

Highlights

- Fast response time down to 10 ms
- Fiber optic cable field-replaceable without recalibration
- High accuracy
- Wide temperature range: 500 to 2500°C (932 to 4532°F)
- One- or two-colour operation (unique feature)
- High optical resolution up to 65:1
- Fiber optic assembly withstands 200°C (392°F), optional up to 315°C (600°F)
- Bi-directional RS485 communication, networkable
- Focus distances down to 100 mm (3.9 in)
- Simultaneous analog output
- Unique “dirty window” alarm
- Programmable relay output: dual temperature setpoints and failsafe alarm
- DataTemp® software for remote configuration and monitoring

General Specifications

Environmental Rating	IP65 (IEC529) / NEMA-4
Ambient Temperature	
Optical head	0 to 315°C (32 to 600°F)
Fiber cable	0 to 200°C (32 to 392°F) optional up to 315°C (600°F)
Electronics housing	0 to 50°C (32 to 122°F) with cooling platform up to 150°C (302°F)
Storage Temperature	
Electronics housing	-20 to 70°C (-4 to 158°F)
Relative Humidity	10 to 95%, non-condensing
Shock	
Electronics housing	IEC 68-2-27
Vibration	
Electronics housing	IEC 68-2-6
Weight	
Optical head	100 g (3.5 oz)
Electronics housing	710 g (25 oz)
Fiber Cable Protection	rated to 200°C (392°F), stainless steel armour, Viton coated, IP65 / NEMA-4, provision for conduit to protect fiber cable

Marathon Series

FR Datasheet



Measurement Specifications

Temperature Range	
FR1A	500 to 1100°C (932 to 2012°F)
FR1B	700 to 1500°C (1292 to 2732°F)
FR1C	1000 to 2500°C (1832 to 4532°F)
Spectral Response	1.0 µm nominal (Si/Si layered detector)
System Accuracy	
No attenuation	± (0.3% T _{meas} ¹ + 2°C)
up to 95% attenuation	± (1% T _{meas} ¹ + 2°C) for FR1A/FR1B
up to 95% attenuation	± (1.3% T _{meas} ¹ + 2°C) for FR1C
Repeatability	±1°C
Temperature Resolution	±1°C
Response Time	10 ms (95%), selectable to 10 s
Emissivity	0.10 to 1.00 in 0.01 increments (one-color)
Slope	0.850 to 1.150 in 0.001 increments (two-color)
Signal Processing	Peak hold, averaging

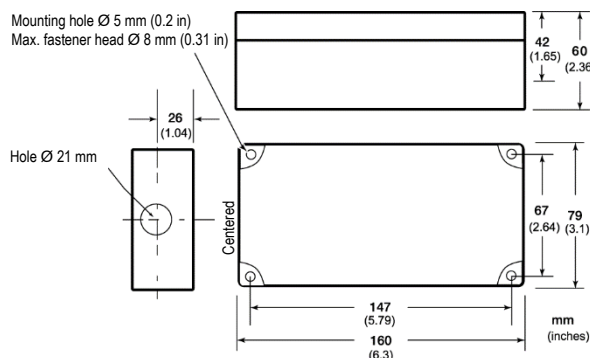
¹ T_{meas} in °C

Electrical Specifications

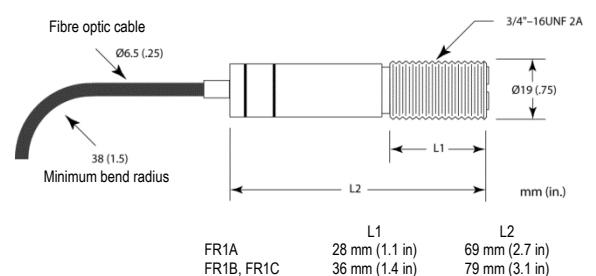
Outputs	0/4-20 mA; RS485, 2-wire or 4-wire, networkable to 32 sensors Relay, 48 V, 300 mA, response time < 2 ms
Power Supply	24 VDC ± 20%, 500 mA

Dimensions

Electronics Housing



Optical Head

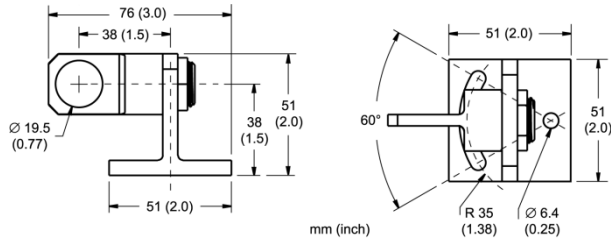


Accessories

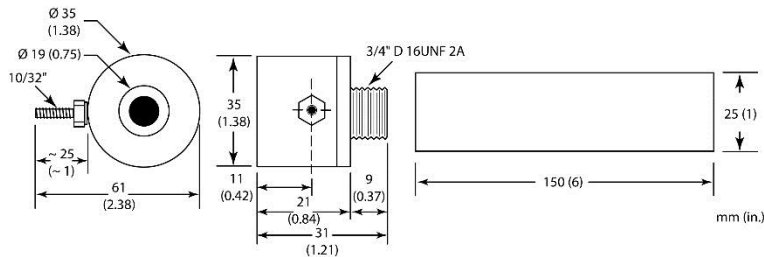
The models will be delivered with an adjustable bracket, mounting nuts, Marathon Support Software, Field Calibration Software, an operator's manual and an aiming-light (battery powered, for A and B models only). Additional accessories are available:

- Furnace rooftop mounting/purging system available with either flange (XXXFORFMF) or gravity-held base (XXXFORFMC)
- Stainless steel air-purge collar for optical head with integrated stainless steel sighting tube (XXXFOHAPA)
- Fiber-optic sighting tube conduit accessory, L 300 mm (12 in), \varnothing 32 mm (1.3 in), (XXXFOSTCA)
- 24 VDC / 1.3 A power supply with universal 100 / 240 VAC input (XXXSYSYS)
- USB/RS485 converter (XXXUSB485)
- Terminal block (XXXMATB)
- Terminal block with 24 VDC power supply and enclosure (RAYMAPB)

Adjustable Bracket (XXXFOMB)



Air Purge Collar (XXXFOHAPA)



Furnace rooftop mounting/purging system available with either flange (XXXFORFMF) or gravity-held base (XXXFORFMC)

Optical Specifications

Optical Resolution D : S¹

FR1A	20 : 1
FR1B	40 : 1
FR1C	65 : 1

Focus Distances

Standard Focus	∞
Close Focus 1	100 mm (3.9 in)
Close Focus 2	300 mm (12 in)

¹ at 95% energy, D: Distance between sensor and object, S: diameter of spot size

Options

Options must be specified at time of order.

- Fiber optic cable lengths: 1, 3, 6, 10 m (3, 10, 20, 33 ft)
- Manufacturer's Calibration Certificate based on certified probes traced on national standards, e.g. DAKK5 (XXXFR1CERT)
- Laser Sighting (...L) only on FR1A/FR1B models
- Electronics Housing Cooling Platform (...W)
- 12-pin DIN quick disconnect connector on electronics box (...C)
- High Temperature Fiber Cable (...H), rated to 315°C (600°F), option excludes Viton coating and IP65 rating

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Worldwide Service

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