SMP pyranometers

Specifications		SMP3	SMP6	SMP10 and SMP11	SMP21	SMP22
Classification to ISO 9060:2018		Spectrally Flat Class C	Spectrally Flat Class B	Spectrally Flat Class A	Spectrally Flat Class A	Spectrally Flat Class A
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/m²	-200 to 2000 W/m²	-200 to 2000 W/m²	-200 to 2000 W/m²	-200 to 2000 W/m²
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/m²	0 to 1600 W/m²	0 to 1600 W/m²	0 to 1600 W/m²	0 to 1600 W/m²
Serial output		RS-485 Modbus®	RS-485 Modbus®	RS-485 Modbus®	RS-485 Modbus®	RS-485 Modbus®
Serial output range		-400 to 2000 W/m²	-400 to 2000 W/m²	-400 to 4000 W/m²	-400 to 4000 W/m²	-400 to 4000 W/m²
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 offsets (unventilated) (a) thermal radiation (at 200 W/m²) (b) temperature change (5 K/h) (c) total zero offset	 < 15 W/m² < 5 W/m² < 20 W/m²	 < 10 W/m² < 4 W/m² < 10 W/m²	 < 7 W/m² < 2 W/m² < 9 W/m²	 < 7 W/m² < 2 W/m² < 9 W/m²	 < 3 W/m² < 1 W/m² < 4 W/m²
	Additional signal processing errors	< 3 W/m²	< 2 W/m²	< 2 W/m²	< 2 W/m²	< 1 W/m²
	Non-stability (change/year)	< 1 %	< 1 %	< 0.5%	< 0.5%	< 0.5%
	Non-linearity (100 to 1000 W/m²)	< 2 %	< 1 %	< 0.2%	< 0.2 %	< 0.2%
	Directional response (up to 80 ° with 1000 W/m² beam)	< 20 W/m²	< 15 W/m²	< 10 W/m²	< 10 W/m²	< 5 W/m²
	Temperature response	< 3 % (-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)
	Clear sky GHI spectral error	< 0.2 %	< 0.1 %	< 0.1 %	< 0.1 %	< 0.04 %
	Spectral selectivity (350 to 1500 nm)	< 3 %	< 3 %	< 3 %	< 3 %	< 3 %
	Tilt response (0 ° to 90 ° at 1000 W/m²)	< 1.5 %	< 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 °
Power consumption (at 12 VDC)		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™		SmartExplorer software, for configuration, test and data logging	SmartExplorer software, for configuration, test and data logging	SmartExplorer software, for configuration, test and data logging	SmartExplorer software, for configuration, test and data logging	SmartExplorer software, for configuration, test and data logging
Supply voltage		5 to 30 VDC	5 to 30 VDC	5 to 30 VDC	5 to 30 VDC	5 to 30 VDC
Detector type		Thermopile	Thermopile	Thermopile	Thermopile	Thermopile
Operating temperature range		-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
Operating 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
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

* adjustable with SmartExplorer Software ** extrapolated after introduction in January 2012 **Note:** The performance specifications quoted are worst-case and/or maximum values