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Find the *Newport 818-F-IR* at our website: ***Click HERE***

818 Series

Low-Power Detectors

Key Features

- *Power levels from pW to 2W*
- *Wavelengths from 190–1800 nm*
- *Proprietary detector optics*
- *Patented, matched OD3 attenuator*
- *NIST/NPL-traceable calibration included*
- *EMI/RFI shielded*
- *Free-space and fiber optic versions available*

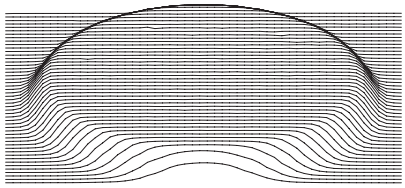


Figure 1—Newport detector response uniformity with coherent light.

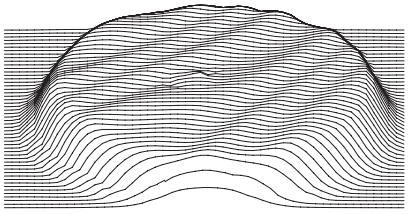


Figure 2—Typical detector response uniformity with coherent light.

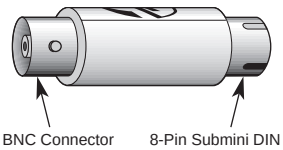


Figure 3—"/CM" Calibration Module, Patent Pending

Newport uses the highest quality semiconductor detector materials available in our **818 Series Low-Power Detectors.** In addition, each detector arrives with a complete full-spectrum calibration report detailing detector responsivity in 10 nm increments.

Proprietary detector optics are designed to address the problems associated with measuring coherent light (see Fig. 1 and 2). In ordinary detectors, coherent light causes reading errors across the detector surface and measurements are more sensitive to thermal drift. This results in an additional, unreported 5% to 8% calibration uncertainty when making laser power measurements. Newport's detector design eliminates these problems for stable, uniform detector response.

Newport's advanced in-house calibration facility performs the tightest calibrations in the business, further improving the absolute accuracy of our detectors. For more information, refer to Detector Calibration Services (see page 165).

Exclusive OD3 attenuator technology extends the calibrated optical dynamic range of our Cylindrical and Hand-Held Wand Detectors by three decades, as shown in Fig. 4. Our patented attenuator design provides low reflection, high damage threshold and spectral flatness, without the damage susceptibility problems of thin-film attenuators or the spectral variance of simple volume-absorbing attenuators.

Calibration modules are required when using Cylindrical and Hand-Held Wand Detectors with Newport's **Model 840-C, 1830-C, 1835-C, 2832-C, 2835-C or 4832-C optical meters**. The module, shown in Figure 3, is matched to an individual detector and provides the meter with detector calibration and operating information. The calibration module option is indicated by the /CM suffix in the detector Model number.

When using Cylindrical or Hand-Held Detectors with Newport's 841-PE Power/Energy Meter, a DB15 connector with EEPROM is required. This option is indicated by the /841 suffix.

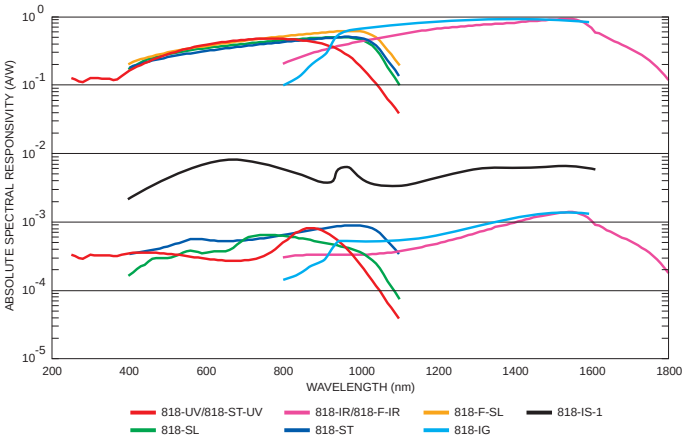
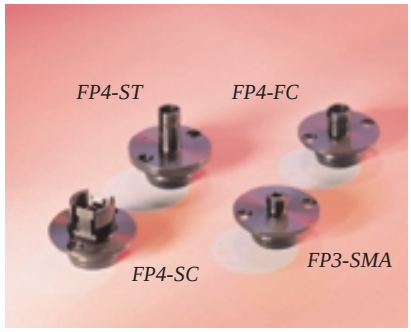


