

# Model SPP

## Standard Precision Pyranometer

A pyranometer is used to measure the total energy from the sun. When leveled in the horizontal plane, this is called the Global Shortwave Irradiance (GLOBAL) and when positioned in a plane of a PV Array, it is called the Total Irradiance in the Plane of Array (TPA). Inverted, a pyranometer is used to measure the Reflected or Albedo Irradiance (ALBEDO). A pyranometer can also be shaded from the direct beam of the sun to measure the Diffuse Shortwave Irradiance (DIFFUSE).

Based on the design of the distinguished PSP Pyranometer, the SPP was developed with a faster response time, a reduced thermal offset, improved cosine response and an improved temperature dependence making it ideal for Global Solar Measurements in High Quality Networks such as GAW, BSRN and ARM, calibration of other Pyranometers or for PV/CSP Performance Testing and Evaluation.

\* Recently, there has been much discussion on "uncertainty" and how it pertains to solar measurements. The RSS of the 9060 Secondary Standard specifications results in an uncertainty of approximately 3.5%. The typical uncertainty of Eppley's factory calibrations are less than 1%. The stated uncertainty of the WRR is 0.4%.

Evidence from comparisons of SPP measurements to component sum derived values (using an AHF and 8-48) show the SPP is capable of hourly averages better than 2% and daily averages better than 1%.



### SPECIFICATIONS

Application	Network Measurements (Global)
Classification	Secondary Standard / High Quality
Traceability	World Radiation Reference (WRR)
Spectral Range	295-2800 nm
Output	0-10 mV analog
Sensitivity	approx. 8 $\mu\text{V} / \text{Wm}^{-2}$
Impedance	approx. 700 $\Omega$
95% Response Time	5 seconds
Zero Offset a)	5 $\text{Wm}^{-2}$
Zero Offset b)	2 $\text{Wm}^{-2}$
Non-Stability	0.5%
Non-Linearity	0.5%
Directional Response	10 $\text{Wm}^{-2}$
Operating Temperature	-50°C to +80°C
Temperature Response	0.5% (-30°C to +50°C)
Tilt Response	0.5%
Calibration Uncertainty*	< 1%
Measurement Uncertainty*	
Single Point	< 10 $\text{Wm}^{-2}$
Hourly Average	approx. 2%
Daily Average	approx. 1%