Wahl®

HeatSpy® Monitors

Fixed Non-Contact Infrared Sensors

Introducing the Next Generation of Heat Spy Monitor Fixed Infrared Sensors from Wahl Instruments!

Specifically designed for easy maintenance and high performance in harsh industrial environments, these sensors offer quick and easy integration into process measurement and control systems for non-contact temperature measurement of non-metallic surfaces or painted, coated or anodized metals.

Temperature ranges from 0° to 5792°F (-18° to 3200°C).

Heavy Duty Stainless Steel housing protects unit even in extreme conditions.

Functions in maximum ambient temperatures on most models from 122° to 392°F (50° to 200°C) with optional cooling jacket. Optional user friendly software allows setting of response time, peak measurement, and emissivity for maximum flexibility of applications.

Extreme Accuracy up to 0.3% of measured value ±1.8°F (1°C).

- **Covers All Spectral Ranges**
- **Fiber Optic & Compact Series available**
- **Laser or Thru the Lens Sighting**
- **Datalogging with Software included**
- **Optional Black Bodies for Recalibration**

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1-800-421-2853

PW1240
07/12 Rev B

Heat Spy Monitor Information

Common Infrared Thermometer Applications

Cement Kiln - burning zones; preheaters

Combustion/Incinerator - hot gases and utility boilers, rotary kiln

Energy Conservation - insulation and heat flow studies

Filaments - annealing, drawing, heat treating

Food - baking, candy-chocolate processing, canning, freezing, frying, mixing, packing, roasting

Furnaces- flames, boiler tubes, catalytic crackers

Glass - drawing, manufacturing/processing bulbs, containers, TV tubes, fibers

Maintenance - appliances, bearings, current overloads, driving shafts, insulation, power lines, thermal leakage detection

Metals (Ferrous and Non-Ferrous) - annealing, billet extrusion, brazing, carbonizing, casting, forging, heat treating, inductive heating, rolling/strip mills, sintering, smelting

Quality Control - printed circuit boards, soldering, universal joints, welding, and metrology

Paint - curing, drying

Paper - coating, ink drying, printing, photographic emulsions, web profiles

Plastic Bulk - blow-molding, RIM, film extrusion, sheet thermo-forming, casting

Plastics,Thin Film - photographic film materials, insulating films, PE, PP, PS, PA

Rubber - calendaring, casting, molding, profile extrusion, tires, latex gloves

Silicon - crystal growing, strand/fiber, wafer annealing, epitaxial deposition

Textile - curing, drying, fibers, spinning

Vacuum Chambers - refining, processing, deposition

Custom Solutions for your Applications
Contact Wahl for custom-made Instruments to your specifications.

Explanation of the Heat Spy Monitor part number configuration:

1	2	3	4	5	6	7

1) Model Series

M45	Fiber Optic
M40	Glass Industry
M35	Heavy Duty Industrial
M30	Compact Industrial
M20	Remote Optical Head
M15	Control Box

2) Micron Range

R	0.7...1.15µm
B	1µm
C	1.4 to 1.8µm
E	3.0 to 4.3µm
F	4.8 to 5.3µm
G	8 to 14µm

3) Sensor Head

F	Fiber Optic
S	Standard
O	Optical

4) Sighting

L	Laser Sighting
T	Thru the Lens
D	LED
N	None

5) °C Range

04	400°C
06	600°C
08	800°C
11	1100°C
12	1200°C
13	1300°C
14	1400°C
18	1800°C
19	1900°C
25	2500°C
32	3200°C

6) Output

A	Local Display with Analog Output
P	Local Display with Relay Contacts
D	Digital and Analog Output RS232
Z	Digital and Analog Output RS485
X	Digital and Analog Output RS232 and RS485
Y	Digital and Analog Output USB 2.0

7) Distance to Spot Ratio

10	10:1
12	12:1
20	20:1
30	30:1
40	40:1
50	50:1
62	62.5:1
80	80:1
100	100:1
180	180:1
200	200:1

Example Part Number:

	Series	Micron Range	Sensor Head	Sighting	Temperature Range	Output	Distance to Spot Ratio
Code	M45	C	F	L	18	D	40

Example: **M45CFL18D40**

Fiber Optic Series, Spectral Range of 1.6µm, Fiber Optic Head, Laser Sighting, 1800°C, Digital and Analog Output RS232, 40:1 Distance to Spot Ratio.

Note: When ordering Accessories and Options, they should be listed as a separate line item.

Calibration Services Available

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Heat Spy Monitor Quick Find Guide

Table of Contents by Spectral Range

Spectral Range	°C Range	°F Range	Distance to Spot Ratio	Series	Page #
1.6µm	250° to 1800°C	482° to 3272°F	40:1	M20	16-19
	260° to 1800°C	500° to 3272°F	50:1, 100:1, 200:1	M35	8-9
	300° to 1800°C	572° to 3272°F	40:1, 80:1	M45	4-5
	400° to 1200°C	752° to 2192°F	80:1	M15	21
1µm	600° to 3200°C	1112° to 5792°F	62.5:1, 100:1, 180:1	M45	4-7
	600° to 1800°C	1112° to 3272°F	100:1	M40	22
	600° to 2500°C	1112° to 4532°F	100:1, 200:1	M35	8-9
	600° to 3200°C	1112° to 5792°F	80:1	M20	16-19
0.7…1.15µm	600° to 3200°C	1112° to 5792°F	50:1, 100:1, 200:1	M35	10-11
	800° to 3200°C	1472° to 5792°F	40:1, 80:1, 62.5:1, 100:1, 180:1	M45	4-7
	800° to 2500°C	1472° to 4532°F	80:1	M20	16-19
3.9	300° to 1300°C	572° to 2372°F	50:1	M35	12-13*
5.14µm	100° to 2500°C	212° to 4532°F	50:1	M35	12-13*
8 to 14µm	-18° to 1200°C	0° to 2192°F	30:1	M15	21
	0° to 400°C	32° to 752°F	12:1	M30	14-15*
	0° to 800°C	32° to 1472°F	50:1	M35	
	0° to 800°C	32° to 1472°F	10:1, 20:1	M20	20*

***For availability of these models, please contact customer Service at 1-800-421-2853**

When choosing the right fixed infrared device for your application, it is necessary to be sure the spot size will be completely filled by the object being measured. Any area of the spot size not filled by the intended target object will average the temperature of other objects into the reading, and reduce accuracy.

Optics tables or diagrams are provided for each model for quick reference. For estimation purposes, divide the distance the IR sensor will be from the target by the size of the area to be measured. This will provide the approximate distance to spot ratio. Look for the distance/spot ratio to be equal to or larger than the ratio calculated.

Table of Contents by Sensor Type

M45 Series Fiber Optic Series, Pgs 4-7

M35 Series Heavy Duty Industrial Series, Pgs 8-15

M30 Series Compact Series, Pgs 14-15

M20 Series Remote Optical Head, Pgs 16-20

M15 Series Control Box, Pg 21

M40 Series Fiber Optic Series for the Glass Industry, Pg 22

Accessories Pg 23

Calibration Services Available

Fiber Optic Series

1.6µm, 1µm & 0.7...1.15µm

M45 Series • Mono Fiber Cable Laser Sighting • Single & Two Color

Wahl's M45-CFL, M45-BFL, and M45-RFL Series Digital Fiber Optic Infrared Sensors offer a high level of accuracy and excellent stability. Specially designed for applications under harsh conditions in **Single and Two Color**. These models offer laser pilot light sighting that can be used in areas with high ambient temperatures (up to 250°C) without cooling, and in areas where strong electromagnetic interference can be avoided using fiber optic cable. Main parameters such as emissivity and response time can be set. Additional parameters such as sub-range, maximum value storage and address, can be adjusted via included PC software.

- **Analog Output 4 to 20mA, 0 to 20mA, or 0 to 10V**
- **Digital Interface RS232 or RS485**
- **Fiber Optics and Optical Head withstand up to 250°C Ambient**
- **Datalogging with included Software**
- **High Optical Resolution**
- **Includes 2.5m Mono Fiber Optic Cable** (optional lengths below)
- **Includes 5m Optical Head Connection Cable with Connector**

1.6µm Models - RS232 Output

M45-CFL18D40: 300° to 1800°C (572° to 3272°F) D to S: 40:1
M45-CFL18D80: 300° to 1800°C (572° to 3272°F) D to S: 80:1

1.6µm Models - RS485 Output

M45-CFL18Z40: 300° to 1800°C (572° to 3272°F) D to S: 40:1
M45-CFL18Z80: 300° to 1800°C (572° to 3272°F) D to S: 80:1

1µm Models - RS232 Output

M45-BFL25D100: 750° to 2500°C (1382° to 4532°F) D to S: 100:1
M45-BFL25D180: 750° to 2500°C (1382° to 4532°F) D to S: 180:1

1µm Models - RS485 Output

M45-BFL25Z100: 750° to 2500°C (1382° to 4532°F) D to S: 100:1
M45-BFL25Z180: 750° to 2500°C (1382° to 4532°F) D to S: 180:1

- **High Accuracy, up to ±0.3% of Reading +1°C**

TWO COLOR - 0.7...1.15µm Models - RS232 and RS485

M45-RFL25X40: 800° to 2500°C (1472° to 4532°F) D to S: 40:1
M45-RFL25X80: 800° to 2500°C (1472° to 4532°F) D to S: 80:1
M45-RFL32X100: 1000° to 3200°C (1832° to 5792°F) D to S: 100:1
M45-RFL32X180: 1000° to 3200°C (1832° to 5792°F) D to S: 180:1

- **High Accuracy, up to ±0.5% of Reading +1°C.**

Optics			
Sensor Head	FOV	40:1	100:1
	Distance (mm/inch)	Spot Size (mm/inch)	Spot Size (mm/inch)
Optical Head 1	120 / 4.72	3 / 0.11	1.2 / 0.04
	260 / 10.23	6.5 / 0.25	2.6 / 1.10
	700 / 27.55	17.5 / 0.68	7 / 0.27
		80:1	**180:1**
Optical Head 2	90 / 3.54	1.2 / 0.04	0.5 / 0.02
	200 / 7.87	2.5 / 0.10	1 / 0.03
	600 / 1.96 ft	7.5 / 0.29	3 / 0.11
	4500 / 14.76 ft	57 / 2.24	23 / 0.90