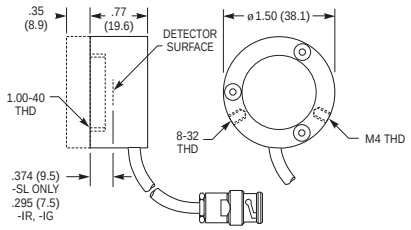
Figure 4—Low-power detector responsivity curves.

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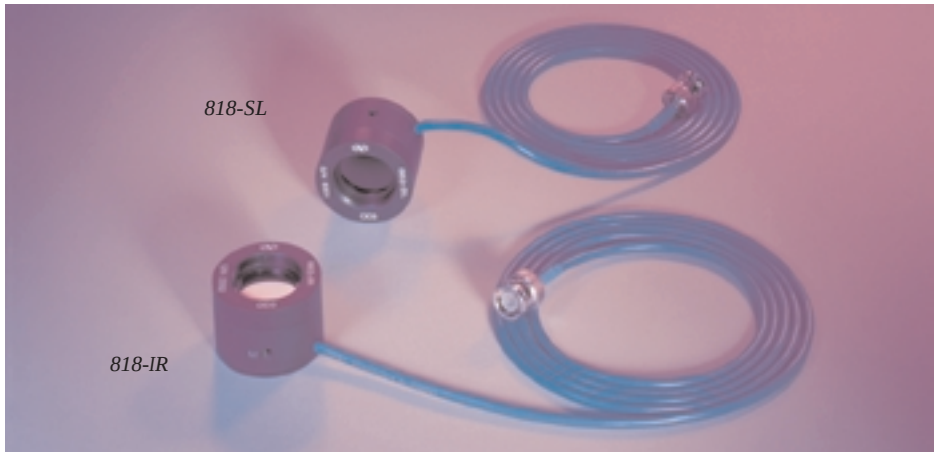
818-SL and 818-IG detectors can be mounted to our 819 Series Integrating Spheres and calibrated as a system. Please see page 143 for more information.







818 Series Cylindrical Detectors



The 818 Series Cylindrical Detectors (818-UV, 818-SL, 818-IR, 818-IG) are offered for broad wavelength ranges covering UV, visible, near-IR, and IR regions. They use the finest large-area planar-diffused PIN silicon, indium gallium arsenide, germanium PIN or inverted-channel silicon detectors. Each is optimized for zero-bias operation to provide the low noise, high stability and uniformity demanded by critical radiometric measurements. Compact packaging, international mounting holes and BNC-terminated cabling make incorporation into experimental, production and field applications straightforward. Please see page 137 for Specifications and Ordering Information.

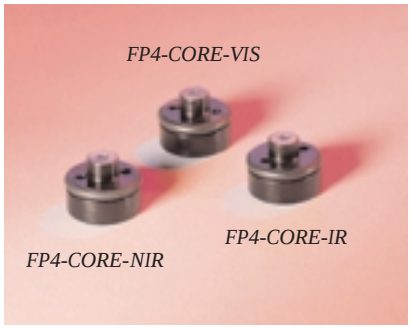
Cylindrical Detector Accessories

Fiber optic adaptors for the **818 Series Cylindrical Detectors** allow the user to perform optical power measurements when working with bare and connector terminated optical fibers.

The FP3-FH1 Bare Fiber Holder is a cleverly designed clamp that is used to hold 250 µm bare fibers without damaging the fiber. It in turn plugs into the **818-FA2 Bare Fiber Holder Mount**, which allows one to attach the assembly to the front end of Newport's Cylindrical Detector housing.

