

Highlights

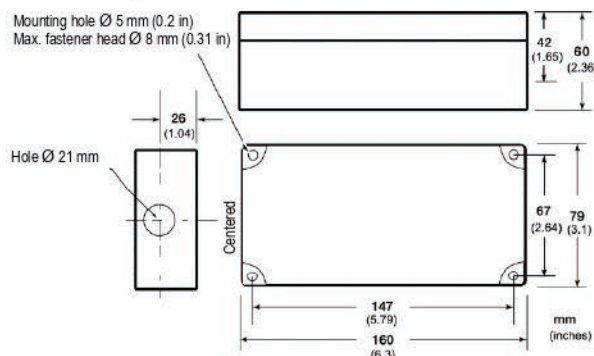
- Fast response time down to 10 ms
- Fiber optic cable field-replaceable without recalibration
- High accuracy
- Wide temperature range: 500 to 2500°C (932 to 4532°F)
- One- or two-colour operation (unique feature)
- High optical resolution up to 65:1
- Fiber optic assembly withstands 200°C (392°F), 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

Dimensions

Electronics Housing



Marathon Series

FR Datasheet



Measurement Specifications

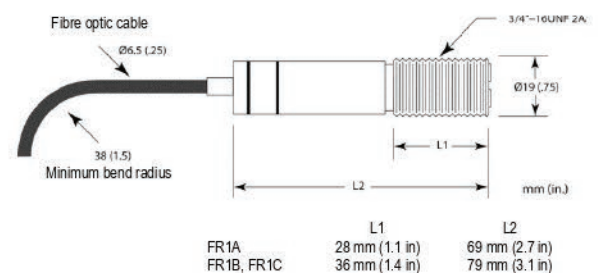
Temperature Range	
FR1A	500 to 1100°C (932 to 2012°F)
FR1B	700 to 1500°C (1292 to 2732°F)
FR1C	1000 to 2500°C (1832 to 4532°F)
Spectral Response	1.0 μ m nominal (Si/Si layered detector)
System Accuracy	
No attenuation	\pm (0.3% $T_{meas} + 2^\circ$ C)
up to 95% attenuation	\pm (1% $T_{meas} + 2^\circ$ C) for FR1A/FR1B
up to 95% attenuation	\pm (1.3% $T_{meas} + 2^\circ$ C) for FR1C
Repeatability	$\pm 1^\circ$ C
Temperature Resolution	$\pm 1^\circ$ 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

[†] T_{meas} in $^\circ$ 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 \pm 20%, 500 mA

Optical Head

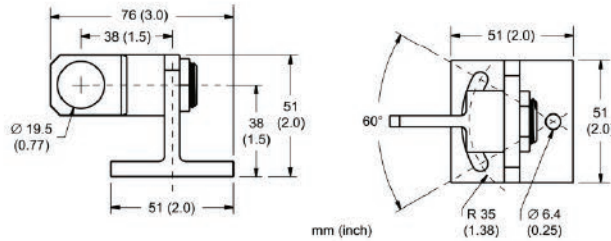


Accessories

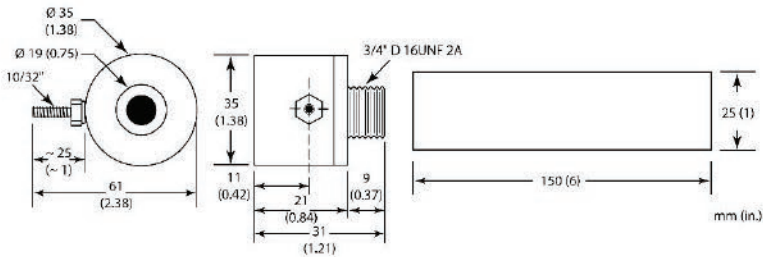
The models will be delivered with an adjustable bracket, mounting nuts, Marathon Support Software, Field Calibration Software, an operator's manual and an aiming-light (battery powered, for A and B models only). Additional accessories are available:

- 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 (XXXSYSPS)
- 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. DAKKS (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