Williamson
Where Wavelength Matters

Williamson is the only company to offer two different types of ratio pyrometer technologies: Two-Color and Dual-Wavelength. The Dual-Wavelength pyrometer has all of the capabilities of a Two-Color with some significant added benefits/capabilities.

Two-Color (TC) Overview

- Overlapping wavelengths produce more of an averaged temperature value when viewing temperature gradients and heavy scale

- Does not tolerate obstruction from water, steam, flames, plasma, laser energy or other interferences

- Faster response and lower cost compared to dual-wavelength

Dual-Wavelength (DW) Overview

- Separated wavelengths produce a heavily-weighted reading towards the hottest temperature viewed, broad temperature spans, and low temperature ranges

- Select wavelength sets tolerate water, steam, flames, combustion gasses, plasma, and laser energy

- Better tolerates misalignment, optical obstruction and scale compared to two-color

Two-color pyrometers are an appropriate choice for many common temperature measurement applications. However, when operating conditions include water, steam, scale, severe temperature gradients, severe or intermittent optical obstruction, flames, combustion gasses, laser energy, plasma, small targets or low temperatures, dual-wavelength pyrometers are a more appropriate choice.

Specifications
Ratio Technologies

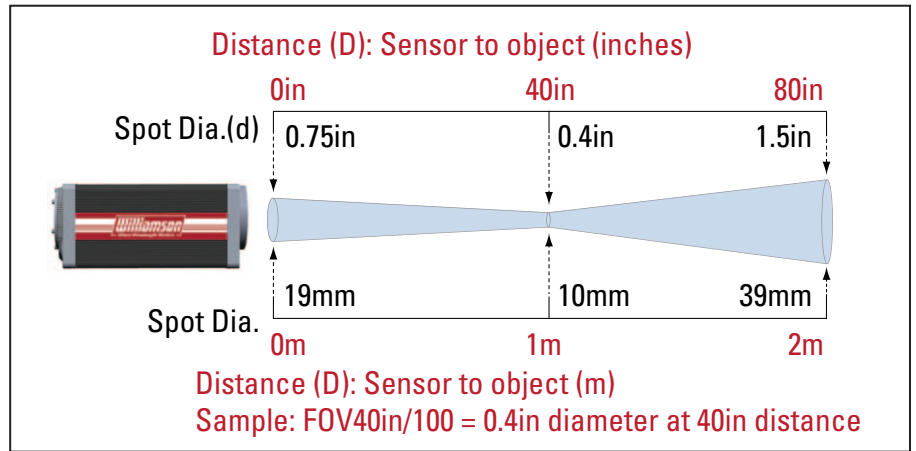*Traditional Style TC, DW*

Fiber Optic Style TCF, DWF

Ratio Specifications	
Temperature Limits	200 to 5500°F / 95 to 3040°C (actual ranges vary by model)
Spectral Response	TC: Fixed wavelength-set at around 1µm DW: Range of precisely selected narrow wavelength bands
Optical Resolution	Range of optics selectable by model
Accuracy	0.25% of reading or 2°C whichever is greater
Repeatability	Better than 1°C
E-Slope	0.000 to 2.000
Response and Update Time	TC: 10ms (initial response) with 5ms update time DW: 50ms (initial response) with 25ms 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 & ESP Filters
Measured Parameters	Filtered and Unfiltered Temperature, Ambient Temperature, Signal Strength/Emissivity, Signal Dilution & Rate of Change
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

Sample Field of View

Ratio pyrometers may be used at any distance and can provide accurate measurements with either a full or a partially filled field of view (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.
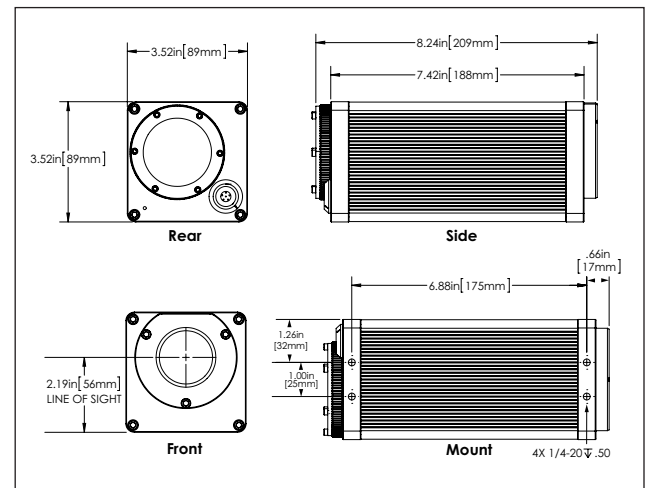
Distance (D): Sensor to object (inches)

	0in	40in	80in
Spot Dia.(d)	0.75in	0.4in	1.5in
Spot Dia.	19mm	10mm	39mm
	0m	1m	2m

Distance (D): Sensor to object (m)

Sample: FOV40in/100 = 0.4in diameter at 40in distance

Ratio Pyrometer Comparison

Intervening Media	TC	DW				
		Wavelength Code				
	11	MS	08	12	24	28
Water 0-13mm		✓				
Water 0-5mm		✓	✓			
Steam		✓	✓		✓	
Flames		✓				
Combustion Gas		✓	✓			
Plasma*		✓*			✓*	
Surface Oxidation	✓	✓	✓	✓	✓	✓
Scale		✓	✓	✓	✓	✓
Emissivity Variation	✓	✓	✓	✓	✓	✓

