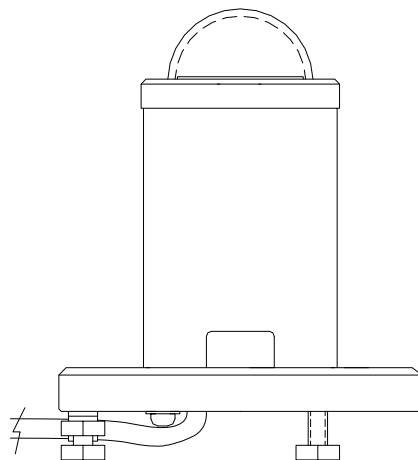




**MIDDLETON SOLAR**  
**SK08 & SK08-E FIRST CLASS PYRANOMETER**  
**USER'S INSTRUCTIONS**

CE 2005



The SK08 is a First Class pyranometer for measuring solar global radiation. It uses a passive thermoelectric sensor with a glass dome windshield. It is sealed and fully weatherproof. In the SK08-E version the sensor signal is boosted by a low-noise amplifier that is drift stabilised.

**Installation.** Select a site that has an unobstructed view of the sun from sunrise to sunset. Place the instrument on a flat horizontal platform and adjust the feet with a 7mm A.F. spanner until the circular level is centered. Secure the instrument to the platform with a 5mm holding screw in the centre of the base; the screw should be brass or stainless steel.

The SK08 cable cores are:

red = output +ve (typically 18-21 $\mu$ V per W/m<sup>2</sup>)  
blue = output -ve

The measurement equipment should range up to 40mV and have an input impedance of at least 1M  $\Omega$ .

The SK08-E cable cores are:

red = supply +V (5 to 15VDC, < 6mA)	blue = supply 0V
yellow = output +ve (1mV per W/m <sup>2</sup> )	green = output -ve

The SK08-E can be powered from a 6V, 9V, or 12V battery. Alternatively it can be connected to a small power supply or datalogger. The typical fullscale output is <+2V. The measuring equipment impedance should exceed 3K  $\Omega$ .

Avoid ground loop induced interference in your measurement setup by ensuring there is only one ground point for the sensor and measurement system.

**Calibration.** The SK08/E is factory calibrated by outdoors comparison to a Secondary Standard reference pyranometer. It is recommended that the calibration be checked annually.

**Maintenance.** Keep the dome of the SK08/E clean and free from debris otherwise the directional response will be compromised. Damaged or faulty units should be returned to the manufacturer for repair.

### Technical Specification

sensitivity	18.0 to 21.0 $\mu\text{V}/\text{W}\cdot\text{m}^{-2}$ (SK08) 1.0 $\text{mV}/\text{W}\cdot\text{m}^{-2}$ (SK08-E)
viewing angle	$2\pi$ steradians
maximum irradiance	$2000 \text{ W}\cdot\text{m}^{-2}$
response time (95%)	11s (typical)
zero offsets	
a) thermal radiation ( $200 \text{ W}\cdot\text{m}^{-2}$ )	$< + 2.5 \text{ W}\cdot\text{m}^{-2}$ (unventilated)
b) temperature gradient (5K/hr)	$< \pm 4 \text{ W}\cdot\text{m}^{-2}$
non-stability (change/year)	$< - 0.5\%$
non-linearity ( $100 - 1000 \text{ W}\cdot\text{m}^{-2}$ )	$< \pm 1\%$
directional response ( $1000 \text{ W}\cdot\text{m}^{-2}$ at $80^\circ$ )	$< \pm 20 \text{ W}\cdot\text{m}^{-2}$
spectral selectivity (0.3 to $3\mu\text{m}$ nominal)	$< \pm 3\%$
temperature dependence of sensitivity	$< 2\%$ ( $-30$ to $+50^\circ\text{C}$ )
tilt response ( $0-90^\circ$ , at $1000 \text{ W}\cdot\text{m}^{-2}$ )	$< \pm 1\%$
spectral range	0.3 - $3 \mu\text{m}$ (nominal); 305 – 2800 nm (50% points)
resolution	$\pm 2 \text{ W}\cdot\text{m}^{-2}$
fullscale output	$< 40\text{mV}$ (SK08); $< 2\text{V}$ (SK08-E)
daily uncertainty (95% confidence)	5%
operating temperature	$-35$ to $+60^\circ\text{C}$
impedance	$40 \Omega$ (SK08); $65 \Omega$ (SK08-E)
level accuracy	$0.2^\circ$
power requirement (SK08-E only)	5 -15VDC; $< 6\text{mA}$
desiccant	orange silica gel (non-toxic)
output lead	6m
mounting method	central M5 hole; two adjustable feet
construction	aluminium, hard anodized for corrosion resistance. Stainless steel fasteners
IP rating	sealed to IP66