

CMP & SMP Pyranometers

Solar Radiation Sensors

CMP and SMP pyranometers are designed for simple maintenance and have a wide range of accessories available. The long operational life and reliability is proven by an MTBF (Mean Time Between Failures) of more than 10 years.



The best and most reliable pyranometers available



Accurate and independent data for performance ratio calculations



Best MTBF performance



Analogue and digital outputs

The pyranometers have been developed to be suitable for use in all environments, from the Antarctic to deserts. They are installed around the world for meteorology, hydrology, climate research, solar energy, environmental and materials testing, greenhouse control, building automation and many other applications.

They have individually optimized temperature compensation and individually measured directional response, with the test results provided. These important features ensure the highest accuracy measurements. To offer you the best accuracy when in the field a new calculator is available to provide you with the real-time uncertainty in your application.

CMP pyranometers specifications

	CMP3	CMP6	CMP10 and CMP11	CMP21	CMP22
Classification to ISO 9060:2018	Spectrally Flat Class C (Second Class)	Spectrally Flat Class B (First Class)	Spectrally Flat Class A (Secondary Standard)	Spectrally Flat Class A (Secondary Standard)	Spectrally Flat Class A (Secondary Standard)
Sensitivity	5 to 20 $\mu\text{V}/\text{W}/\text{m}^2$	5 to 20 $\mu\text{V}/\text{W}/\text{m}^2$	7 to 14 $\mu\text{V}/\text{W}/\text{m}^2$	7 to 14 $\mu\text{V}/\text{W}/\text{m}^2$	7 to 14 $\mu\text{V}/\text{W}/\text{m}^2$
Impedance	20 to 200 Ω	20 to 200 Ω	10 to 100 Ω	10 to 100 Ω	10 to 100 Ω
Expected output range (0 to 1500 W/m²)	0 to 30 mV	0 to 30 mV	0 to 20 mV	0 to 20 mV	0 to 20 mV
Maximum operational irradiance	2000 W/m ²	2000 W/m ²	4000 W/m ²	4000 W/m ²	4000 W/m ²
Response time (63 %)	< 6 s	< 6 s	< 1.7 s	< 1.7 s	< 1.7 s
Response time (95 %)	< 18 s	< 18 s	< 5 s	< 5 s	< 5 s
Temperature sensor output				10 k Thermistor (optional Pt-100)	10 k Thermistor (optional Pt-100)
Detector type	Thermopile	Thermopile	Thermopile	Thermopile	Thermopile
Operating and storage temperature range	-40 °C to +80 °C	-40 °C to +80 °C	-40 °C to +80 °C	-40 °C to +80 °C	-40 °C to +80 °C
Humidity range	0 to 100 %	0 to 100 %	0 to 100 %	0 to 100 %	0 to 100 %
MTBF (Mean Time Between Failures)	> 10 years	> 10 years	> 10 years	> 10 years	> 10 years
Ingress Protection (IP) rating	67	67	67	67	67
Onsite pyranometer uncertainty	Calculate with Suncertainty App	Calculate with Suncertainty App	Calculate with Suncertainty App	Calculate with Suncertainty App	Calculate with Suncertainty App
Recommended applications	Economical solution for routine measurements in weather stations, field testing	Good quality measurements for hydrology networks, greenhouse climate control	Meteorological networks, PV panel and thermal collector testing, materials testing	Meteorological networks, reference measurements in extreme climates, polar or arid	Scientific research requiring the highest level of measurement accuracy and reliability

Instrument accuracy

Spectral range (20 % points)	285 to 3000 nm	270 to 3000 nm	270 to 3000 nm	270 to 3000 nm	210 to 3600 nm
Spectral range (50 % points)	300 to 2800 nm	285 to 2800 nm	285 to 2800 nm	285 to 2800 nm	250 to 3500 nm
Zero offsets (unventilated)					
(a) thermal radiation (at 200 W/m)	< 15 W/m ²	< 10 W/m ²	< 7 W/m ²	< 7 W/m ²	< 3 W/m ²
(b) temperature change (5 K/h)	< 5 W/m ²	< 4 W/m ²	< 2 W/m ²	< 2 W/m ²	< 1 W/m ²
Non-stability (change/year)	< 1 %	< 1 %	< 0.5 %	< 0.5 %	< 0.5 %
Non-linearity (100 to 1000 W/m²)	< 1.5 %	< 1 %	< 0.2 %	< 0.2 %	< 0.2 %
Directional response (up to 80° with 1000 W/m² beam)	< 20 W/m ²	< 20 W/m ²	< 10 W/m ²	< 10 W/m ²	< 5 W/m ²
Spectral selectivity (350 to 1500 nm)	< 3 %	< 3 %	< 3 %	< 3 %	< 3 %
Tilt response (0° to 90° at 1000 W/m²)	< 1 %	< 1 %	< 0.2 %	< 0.2 %	< 0.2 %
Temperature response	< 5 % (-10 °C to +40 °C)	< 4 % (-10 °C to +40 °C)	< 1 % (-10 °C to +40 °C)	< 1 % (-20 °C to +50 °C)	< 0.5 % (-20 °C to +50 °C)
Field of view	180°	180°	180°	180°	180°
Accuracy of bubble level	< 0.2°	< 0.1°	< 0.1°	< 0.1°	< 0.1°