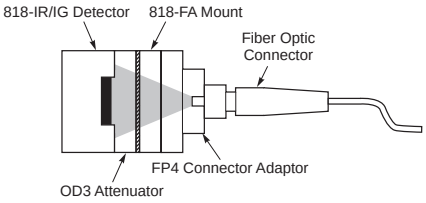
FP3/FP4 Series Connector Adaptors accommodate optical fibers terminated in the most popular fiber optic connector styles: SMA, ST, FC and SC. The redesigned adaptors have more space around the threaded input and can be attached to the **818-FA Fiber Adaptor Mount** with two screws, allowing for easier insertion and unplugging of fiber optic connectors. When working with our small area detectors (**818-IR/818-IG**), we recommend using an **FP4-CORE-IR**, described next. **FP4-CORE-VIS/NIR Adaptor Cores** do not contain collimating optics, and are suitable only for use with our large area detectors.

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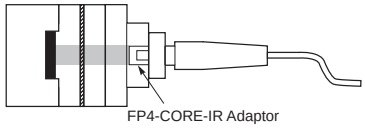


FP4-CORE-IR Series Adaptor Cores allow you to make accurate measurements from connectorized fibers regardless of input conditions by preventing detector overfill effects. The **FP4-CORE-IR** collimates the light emerging from the fiber tip to prevent detector overfill when using small area detectors (**818-IR, 818-IG**), even when the attenuator is used. Insertion loss and backreflection from the fiber tip may be reduced by applying a small amount of index matching gel to the air gap between the fiber tip and the fused silica input surface. The coating is optimized for 900–1600 nm.

Models **FP4-CORE-NIR** and **FP4-CORE-VIS** do not have the collimating optics, and are intended only for use with our large area detectors (**818-UV, 818-SL**). They do have the fused silica window, and can be used with index matching gel to obtain low backreflection and low insertion loss connections. The modularity of the **FP4 Series** allows quick interchangeability of the cores into the various **FP4 Series** connector adaptors. The FP4 cores cannot be used with the **FP3-SMA** connector adaptor.



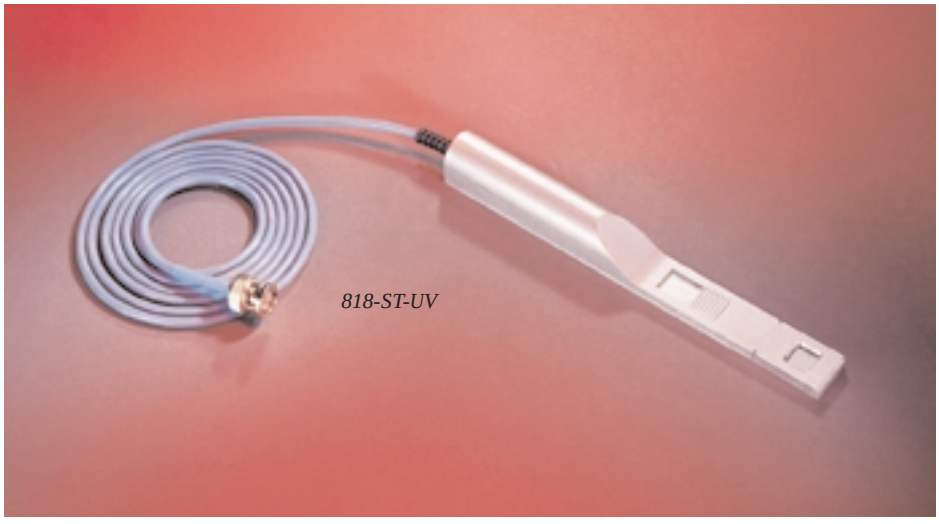
Diverging beam overfills detector area



FP4-CORE-IR collimates beam onto small area detector, even with use of OD3 attenuator

