

Measure Shortwave Radiation Reaching the Earth's Surface



The SP-series silicon cell pyranometers are available in self-powered voltage, amplified voltage, and current output options. They are calibrated to measure total shortwave radiation. This cosine-corrected sensor is designed to maintain its accuracy when radiation comes from low zenith angles. This accuracy is shown in the graph below. The SP-110 closely matches the Kipp & Zonen CM21.

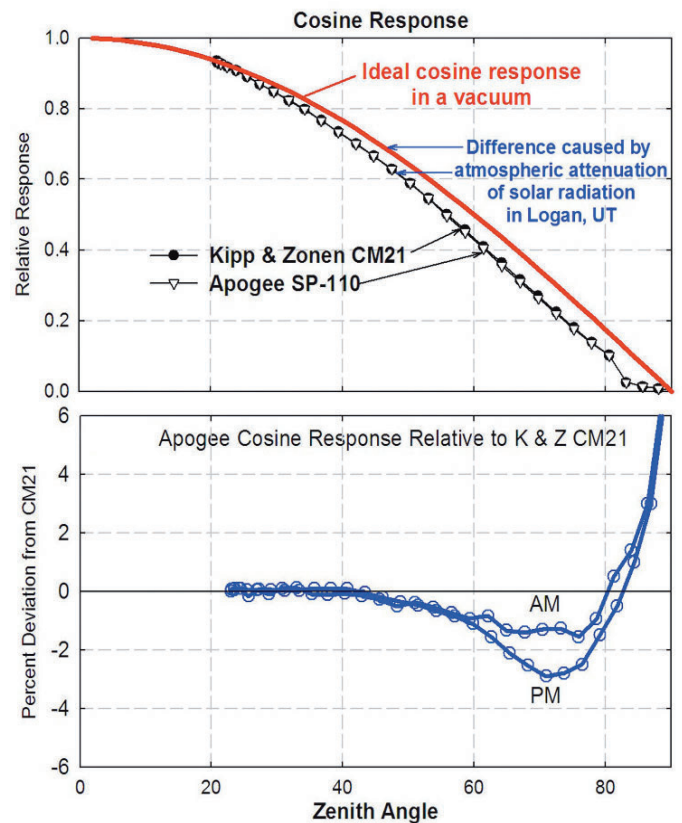
The cosine response and accuracy of the pyranometer have met with the high standards of Campbell Scientific, one of the world's leaders in environmental instrumentation. Campbell Scientific installs Apogee pyranometers on weather stations such as the ET107.

Related Product



AL-100

A plate used to keep the sensor heads level.



Specifications

Cosine Directional Response

- 45° zenith angle: $\pm 1\%$
- 75° zenith angle: $\pm 5\%$

Absolute Accuracy

- $\pm 5\%$

Uniformity

- $\pm 3\%$

Repeatability

- $\pm 1\%$

Spectral Range

- 380 to 1120 nanometers

Output

SP-110 and SP-230

- Responsivity = 0.2 mV per $W m^{-2}$, Full sunlight = 220 mV ($1100 W m^{-2}$)
- Calibration Factor = 5.0 $W m^{-2}$ per mV
- Range = 0 to 350 mV (0 to $1750 W m^{-2}$)

SP-212

- Responsivity = 2 mV per $W m^{-2}$, full sunlight = 2.2 V ($1100 W m^{-2}$)
- Calibration Factor = 0.5 $W m^{-2}$ per mV
- Range = 0 to 2.5 V (0 to $1250 W m^{-2}$)

SP-215

- Responsivity = 4 mV per $W m^{-2}$, full sunlight = 4.4 V ($1100 W m^{-2}$)
- Calibration Factor = 0.25 $W m^{-2}$ per mV
- Range = 0 to 5 V (0 to $1250 W m^{-2}$)

SP-214

- Responsivity = 0.013 mA per $W m^{-2}$, full sunlight = 18.1 mA ($1100 W m^{-2}$)
- Calibration Factor = 78 $W m^{-2}$ per mA
- Range = 4 to 20 mA (0 to $1250 W m^{-2}$)

Power Requirement

SP-110 = None, self-powered

SP-212 = 2.5 to 5.5 VDC

• Current Draw = nominal 300 μA

SP-215 = 5 to 5.5 VDC

• Current Draw = nominal 300 μA

SP-214 = 5 to 36 VDC

• Current Draw = 2 mA quiescent current, 22 mA = max current at $1250 W m^{-2}$

SP-230 = 12 VDC for integrated heater

• Current Draw = 15 mA

Response Time

- Less than 1 millisecond

Long Term Drift

- Less than 3% per year

Temperature Response

- 0.1 % / $^{\circ}C$

Field of View

- 180 $^{\circ}$

Operating Environment

- -40 to 60 C
- 0 to 100% relative humidity
- Designed for continuous outdoor use
- Can be submerged in water

Materials

- Anodized aluminum with cast acrylic lens

Mass

- 70 g (with 5 m lead wire)

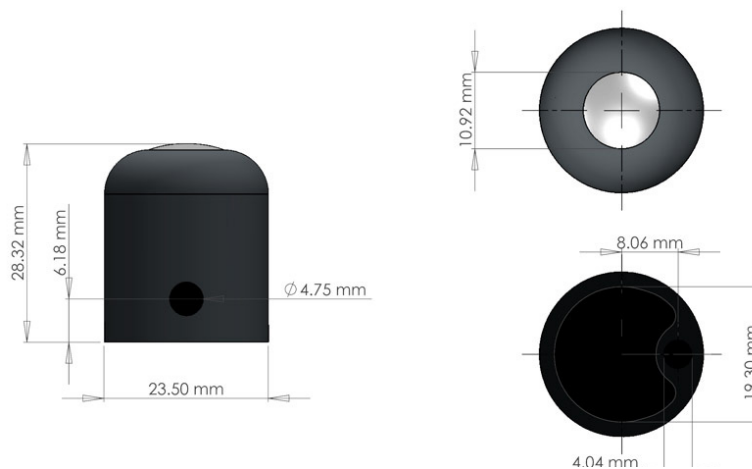
Cable

- 5 meters of twisted-pair, shielded wire with Santoprene jacket
- Custom lengths available

Warranty

- 1 year against defects in materials and workmanship

Measurements



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www.apogeeinstruments.com



Scan for more information on
SP sensors