

818P Series High-Power Detectors



- Very high sensitivity to power
- Broadband flat spectral response from 0.19–11 μm
- NIST-traceable calibration included
- Insensitive to beam position

Newport's 818P Series High Power Detectors provide a full range of the highest quality detectors to meet most optical power measurement needs. The 818P series offers broadband, spectrally flat power detectors for general use. High peak power pulse damage resistance in specific UV and IR bands are also available. Maximum power ratings range from 1 to 400 Watts. Higher maximum power ratings require heatsink, fan, or water-cooled operation. Standard apertures of 12, 19, 25 and 55 mm are available. Volume absorber versions with an 18mm aperture are also available. Typical applications include measurements of CW or pulsed Ion, Nd:YAG, Ti:Sapphire, CO₂, Holmium lasers, high-power laser diodes and Excimer laser measurements in the UV range.

The newly introduced 818P-001-12 offers the flat spectral response and the low spatial dependence of thermopile detectors, while retaining the high sensitivity of photodiodes. Users working with lasers in the μW and mW range will appreciate its lower thermal drift compared to the standard thermopile detectors. It is ideally suited for measuring pulsed laser diodes, OPA, gas lasers (HeNe, argon, etc) or any low power laser.

All 818P high power detectors include a DB15 connector and internal EEPROM for storing factory calibration data, making them compatible with Newport's new 1935-C and 2935-C Series Optical Meters (see page 1131), and 1918-C (see page 1136) and 842-PE Handheld Power/Energy Meter (see page 1138). When using with Newport's 1835-C and 2835-C Series Optical Meters, use the adaptor cable 818P-DIN (ordered separately).

All 12mm aperture 818P detectors have a 8-32 tapped hole and all other 818P Series detectors have a 1/4-20 tapped hole for post or plate mounting.

Calibration of optical detectors is required annually to assure NIST traceability. Newport's recalibration services are geared to provide fast turnaround to meet your tight schedule.

818P Specifications (12 & 17 mm Aperture versions)

Model	818P-001-12 ⁽¹⁾	818P-010-12	818P-020-12	818P-070-12	818P-015-17W	818P-030-17W	818P-050-17W
Spectral Range (μm)	0.19 - 11	0.19 - 11	0.19 - 11	0.19 - 11	0.19 - 10	0.19 - 10	0.19 - 10
Max. Measurable Power (W)	1	10	20	70	15	30	50
Minimum Detectable Power (mW)	0.001		1			1	
Rise Time (s)	2.5		0.3			1.4	
Responsivity, Approximate (mV/W)	0.5		0.5			0.7	
Accuracy (%)	± 2.5		± 2.5			± 2.5	
Repeatability (%)	± 0.5		± 0.5			± 0.5	
Resolution (%)			± 0.5			± 0.5	
Beam Size Dependence (%)			± 0.5			± 0.5	
Maximum Average Power (W)	(continuous) (2 minutes)	1 15	20 30	70 90	15 23	30 45	50 75
Power Density, Maximum Average @ 1064nm, CW	3 kW/cm ²		36 kW/cm ²			100 kW/cm ²	
Pulse Energy Density, Maximum (J/cm ²)			1.0			1.1	
Active Diameter (mm)	12		12			17	
Active Area (cm ²)	1.13		1.13			2.27	
Cooling Method	Air	Air	Heat Sink	Water	Air	Heat Sink	Heat Sink
Dimensions (L x W x D) [in. (mm)]	2.87 x 2.87 x 0.79 (73 x 73 x 20) ⁽²⁾	1.50 x 1.50 x 0.55 (38 x 38 x 14)	1.50 x 1.50 x 1.77 (38 x 38 x 45)	1.50 x 1.50 x 1.77 (38 x 38 x 32)	1.97 x 1.97 x 0.81 (50 x 50 x 20.6)	1.97 x 1.97 x 2.22 (50 x 50 x 56.3)	3.0 x 3.0 x 2.94 (76.2 x 76.2 x 74.7)
Weight [lb (kg)]	0.67 (0.31)	0.29 (0.13)	0.33 (0.15)	0.42 (0.19)	0.35 (0.16)	0.46 (0.21)	1.1 (0.48)

1) Thermal drift: 12 $\mu\text{W}/\text{C}^\circ$; Thermal drift (30 min): 1 μW

2) Tube adds 2 inches (50mm) to detector depth (see photo)