818-ST and 818-ST-UV Hand-Held Wand Detectors

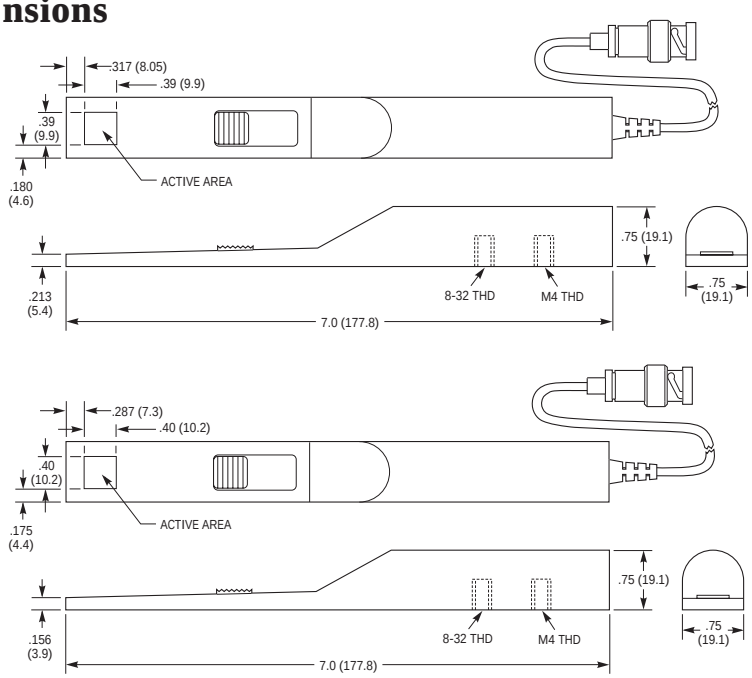




The **818-ST and 818-ST-UV** Hand-Held Wand puts all the performance of the 818-SL and 818-UV detector into a narrow-profile, hand-held wand. It even provides a built-in OD3 attenuator at the flick of a button. BNC termination provides compatibility with Newport optical meters. The wand is compatible with both English and metric post mounts. Please see page 136 for specifications and ordering information.

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Dimensions



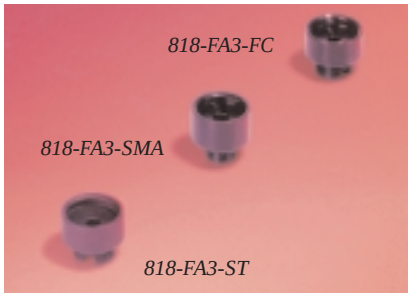


818-F Series Fiber Optic Detector Modules

818-F Series Fiber Optic Detector Modules are optimized for measurements on connectorized fiber optics. These compact detector modules allow the connection of an optical fiber directly to the meter, configuring it as a dedicated fiber optic power meter. These detector modules are only compatible with Newport meters that support the /CM detector option. They are not BNC-terminated.

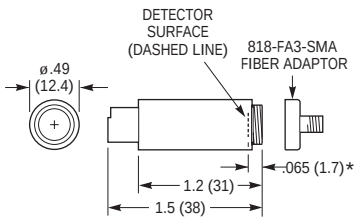
Please see page 136 for specifications

Connector adaptors for the **818-F Series Fiber Optic Detector Modules** are available for five popular fiber optic connectors. An SMA adaptor comes with each fiber optic module.



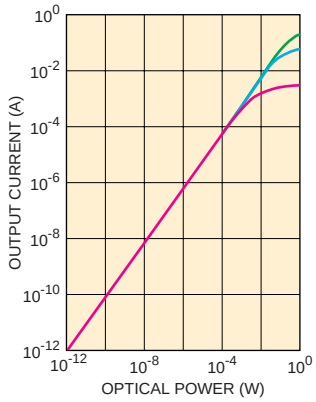
818-F Series Ordering Information

Model	Description
818-F-SL	Detector Module 400–1100 nm
818-F-IR	Detector Module 780–1800 nm
818-FA3-SMA	SMA Adaptor
818-FA3-FC	FC Adaptor
818-FA3-ST	ST Adaptor



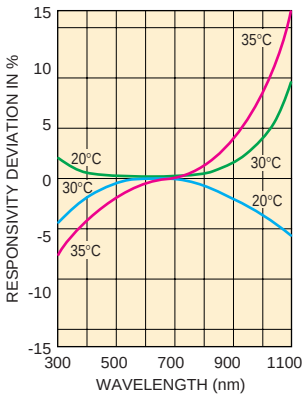
* This dimension is also the fiber tip-to-detector distance.