ONE YEAR 1 WARRANTY

CE

M45-CFL, M45-BFL, M45-RFL Accessories - for more info see page 23

12450-01	Replacement Optical Head 1 - 40:1 or 100:1
12450-02	Replacement Optical Head 2 - 80:1 or 180:1
12450-18	Optical Head Connection Cable, 12 Core/4 Wire, 5m
12450-19	Optical Head Connection Cable, 12 Core/4 Wire, 7.5m
12450-20	Optical Head Connection Cable, 12 Core/4 Wire, 10m
12450-29	Water Cooling Jacket with Air Purge for Optical Head 2
12450-37	Air Purge Unit for Optical Head 1
12450-38	Air Purge Unit for Optical Head 2
12450-39	Air Purge Unit, with Ceramic Sighting Tube
12450-40	Adjustable Mount Support for Optical Head 1
12450-41	Adjustable Mount Support for Optical Head 2
12450-43	Temp Indicator, Power Supply: AC Input, 4/20 Output
12450-44	Power Supply for 110/220VAC, 24VDC, 0.7A
12450-45	Interface Module RS485 to RS232
12450-46	P-120, Temperature Indicator with Parameterizer
	Fiber Optic Cable for M45-CFL and M45-RFL
12450-04	Mono Fiber Optic Cable, 800° to 2500°C, Replacemt, 2.5m
12450-05	Mono Fiber Optic Cable, 800° to 2500°C, Upgrade to 5m
12450-06	Mono Fiber Optic Cable, 800° to 2500°C, Upgrade to 7.5m
12450-07	Mono Fiber Optic Cable, 800° to 2500°C, Upgrade to 10m
12450-08	Mono Fiber Optic Cable, 800° to 2500°C, Upgrade to 15m
12450-09	Mono Fiber Optic Cable, 800° to 2500°C, Upgrade to 30m
	Fiber Optic Cable for M45-BFL and M45-RFL
12450-10	Mono Fiber Optic Cable, 1000° to 3200°C, Replacemt, 2.5m
12450-11	Mono Fiber Optic Cable, 1000° to 3200°C, Upgrade to 5m
12450-12	Mono Fiber Optic Cable, 1000° to 3200°C, Upgrade to 7.5m
12450-13	Mono Fiber Optic Cable, 1000° to 3200°C, Upgrade to 10m
12450-14	Mono Fiber Optic Cable, 1000° to 3200°C, Upgrade to 15m
12450-15	Mono Fiber Optic Cable, 1000° to 3200°C, Upgrade to 30m

Calibration Services Available

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M45-CFL • BFL • RFL Series Specifications

Specifications				
Optical Head 1 Model	**M45-CFL18D40 M45-CFL18Z40**	**M45-BFL25D100 M45-BFL25Z100**	**M45-RFL25X40**	**M45-RFL32X100**
Optical Head 2 Model	**M45-CFL18D80 M45-CFL18Z80**	**M45-BFL25D180 M45-BFL25Z180**	**M45-RFL25X80**	**M45-RFL32X180**
Temperature Range	**300° to 1800°C 572° to 3272°F**	**750° to 2500°C 1382° to 4532°F**	**800° to 2500°C 1472° to 4532°F**	**1000° to 3200°C 1832° to 5792°F**
Spectral Range	**1.6µm**	**1µm**	**Two Color 0.7...1.15µm**	
Head	**Fiber Optic Head**			
Sighting	**Laser**			
Distance to Spot Ratio	**Optical Head 1 - 40:1 Optical Head 2 - 80:1**	**Optical Head 1 - 100:1 Optical Head 2 - 180:1**	**Optical Head 1 - 40:1 Optical Head 2 - 80:1**	**Optical Head 1 - 100:1 Optical Head 2 - 180:1**
Emissivity	0.1 to 1.0 Adjustable		0.1 to 1.0 Adjustable (Single Color Mode)	
E-Slope	N/A		0.75 to 1.25 Adjustable (Two Color Mode)	
Photo Detector	InGaAs	Si	Si/Si	
Response Time	20 mS, Adjustable up to 10 S		20 mS Adjustable up to 10 S	
Accuracy & Repeatability	±0.3% of reading +1°C		±0.5% of reading +1°C	
Analog Output	4-20 mA, 0-20mA, 0-10V, User Selectable			
Digital Output	RS232 **(Code D)** or RS485 **(Code Z)**		RS232 and RS485 **(Code X)**	
Operating Temperature	Max. 452°F (250°C) at Fiber Optics Cable & Optical Head, 32° to 158°F (0° to 70°C) at Infrared Sensor End			
Operating Humidity	0 - 100%			
Storage Temperature	-20° to 70°C (-4° to 158°F)			
Power Supply	24 V DC			
Laser Power	< 2mW			
Protection Class	IP65			
Isolation	Power supply is galvanically isolated from the output			
Fiber Optic	2.5 meter standard (5, 7.5, 10, 15, 30 meter available)			
Optical Head 1	Diameter: 0.57 inch, Length:1.73 inch (Diameter: 14.5 mm, Length: 44 mm) Thread M16 x 1.0 mm, SS, 1.41 oz (40g)			
Optical Head 2	Diameter: 0.98 inch, Length: 2.93 inch (Diameter: 25 mm, Length: 74.5 mm) Thread M25 x 1.5 mm, SS, 4.23 oz (120g)			
Parameters Adjustable via software	Response Time, Peak Picker, Average, Scaleable Current or Voltage, Emissivity, Interval of Data Storage		Emissivity, Emissivity Slope, Analog Output, Response Time, Peak Picker, Average, Scaleable Current or Voltage, Single-Two Color Switchable	
Parameters Readable via software	Measured Temperature, Temperature Graph, Internal Temperature of Sensor, Brightness Temperature			
Included Accessories	Optical Head, 2.5m Mono Fiber Optic Cable, Inspection Sheet, Software, 5m Optical Head Connection Cable with Connector, and User Manual			

Accessories are not CE

Specifications subject to change without notice

12450-01
Optical Head 1
40:1 or 100:1

12450-02
Optical Head 2
80:1 or 180:1

Applications

Annealing	Melting	Pouring Stream
Welding	Rotary Kilns	Rolling Mills
Forging	Casting	
Sintering	Induction Heating	

CE ONE YEAR 1 WARRANTY

Calibration Services Available

M45 Series • Multi Fiber Cable
No Sighting • Single & Two Color

Wahl's M45-BFN and M45-RFN Digital Fiber Optic Infrared Sensors are highly accurate sensors, specially designed for applications under harsh conditions.

Single and Two-Color models with no sighting can be used in areas with high ambient temperatures (up to 250°C) without cooling, and in areas where strong electromagnetic interference can be avoided using fiber optic cable. Main parameters such as emissivity and response time can be set. Additional parameters such as sub-range, maximum value storage and address, can be adjusted via included PC software.

- **High Accuracy, ±0.5% of Reading +1°C**
- **Digital Interface RS232 or RS485**
- **Datalogging with included Software**
- **High Optical Resolution**
- **Very Good Stability**
- **Rugged Stainless Steel Housing**
- **User Friendly Software**
- **Includes 5m Multi Fiber Optic Cable with Heavy Duty SS Conduit**
- **Includes 5m Optical Head Connection Cable with Connector**

1µm Models - RS232 Output

M45-BFN18D62: 600° to 1800°C (1112° to 3272°F) D to S: 62.5:1
M45-BFN32Z62: 750° to 3200°C (1382° to 5792°F) D to S: 62.5:1

1µm Models - RS485 Output

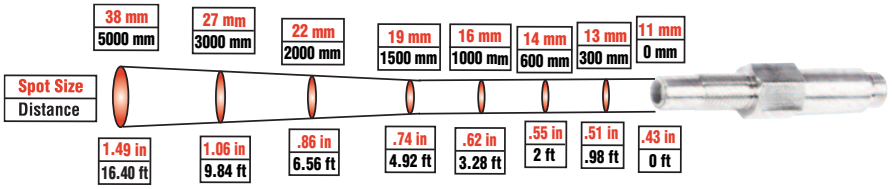
M45-BFN18Z62: 600° to 1800°C (1112° to 3272°F) D to S: 62.5:1
M45-BFN32D62: 750° to 3200°C (1382° to 5792°F) D to S: 62.5:1

TWO COLOR - 0.7...1.15µm Model - RS232 Output

M45-RFN25D62: 800° to 2500°C (472° to 4532°F) D to S: 62.5:1

TWO COLOR - 0.7...1.15µm Model - RS485 Output

M45-RFN25Z62: 800° to 2500°C (472° to 4532°F) D to S: 62.5:1



M45-BFN, M45-RFN Optical Resolution

12450-34 Air Purge Unit, with 300mm INCONEL Sighting Tube

12450-35 Air Purge Unit, with Ceramic Sighting Tube

M45-BFN, M45-RFN Accessories - for more info see page 23

12450-03	Replacement Optical Head - 62.5:1
12450-16	Multi Fiber Optic Cable, Replacement, 5m
12450-17	Multi Fiber Optic Cable, Upgrade to 10m
12450-18	Optical Head Connection Cable, 12 Core/4 Wire, 5m
12450-19	Optical Head Connection Cable, 12 Core/4 Wire, 7.5m
12450-20	Optical Head Connection Cable, 12 Core/4 Wire, 10m
12450-34	Air Purge Unit with 300mm INCONEL Sighting Tube
12450-35	Air Purge Unit with Ceramic Sighting Tube
12450-43	Temp Indicator, Power Supply: AC Input, 4/20 Output
12450-44	Power Supply for 110/220VAC, 24VDC, 0.7A

ONE YEAR 1 WARRANTY

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Calibration Services Available

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M45-BFN • RFN Series Specifications