SMP pyranometers specifications

	SMP3	SMP6	SMP10 and SMP11	SMP21	SMP22
Classification to ISO 9060:2018	Spectrally Flat Class C (Second Class)	Spectrally Flat Class B (First Class)	Spectrally Flat Class A (Secondary Standard)	Spectrally Flat Class A (Secondary Standard)	Spectrally Flat Class A (Secondary Standard)
Analogue output - V-version	0 to 1 V	0 to 1 V	0 to 1 V	0 to 1 V	0 to 1 V
Analogue output range	-200 to 2000 W/m ²	-200 to 2000 W/m ²	-200 to 2000 W/m ²	-200 to 2000 W/m ²	-200 to 2000 W/m ²
Analogue output - A-version	4 to 20 mA	4 to 20 mA	4 to 20 mA	4 to 20 mA	4 to 20 mA
Analogue output range	0 to 1600 W/m ²	0 to 1600 W/m ²	0 to 1600 W/m ²	0 to 1600 W/m ²	0 to 1600 W/m ²
Serial output	RS-485 Modbus®	RS-485 Modbus®	RS-485 Modbus®	RS-485 Modbus®	RS-485 Modbus®
Serial output range	-400 to 2000 W/m ²	-400 to 2000 W/m ²	-400 to 4000 W/m ²	-400 to 4000 W/m ²	-400 to 4000 W/m ²
Power consumption (at 12 V DC)	V-version: 55 mW A-version: 100 mW	V-version: 55 mW A-version: 100 mW	V-version: 55 mW A-version: 100 mW	V-version: 55 mW A-version: 100 mW	V-version: 55 mW A-version: 100 mW
Software, Windows™	Smart Sensor Explorer Sowa, for configuration, test and data logging				
Supply voltage	5 to 30 V DC	5 to 30 V DC	5 to 30 V DC	5 to 30 V DC	5 to 30 V DC
Detector type	Thermopile	Thermopile	Thermopile	Thermopile	Thermopile
Operating and storage temperature range	-40 °C to +80 °C	-40 °C to +80 °C	-40 °C to +80 °C	-40 °C to +80 °C	-40 °C to +80 °C
Humidity range	0 to 100 %	0 to 100 %	0 to 100 %	0 to 100 %	0 to 100 %
MTBF (Mean Time Between Failures)	> 10 years	> 10 years	> 10 years	> 10 years	> 10 years
Ingress Protection (IP) rating	67	67	67	67	67
Onsite pyranometer uncertainty	Calculate with Suncertainty App				
Recommended applications	Economical solution for efficiency and maintenance monitoring of PV power installations, routine measurements in weather stations, agriculture, horticulture and hydrology	Good quality measurements for Solar Monitoring, hydrology networks, greenhouse climate control	High performance for PV panel and thermal collector testing, solar energy research, solar prospecting, materials testing, advanced meteorology and climate networks	Meteorological networks, reference measurements in PV monitoring, extreme climates, polar or arid	Scientific research requiring the highest level of measurement accuracy and reliability under all conditions
Instrument accuracy					
Response time (63 %)	< 1.5 s	< 1.5 s	< 0.7 s	< 0.7 s	< 0.7 s
Response time (95 %)	< 12 s	< 12 s	< 2 s	< 2 s	< 2 s
Spectral range (20 % points)	285 to 3000 nm	270 to 3000 nm	270 to 3000 nm	270 to 3000 nm	210 to 3600 nm
Spectral range (50 % points)	300 to 2800 nm	285 to 2800 nm	285 to 2800 nm	285 to 2800 nm	250 to 3500 nm
Zero ossets (unventilated)					
(a) thermal radiation (at 200 W/m²)	< 15 W/m ²	< 10 W/m ²	< 7 W/m ²	< 7 W/m ²	< 3 W/m ²
(b) temperature change (5 K/h)	< 5 W/m ²	< 4 W/m ²	< 2 W/m ²	< 2 W/m ²	< 1 W/m ²
Non-stability (change/year)	< 1 %	< 1 %	< 0.5 %	< 0.5 %	< 0.5 %
Non-linearity (100 to 1000 W/m²)	< 1.5 %	< 1 %	< 0.2 %	< 0.2 %	< 0.2 %
Directional response (up to 80° with 1000 W/m² beam)	< 20 W/m ²	< 15 W/m ²	< 10 W/m ²	< 10 W/m ²	< 5 W/m ²
Temperature response	< 2 % (-20 °C to +50 °C) < 4 % (-40 °C to +70 °C)	< 1.5 % (-20 °C to +50 °C) < 3 % (-40 °C to +70 °C)	< 1 % (-20 °C to +50 °C) < 2 % (-40 °C to +70 °C)	< 0.3 % (-20 °C to +50 °C) < 0.3 % (-40 °C to +70 °C)	< 0.3 % (-20 °C to +50 °C) < 0.3 % (-40 °C to +70 °C)
Spectral selectivity (350 to 1500 nm)	< 1 %	< 1 %	< 1 %	< 1 %	< 2 %
Tilt response (0° to 90° at 1000 W/m²)	< 1 %	< 1 %	< 0.2 %	< 0.2 %	< 0.2 %
Field of view	180°	180°	180°	180°	180°
Accuracy of bubble level	< 0.2°	< 0.1°	< 0.1°	< 0.1°	< 0.1°

