

# Apogee Pyranometer SP-110

## SPECIFICATIONS

### PURPOSE

The instrument measures the total solar global irradiance: *the diffuse irradiance* from the sky and clouds plus *the direct rays*. The pyranometer can be mounted on a horizontal surface or parallel to the surface of interest for measurements on a solar heating or photovoltaic system.

### CALIBRATION FACTOR

The pyranometer can be used to find the instantaneous value of the solar irradiance in  $W/m^2$  or by integration to find the total energy per square meter which strikes the instrument during a given period. The calibration factor  $K$  can be expressed as follows:

$$K = 200 \text{ mV}/(\text{kW}/\text{m}^2) \quad (1)$$

This value means that when the solar irradiance equals  $1 \text{ kW}/\text{m}^2$  (typical for a clear, sunny day around noon), then the pyranometer output voltage will be about 200 mV. If the output voltage for example is 100 mV, then the solar irradiance would be about  $0,5 \text{ kW}/\text{m}^2 = 500 \text{ W}/\text{m}^2$ . In other words:

$$S[\text{kW}/\text{m}^2] = U[\text{mV}]/K \quad (2)$$

where  $U$  is the signal voltage in millivolts, and  $S$  is measured in  $\text{kW}/\text{m}^2$ .

### CABLE CONNECTIONS

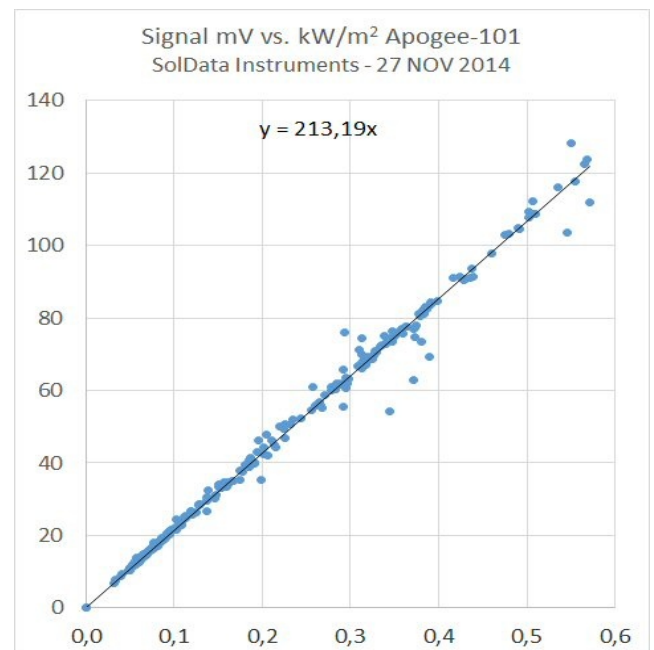
The SP-110 is supplied with a 4.8 meter cable with a waterproof connection to the instrument. The electrical connections to the cable are as follows:

- red:** signal plus (0-250 mV)
- black:** signal ground
- white:** cable shield (ground)

Experience has shown that cable length is not critical, and that lengths of up to 30 meters can be used without problems. Atmospheric disturbances such as lightning strikes can, however, damage installations, and appropriate protective action should be taken. If a significant amount of electrical noise is expected, then the white shield lead should be used. If the cable must be extended beyond the standard length, then the splice must be protected against wind,



**Figure 1:** The Apogee SP-110 pyranometer is supplied with a 4.8 m cable.



**Figure 2:** Typical calibrations data: Apogee pyranometer compared to the Kipp-Zonen CM21.

precipitation and high relative humidity. The instrument comes with a four year factory guarantee. Apogee pyranometer specifications and user's manual:

[www.soldata.dk/pdf/Apogee-sp-110.pdf](http://www.soldata.dk/pdf/Apogee-sp-110.pdf)

Contact: SolData Instruments  
Frank Bason: [soldata@soldata.dk](mailto:soldata@soldata.dk)