Global Precision Pyranometer

MODEL
GPP

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 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).

In 2013, Eppley introduced the ISO 9060 Secondary Standard SPP Pyranometer to replace the venerable PSP. For 2014, the design team was tasked with making a pyranometer targeted for the PV/CSP Industry that as"as good or better at a lower cost"and the GPP was introduced in 2015.

SPECIFICATIONS

Application	PV/CSP Performance Testing
Classification	Secondary Standard / High Quality
Traceability	World Radiation Reference (WRR)
Spectral Range	295-2800 nm
Output	0-10 mV analog
Sensitivity	approx. 8 µV / Wm^{-2}
Impedance	approx. 700 Ω
95% Response Time	5 seconds
Zero Offset a)	5 Wm^{-2}
Zero Offset b)	2 Wm^{-2}
Non-Stability	0.5%
Non-Linearity	0.5%
Directional Response	10 Wm^{-2}
Spectral Selectivity	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 Wm^{-2}
Hourly Average	approx. 2%
Daily Average	approx. 1%

* 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 GPP is capable of hourly averages better than 2% and daily averages better than 1%.

The Eppley Laboratory INC.
12 Sheffield Avenue
Newport, RI 02840-1618 USA

+1.401.847.1020
info@EppleyLab.com
www.EppleyLab.com