818P Specifications (18 & 19 mm Aperture versions)

Model	818P-015-18	818P-030-18	818P-015-19	818P-030-19	818P-110-19	818P-150-19	818P-015-18H	818P-030-18H	
Spectral Range (μm)	0.19 - 2.5				0.19 - 11		0.19 - 0.60, & 0.90 - 1.44		
Max. Measurable Power (W)	15	30	15	30	110	150	15	30	
Minimum Detectable Power (mW)	1		1		1		1		
Rise Time (s)	1.8		0.6		1.5		2.5		
Responsivity, Approximate (mV/W)	0.8		0.7		0.2		0.7		
Accuracy (%)	± 2.5		± 2.5		± 2.5		± 2.5		
Repeatability (%)	± 0.5		± 0.5		± 0.5		± 0.5		
Resolution (%)	± 0.5		± 0.5		± 0.5		± 0.5		
Beam Size Dependence (%)	± 0.5		± 0.5		± 0.5		± 0.5		
Maximum Average Power (W)	(continuous)	15	30	15	30	110	150	15	30
	(2 minutes)	23	40	23	45	135	170	20	35
Power Density, Maximum Average (1064 nm, CW)	110 W/cm ²		36 kW/cm ² and 11 kW/cm ² with CO ₂ lasers				300 W/cm ²		
Pulse Energy Density, Maximum (J/cm ²) (1064nm, 7 nS, 10 Hz)	4		1.0		1.0		5		
Active Diameter (mm)	18		19		19		18		
Active Area (cm ²)	2.54		2.84		2.84		2.54		
Cooling Method	Air	Heat Sink	Air	Heat Sink	Fan	Water	Air	Heat Sink	
Dimensions (L x W x D) [in. (mm)]	1.97 x 1.97 x 0.81	1.97 x 1.97 x 0.81	2.22 x 1.97 x 0.81	1.97 x 1.97 x 0.81	2.2 x 2.13 x 2.2	2.13 x 2.13 x 2.2	2.01 x 1.97 x 1.3	1.01 x 0.97 x 0.81	1.97 x 2.22 x 2.22
	(50 x 50 x 20.6)	(50 x 50 x 56.3)	(50 x 50 x 20.6)	(50 x 50 x 56)	(54 x 54 x 56)	(50 x 50 x 33)	(50 x 50 x 20.6)	(50 x 50 x 56.3)	
Weight [lb (kg)]	0.35 (0.16)	0.46 (0.21)	0.35 (0.16)	0.46 (0.21)	0.55 (0.25)		0.53 (0.26)	0.46 (0.21)	

818P Specifications (25, 50 & 55 mm Aperture versions)

Model	818P-040-25	818P-100-25	818P-250-25	818P-300-25	818P-040-55	818P-100-55	818P-300-55	818P-400-55	818P-050-50W	
Spectral Range (μm)	0.19 - 11				0.19 - 11			0.19 - 10		
Max. Measurable Power (W)	40	100	250	300	40	100	300	400	50	
Minimum Detectable Power (mW)	3				3			5		
Rise Time (s)	1.3				1.3			3.5		
Responsivity, Approximate (mV/W)	0.23				0.23			0.12		
Accuracy (%)	± 2.5				± 2.5			± 2.5		
Repeatability (%)	± 0.5				± 0.5			± 0.5		
Resolution (%)	± 0.5				± 0.5			± 0.5		
Beam Size Dependence (%)	± 0.5				± 0.5			± 0.5		
Maximum Average Power (W)	(continuous)	40	100	250	300	40	100	300	400	50
	(2 minutes)	60	150	300	300	60	150	300	400	75
Power Density, Maximum Average (1064 nm, CW)	45 kW/cm ² and 14 kW/cm ² with CO ₂ lasers				45 kW/cm ² and 14 kW/cm ² with CO ₂ lasers			100 kW/cm ²		
Active Diameter (mm)	25				55			50		
Pulse Energy Density, Maximum (J/cm ²) (1064nm, 7 nS, 10 Hz)	1.0				1.0			1.1		
Active Area (cm ²)	4.9				23.76			19.6		
Cooling Method	Air	Heat Sink	Fan	Water	Air	Heat Sink	Fan	Water	Heat Sink	
Dimensions (L x W x D) [in. (mm)]	3.5 x 3.5 x 1.3 (89 x 89 x 32)	3.5 x 3.5 x 4.2 (89 x 89 x 106)	3.5 x 3.5 x 4.5 (89 x 89 x 115)	3.5 x 3.5 x 1.7 (89 x 89 x 44)	3.5 x 3.5 x 1.3 (89 x 89 x 32)	3.5 x 3.5 x 4.2 (89 x 89 x 106)	3.5 x 3.5 x 4.5 (89 x 89 x 115)	3.5 x 3.5 x 1.7 (89 x 89 x 44)	3.5 x 3.5 x 4.2 (89 x 89 x 106)	
Weight [lb (kg)]	1.5 (0.68)	2.2 (0.99)	3.17 (1.44)	2.0 (0.90)	1.4 (0.62)	2.05 (0.93)	3.04 (1.38)	1.8 (0.84)	2.05 (0.93)	

