

Single-Wavelength Pyrometers

Williamson
Where Wavelength Matters

There are three distinct technologies for single-wavelength Pro series pyrometers: Short-Wavelength, Long-Wavelength and Specialty-Wavelength.

For most applications, select the shortest wavelength compatible with the measurement conditions and desired temperature span.

Short-Wavelength (SW)

- 4-20 times less sensitive to emissivity variation and optical obstruction compared to general purpose long-wavelength models
- Certain wavelengths can view through common interferences such as steam, flames, combustion gasses, and plasmas without error
- Available in traditional and fiber optic configuration (SWF)

Long-Wavelength (LW)

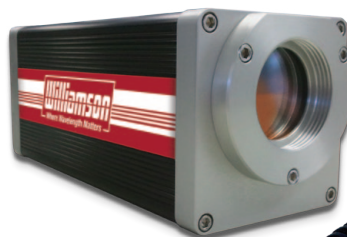
- General purpose pyrometer used for high-emissivity materials
- Can make low temperature readings (near ambient). Ideal for applications under 200°F/100°C

Specialty-Wavelength (SP)

- Used for certain materials that are least reflective and most opaque at a particular wavelength
- Used when optical obstructions are most transparent at a specific wavelength
- Popular applications: plastics, glass, flames, etc.

Specifications

Single-Wavelength Technologies



*Traditional Style
SW, LW, SP*



*Fiber Optic Style
SWF*

Single-Wavelength Specifications

Temperature Limits	0 to 5500°F / 0 to 3040°C (actual ranges vary by model)
Spectral Response	SW: 0.9μm, 1.6μm, 2.2μm, 2.9μm LW: 8-12μm SP: 1.15μm, 1.86μm, 3.43μm, 4.65μm, 5μm, 7.9μm
Optical Resolution	Range of optics selectable by model
Accuracy	SW: 0.25% of reading or 2°C whichever is greater LW: 0.5% of reading or 2°C whichever is greater SP: 0.5% of reading or 2°C whichever is greater
Repeatability	Better than 1°C
Emissivity	0.010 to 1.500
Response and Update Time	10ms initial response with 5ms update time with Auto Null: 100ms initial response with 50ms update time
Analog Output	0/4-20mA output (max impedance 1000 ohms)
Alarm	One field-selectable N.O. or N.C. Relay rated 1A @ 24V
Analog Input	4-20mA/0-20mA input (impedance 250 ohms)
Digital Communications	Bi-Directional RS485 and RS232 Multidrop communications available
Human Interface	Built-in menu system with Averaging, Peak/Valley Hold (Time or Temp Reset), Programmable Outputs & Alarms
Measured Parameters	Filtered and Unfiltered Temperature, Ambient Temperature & Rate of Change. (Auto Null Models: Cell Strength)
Input Power	24Vdc (300mA)
Ambient Temperature Limits	0 to 150°F / -17 to 65°C with Water Cooling Plate: 350°F / 175°C (varies with water rate & temp) with Protective Cooling Jacket: 600°F / 315°C Fiber Optic Cable & Lens Barrel: 400°F / 200°C
Enclosure Rating	Corrosion resistant enclosure w/ NEMA4X (IP65) rating. Optional IECEx and ATEX enclosures are available
Weight	3.6lbs (1.6kg)
Dimensions	3.5in x 3.5in x 8.25in / 89mm x 89mm x 210mm
Certification	Calibration certificate is standard with each unit CE: EMI / RFI for heavy industry; LVD (Low Voltage Directive)
Warranty	2 years

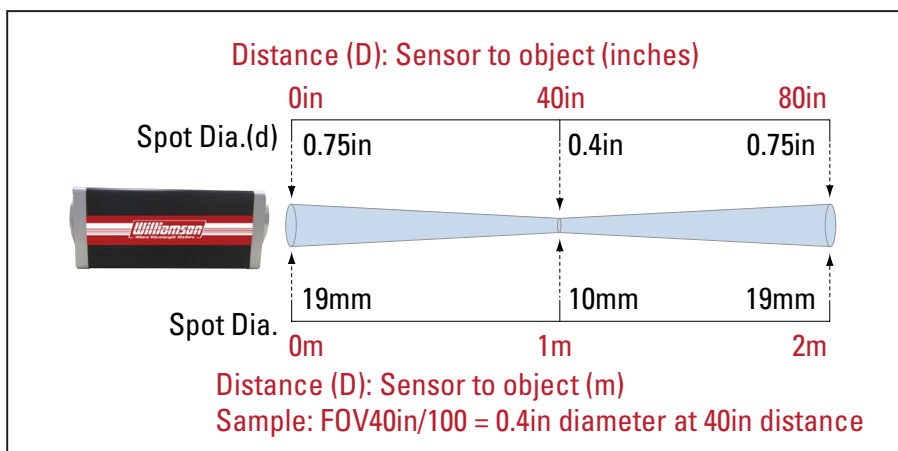
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Single-Wavelength Technology

Sample Field of View

Single-wavelength pyrometers may be used at any distance as long as the measured target fills the sensor's viewing area (i.e. a full FOV). The diameter (d) of the viewing area is calculated as $d=D/F$ where D is the focal distance of the sensor from the target and F is the optical resolution factor of the sensor.