Specifications			
Model	**M45-BFN18D62 M45-BFN18Z62**	**M45-BFN32D62 M45-BFN32Z62**	**M45-RFN25D62 M45-RFN25Z62**
Temperature Range	**600° to 1800°C 1112° to 3272°F**	**750° to 3200°C 1382° to 5792°F**	**800° to 2500°C 1472° to 4532°F**
Spectral Range	**1µm**		**Two Color 0.7...1.15µm**
Head	**Fiber Optic Head**		
Sighting	**None**		
Distance to Spot Ratio	**62.5:1**		**62.5:1**
Emissivity	0.1 to 1.0 Adjustable		0.1 to 1.0 Adjustable (Single Color Mode)
E-Slope	N/A		0.75 to 1.25 Adjustable (Two Color Mode)
Photo Detector	Si		Si/Si
Response Time	20 mS Adjustable up to 10 S		20 mS Adjustable up to 10 S
Accuracy & Repeatability	±0.5% of reading +1°C		
Analog Output	4-20 mA, 0-20mA, 0-10V, User Selectable		
Digital Output	RS232 **(Code D)** or RS485 **(Code Z)**		
Operating Temperature	Max. 452°F (250°C) at Fiber Optics Cable & Optical Head, 32° to 158°F (0° to 70°C) at Infrared Sensor End		
Operating Humidity	0 - 100%		
Storage Temperature	-20° to 70°C (-4° to 158°F)		
Power Supply	24 V DC		
Protection Class	IP65		
Isolation	Power supply is galvanically isolated from the output		
Fiber Optic	5m Multi Fiber Cable in Heavy Duty Stainless Steel Flexible Conduit		
Head Dimensions	Diameter: 0.826 inch, Length: 4.25 inch (Diameter: 21 mm, Length: 108 mm)		
Housing / Weight	Stainless Steel, 6 oz (170g)		
Parameters Adjustable via Software	Response Time, Peak Picker, Average, Scaleable Current or Voltage, Emissivity, Interval of Data Storage		Emissivity, Emissivity Slope, Analog Output, Response Time, Peak Picker, Average, Scaleable Current or Voltage, Single-Two Color Switchable
Parameters Readable via software	Measured Temperature, Temperature Graph, Internal Temperature of Sensor, Brightness Temperature		
Included Accessories	Optical Head, 5m Multi Fiber Optic Cable in Heavy Duty Stainless Steel Conduit, Inspection Sheet, Software, 5m Optical Head Connection Cable with Connector, and User Manual		

Accessories are not CE

Specifications subject to change without notice

Applications

- Induction Heating
- Annealing
- Welding
- Forging
- Sintering
- Crystal Growing
- Melting
- Rolling Mills
- Rotary Kilns

CE ONE YEAR 1 WARRANTY

Calibration Services Available

M35 Series • Heavy Duty Industrial Laser or Thru the Lens Sighting

The M35-CSL/T and M35-BSL/T Series high accuracy digital infrared sensors with laser or through the lens sighting provide high performance and low maintenance non-contact temperature measurements. The emissivity, analog output sub-range, or response time and peak picker can be preset at the factory or adjusted through included software. This enables the instruments to be adapted to various measuring tasks. These infrared sensors have a heavy duty IP65 Stainless Steel housing that provides reliability and safety even in harsh industrial environments. A variety of optics with fixed focus can be easily used in all industrial areas.These features provide highly accurate measurements at the resolution required.

- **High Accuracy, ±0.3% of Reading +1°C**
- **Small Spot Size**
- **Rugged Stainless Steel Housing**
- **User Friendly Software**
- **Fast Response Time**
- **Very Good Stability**
- **Includes 5m Optical Head Connection Cable with Connector**

1.6µm Laser Sighting Models - RS232 Output

M35-CSL14D50: 260° to 1400°C (500° to 2552°F) D to S: 50:1
M35-CSL13D100: 300° to 1300°C (572° to 2372°F) D to S: 100:1
M35-CSL18D200: 350° to 1800°C (662° to 3272°F) D to S: 200:1

1.6µm Laser Sighting Models - RS485 Output

M35-CSL14Z50: 260° to 1400°C (500° to 2552°F) D to S: 50:1
M35-CSL13Z100: 300° to 1300°C (572° to 2372°F) D to S: 100:1
M35-CSL18Z200: 350° to 1800°C (662° to 3272°F) D to S: 200:1

1.6µm Through the Lens Sighting Models - RS232 Output

M35-CST14D50: 260° to 1400°C (500° to 2552°F) D to S: 50:1
M35-CST13D100: 300° to 1300°C (572° to 2372°F) D to S: 100:1
M35-CST18D200: 350° to 1800°C (662° to 3272°F) D to S: 200:1

1.6µm Through the Lens Sighting Models - RS485 Output

M35-CST14Z50: 260° to 1400°C (500° to 2552°F) D to S: 50:1
M35-CST13Z100: 300° to 1300°C (572° to 2372°F) D to S: 100:1
M35-CST18Z200: 350° to 1800°C (662° to 3272°F) D to S: 200:1

1µm Laser Sighting Models - RS232 Output

M35-BSL19D100: 600° to 1900°C (1112° to 3452°F) D to S: 100:1
M35-BSL25D200: 750° to 2500°C (1382° to 4532°F) D to S: 200:1

1µm Laser Sighting Models - RS485 Output

M35-BSL19Z100: 600° to 1900°C (1112° to 3452°F) D to S: 100:1
M35-BSL25Z200: 750° to 2500°C (1382° to 4532°F) D to S: 200:1

1µm Through the Lens Sighting Models - RS232 Output

M35-BST19D100: 600° to 1900°C (1112° to 3452°F) D to S: 100:1
M35-BST25D200: 750° to 2500°C (1382° to 4532°F) D to S: 200:1

1µm Laser Sighting Models - RS485 Output

M35-BST19Z100: 600° to 1900°C (1112° to 3452°F) D to S: 100:1
M35-BST25Z200: 750° to 2500°C (1382° to 4532°F) D to S: 200:1

Optics			
FOV	**50:1**	**100:1**	**200:1**
Focus Distance (mm/ft)	**Spot Size (mm/inch)**	**Spot Size (mm/inch)**	**Spot Size (mm/inch)**
300 / 0.98	6 / 0.23	3 / 0.11	1.5 / 0.05
500 / 1.64	10 / 0.39	5 / 0.19	2.5 / 0.10
700 / 2.29	14 / 0.55	7 / 0.27	3.5 / 0.13
1000 / 3.28	20 / 0.78	10 / 0.39	5 / 0.19
1500 / 4.92	30 / 1.18	15 / 0.59	7.5 / 0.29
2000 / 6.56	40 / 1.57	20 / 0.78	10 / 0.39
2500 / 8.20	50 / 1.96	25 / 0.98	12.5 / 0.49
3000 / 9.84	60 / 2.36	30 / 1.18	15 / 0.59
5000 / 16.4	100 / 3.93	50 / 1.96	25 / 0.98
Aperture	18 / 0.70	18 / 0.70	18 / 0.70

M35-CSL/CST, M35-BSL/BST Accessories - for more info see page 23

12450-18	Optical Head Connection Cable, 12 Core/4 Wire, 5m
12450-19	Optical Head Connection Cable, 12 Core/4 Wire, 7.5m
12450-20	Optical Head Connection Cable, 12 Core/4 Wire, 10m
12450-30	Water Cooling Jacket with Air Purge & Adjustable Flange
12450-31	Adjustable Mounting Stand
12450-32	Air Purge Unit with Mounting Bracket
12450-33	Mounting Support
12450-43	Temp Indicator, Power Supply, AC Input, 4/20 Output
12450-44	Power Supply for 110/220VAC, 24VDC, 0.7A
12450-45	Interface Module RS485 to RS232
12450-46	P-120, Temperature Indicator with Parameterizer

12450-32 Air Purge with Mounting Bracket

12450-33 Mounting Clamp

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M35-CSL • CST • BSL • BST Series Specifications

Heavy Duty Industrial Series

1.6µm & 1µm

Specifications					
Laser Sighting	**M35-CSL14D50 M35-CSL14Z50**	**M35-CSL13D100 M35-CSL13Z100**	**M35-CSL18D200 M35-CSL18Z200**	**M35-BSL19D100 M35-BSL19Z100**	**M35-BSL25D200 M35-BSL25Z200**
Thru the Lens Sighting	**M35-CST14D50 M35-CST14Z50**	**M35-CST13D100 M35-CST13Z100**	**M35-CST18D200 M35-CST18Z200**	**M35-BST19D100 M35-BST19Z100**	**M35-BST25D200 M35-BST25Z200**
Temperature Range	**260° to 1400°C 500° to 2552°F**	**300° to 1300°C 572° to 2372°F**	**350° to 1800°C 662° to 3272°F**	**600° to 1900°C 1112° to 3452°F**	**750° to 2500°C 1382° to 4532°F**
Spectral Range	**1.6µm**			**1µm**	
Head	**Standard**				
Sighting	**Laser or Thru the Lens**				
Distance to Spot Ratio	**50:1**	**100:1**	**200:1**	**100:1**	**200:1**
Emissivity	0.1 to 1.0 Adjustable				
Photo Detector	InGaAs			Si	
Response Time	20 mS Adjustable up to 10 S				
Accuracy & Repeatability	±0.3% of reading +1°C				
Analog Output	4-20 mA, 0-20mA, 0-10V, User Selectable				
Digital Output	RS232 **(Code D)** or RS485 **(Code Z)**				
Operating Temperature	0° to 70°C 32° to 158°F				
with Cooling Jacket	0° to 200°C 32° to 392°F				
Operating Humidity	0 - 100%				
Storage Temperature	-20° to 70°C (-4° to 158°F)				
Power Supply	24 V DC				
Laser Power	<1mW (with external switch)				
Protection Class	IP65				
Isolation	Power supply is galvanically isolated from the output				
Head Dimensions	Diameter: 1.96 inch, Length: 4.64 inch (Diameter: 50 mm, Length: 118 mm)				
Housing / Weight	Stainless Steel, 1.32 lb (0.6 kg)				
Parameters Adjustable via software	Response Time, Peak Picker, Average, Scaleable Current or Voltage, Emissivity, Interval of Data Storage, Scaleable Current or Voltage				
Parameters Readable via software	Measured Temperature, Temperature Graph, Sensor Internal Temperature of Sensor, Brightness Temperature				
Included Accessories	5m Optical Head Connection Cable with Connector, Inspection Sheet, Software, and User Manual				

Accessories are not CE

Specifications subject to change without notice

Applications

Induction Heating	Sintering
Casting	Melting
Annealing	Rolling
Welding	Hardening
Forging	

CE ONE YEAR 1 WARRANTY

Calibration Services Available

M35 Series • Heavy Duty Industrial Laser or Thru the Lens Sighting Two Color

The M35-RSL/T Series Two-Color high accuracy digital infrared sensors with laser pilot light provide high performance and low maintenance non-contact temperature measurements. The emissivity, analog output sub-range or response time and peak picker can be preset at the factory or adjusted through included software. This enables the instruments to be adapted to various measuring tasks. These infrared sensors have a heavy duty Stainless Steel housing which provides reliability and safety even in harsh industrial environments. A variety of optics with fixed focus can be easily used in all industrial areas. These features provide highly accurate measurements at the resolution required.

