



Extreme Accuracy in High Temperature Environments without Cooling

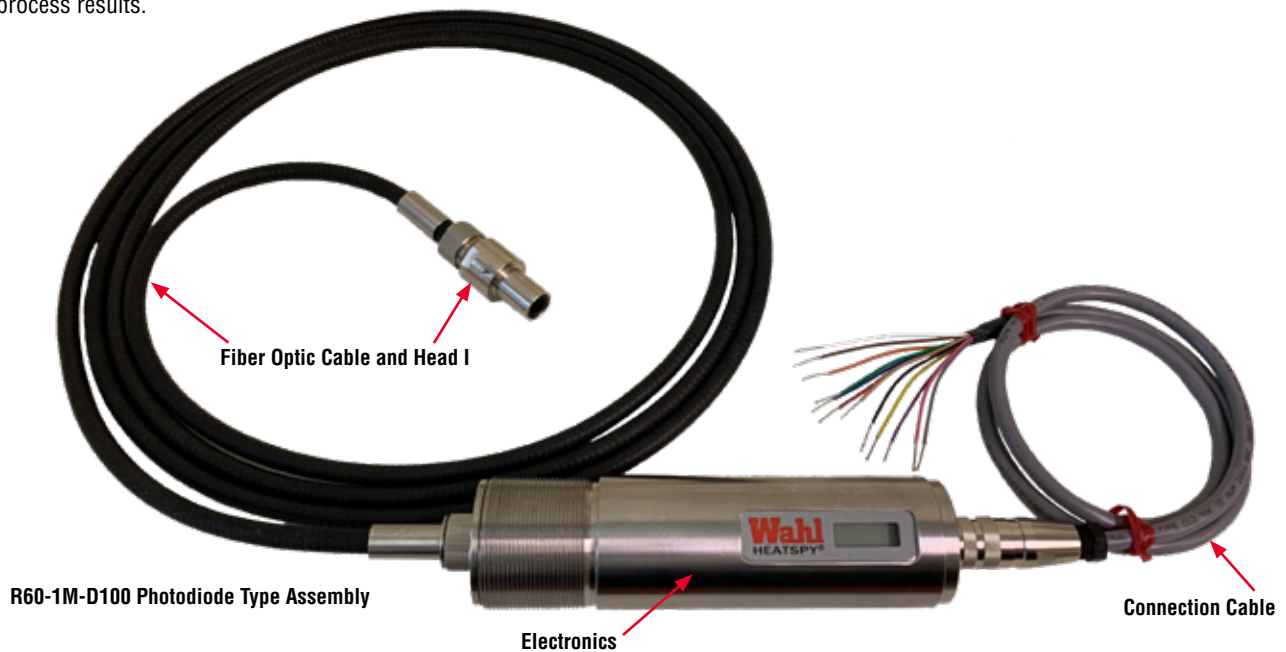
Designed and Built in Asheville, North Carolina - USA!

**Heat Spy® Monitor R60 Series
Fiber Optic Fixed Infrared Sensor**

The new Wahl R60 Fiber Optic Fixed Infrared Sensor maintains its accuracy in high ambient temperatures up to 200°C without cooling. Ideal for processes involving electromagnetic interference, tight installation space, or where a water source is not practical.

Choose from five available optics options to fit the requirements of your installation.

Backed by our 2 year warranty, the R60 can be used in a wide range of applications, assuring confidence in your process results.



R60-1M-D100 Photodiode Type Assembly

Electronics

Connection Cable

Micron Spectral Range to Cover Application				
		Spectral Range	Temperature Range	Application
1M	Molten Metal	1.0µm	400° to 3000°C, (752° to 5432°F)	Molten Glass Molten Metal Molten Ceramics Hot Graphite Ferrous Metal
2M	Hot Metal	1.6µm	300° to 2300°C, (572° to 4172°F)	Hot Metal Hot Ceramic Non-Ferrous Metal

R60 FEATURES

Measuring System

Each R60 Infrared Thermometer consists of three separate parts:

1. Single lens optical head to collect the IR radiation from up to 200°C in harsh environments without a cooling system!
2. Flexible Fiber Optic steel coated cable transmits the IR radiation up to 100 meters from the “head” to the electronic module.
3. Microprocessor electronic module to convert the IR radiation in electric signal and temperature reading.