Ordering Information

Model	Description
818P-001-12	High Power Detector, 12 mm Aperture, 1 W, Air Cooled
818P-010-12	High Power Detector, 12 mm Aperture, 10 W, Air Cooled
818P-020-12	High Power Detector, 12 mm Aperture, 20 W, Heat Sink
818P-070-12	High Power Detector, 12 mm Aperture, 70 W, Water Cooled
818P-015-19	High Power Detector, 19 mm Aperture, 15 W, Air Cooled
818P-030-19	High Power Detector, 19 mm Aperture, 30 W, Heat Sink
818P-110-19	High Power Detector, 19 mm Aperture, 110 W, Fan Cooled
818P-150-19	High Power Detector, 19 mm Aperture, 150 W, Water Cooled
818P-040-25	High Power Detector, 25 mm Aperture, 40 W, Air Cooled
818P-100-25	High Power Detector, 25 mm Aperture, 100 W, Heat Sink
818P-250-25	High Power Detector, 25 mm Aperture, 250 W, Fan Cooled
818P-300-25	High Power Detector, 25 mm Aperture, 300 W, Water Cooled
818P-040-55	High Power Detector, 55 mm Aperture, 40 W, Air Cooled
818P-100-55	High Power Detector, 55 mm Aperture, 100 W, Heat Sink
818P-300-55	High Power Detector, 55 mm Aperture, 300 W, Fan Cooled
818P-400-55	High Power Detector, 55 mm Aperture, 400 W, Water Cooled
818P-015-18	High Power Detector, 18 mm Aperture, 15 W, Air Cooled, Volume Absorber
818P-030-18	High Power Detector, 18 mm Aperture, 30 W, Heat Sink, Volume Absorber
818P-015-18H	High Power Detector, 18mm Aperture, 15W, High Peak Power
818P-030-18H	High Power Detector, 18mm Aperture, 30W, Heatsink, High Peak Power
818P-015-17W	High Power Detector, 17mm Aperture, 15W, Stand Alone, High Avg. Power Density
818P-030-17W	High Power Detector, 17mm Aperture, 30W, Heatsink, High Avg. Power Density
818P-050-17W	High Power Detector, 17mm Aperture, 50W, Heatsink, High Power Density
818P-040-50W	High Power Detector, 50mm Aperture. 40W, High Avg. Power Density
818P-050-50W	High Power Detector, 50mm Aperture. 50W, Heatsink, High Avg. Power Density
818P-FC	FC Connector, Threaded, Stainless Steel
818P-SM	SMA Connector, Threaded, Stainless Steel
818P-SC	SC Connector, Threaded, Stainless Steel
818P-FA-12	1-Port Fiber Adaptor for 12 mm 818P Detectors
818P-FA-19	1-Port Fiber Adaptor for 19 mm 818P Detectors
818P-FA-25	1-Port Fiber Adaptor for 25 mm 818P Detectors
818P-FA-3P	3-Port Fiber Adaptor for 50mm 818P Detectors
818P-VH	Replacement Absorber Glass, 18H Series
818P-VM	Replacement Absorber Glass, 18 Series
818P-BNC	DB15 to BNC Adapter (for use with DVM or Scope)
818P-DIN	DB15 to DIN Adaptor (for use with 1835-C or 2835-C power meters)



The 818P-001-12 offers flat spectral response, high sensitivity and extremely low thermal drift.

Compatible Power Meter Models

- 1916-C
- 842-PE
- 1918-C
- 1935-C/2935-C