TWO COLOR - 0.7...1.15µm

Laser Sighting Models - RS485 Output

M35-RSL18Z50: 600° to 1800°C (1112° to 3272°F) D to S: 150:1
M35-RSL25Z100: 800° to 2500°C (1472° to 4532°F) D to S: 100:1
M35-RSL32Z200: 1000° to 3200°C (1832° to 5792°F) D to S: 200:1

Through the Lens Sighting Models - RS485 Output

M35-RST18Z50: 600° to 1800°C (1112° to 3272°F) D to S: 50:1
M35-RST25Z100: 800° to 2500°C (1472° to 4532°F) D to S: 100:1
M35-RST32Z200: 1000° to 3200°C (1832° to 5792°F) D to S: 200:1

- **High Accuracy, ±0.5% of Reading +1°C**
- **Two Color, One Color Switchable**
- **Wide Temperature Range**
- **Digital Interface**
- **Small Spot Size**
- **Fast Response Time**
- **Very Good stability**
- **Rugged Stainless Steel**
- **User Friendly Software**
- **Includes 5m Optical Head Connection Cable with Connector**

Optics			
FOV	**50:1**	**100:1**	**200:1**
Focus Distance (mm/ft)	**Spot Size (mm/inch)**	**Spot Size (mm/inch)**	**Spot Size (mm/inch)**
300 / 0.98	6 / 0.23	3 / 0.11	1.5 / 0.05
500 / 1.64	10 / 0.39	5 / 0.19	2.5 / 0.10
700 / 2.29	14 / 0.55	7 / 0.27	3.5 / 0.13
1000 / 3.28	20 / 0.78	10 / 0.39	5 / 0.19
1500 / 4.92	30 / 1.18	15 / 0.59	7.5 / 0.29
2000 / 6.56	40 / 1.57	20 / 0.78	10 / 0.39
2500 / 8.20	50 / 1.96	25 / 0.98	12.5 / 0.49
3000 / 9.84	60 / 2.36	30 / 1.18	15 / 0.59
5000 / 16.4	100 / 3.93	50 / 1.96	25 / 0.98
Aperture	10 / 0.39	8 / 0.31	5 / 0.19

12450-43 Temperature Indicator and Power Supply, AC Input, 4/20 Output, and Alarm

12450-45 Interface Module RS485 to RS232, Power Supply: 230 VAC or 24V DC Isolated

M35-RSL, M35-RST Accessories - for more info see page 23

12450-18	Optical Head Connection Cable, 12 Core/4 Wire, 5m
12450-19	Optical Head Connection Cable, 12 Core/4 Wire, 7.5m
12450-20	Optical Head Connection Cable, 12 Core/4 Wire, 10m
12450-30	Water Cooling Jacket with Air Purge & Adjustable Flange
12450-31	Adjustable Mounting Stand
12450-32	Air Purge Unit with Mounting Bracket
12450-33	Mounting Support
12450-43	Temp Indicator, Power Supply, AC Input, 4/20 Output
12450-44	Power Supply for 110/220VAC, 24VDC, 0.7A
12450-45	Interface Module RS485 to RS232
12450-46	P-120, Temperature Indicator with Parameterizer

ONE YEAR 1 WARRANTY

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Calibration Services Available

M35-RSL • RST Series Specifications

Specifications			
Laser Sighting	**M35-RSL18Z50**	**M35-RSL25Z100**	**M35-RSL32Z200**
Thru the Lens	**M35-RST18Z50**	**M35-RST25Z100**	**M35-RST32Z200**
Temperature Range	**600° to 1800°C 1112° to 3272°F**	**800° to 2500°C 1472° to 4532°F**	**1000° to 3200°C 1832° to 5792°F**
Spectral Range	**Two Color 0.7...1.15µm**		
Head	**Standard**		
Sighting	**Laser or Thru the Lens**		
Distance to Spot Ratio	**50:1**	**100:1**	**200:1**
Emissivity	0.1 to 1.0 Adjustable (Single Color Mode)		
E-Slope	0.75 to 1.25 Adjustable (Two Color Mode)		
Photo Detector	Si/Si		
Response Time	20 mS Adjustable up to 10 S		
Accuracy & Repeatability	±0.5% of reading +1°C		
Analog Output	4-20 mA, 0-20mA, 0-10V, User Selectable		
Digital Output	RS485 **(Code Z)**		
Operating Temperature	0° to 70°C (32° to 158°F)		
with Cooling Jacket	0° to 200°C (32° to 392°F)		
Operating Humidity	0 - 100%		
Storage Temperature	-20° to 70°C (-4° to 158°F)		
Power Supply	24 V DC		
Laser Power	< 2mW		
Protection Class	IP65		
Isolation	Power supply is galvanically isolated from the output		
Head Dimensions	Diameter: 1.96 inch, Length: 4.64 inch (Diameter: 50 mm, Length: 118 mm)		
Housing / Weight	1.32 lb (0.6 kg)		
Housing	Stainless Steel		
Parameters Adjustable via Software	Emissivity, Emissivity Slope, Analog Output, Address, Switch Off Limit, Response Time, Peak Picker, Scaleable Current or Voltage, Single-Two Color Switchable		
Parameters Readable via software	Measured Temperature, Temperature Graph, Internal Temperature of Sensor, Temperature Brightness 1, Temperature Brightness 2		
Included Accessories	5m Optical Head Connection Cable with Connector, Inspection Sheet, Software, and User Manual		

Accessories are not CE

Specifications subject to change without notice

Applications

Induction Heating
Annealing
Welding
Forging
Sintering
Melting
Rolling Mills
Rotary Kilns
Crystal Growing

CE ONE YEAR 1 WARRANTY

Calibration Services Available

M35 Series • Heavy Duty Industrial Laser Sighting • Optional Optics

Please contact Customer Service for availability.

The M35ESL/FSL Series high accuracy digital infrared sensors with laser sighting provide high performance and low maintenance non-contact temperature measurements of non-metallic surfaces. They provide multiple user selectable options such as; emissivity, resolution, response time, and data logging frequency. These features in combination with the high stability, adjustable analog output, and digitally linearized output, provide highly accurate temperature measurements at the resolution required. The optics focal points are provided to easily calculate the distance needed to get the proper spot size.

The M35ESL Series models provide non-contact temperature measurements of non-metallic surfaces & metal parts in flame heated furnaces, e.g. through flames and flue gas with a wavelength of 3.9µm. The sensor can measure the temperature of furnace gases during the heating process.

The M35FSL Series models provides for temperature measurement of glass and quartz surfaces with a wavelength of 5.14µm.

- **Highly Accurate due to Digital Linearization of the Output**
- **Four Wire Form with Analog Output**
- **4 to 20mA, 0 to 20mA, or 0 to 10 V**
- **Serial Communication RS232 or RS485**
- **Response Time 60 mS**
- **Includes 5m Optical Head Connection Cable with Connector**

3.9µm Model - RS232 Output

M35-ESL13D50: 300° to 1300°C (572° to 2372°F) D to S: 50:1

3.9µm Model - RS485 Output

M35-ESL13Z50: 300° to 1300°C (572° to 2372°F) D to S: 50:1

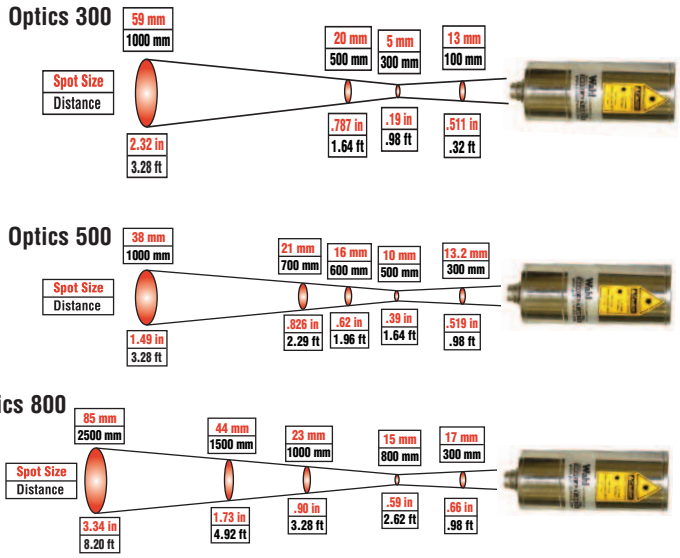
5.14µm Models - RS232 Output

M35-FSL06D50: 100° to 600°C (212° to 1112°F) D to S: 50:1
M35-FSL11D50: 250° to 1100°C (482° to 2012°F) D to S: 50:1
M35-FSL25D50: 400° to 2500°C (752° to 4532°F) D to S: 50:1

5.14µm Models - RS485 Output

M35-FSL06Z50: 100° to 600°C (212° to 1112°F) D to S: 50:1
M35-FSL11Z50: 250° to 1100°C (482° to 2012°F) D to S: 50:1
M35-FSL25Z50: 400° to 2500°C (752° to 4532°F) D to S: 50:1

One Optics option is included with sensor. Specify selection from diagrams below to best suit your application.



12450-30 Water Cooling Jacket with Adjustable Flange

12450-31 Adjustable Mounting Stand

M35-ESL, M35-FSL Accessories - for more info see page 23

12450-18	Optical Head Connection Cable, 12 Core/4 Wire, 5m
12450-19	Optical Head Connection Cable, 12 Core/4 Wire, 7.5m
12450-20	Optical Head Connection Cable, 12 Core/4 Wire, 10m
12450-30	Water Cooling Jacket with Air Purge & Adj Flange
12450-31	Adjustable Mounting Stand
12450-32	Air Purge Unit with Mounting Bracket
12450-33	Mounting Support
12450-43	Temp Indicator, Power Supply, AC Input, 4/20 Output
12450-44	Power Supply for 110/220VAC, 24VDC, 0.7A
12450-45	Interface Module RS485 to RS232
12450-46	P-120, Temperature Indicator with Parameterizer

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M35-ESL • M35-FSL Series Specifications

Heavy Duty Industrial Series

3.9µm & 5.14µm

Please contact Customer Service for availability.