Laser Pinpointing System

A laser is installed into the electronic module and the spot is projected by the optical head for target alignment. The laser can be operated remotely or with the user interface.



Specifications subject to change without notice.

Heat Spy is a registered trademark of Wahl Instruments, Inc.

R60 FEATURES AND SPECIFICATIONS

Back-lit 5-Digit LCD display with 4-Key Pad for convenient on-site viewing and setting without a computer.

12-Pin connection cable for simultaneous analog/digital input and output.

- 0-20 or 4-20 mA Linear Current Loop, sub-range programmable, user selectable.
- RS485 for networking up to 32 sensors.
- Relay for alarm and PLC control, user programmable.
- External Input for reset and parameter adjusting of AVG, PEAK HOLD and VALLEY HOLD.

Built-in Laser to simplify alignment operation.

Programmable for OEM applications through RS485 for remote setup and monitoring.

Optional non-contact Thermocouple Type IR tube with extremely long life is available as an alternative to traditional contact thermocouples, (see pg 5).

Sensor Specifications	
Ambient Temperature	0° to 200°C, (32° to 392°F)
Optical Head	0° to 200°C, (32° to 392°F)
Optical Cable	0° to 200°C, (32° to 392°F)
Electronic Module	-20° to 60°C (-4° to 140°F)
Storage	-20° to 70°C (-4° to 158°F)
Relative Humidity	10% to 95% non-condensing
Protection Class	IP65 (NEMA 4)
Laser Sight	650 nm <1mW, Class II
Shock & Vibration	MIL-STD-810D
Optical Head I Dimensions	30 x 52 mm (1.18 x 2.04 in) - Fast Lock
Optical Head II Dimensions	30 x 94 mm (1.18 x 3.70 in) - Threaded M30 x 1
Fiber Optic Cable	8 mm (0.31 in) Diameter
Housing Material	ANSI 304 Stainless Steel
Housing Dimensions	45mm Dia. x 183mm (1.77 x 7.20 in)
Weight	0.72 kg (1.58 lbs)

R60 FEATURES

A high technology non-contact infrared sensor, designed to meet all application requirements by offering high performance and advanced functionality. The rugged, IP65 (NEMA 4) system gives the R60 the flexibility to handle nearly any application.

The R60 is widely used in high ambient temperature applications up to 200°C without cooling, and in processes involving electromagnetic interferences.

The R60 includes signal processing features including Peak Hold, Valley Hold and Averaging, all of which are adjustable on-site via the keypad or controlled remotely when interfaced with user's software.



Electronic Specifications

LCD	5-Digit, 1° Resolution
Keyboard	4 - Key
Analog Output	0-20mA, 4-20mA
Digital Output	RS485
Alarm	High or Low
Signal Processing	AVG / PEAK HOLD / VALLEY HOLD
Relay	User Programmable
Cable	12-pin Connection Cable
Power Supply	24 VDC Nominal, (10 - 32 VDC)

Measuring Specifications

	1ML / 1MM / 1MH / 2ML / 2MM / 2MH
Accuracy ¹	± 0.25% of reading
Repeatability ²	± 0.10% of reading
LCD Resolution	1°C / 1°F
Response Time ³	5 mS
Emissivity	0.10 to 1.00

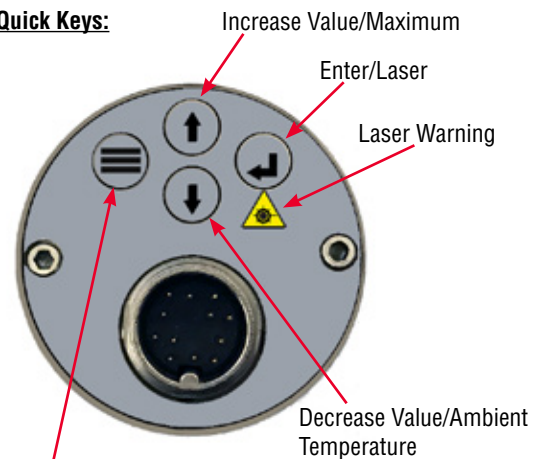
¹ at ambient temperature 23°C, e = 1.0, NIST transfer standard.

