

Normal Incidence Pyrheliometer

MODEL

sNIP

A pyrheliometer mounted on a solar tracker is used to measure the Direct Normal Solar Irradiance (DNI) from the sun. Historically, the preferred field of view for Pyrheliometers was based on a 10:1 ratio which equated to approximately 5.7° . Due in part to the commercialization of the Eppley AHF Cavity Radiometer as a Primary Standard and advances in accuracy of Automatic Solar Trackers (such as the Eppley SMT Tracker), the preferred FOV for pyrheliometers is now 5° which the Eppley sNIP uses. In fact, the sNIP has the exact same geometric dimensions as used in the AHF. Compared to the older NIP, the sNIP also has a faster response time, reduced conduction and convection effects and a thermistor is included for those who wish to measure the instrument temperature.

As a result, the Normal Incidence Pyrheliometer, Model sNIP meets the performance specifications of an ISO Secondary Standard* and a WMO High Quality Pyrheliometer.

* To officially be considered a Secondary Standard, the pyrheliometer in question must be calibrated with WRR traceability through a Primary Standard Pyrheliometer such as the Eppley AHF Cavity Radiometer. EPLAB Calibrations are typically performed against a Secondary Standard Pyrheliometer. At the customer's request and for an additional fee, this calibration can be performed against our WRR traceable AHF Cavity Radiometer. Please contact Eppley for additional information.

** There has been much discussion on "uncertainty" and how it pertains to solar measurements. The RSS of the 9060 specifications results in an uncertainty of approximately 1.5%. The typical uncertainty of Eppley's factory calibrations are less than 1%. The stated uncertainty of the WRR is 0.4%. Evidence from direct comparisons of sNIP to AHF show the sNIP is capable of hourly and daily averages better than 1% (assuming proper tracking and clean windows).



SPECIFICATIONS

Application	Standard/Network Measurements
Classification	Secondary Standard* / High Quality
Traceability	World Radiation Reference (WRR)
Spectral Range	250-3500 nm
Field of View	5°
Output	0-10 mV analog
Sensitivity	approx. $8 \mu\text{V} / \text{Wm}^{-2}$
Impedance	approx. 200Ω
95% Response Time	5 seconds
Zero Offset	1 Wm^{-2}
Non-Stability	0.5%
Non-Linearity	0.2%
Spectral Selectivity	0.5%
Temperature Response	0.5%
Calibration Uncertainty**	< 1%
Measurement Uncertainty**	
Single Point	< 5 Wm^{-2}
Hourly Average	approx. 1%
Daily Average	approx. 1%