Specifications				
Model	**M35-ESL13D50 M35-ESL13Z50**	**M35-FSL06D50 M35-FSL06Z50**	**M35-FSL11D50 M35-FSL11Z50**	**M35-FSL25D50 M35-FSL25Z50**
Temperature Range	**300° to 1300°C 572° to 2372°F**	**100° to 600°C 212° to 1112°F**	**250° to 1100°C 482° to 2012°F**	**400° to 2500°C 752° to 4532°F**
Spectral Range	**3.9µm**	**5.14µm**		
Head	**Standard**			
Sighting	**Laser**			
Distance to Spot Ratio	**50:1**	**50:1**		
Emissivity	0.2 to 1.0 Adjustable			
Photo Detector	Thermopile			
Response Time	60 mS			
Accuracy & Repeatability	±1.5% of reading or 3.6°F (2°C) (at ambient temperature of: 30 to 60°C) *Instrument must be at a constant temperature for a minimum of 30 minutes.*			
Analog Output	4-20 mA, 0-20mA or 0-10V, User Selectable			
Digital Output	RS232 **(Code D)** or RS485 **(Code Z)**			
Operating Temperature	0° to 70°C 32° to 158°F	0° to 70°C 32° to 158°F		
Operating Temperature with Cooling Jacket		0° to 200°C 32° to 392°F		
Operating Humidity	0 - 100%			
Storage Temperature	-20° to 70°C -4° to 158°F			
Power Supply	24 V DC			
Laser Power	< 1mW			
Protection Class	IP65			
Isolation	Power supply is galvanically isolated from the output			
Head Dimensions	Diameter: 1.96 inch, Length: 4.64 inch (Diameter: 50 mm, Length: 118 mm)			
Housing / Weight	Stainless Steel, 1.32 lb (0.6 kg)			
Parameters Adjustable via Software	Emissivity, Analog Output, Address, Response Time, Peak Picker, Scaleable Current or Voltage			
Parameters Readable via Software	Measured Temperature, Temperature Graph, Scaleable Current or Voltage, Brightness Temperature of Sensor.			
Included Accessories	5m Connection Cable with Connector, Inspection Sheet, Software, and User Manual			

Accessories are not CE

Specifications subject to change without notice

35-ESL Applications

Measures sub-surface of Glass
Measures metal parts in Flame Heated Furnaces
Measures through Flames and Flue Gas.

35-FSL Applications

Measures Glass Surface Temperature

CE ONE YEAR 1 WARRANTY

Calibration Services Available

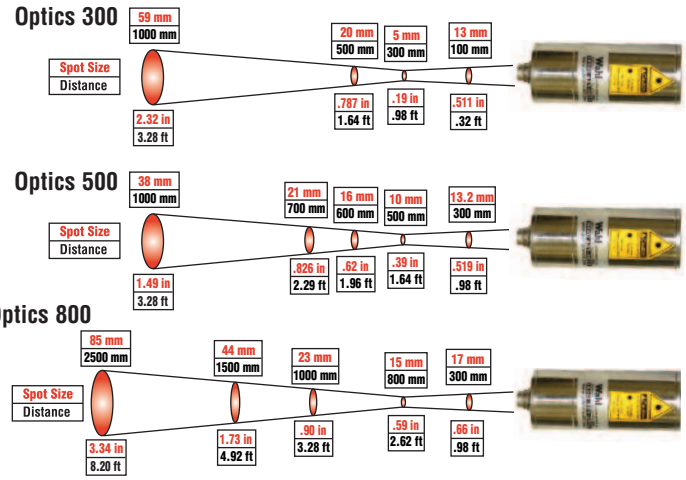
M35 Series • Heavy Duty Industrial Laser Sighting • Optional Optics

8 to 14µm Model - RS232 Output

M35-GSL08D50: 0° to 1000°C (32° to 1832°F) D to S: 50:1

8 to 14µm Model - RS485 Output

M35-GSL08Z50: 0° to 1000°C (32° to 1832°F) D to S: 50:1



Wahl's M35-GSL Series are high accuracy digital infrared sensors which provide high performance and low maintenance non-contact temperature measurements. The emissivity, analog output sub-range or response time and peak picker can be preset at the factory or adjusted through software. This enables the instruments to be adapted to various measuring tasks. These infrared sensors have a heavy duty Stainless Steel housing which provides reliability and safety even in harsh industrial environments. A variety of optics with fixed focus can be easily used in many industrial applications. Select from the optional Optics diagrams below left to best suit your application.

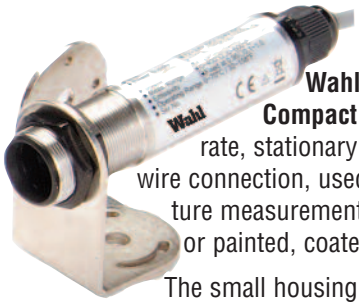
One Optics option is included with sensor. Specify selection from diagrams at left to best suit your application.

M35-GSL Accessories - for more info see page 23

12450-18	Optical Head Connection Cable, 12 Core/4 Wire, 5m
12450-19	Optical Head Connection Cable, 12 Core/4 Wire, 7.5m
12450-20	Optical Head Connection Cable, 12 Core/4 Wire, 10m
12450-30	Water Cooling Jacket with Air Purge & Adj Flange
12450-31	Adjustable Mounting Stand
12450-32	Air Purge Unit with Mounting Bracket
12450-33	Mounting Support
12450-43	Temp Indicator, Power Supply, AC Input, 4/20 Output
12450-44	Power Supply for 110/220VAC, 24VDC, 0.7A
12450-45	Interface Module RS485 to RS232
12450-46	P-120, Temperature Indicator with Parameterizer

Please contact Customer Service for availability

M30 Series • Compact Industrial Low Temperature • No Sighting



Wahl's M30-GSN Compact Sensor is a highly accurate, stationary infrared sensor with 2 wire connection, used for non-contact temperature measurement of non-metallic surfaces or painted, coated or anodized metals.

The small housing dimensions enable the integration of the instrument into compact production machines. The solid and robust design of the instrument guarantees reliability even in tough industrial environments. The built-in air purge unit protects the lens from contamination of dust and moisture, enabling the instrument to be adapted to various measuring tasks.

8 to 14µm Model - RS232 Output

M30-GSN04D12: 0° to 400°C (32° to 752°F) D to S: 12:1

8 to 14µm Model - RS485 Output

M30-GSN04Z12: 0° to 400°C (32° to 752°F) D to S: 12:1

- **Accuracy, ±2% of Reading +1°C**
- **Small and robust infrared sensor**
- **2 wire installation**
- **Small spot size**
- **Fast response time**
- **Easy electrical and mechanical installation**
- **Linear current output**
- **IP65 Splash Proof**
- **Includes Mounting Accessories and Air Purge**

M30-GSN Accessories - for images see page 23

12450-43	Temp Indicator, Power Supply, AC Input, 4/20 Output
12450-44	Power Supply for 110/220V AC, 24VDC, 0.7A

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M35-GSL • M30-GSN Series Specifications

Heavy Duty and Compact Series

8 to 14µm

Specifications		
Model	**M35-GSL08D50 M35-GSL08Z50**	**M30-GSN04D12 M30-GSN04Z12**
Temperature Range	**0° to 1000°C 32° to 1832°F**	**0° to 400°C 32° to 752°F**
Spectral Range	**8 to 14µm**	**8 to 14µm**
Head	**Standard**	**Standard**
Sighting	**Laser**	**None**
Distance to Spot Ratio	**50:1**	**12:1**
Emissivity	0.1 to 1.0 Adjustable	0.95 Fixed
Photo Detector	Thermopile	Thermopile
Response Time	60 mS	300 mS
Accuracy & Repeatability	±1.5% of reading or 3.6°F (2°C) (30°C to 60°C) *Instrument must be at a constant temperature for a minimum of 30 minutes.*	±2% of reading or 1°C
Analog Output	4-20 mA, 0-20mA, 0-10V, User Selectable	4-20 mA, Linear to temperature
Digital Output	RS232 **(Code D)** or RS485 **(Code Z)**	RS232 **(Code D)** or RS485 **(Code Z)**
Operating Temperature	0° to 70°C 32° to 158°F	0° to 50°C 32° to 122°F
Operating Humidity	N/A	N/A
Storage Temperature	-20° to 70°C -4° to 158°F	-30° to 85°C -22° to 185°F
Power Supply	24 V DC	24 V DC
Laser Power	< 1mW	N/A
Protection Class	IP65	IP65
Isolation	Power supply is galvanically isolated from the output	N/A
Head Dimensions	Diameter: 1.96 inch, Length: 4.64 inch (Diameter: 50 mm, Length: 118 mm)	Diameter: 0.86 inch, Length: 3.58 inch (Diameter: 22 mm, Length: 91 mm)
Housing / Weight	Stainless Steel, 1.32 lb (0.6 kg)	Stainless Steel, 7.05 oz (200 g)
Parameters Adjustable via Software	Emissivity, Analog Output, Address, Response Time, Peak Picker, Scaleable Current or Voltage	N/A
Parameters Readable via Software	Measured Temperature, Temperature Graph, Internal Temperature of Sensor.	N/A
Included Accessories	5m Connection Cable with Connector, Inspection Sheet, Software, and User Manual	Mounting Accessories, Air Purge Unit

Accessories are not CE

Specifications subject to change without notice

M35-GSL Applications

Plastic	Wood
Fluids	Glass
Rubber	Coated Metals
Ceramic	Textiles

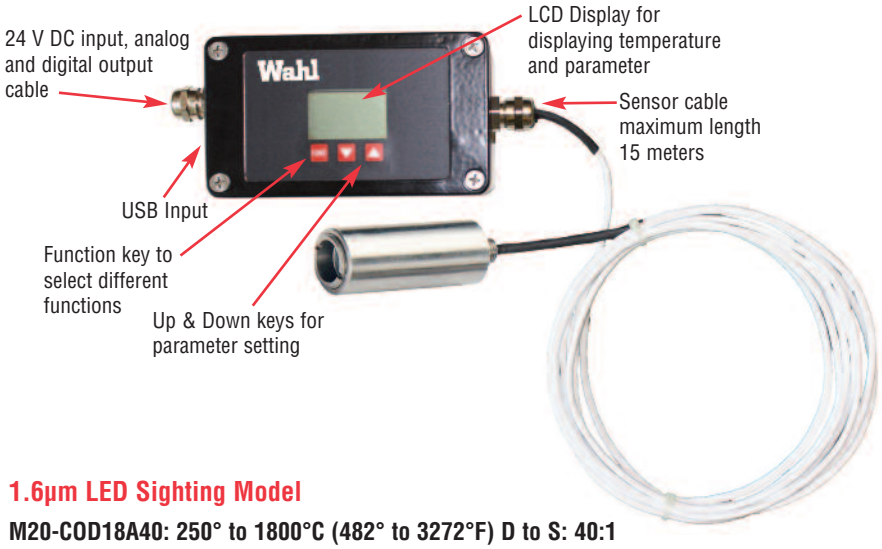
M30-GSN Applications

Plastic	Painted Metals
Textile	Coated Metals
Ceramic	Anodized Metals
Liquids	Crystal Growing

CE ONE YEAR 1 WARRANTY

Calibration Services Available

M20 Series • Remote Optical Head Built in LCD • LED Sighting Single & Two Color



Wahl's M20-COD, M20-BOD, and M20-ROD Series Single and Two-Color digital infrared sensors feature a remote optical head for non-contact temperature measurement on metals, ceramics, graphite, etc. The sensor head is un-affected by electromagnetic interferences (e.g. induction). Equipped with a display that shows the current temperature in measuring mode, parameters can be read and changed via integrated keys. The infrared sensor can be powered through the USB port of a laptop computer with no external power supply required. Optional outputs available.