² at ambient temperature 23°C.

³ 90% of value.

R60 MENU

Quick Keys:



LCD Display Menu Selections to view and set:

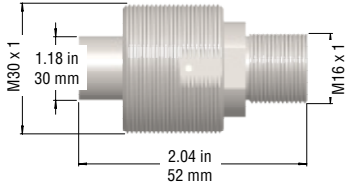
- Real Time Temperature
- Emissivity
- Transmission
- Average/Peak/Valley Select
- Average/Peak/Valley Time Setting
- Analog Output Selection
- High End of mA T Range
- Low End of mA T Range
- Laser Setting
- Alarm Low
- Alarm High
- Multiple Sensor ID
- Baud Rate
- Temperature Unit °F/°C

Specifications subject to change without notice.

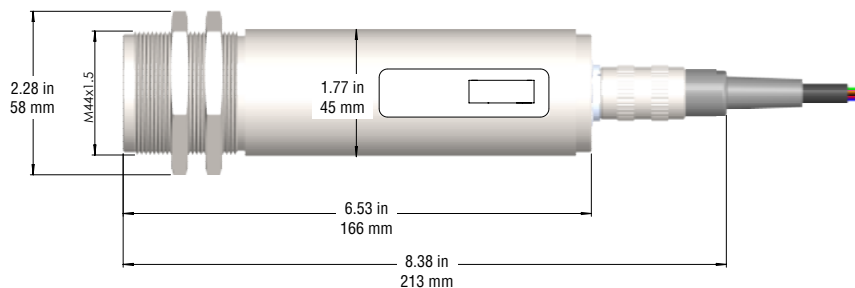
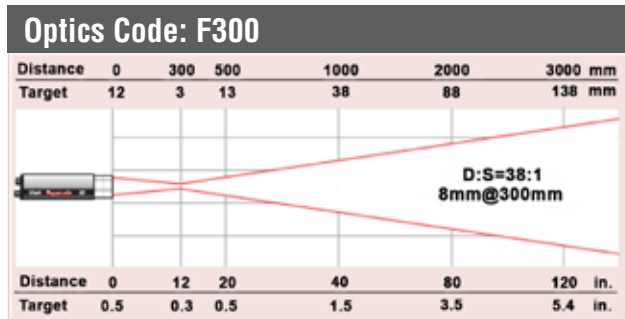
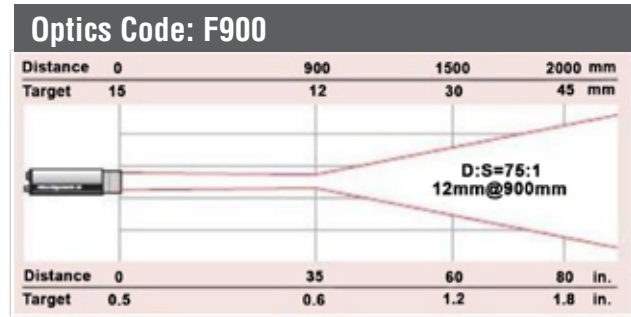
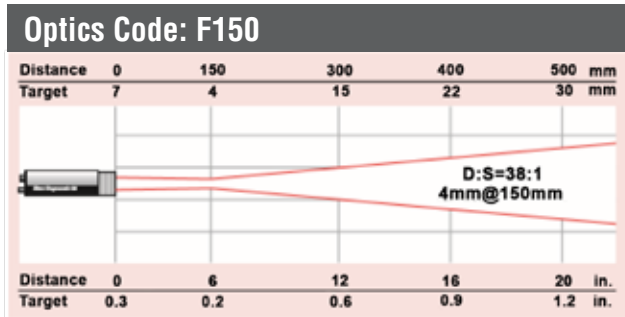
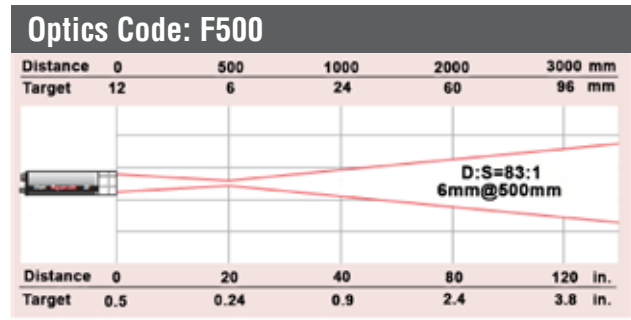
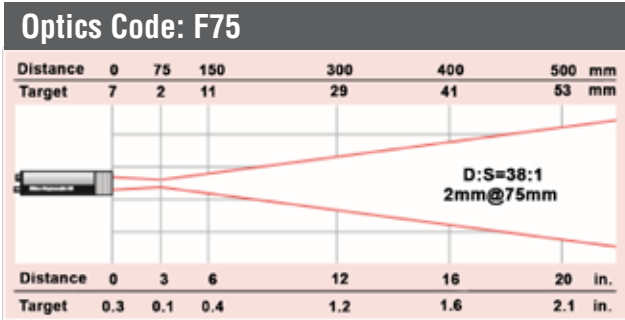
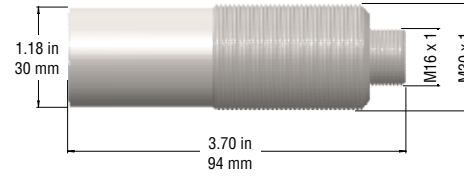
Photodiode Models