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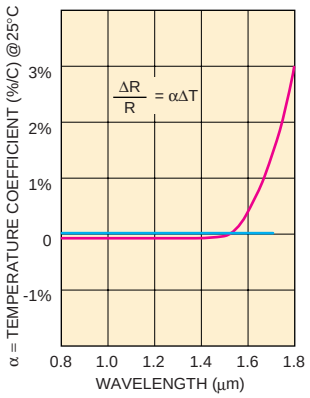


Linearity of photodiode response

818-UV
818-SL, 818-ST, 818-IS-1
818-IR, 818-IG

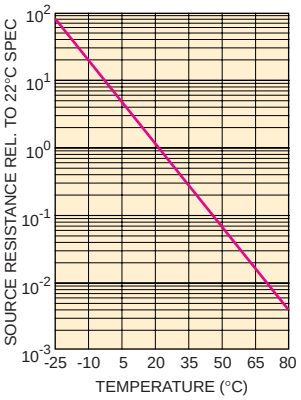


Temperature variation of response vs. wavelength for 818-UV, 818-SL, 818-ST



Temperature variation of response vs. wavelength

818-IG
818-IR



Relative shunt resistance vs. temperature

818 Series Detector Specifications

Model w/ Calib. Module w/ DB15 Connector	818-ST 818-UV/CM 818-ST/841	818-SL 818-SL/CM 818-SL/841	818-F-SL	818-ST 818-ST/CM 818-ST/841	818-IR 818-F-IR / 818-IR/CM 818-IR/841	818-IG 818-IG/CM 818-IG/841
Spectral Range (μm)	0.4–1.1	0.4–1.1	0.4–1.1	0.4–1.1	0.78–1.8	0.8–1.65
Power, Average Max w/ Attenuator (W/cm^2)(1)	2	2		2	2(6)	2
Power, Average Maximum w/o Attenuator (mW/cm^2)(1)	2	2	2	2	3	3
Pulse Energy, Maximum - w/ Attenuator ($\mu J/cm^2$)(2)	0.03	1		0.03	0.35 Not Avail.(3)	0.35
Pulse Energy, Maximum - w/o Attenuator (nJ/cm^2)(2)	0.03	1	0.03	0.03	0.35	0.35
Accuracy at constant temperature	±2% @ 0.4-1.1	±2% @ 0.4-1.1	±2% @ 0.4 - 1.1	±2% @ 0.4-1.1	±3% @ 0.78-1.7; ±5% @ 1.71-1.8; ±7% w/ Attenuator(5)	±2% @ 0.8-1.65
Uniformity(4)	±2%	±2%	±2%	±2%	±2%	±2%
Linearity	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
Saturation Current (mA/cm^2)	8	4.6	2	8	400	250
Responsivity	>0.1 A/W 400–1000 nm	>0.1 A/W 400–1000 nm	>0.1 A/W 400–1000 nm	>0.1 A/W 400–1000 nm	≥0.2 A/W 850–1700 nm	≥0.1 A/W 800–1600 nm
Responsivity (Peak)	>0.5 A/W @ 400–1000nm	>0.5 A/W @ 400–1000 nm	>0.4 A/W @ 400–1000 nm	>0.5 A/W @ 400–1000 nm	>0.8 A/W @ 850–1700 nm	>0.9 A/W @ 800–1600 nm
Rise Time (μs)	≤3	≤2	≤1	≤3	≤2	≤2
Shunt Resistance (MΩ) (typ)	≥50	≥2	≥200	≥50	≥35	≥20
Die Capacitance (pF)	1,100	12,000	160	1,100	14 nF	1500
Reverse Bias, Maximum (V)	5	10	5	5	0.25	2
NEP ($W/\sqrt{Hz}$)	1.5×10^{-14}	5.5×10^{-13}	1.1×10^{-14}	1.5×10^{-14}	0.7×10^{-12}	3.0×10^{-14}
Material	Silicon	Silicon	Silicon	Silicon	Germanium	Indium Gallium Arsenide
Active Area (cm^2)	1	1	0.071	1	0.071	0.071
Active Diameter (cm)	1x1	1.13	0.3	1x1	0.3	0.3
Shape	Wand	Cylinder	Fiber Module	Wand	Cylinder(5) Fiber Module(3)	Cylinder
Attenuator, OD3	Built-In	Detachable		Built-In	Detachable(6) Not Avail.(3)	Detachable