Short-Wavelength Pyrometer Comparison

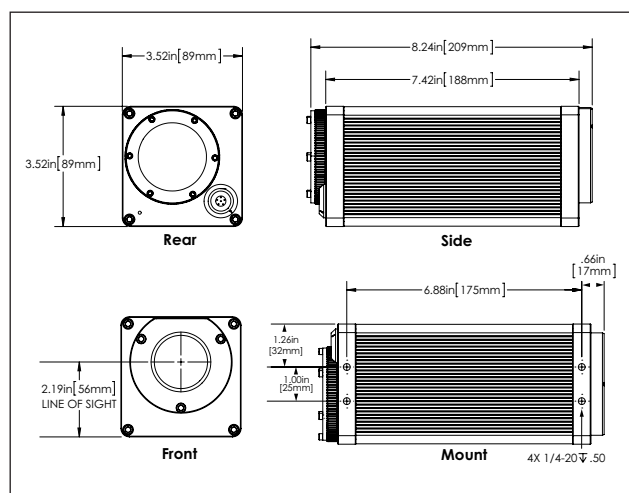
Intervening Media	SW Wavelength Code				
	09	16	2A	22	29
Water 0-13mm	✓				
Water 0-5mm	✓				
Steam		✓	✓	✓	
Flames		✓	✓	✓	
Combustion Gas		✓	✓	✓	
Plasma*		✓*	✓*	✓*	
Dust & Smoke	✓	✓	✓	✓	

*Consult Williamson for plasma compatibility

Speciality Wavelength Pyrometer Applications

Wavelength	Application
WA-1.15μm	Views through <5 mm water
FH-1.86μm	Hydrogen, Ammonia, Hydrocarbon based flames
PF-3.43μm	Thin films of H-C based plastics (polyethylene & polypropylene)
FC-4.65μm	Hot combustion gas, carbon based flames (CO, CO2 flames)
GL-5μm	Glass surfaces - inside furnaces, ovens & Quartz IR heaters
PG-7.9μm	Thin film plastics such as polyester, acrylic & Teflon epoxy, and painted surfaces. Applications using IR heaters.

Pro Series Dimensions



Local and Remote User Interface



Local Interface

- ▲ Increase Value
- ▼ Decrease Value
- M Menu
- ↵ Enter
- ☀ Aiming On/Off
- VIEW Through Lens Aiming
(local interface only)



Remote Interface

Sample Part Numbers

A – Model	B – Wavelength	C – Temp Code	Temp Scale	D – Field of View	E – Sensor Output	F – Options	G – Accessories	H – Cable
SW-	16-	30-	F- or C-	FOV5ft/110-	A- or D-	LA-	IM-WC-SB-	CF040
SWF-	16 -	30-	F- or C-	FOV6in/50-	A- or D-	SSB-G10-AL-	IM-STSB-	CF040

Model	Wavelength	Temp Code	Temperature Range		Traditional Style Optical Res.	Fiber Optic Optical Res.	Type of Fiber Cable	Max Fiber Cable Length
			Fahrenheit	Celsius				
SW SWF	09	50	1000-2500°F	540-1375°C	D/100	D/15	Glass	20ft / 6m
		60	1200-3200°F	650-1750°C	D/100	D/35	Glass	20ft / 6m
		70	1400-4500°F	760-2475°C	D/150	D/50	Glass	30ft/ 9.1m
	16	20	500-2100°F	260-1150°C	D/110	D/35	Quartz	10ft / 3m
		25	600-2500°F	315-1375°C	D/110	n/a	n/a	n/a
		30	700-3200°F	375-1750°C	D/110	D/50	Glass	20ft / 6m
	2A*	29	300-800°F	150-425°C	D/75	n/a	n/a	n/a
		30	150-800°F	65-425°C	D/50	D/15	Quartz	3ft / 1m
		32	200-1000°F	95-540°C	D/75	D/35	Quartz	6ft / 2m
	22	36	300-1500°F	150-815°C	D/100	D/15	Quartz	30ft / 9.1m
		37	350-2000°F	175-1100°C	D/50	n/a	n/a	n/a
		40	400-2500°F	200-1375°C	D/100	D/35	Quartz	30ft / 9.1m
	29*†	08	100-800°F	40-425°C	D/35	n/a	n/a	n/a
		10	125-800°F	50-425°C	D/50	n/a	n/a	n/a
		20	150-800°F	65-425°C	D/100	n/a	n/a	n/a
SP	WA	21	700-2000°F	375-1100°C	D/50	D/35	Quartz	20ft / 6m
	FH	33	700-3200°F	375-1750°C	D/50	n/a	n/a	n/a
	PF*	30	250-1000°F	125-535°C	D/35	n/a	n/a	n/a
	FC	40	1000-4000°F	550-2200°C	D/100	n/a	n/a	n/a
	GL	10	200-1000°F	95-540°C	D/50	n/a	n/a	n/a
		20	500-2500°F	250-1375°C	D/100	n/a	n/a	n/a
	PG	30	150-1000°F	60-535°C	D/50	n/a	n/a	n/a
		40	500-2500°F	260-1375°C	D/50	n/a	n/a	n/a
LW	GP	-	0-1000°F	0-550°C	D/50	n/a	n/a	n/a

* Denotes Auto Null. †Wavelength 29 not available as a fiber optic configuration.