1.6µm LED Sighting Model

M20-COD18A40: 250° to 1800°C (482° to 3272°F) D to S: 40:1

1µm LED Sighting Model

M20-BOD19A80: 600° to 1900°C (1112° to 3452°F) D to S: 80:1

Sensor with LED Sighting

- **High Accuracy, ±0.3% of Reading +1°C**
- **Wide Temperature Range**
- **Built-in LCD Display**
- **LED for Targeting**
- **Adjustable Parameter via Integrated Keypad or Interface**
- **Optional 4-20 mA, 0-20mA, or 0-10V**
- **Optional Isolated RS485 or USB 2.0 Interface**
- **Optional Relay Output**
- **Includes 3m Connection Cable**

Optics		
FOV	**40:1**	**80:1**
Working Distance (mm/ft)	**Spot Size (mm/in)**	**Spot Size (mm/in)**
90 / 0.29	2.3 / 0.09	1.12 / 0.04
300 / 0.98	7.5 / 0.29	3.8 / 0.14
600 / 1.96	15 / 0.59	7.5 / 0.29

TWO COLOR - 0.7...1.15µm LED Sighting Model

M20-ROD25A80: 800° to 2500°C (1472° to 4532°F) D to S: 80:1

- **High Accuracy, ±0.5% of Reading +1°C**
- **Two Color, One Color Switchable**
- **Wide Temperature Range**
- **Built-in LCD Display**
- **LED for Targeting**
- **Adjustable Parameter via Integrated Keypad or Interface**
- **Optional 4-20 mA, 0-20mA, or 0-10V**
- **Optional Isolated RS485 or USB 2.0 Interface**
- **Optional Relay Output**
- **Includes 3m Connection Cable**

M20-COD, M45-BOD, M20-ROD Accessories - for more info see page 23

12450-21	Optical Head Connection Cable, 10 Core/4 Wire, 5m
12450-22	Optical Head Connection Cable, 10 Core/4 Wire, 7.5m
12450-23	Optical Head Connection Cable, 10 Core/4 Wire, 10m
12450-24	Optical Head Connection Cable, 10 Core/4 Wire, 15m
12450-29	Water Cooling Jacket with Air Purge for Optical Head 2
12450-38	Air Purge Unit for Optical Head 2
12450-41	Adjustable Mount Support for Optical Head 2
12450-44	Power Supply 110/220 AC, 24 V DC, 0.7A
12450-45	Interface Module RS485 to RS232

M20-COD, M45-BOD, M20-ROD Options

12450-47	RS485 Output with PC Software
12450-48	USB Output, PC Cable and Software
12450-49	Relay Output, 60VDC/42VAC, RMS 0.4A

ONE YEAR 1 WARRANTY

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07/12 Rev B

M20-COD • BOD • ROD Series Specifications

Specifications			
Model	**M20-COD18A40**	**M20-BOD19A80**	**M20-ROD25A80**
Temperature Range	**250° to 1800°C 482° to 3272°F**	**600° to 1900°C 1112° to 3452°F**	**800° to 2500°C 1472° to 4532°F**
Spectral Range	**1.6µm**	**1µm**	**Two Color 0.7...1.15µm**
Head	**Optical**		
Sighting	**LED**		
Distance to Spot Ratio	**40:1**	**80:1**	**80:1**
Emissivity	0.1 to 1.0 Adjustable		0.1 to 1.0 Adjustable (Single Color Mode)
E-Slope	N/A		0.75 to 1.25 Adjustable (Two Color Mode)
Photo Detector	InGaAs	Si	Si/Si
Response Time	10 mS, Adjustable up to 10 S		20 mS Adjustable up to 10 S
Accuracy & Repeatability	±0.3% of reading +1°C		±0.5% of reading +1°C
Analog Output	Standard: 4-20 mA, 0-20mA, or 0-10V, User Selectable		
Digital Output	Optional: RS485 (Code **12450-47)**, or USB 2.0 (Code **12450-48)**		
Relay Output	Optional: Relay output with Hysteresis 60VDC/42VAC, RMS 0.4A (Code **12450-49)**		
Display Resolution	0.1°C		
Operating Temperature	Electronic and Optical Head 0° to 70°C (32° to 158°F)		
Storage Temperature	-20° to 70°C (-4° to 158°F)		
Power Supply	24 V DC		
Protection Class	IP65		
Head Dimensions/Weight	Sensor with LED Sighting: Diameter: 0.98 inch, Length: 2.83 inch, Weight: 6 oz (Diameter: 25 mm, Length: 72 mm, Weight: 170g)		
Parametizer Dimensions	L: 4.52 x W: 2.55 x D: 2.16 inch (L: 115 x W: 65 x D: 55 mm)		
Housing / Weight	Stainless Steel, 11.28 oz (320 g)		
Parameters Adjustable via Keypad and Software	Emissivity, Analog Output, Address, Response Time, Peak Picker, Scaleable Current or Voltage		Emissivity, Emissivity Slope, Analog Output, Address, Response Time, Peak Picker, Scaleable Current or Voltage
Included Accessories	Remote Sensor Head with 3m Cable and LED Target Lighting, LCD Display, and Keypad for Parameterizing		

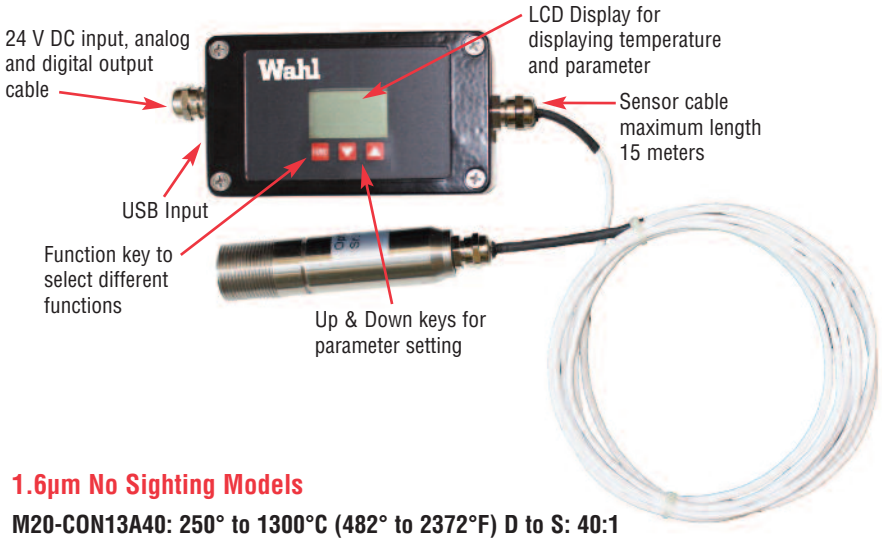
Accessories are not CE

Specifications subject to change without notice

CE ONE YEAR 1 WARRANTY

Calibration Services Available

M20 Series • Remote Optical Head Built in LCD • No Sighting Single & Two Color



Wahl's M20-CON, M20-BON, and M20-RON Series Single and Two-Color digital infrared sensors feature a remote optical head for non-contact temperature measurement on metals, ceramics, graphite, etc. The sensor head is un-affected by electromagnetic interferences (e.g. induction). Equipped with a display which shows the current temperature in measuring mode, parameters can be read and changed via integrated keys. The infrared sensor can be powered through the USB port of a laptop computer with no external power supply required. Optional outputs available.


Sensor with No Sighting

1.6µm No Sighting Models

M20-CON13A40: 250° to 1300°C (482° to 2372°F) D to S: 40:1
M20-CON18A40: 350° to 1800°C (662° to 3272°F) D to S: 40:1

1µm No Sighting Models

M20-BON19A80: 600° to 1900°C (1112° to 3452°F) D to S: 80:1
M20-BON32A80: 750° to 3200°C (1382° to 5792°F) D to S: 80:1

- High Accuracy, ±0.3% of Reading +1°C
- Wide Temperature Range
- Built-in LCD Display
- Adjustable Parameter via Integrated Keypad or Interface.
- Optional 4-20 mA, 0-20mA, or 0-10V
- Optional Isolated RS485 or USB 2.0 Interface
- Optional Relay Output
- Includes 3m Connection Cable

TWO COLOR - 0.7...1.15µm No Sighting Model

M20-RON25A80: 800° to 2500°C (1472° to 4532°F) D to S: 80:1

- High Accuracy, ±0.5% of Reading +1°C
- Two Color, One Color Switchable
- Wide Temperature Range
- Built-in LCD Display
- Adjustable Parameter via Integrated Keypad or Interface.
- Optional 4-20 mA, 0-20mA, or 0-10V
- Optional Isolated RS485 or USB 2.0 Interface
- Optional Relay Output
- Includes 3m Connection Cable

Optics			
	FOV	40:1	80:1
	Working Distance (mm/ft)	Spot Size (mm/in)	Spot Size (mm/in)
Close Focus	100 / 0.32	2.5 / 0.10	1.3 / 0.05
	200 / 0.65	5 / 0.19	2.5 / 0.10
	300 / 0.98	7.5 / 0.29	3.8 / 0.14
Standard Focus	600 / 1.96	15 / 0.59	7.5 / 0.29
	900 / 2.95	22.5 / 0.88	11.3 / 0.44
	1200 / 3.93	30 / 1.18	15 / 0.59

M20-CON, M45-BON, M45-RON Accessories - for more info see page 23

12450-21	Optical Head Connection Cable, 10 Core/4 Wire, 5m
12450-22	Optical Head Connection Cable, 10 Core/4 Wire, 7.5m
12450-23	Optical Head Connection Cable, 10 Core/4 Wire, 10m
12450-24	Optical Head Connection Cable, 10 Core/4 Wire, 15m
12450-29	Water Cooling Jacket with Air Purge for Optical Head 2
12450-38	Air Purge Unit for Optical Head 2
12450-41	Adjustable Mount Support for Optical Head 2
12450-44	Power Supply 110/220 AC, 24 V DC, 0.7A
12450-45	Interface Module RS485 to RS232

M20-CON, M45-BON, M45-RON Options

12450-47	RS485 Output with PC Software
12450-48	USB Output, PC Cable and Software
12450-49	Relay Output, 60VDC/42VAC, RMS 0.4A

ONE YEAR 1 WARRANTY

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Calibration Services Available