1) Applies to entire spectral response
2) 15 ns pulse width
3) Applies to 818-F-IR
4) When measured with 1.0 mm diameter beam centered within 80% of active area
5) Applies to 818-IR and 818-IR/CM
6) Not applicable to 818-F-IR

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Powerful and portable, the 841-PE Handheld Power and Energy Meter is a perfect match for your 818 Series Low Power Detector. Please see page 122 for more information.

818-ST-UV Detector Specifications

Model w/ Calib. Module w/ DB15 Connector	818-ST-UV 818-ST-UV/CM 818-ST-UV/841
Spectral Range (µm)	0.19–1.1
Uniformity[1]	±2%
Linearity	±0.5%
Saturation Current (mA/cm^2)	8
Responsivity	>0.120 A/W @ 200 nm
Rise Time (µs)	≤3
Shunt Resistance (MΩ) (typ)	≥50
Die Capacitance (pF)	1,100
Reverse Bias, Maximum (V)	5
NEP (W/√Hz)	1.8 x 10^{-14}
Material	Silicon (UV Enhanced)
Active Area (cm^2)	1
Shape	Wand
Attenuator, OD3	Built-In

1) When measured with beam centered and filling 80% of active area.
Refer to www.newport.com for additional specifications on the product.
Type"818-ST-UV" in the Search.

818 Series Ordering Information

Model (Metric)	Description
818-UV	818-UV Detector
818-UV/CM	818-UV with Calibration Module
818-UV/841	Silicon Detector (190–1100 nm) for 841-PE Power Meter
818-ST-UV	818-ST-UV Detector
818-ST-UV/CM	818-ST-UV with Calibration Module
818-ST-UV/841	Silicon Detector (190–1100 nm) for 841-PE Power Meter
818-SL	Silicon Detector (400–1100 nm)
818-SL/CM	818-SL with Calibration Module
818-SL/841	Silicon Detector (400–1100 nm) for 841-PE Power Meter
818-ST	818-ST Detector
818-ST/CM	818-ST with Calibration Module
818-ST/841	Silicon Detector (400–1100 nm) for 841-PE Power Meter
818-IR	Germanium Detector (800–1800 nm)
818-IR/CM	818-IR with Calibration Module
818-IR/841	Germanium Detector (800–1800 nm) for 841-PE Power Meter
818-IG	InGaAs Detector (800–1600 nm)
818-IG/CM	818-IG with Calibration Module
818-IG/841	InGaAs Detector (800–1600 nm) for 841-PE Power Meter

Cylindrical Detector Accessories Ordering Information

Model	Description
818-FA2	Bare Fiber Holder Mount
FP3-FH1	Bare Fiber Holder
818-FA	Fiber Adaptor Mount
FP3-SMA	Connector Adaptor
FP4-ST	ST Connector Adaptor
FP4-LC	LC Connector Adapter

Model	Description
FP4-FC	FC Connector Adaptor
FP4-SC	SC Connector Adaptor
FP4-CORE-VIS	Adaptor Core (430-700 nm)
FP4-CORE-NIR	Adaptor Core (650-1000 nm)
FP4-CORE-IR	Lensed Adaptor Core (1000-1550 nm)

Please see this page for ordering information on Newport's cylindrical detector accessories.

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