1M / 2M OPTICS

Optical Head I with M30 x 1 adapter
for R60 Optical Codes: F75/F150/F300



Optical Head II
for R60 Optics Codes: F500/F900



R60 Fiber Optic Sensor - Dimensions

Specifications subject to change without notice.



R60 Fiber Optic Sensor Ordering Guide

PHOTODIODE MODEL - Step 1 - Select: Model

R60	Fiber Optic Head with Control and Display Box, includes: Certificate of Conformance and User Manual
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Step 2 - Select: Spectral and Temperature Range			
Code	Spectral Range	Temperature Range	Application
1ML	1.0µm	400° to 1800°C, (752° to 3272°F)	Molten Metal/Ceramics Hot Graphite Ferrous Metal
1MM	1.0µm	600° to 1800°C, (1112° to 3272°F)	
1MH	1.0µm	600° to 3000°C, (1112° to 5432°F)	
2ML	1.6µm	300° to 1400°C, (572° to 2552°F)	Hot Metal Hot Ceramic Non-Ferrous Metal
2MM	1.6µm	400° to 1600°C, (752° to 2912°F)	
2MH	1.6µm	400° to 2300°C, (752° to 4172°F)	

Step 3 - Select: Optics		
Optics Code	Optics	Optical Head
F75	2mm@75mm 38:1	Optical Head I
F150	4mm@150mm 38:1	
F300	8mm@300mm 38:1	
F500	6mm@500mm 83:1	Optical Head II
F900	12mm@900mm 75:1	

Step 4 - Select: Fiber Optic Cable Length	
Fiber Optic Cable Code	Length
FB1	1 meter, (3.28 feet) Standard
FB3	3 meters, (9.84 feet)
FB5	5 meters, (16.40 feet)
FB8	8 meters, (26.24 feet)
FB15	15 meters, (49.21 feet)
FBX	Customer Specified Length (100 meters (300 ft) Max)

Step 5 - Select Connection Cable Length	
Code	Length
CB1	Cable, 1 meter, (3.28 feet) (Standard)
CB3	Cable, 3 meters, (9.84 feet)
CB5	Cable, 5 meters, (16.40 feet)
CB8	Cable, 8 meters, (26.24 feet)
CB15	Cable, 15 meters, (49.21 feet)
CBX	Cable, Customer Specified Length (100m (300 ft) Max)

Add desired Accessories (shown on following page) as separate line items.

Model	Spectral/Temp Range Code	Optics Code	Fiber Optic Cable Code	Connection Cable Length Code
R60				
Insert Codes in boxes above to build part number				

Model # Example:

R601MMF300FB1CB15: R60 Series, 1.0µm Spectral Range, 600° to 1800°C, (1112° to 3272°F) Temperature Range, 8mm@300mm Focal Point, 37.5:1 D to S, 1 meter Fiber Optic Cable Length, 15 meter Connection Cable Length.