Consult Williamson for plasma compatibility

Pro Series Dimensions

3.52in [89mm]
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Rear

8.24in [209mm]
7.42in [188mm]
Side

2.19in [56mm] LINE OF SIGHT
Front

6.88in [175mm]
.66in [17mm]
1.26in [32mm]
1.00in [25mm]
Mount
4X 1/4-20 ▼ .50

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
DW-	08-	50-	F- or C-	FOV5ft/50-	A- or D-	LA-	IM-SB-WC-AP-	CF040
DWF-	08-	50-	F- or C-	FOV6in/35-	A- or D-	AG-G20-AL-	IM-STSB-	CF040

Model	Wavelength	Temp Code	Temperature Range Fahrenheit	Temperature Range Celsius	Traditional Style Optical Res.	Fiber Optic Optical Res.	Type of Fiber Cable	Max Fiber Cable Length
TC	11	32	1300-3200°F	700-1750°C	D/100	n/a	n/a	n/a
		25	1100-2500°F	600-1375°C	D/50	n/a	n/a	n/a
DW DWF	MS	62	2000-3200°F	1100-1760°C	D/25, D/50, D/80, D/100	D/.75, D/15	Glass	30ft / 9.1m
	08	40	1100-2000°F	600-1100°C	D/17, D/25	D/.75, D/15	Glass	15ft / 4.6m
		50	1300-2500°F	700-1375°C	D/17, D/25, D/50, D/80	D/.75, D/15, D/35	Glass	25ft/ 7.6m
		65	1600-3200°F	875-1750°C	D/25, D/50, D/80, D/100	D/35, D/50	Glass	30ft / 9.1m
		70	1700-4500°F	925-2475°C	D/25, D/50, D/80, D/100, D/120, D/150	D/35, D/50	Glass	30ft / 9.1m
	12	10	700-2100°F	375-1150°C	D/17, D/25, D/50, D/75	D/2, D/15, D/35, D/60	Quartz	10ft / 3m
		15	750-2500°F	400-1375°C	D/17, D/25, D/50, D/75	D/2, D/15, D/35, D/60	Quartz	10ft / 3m
		20	900-3200°F	475-1750°C	D/25, D/50, D/75, D/90	D/35, D/60	Quartz	25ft / 7.6m
		30	1000-4000°F	550-2200°C	D/25, D/50, D/75, D/90, D/110	D/35, D/60	Quartz	30ft / 9.1m
		35	1100-4500°F	600-2475°C	D/25, D/50, D/75, D/90, D/110	n/a	n/a	n/a
	24	05	300-900°F	150-475°C	D/17, D/25	D/2, D/8	Quartz	3ft / 91cm
		27	400-1200°F	200-650°C	D/17, D/25, D/50	D/2, D/15	Quartz	10ft / 3m
		34	500-1700°F	260-925°C	D/17, D/25, D/50, D/75	D/2, D/15, D/35	Quartz	10ft / 3m
		36	600-1900°F	315-1035°C	D/17, D/25, D/50, D/75, D/100	D/2, D/15, D/35, D/60	Quartz	10ft / 3m
		40	900-2700°F	475-1475°C	D/17, D/25, D/50, D/75, D/100	D/35, D/60	Quartz	15ft / 4.6m
	28*	03	200-700°F	95-300°C	D/17	n/a	n/a	n/a

*Wavelength 28 not available as fiber optic
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 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
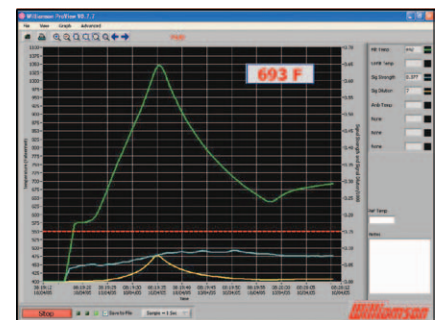
ProView PC software is compatible with Williamson Pro Series sensors. It may be used to log and analyze data and to make remote sensor adjustments.
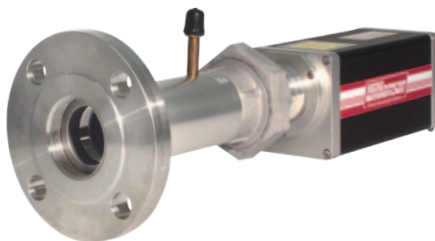
Traditional Style Mounting and Protective Accessories

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)
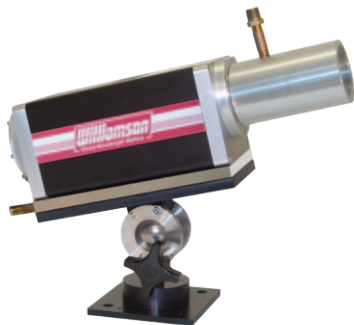
Swivel Bracket, Water Cooling Plate and Air Purge

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 (indludes 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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