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PW1240
07/12 Rev B

M20-CON • BON • RON Series Specifications

Specifications					
Model	**M20-CON13A40**	**M20-CON18A40**	**M20-BON19A80**	**M20-BON32A80**	**M20-RON25A80**
Temperature Range	**250° to 1300°C 482° to 2372°F**	**350° to 1800°C 662° to 3272°F**	**600° to 1900°C 1112° to 3452°F**	**750° to 3200°C 1382° to 5792°F**	**800° to 2500°C 1472° to 4532°F**
Spectral Range	**1.6µm**		**1µm**		**Two Color 0.7...1.15µm**
Sighting	**None**				
Head	**Optical**				
Distance to Spot Ratio	**40:1**		**80:1**		**80:1**
Emissivity	0.1 to 1.0 Adjustable				0.1 to 1.0 Adjustable (Single Color Mode)
E-Slope	N/A				0.75 to 1.25 Adjustable (Two Color Mode)
Photo Detector	InGaAs		Si		Si/Si
Response Time	10 mS Adjustable up to 10 S				20 mS Adjustable up to 10 S
Accuracy & Repeatability	±0.3% of reading +1°C				±0.5% of reading +1°C
Analog Output	Standard: 4-20 mA, 0-20mA, or 0-10V, User Selectable				
Digital Output	Optional: RS485 (Choose Option: **12450-47)**, or USB 2.0 (Choose Option: **12450-48)**				
Relay Output	Optional: Relay output with Hysteresis 60VDC/42VAC, RMS 0.4A (Choose Option: **12450-49)**				
Display Resolution	0.1°C				
Operating Temperature	Electronic and Optical Head 0° to 70°C (32° to 158°F)				
Storage Temperature	-20° to 70°C (-4° to 158°F)				
Power Supply	24 V DC				
Protection Class	IP65				
Head Dimensions/Weight	Sensor with No Sighting: Diameter: 0.98 inch, Length: 3.70 inch, Weight: 5.64 oz (Diameter: 25 mm, Length: 94 mm, Weight: 160 g) Thread: M25 x 1.5 mm				
Parametizer Dimensions	L: 4.52 x W: 2.55 x D: 2.16 inch (L: 115 x W: 65 x D: 55 mm)				
Housing / Weight	Stainless Steel, 11.28 oz (320 g)				
Parameters Adjustable via Keypad & Software	Emissivity, Analog Output, Address, Response Time, Peak Picker, Scaleable Current or Voltage				Emissivity, Emissivity Slope, Analog Output, Address, Response Time, Peak Picker, Scaleable Current or Voltage
Included Accessories	Remote Sensor Head with 3m Cable, LCD Display, and Keypad for Parameterizing				

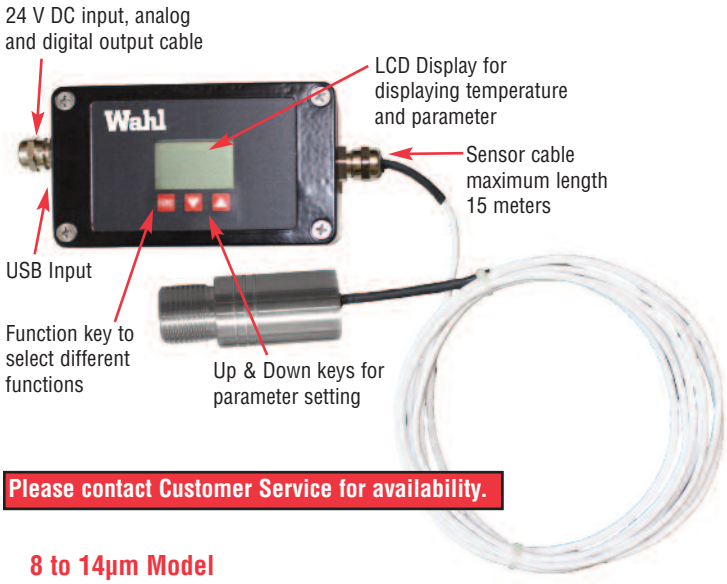
Accessories are not CE

Specifications subject to change without notice

CE ONE YEAR 1 WARRANTY

Calibration Services Available

M20-GON Series • Remote Optical Head Built in LCD • Precision Optics

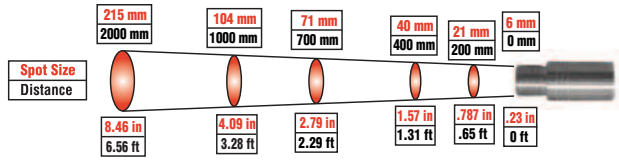


Please contact Customer Service for availability.

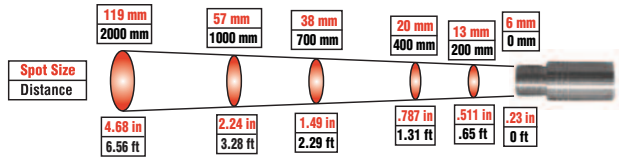
8 to 14µm Model

M20-GON08A10: 0° to 800°C (32° to 1472°F) D to S: 10:1
M20-GON08A20: 0° to 800°C (32° to 1472°F) D to S: 20:1

- **Precision Optics for small spot size**
- **Adjustable Parameter via Integrated Keypad or Interface**
- **Includes 3m Connection Cable**



Distance to Spot Ratio 10:1



Distance to Spot Ratio 20:1

M20-GON Accessories - for more info see page 23

12450-21	Optical Head Connection Cable, 10 Core/4 Wire, 5m
12450-22	Optical Head Connection Cable, 10 Core/4 Wire, 7.5m
12450-23	Optical Head Connection Cable, 10 Core/4 Wire, 10m
12450-24	Optical Head Connection Cable, 10 Core/4 Wire, 15m
12450-40	Adjustable Mount Support for Optical Head 1
12450-42	Air Purge Unit with Mounting Support for Optical Head Supply 110/220 AC, 24 V DC, 0.7A
12450-45	Interface Module RS485 to RS232

M20-GON Options

12450-47	RS485 Output with PC Software
12450-48	USB Output, PC Cable and Software
12450-49	Relay Output, 60VDC/42VAC, RMS 0.4A

ONE YEAR 1 WARRANTY

CE

Specifications

Model	M20-GON08A10	M20-GON08A20
Temperature Range	0° to 800°C 32° to 1472°F	
Spectral Range	8 to 14µm	
Head	Optical	
Sighting	None	
Distance to Spot Ratio	10:1	20:1
Emissivity	0.1 to 1.0 Adjustable	
Photo Detector	Thermopile	
Response Time	60 mS Adjustable up to 10 S	
Accuracy & Repeatability	±1.5% of reading or +2°C*	
Analog Output	Standard: 4-20 mA, 0-20mA, or 0-10V, User Selectable	
Digital Output	RS485 (Choose Option: **12450-47**), or USB 2.0 (Choose Option: **12450-48**)	
Relay Output	Optional: Relay output with Hysteresis 60VDC/42VAC, RMS 0.4A (Choose Option: **12450-49**)	
Display Resolution	0.1°C	
Operating Temperature	Electronic and Optical Head 0° to 70°C (32° to 158°F)	
Storage Temperature	-20° to 70°C (-4° to 158°F)	
Power Supply	24 V DC	
Protection Class	IP65	
Head Dimensions	Diameter: 1.96 in, Length: 4.64 inch (Diameter: 14.5 mm, Length: 36 mm) Thread: M12 x 1.0 mm	
Housing / Weight	Stainless Steel, 0.705 oz (20g)	
Parametizer Dimensions	L: 4.52 x W: 2.55 x D: 2.16 in (L: 115 x W: 65 x D: 55 mm)	
Parameters Adjustable via Keypad and Software	Emissivity, Analog Output, Address, Response Time, Peak Picker, Scaleable Current or Voltage	
Included Accessories	Remote Sensor Head with 3m Cable, LCD Display, and Keypad for Parameterizing	

Specifications subject to change without notice
**Optical head should be at a constant ambient temperature.*
Accessories are not CE

12450-40 Adjustable Mount Support for Optical Head 1

12450-42 Air Purge Unit, with Mounting Clamp for Optical Head

Calibration Services Available

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PW1240
07/12 Rev B

M15 Series • Control Box with Relay Output • Laser Sighting

Specifications		
Model	**M15-GSL12P30**	**M15-CSL12P80**
Temperature Range	**0° to 1200°C 32° to 2192°F**	**400° to 1200°C 752° to 2192°F**
Spectral Range	**8 to 14µm**	**1.6µm**
Head	**Standard**	
Sighting	**Coaxial Laser Sighting**	
Distance to Spot Ratio	**30:1**	**80:1**
Emissivity	0.1 to 1.0 Adjustable	0.2 to 1.0 Adjustable
Photo Detector	Thermopile	InGaAs
Minimum Measuring Distance	0.5m	0.3m
Response Time	500 mS	200 mS
Accuracy	1% of Full Span	
Repeatability	0.3% of Full Measuring Range	
Analog Output	4-20mA DC, 250 Ω max	
Digital Output	RS485	
Relay Output	10A / 125V AC, 7A / 250V AC, 30VDC	
Display Resolution	1°C	
Operating Temperature	0° to 50°C (32° to 122°F)	
Operating Humidity	80%	
Storage Temperature	-18° to 50°C 0° to 122°F	
Power Supply	220V AC, 50HZ	
Protection Class	IP65	
Sensor Head Dimensions	Diameter: 2.87 inch Length: 7.0 inch (Diameter: 73 mm Length: 178 mm)	Diameter: 1.96 inch Length: 9.13 inch (Diameter: 50 mm Length: 232 mm)
Sensor Head Weight	1 lb (450 g)	1.58 lbs (720 g)
Sensor Head Housing	Aluminum	Aluminum
Control Box Dimensions	L: 6.4 x W: 3.3 x D: 7.5 in (L: 163 x W: 83 x D: 190 mm)	
Parameters Adjustable via Software	High/Low Temperature Limit & High/Low Alarm, Peak Temperature Display, Above/Below Measuring Range Indication	
Included Accessories	Temperature Indicator Control Box, Power Cord, Connection Cable, Adjustable Mount, User Manual	

M15 Series units are not CE

Specifications subject to change without notice

Applications

Heat Treating
Metals, Melted
Metals, Anodized
Metals, Coated
Metals, Painted

Calibration Services Available

8 to 14µm Model

M15-GSL12P30: 0° to 1200°C (31° to 2192°F)

- **D to S: 30:1**

1.6µm Model

M15-CSL12P80: 400° to 1200°C (752° to 2192°F)

- **D to S: 80:1**.

The M15-GSL and M15-CSL Series features several user selectable options, standard heads, oversized displays, and high/low alarms. With 1% full span accuracy, these robust stand alone units can be easily integrated into your process to monitor for critical temperature deviations.