R60 Accessories

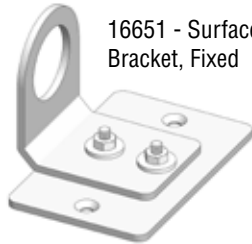
MOUNTING SYSTEM OPTIONS

SURFACE MOUNT

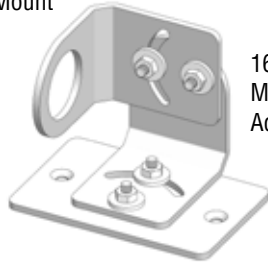
R60 Surface Mount Brackets:

16651 - R60 Surface Mount Bracket, Fixed, Diameter: 30.5mm (1.20")

16653 - R60 Surface Mount Bracket, Adjustable, Dia: 30.5mm (1.20")



16651 - Surface Mount Bracket, Fixed



16653 - Surface Mount Bracket, Adjustable

WALL MOUNT

R40/60 Series Mounting Flange:

16483 - R40/60 Series Wall Mount Flange - M30x1 Male on Fixed IR/Air Purge side



16483 - Wall Mount Flange

ROOFTOP MOUNT

R60 Series Rooftop Mounting Assemblies for Glass Furnace:

16662 - R60 Rooftop Mount with Flange Assembly

16663 - R60 Rooftop Mount with Gravity Assembly



16662



16663

Wahl offers optional Mounting Assemblies for a glass furnaces which enable the user to easily reach the sensor for cleaning and calibration.

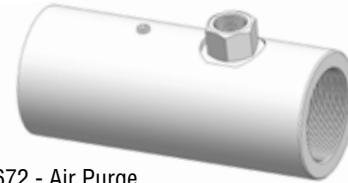
16662 - Flange Assembly includes flange with 4 mounting holes to attach to roof or wall of furnace,

16663 - Heavy Duty Stainless Steel includes heavy duty stainless steel cover specifically designed for a gravity held rooftop mounting.

AIR PURGE

R60 Air Purge

16672 - R60 Air Purge, M30x1 to M30x1



16672 - Air Purge

An Air Purge is used to eliminate dust, dirt, heat, fumes or vapors from the front of the optical head, and to keep the lens clean. Optional windows are not available for the R60.

Note: The R60 does not require a Air/Water Cooling Jacket.

SIGHTING / IR TUBES

R40/60 Series Sighting Tube for use with R60 Optics Code

F900 (D to S: 75:1). M30 x 1, Length: 11.81 in. (300 mm)

16491-1 - SS304, 1500°F (800°C)

16491-2 - Inconel, 2000°F (1100°C)

16491-3 - Silicon Carbide, 3000°F (1600°C)

16491-4 - High Purity Alumina, (99.8%), 3500°F (1900°C)

16491-5 - Glassy Carbon, 5430°F (3000°C)



Use a Sighting Tube to avoid reflected energy in temperature measurement environments. Sighting tubes should be used when the target is blocked by fumes or flames. Use together with an air purge system for a clean viewing path from target to the thermometer.

R40/60 Series Thermocouple IR Tube for use with R60 Optics Code

F300 (D to S: 37.5:1). M30 x 1, Length: 11.81 in. (300 mm)

16492-1 - SS304, 1500°F (800°C)

16492-2 - Inconel, 2000°F (1100°C)

16492-3 - Silicon Carbide, 3000°F (1600°C)

16492-4 - High Purity Alumina, (99.8%), 3500°F (1900°C)

16492-5 - Glassy Carbon, 5430°F (3000°C)



The Thermocouple IR Tube includes a protective thermowell, infrared lens, fiber optic cable and remote electronics. Infrared radiation from the bottom of the well is transmitted by the optical fiber to the detector.

POWER SUPPLY

Power Supply:

16116 - Compact AC/DC Power Supply, 24V, 31W (for use outside control box)

16117 - AC/DC Power Supply, 24V, 25 to 150 W (for use inside control box)



16116



16117

