head

## NIST Calibration (2132558)

Power Supply (24VDC, 110/220VAC input) and Marathon Terminal Block mounted in a NEMA 4 (IP65) enclosure (RAYMAPB)

Power Supply 24VDC 1.1A Switching power supply with universal input (110/220V) (XXX2CDCPSS)

## Spare Marathon Terminal Block Accessory (XXXMATB)

Spare Marathon Terminal Block in a NEMA-4 enclosure (XXXMATBN4)

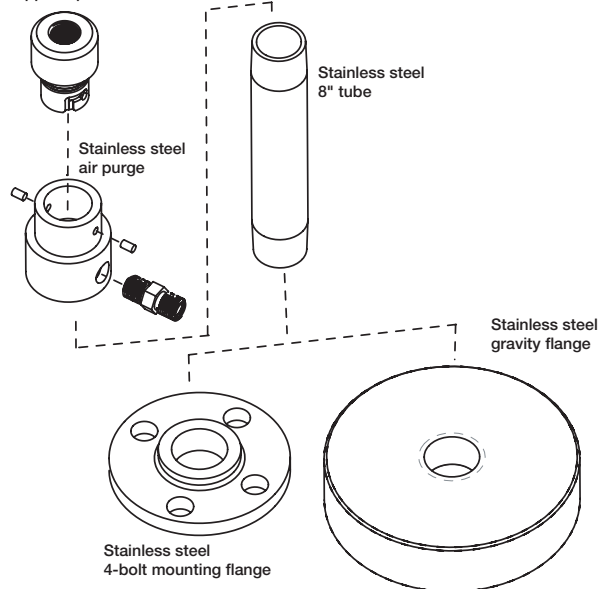
## SMART RS485/RS232 CONVERTERS

DB25 to Terminal Strip Interface Converter, recommended for direct wiring between a serial interface and the Marathon terminal block (XXX485CVT)

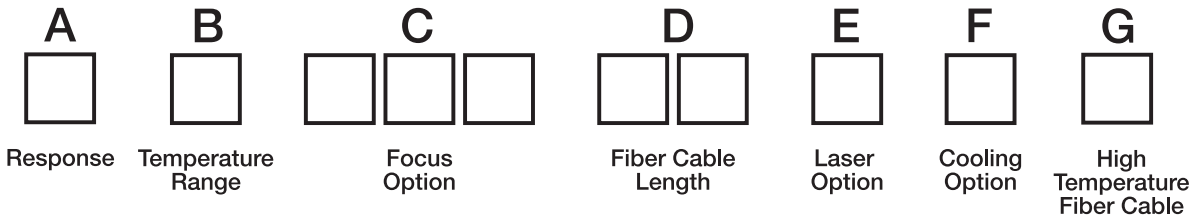
## Rooftop Mounting/Purging

Available with flange (XXXFORFMF) or gravity-held base (XXXFORFMC) with quick-release fitting for Optical Head, sapphire window, stainless steel pipe-cap or flanged mounting base.

Stainless steel quick disconnect and sapphire protective window



**RAYFA**



Model	Description	
RAYFA	Raytek Fiber Optic Thermometer	
Code A	Response	
1	1 micron spectral response	
2	1.6 micron spectral response	
Code B	Temperature Range (FA1)	Code B Temperature Range (FA2)
A	475° to 900°C (752° to 1652°F) 20:1 D:S	A 250° to 800°C (482° to 1472°F)
B	800° to 1900°C (1472° to 3092°F) 100:1 D:S	B 400° to 1700°C ( 752° to 3092°F)
C	1200° to 3000°C (2192° to 5432°F) 100:1 D:S	
G	750° to 1675°C (1382° to 3047°F) 100:1* D:S	
Code C	Focus Option	
SF0	Standard Focus Optical Head Focused at "infinity" *	
CF1	Close Focus Optical Head Focused distance at 100mm (4 inch)	
CF2	Close Focus Optical Head Focused distance at 300mm (12 inch)	
Code D	Fiber Cable Length	
01	1m (≈ 3') length fiber optic cable with connector	
03	3m (≈10') length fiber optic cable with connector	
06	6m (≈19.7') length fiber optic cable with connector	
10	10m (≈ 32.8') length fiber optic cable with connector	
Code E	Laser Aiming Option **	
L	Laser aiming available on FA1A and FA2A models	
Code F	Cooling Platform Option	
W	Water cooled mounting platform for FA housing	
Code G	High Temperature Fiber Cable	
H	Rated to 315°C (600°F) (Not available on FA2); option excludes Teflon Sheath and NEMA-4 rating	
Typical Model Number	FA1ACF103LW	

\* The FA1G is available only with SF0 optics \*\* Contact factory for availability of special FA1B or FA1C laser models

**The Worldwide Leader in Noncontact Temperature Measurement**

**Raytek Corporation**  
**Worldwide Headquarters**  
 Santa Cruz, CA USA  
 Tel: 1 800 227 8074 (USA and Canada, only)  
 1 831 458 3900  
 solutions@raytek.com

**European Headquarters**  
 Berlin, Germany France United Kingdom  
 Tel: 49 30 4 78 00 80 Tel: 0800 888 244 Tel: +44 1908 630 800  
 raytek@raytek.de info@raytek.fr ukinfo@raytek.com

**China Headquarters**  
 Beijing, China  
 Tel: 8610 6438 4691  
 info@raytek.com.cn

To find a Raytek office near you, please visit [www.raytek.com](http://www.raytek.com)

**Worldwide Service**  
 Raytek offers services, including repair and calibration.  
 For more information, contact your local office or e-mail support@raytek.com

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



Raytek is an ISO 9001 certified company

© 2008 Raytek Corporation (3112050 Rev. G) 9/2008  
 Raytek, the Raytek logo and DataTemp are registered trademarks of Raytek Corporation.  
 Viton is a registered trade mark of DuPont Dow Elastomers.  
 Windows is a registered trademark of Microsoft Corporation.  
 Specifications subject to change without notice.

<https://www.kontrolkalemi.com/forum/>