The M15 sensors come standard with an adjustable 4-20mA output and two built in relays for running as a control circuit.

- **Max Value**
- **2 Relay Outputs**
- **Built-in LED Display**
- **Parameters Adjustable via Keypad**
- **RS485 Output**
- **Adjustable Emissivity 0.1 to 1.0**
- **High-Low Alarm with Control Box**
- **Audible Over-Limit Alarm**
- **Linear Current Output**

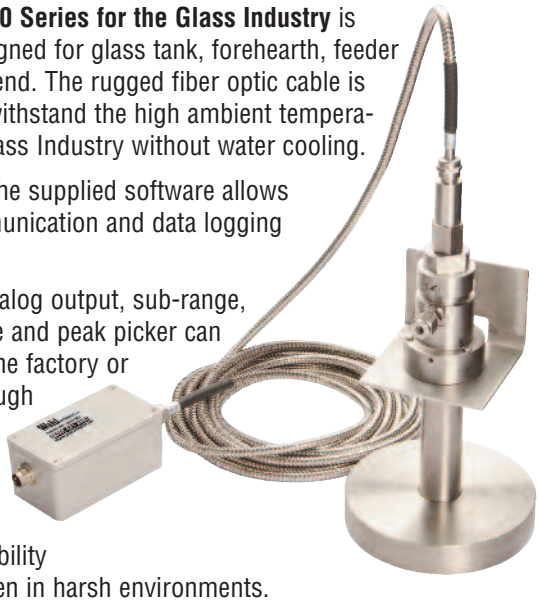
ONE YEAR 1 WARRANTY

M40-BFN • Glass Industry
Multi Fiber Cable • No Sighting

The Wahl M40 Series for the Glass Industry is specially designed for glass tank, forehearth, feeder and working end. The rugged fiber optic cable is designed to withstand the high ambient temperature of the Glass Industry without water cooling.

Fully digital, the supplied software allows remote communication and data logging through USB.

Emissivity, analog output, sub-range, response time and peak picker can be preset at the factory or adjusted through software. The heavy duty Stainless Steel housing provides reliability and safety even in harsh environments.



1µm Model - USB 2.0 Output

M40-BFN18Y100: 600° to 1800°C (1112° to 3272°F) D to S: 100:1

- **Fast Response Time 250 mS, Adjustable up to 10 S**
- **Includes 5m Fiber Optic Cable with Heavy Duty SS Conduit**
- **Two Wire Technology**
- **Test Current Output**
- **High Accuracy, ±0.3% of Reading**
- **High Optical Resolution**
- **Rugged Stainless Steel Housing**
- **Very Good Stability**
- **Fully Digital**
- **User Friendly Software**
- **Variety of Accessories**

M40-BFN Accessories - for images see page 23

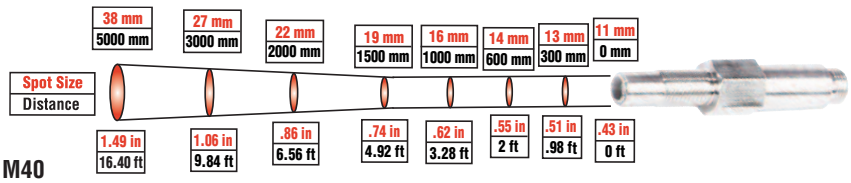
12450-03	Replacement Optical Head
12450-16	Multi Fiber Optic Cable, Replacement, 5m
12450-17	Multi Fiber Optic Cable, Upgrade to 10m
12450-25	Optical Head Connection Cable, 3 Core/2 Wire, 1/2m
12450-26	Optical Head Connection Cable, 3 Core/2 Wire, 5m
12450-27	Optical Head Connection Cable, 3 Core/2 Wire, 10m
12450-28	USB Cable with Connector, 1m
12450-34	Air Purge Unit, with 300mm INCONEL Sighting Tube
12450-35	Air Purge Unit, with Ceramic Sighting Tube
12450-36	Air Purge with Mounting Flange
12450-43	Temp Indicator, Power Supply, AC Input, 4/20 Output
12450-44	Power Supply for 110/220V AC, 24VDC, 0.7A

Applications

Furnace Sidewall
Forehearth
Furnace Crown
Feeder
Working End

Specifications	
Model	**M40-BFN18Y100**
Temperature Range	**600° to 1800°C 1112° to 3272°F**
Spectral Range	**1µm**
Head	**Standard**
Sighting	**None**
Distance to Spot Ratio	**100:1**
Emissivity	0.05 to 1.0 Adjustable via DIP switches and USB
Photo Detector	Si
Response Time	250 mS, Adjustable up to 10 S
Accuracy & Repeatability	±0.3% of reading or 3°C, whichever is greater
Test Current	12 mA
Analog Output	4-20 mA
Digital Output	USB 2.0
Optical Resolution	100:1 Min Spot Size 13 mm
Operating Temperature	Max. 452°F (250°C) at Fiber Optics Cable & Optical Head, 32° to 158°F (0° to 70°C) at Infrared Sensor End
Storage Temperature	-20° to 70°C -4° to 158°F
Power Supply	24 V DC
Protection Class	IP65
Isolation	N/A
Fiber Optic	5m Multi Fiber Cable in Heavy Duty Stainless Steel Flexible Conduit
Parametizer Dimensions	L: 4.52 x W: 2.55 x D: 2.16 inch (L: 115 x W: 65 x D: 55 mm)
Housing / Weight	Stainless Steel, 1.10 lb (0.5 kg)
Parameters Adjustable via Software	Response Time, Scaleable Current or Voltage, Emissivity
Parameters Readable via software	Measured Temperature, Temperature Graph, Internal Temperature of Sensor, Brightness Temperature
Included Accessories	Software, Optical Head, 5m Fiber Optic Cable in Heavy Duty SS Conduit, 5m Optical Head Connection Cable with Connector, Software, Inspection Sheet, and User Manual

Specifications subject to change without notice Accessories are not CE



M40
Optical Resolution

ONE YEAR 1 WARRANTY

CE

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Cooling, Air Purge, and Mounting Accessories

12450-29 Water Cooling Jacket with Air Purge for Optical Head 2

12450-30 Water Cooling Jacket with Air Purge & Adjustable Flange

12450-31 Adjustable Mounting Stand

12450-32 Air Purge with Mounting Bracket

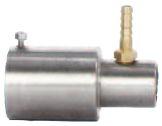
12450-33 Mounting Support

12450-34 Air Purge Unit, with 300mm INCONEL Sighting Tube

12450-35 Air Purge Unit, with Ceramic Sighting Tube

12450-36 Air Purge Unit with Mounting Flange

12450-37 Air Purge Unit, for Optical Head 1



12450-38 Air Purge Unit, for Optical Head 2

12450-39 Air Purge Unit, with Ceramic Sighting Tube

12450-40 Adjustable Mount Support for Optical Head 1

12450-41 Adjustable Mount Support for Optical Head 2

Optical Head Replacement

12450-01 Optical Head 1

12450-02 Optical Head 2

12450-03 Optical Head

Fiber Optic and Connection Cables

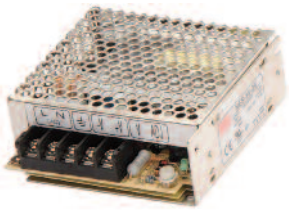
12450-04 thru 12450-17 Fiber Optic Cable

12450-25-26-27 Optical Head Connection Cable, 3 Core

12450-18 thru 1250-24 Optical Head Connection Cable, 12 & 10 Core

Temperature Indicators, Interface and Power Accessories

12450-43 Temperature Indicator and Power Supply, AC Input, 4/20 Output, and Alarm



12450-44 Power Supply: 110 /220 VAC, Output: 24VDC, Output Current: 0.7 Amp

12450-45 Interface Module RS485 to RS232, Power Supply: 230VAC or 24VDC Isolated

12450-46 P-120 Temperature Indicator with Parametizer

Note: Please see model page for accessories specific to each unit.

Calibration Services Available

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INSTRUMENTATION GROUP

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Calibration Services

We offer two levels of calibration services to choose from to meet your quality system requirements.

STANDARD CERTIFICATION: Unit is calibrated to factory specifications using NIST traceable equipment. Unit is provided with:

Certificate of Conformance*- Statement that our product meets published specifications. Included when you buy a new product.

Calibration Sticker*- (or tag) Advising you of the date your instrument(s) was/were calibrated, and the suggested date for its next calibration. This is provided when you buy a new product and when you return a product for calibration. (*Most Products)

NIST TRACEABLE TEST REPORT: Unit is calibrated to factory specifications using NIST Traceable equipment. Unit is provided with:

TRACEABLE TO NIST

NIST Traceable Test Report - Our quality Management system is certified to conform to ISO9001:2008. We maintain a calibration system in conformance with ANSI/NCSL Z-540 and MIL-STD-45662A.

"As Received" and "As Last" Data with Out of Tolerance conditions noted.

Calibration Sticker (see above).

Repair and Other Services

We offer repair services on the products we sell. The customer will be sent a written estimate for approval before proceeding with work. Repair pricing includes Standard Certification as listed above.

Detailed Repair Report - Available upon request, this report provides details of evaluation and repairs made.

Reminders - Go to www.palmerwahl.com/register, and in about a minute you can register your product for warranty protection and our calibration reminder service. Let us help you protect your investment, and maintain product accuracy and compliance with ISO and other quality standards.

Custom Points - Palmer Wahl will calibrate your instruments at your specified temperatures or pressure.

Special Requests - When calibrating your instrument, our experienced personnel will help you to achieve the level of quality that you need in your facility.

Note: Before returning your product please call Customer Service at 1-800-421-2853 or go to www.palmerwahl.com and click on Service/Product Return Request.

Other Instruments from Palmer Wahl

Wahl Black Body Calibration Sources calibrate non-contact temperature instruments quickly and accurately.

Wahl FD5 Datalogger allows multiple modules to be connected and synchronized for up to 45 analog inputs and unlimited calculation channels.

Wahl Heat Spy® Monitor Instruments are available from:

Palmer Wahl Warranty

Manufacturer warrants all products listed in this catalog to be free from defects in material or workmanship under normal use and service. The Manufacturer agrees to repair or replace any product which upon examination is revealed to have been defective due to faulty workmanship or material if returned to our factory, transportation charges prepaid, within the product specific warranty period stated in the catalog by the manufacturer. This warranty is in lieu of all other warranties, expressed or implied and of all obligations or liabilities on its part for damages including but not limited to consequential damages, following the use or misuse of instruments sold by the Manufacturer. No agent is authorized to assume for manufacturer any liability except as set forth above.

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