Note: Not all temperature ranges shown. Consult Williamson for longer fiber cable lengths

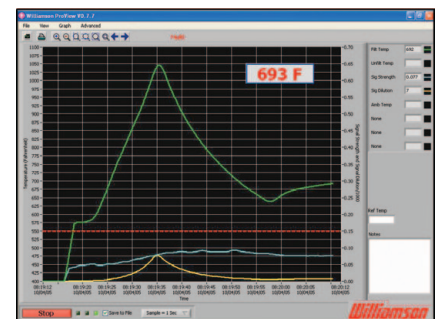
E – Sensor Output (Select One)

Part No.	Description
A	Set to Analog Output/Input with linear mA output
D	Set to Digital Communications for operation w/ Interface Module or for 4-wire digital operation

F – Options (Must Be Specified at Time of Order)

Part No.	Description
Traditional Style	
LA	Laser Aiming
VALA	Visual Aiming and Laser Aiming
Fiber Optic Style	
AL	Built in Aim Light
FLB	Flanged Lens Barrel
LBMB	Lens Barrel Mounting Thread, Brass
4QT	Non-conductive Ceramic Quartz Tip, 4in/102mm long, threads onto end of fiber cable

ProView PC software

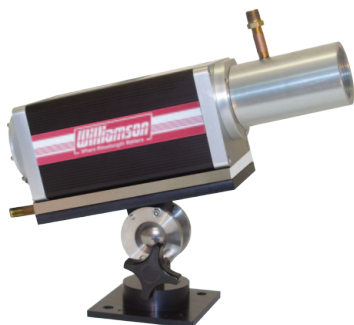


ProView PC software is compatible with Williamson Pro Series sensors. It may be used to log and analyze data and to make remote sensor adjustments.

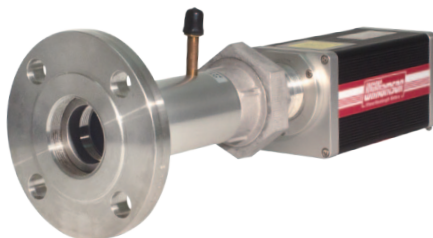
Single-Wavelength Technology

Traditional Style Mounting and Protective Accessories

Popular Williamson accessories include: Swivel Bracket (SB), Water Cooling Plate (WC), Air Purge (AP), Protective Cooling Jacket (PCJ) and a selection of Flange Mounts (FMxx)



Swivel Bracket, Water Cooling Plate and Air Purge



Flange Mount (includes AP)



Protective Cooling Jacket

Fiber Optic Mounting and Protective Accessories

To simplify the installation and alignment of the pyrometers, Williamson offers a Fiber Optic Swivel Bracket (FOSB), Sight Tube Swivel Bracket (STSB), and a selection of Flange Mounts (FOFMxx/STFMxx).



Fiber Cable Mounting Brackets



Fiber Optic Flange Mount (includes AP)

Fiber Optic Cable Options



Standard Fiber Optic Cable (Gn and Qn)



Cable with Stainless Steel Braid (SSB)



Cable with Heavy Duty ArmorGuard (AG)



Monofilament Cable (Mn)

Standard fiber optic cables are sealed with a Teflon jacket over a stainless steel sheath and are available in lengths of 3-30 feet (1-9 meters). For added protection, the flexible, lightweight Stainless Steel Braid or heavy duty ArmorGuard is available. These options include an air purge and stainless steel sight tube with a 1 inch pipe thread. For applications with very confined access or a high potential for electromagnetic interference, the monofilament fiber cables with a Teflon sheathing and Teflon outer jacket offer a smaller diameter of 0.05in/1.3mm and non-conductive packaging.

G – Accessories

Part No.	Description
Traditional Style	
AP	Air Purge
SB	Swivel Bracket
FMxx	Flange Mounts*
PCJ	Protective Cooling Jacket
Fiber Optic Style	
FOSB	Fiber Optic Swivel Bracket
FOMAQ	Non-conductive Fiber Optic Mounting Assembly, Quartz Window
STSB	Sight Tube Swivel Bracket (for use with SSB & AG)
FOFMxx	Fiber Optic Flange Mounts*
STFMxx	Sight Tube Flange Mounts (for use with SSB and AG)*
Pro Series – All Models	
IM	Interface Module, 1/4DIN, Outputs, Inputs, Relay Alarms Power to Sensor, Input Power (90-260Vac)
VCS	Vortex Cooling System includes Filter & Regulator
ABF	Adjustable Bellows Flange 2" ANSI both ends
WC	Water Cooling Plate

*See accessories brochure for complete listing

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