

CERTIFICATE OF CALIBRATION

NET RADIOMETER

MODEL	NR LITE
SERIAL NUMBER	062404
SENSITIVITY of upper sensor at normal incidence	13.0 $\mu\text{V/W/m}^2$
CALIBR. PROCEDURE	Exact interchange of test NR LITE and reference NR LITE in a horizontal parallel beam of light from a Xenonlamp. Full collimation angle of beam is 1.0°. Irradiance is 500 \pm 50 W/m ² . Roomtemperature is 20 - 22°C. Only the upper sensors are compared. Also is checked whether the lower sensor sensitivity is within \pm 15% from the upper sensor sensitivity. Because test and reference radiometer are of the same model, the indoor conditions have at principle less influence on the transfer of calibration. The above sensitivity is theoretically best for conditions as during the calibration of the reference NR LITE outdoors (see below).

REFERENCE NR LITE -- FT006, active from January 1, 2006.

hierarchy of traceability

The reference NR LITE FT006 has been compared against a pyrhelimeter CH 1 sn940068 with the sun as source under clear sky conditions. The reference CH 1 sn940068 has been calibrated at the WRC Davos against the World Standard Group in summer 2004.

The instruments were placed side by side on a tracking platform in such a way that the direct radiation was always normal incident. The reference NR LITE was built in a box with collimation tube, so having a field of view comparable with the pyrhelimeter.
The calibration periods were in 2005 on August 18, from 11:19 to 14:57 (civil time, summertime). For this periods the Airmass passed by the sunbeam ranged from 1.27 to 1.49.
The sky was light blue and cloudless.
The instrument temperatures ranged from 29.1 to 31.5°C.

The sensitivity is determined from seventeen 10 min. measurement series consisting of 10 instantaneous voltage readings for both NR LITE and CH 1 and taking into account the "zero-offset" of the NR LITE.
Measurement series were chosen from a continuous log file by selecting periods with direct irradiance continuously $>700 \text{ W/m}^2$. NR LITE zero-offset is measured before and after the series by shading the NR LITE during a period of $>2 \text{ min}$. Rather stable zero-offsets ($+33 \pm 11 \mu\text{V}$) were found and subtracted from all NR LITE voltages
Momentaneous sensitivities for every reading (sampling interval 1 min) are calculated from corrected NR LITE voltages and CH1 irradiance signals.
The seventeen mean sensitivities, calculated for each measurement series, ranged from 12.89 to 13.25. Averaged value is 13.06 $\mu\text{V/W/m}^2$ with a standard deviation (σ) of 0.1 $\mu\text{V/W/m}^2$.

IN CHARGE OF TEST	K.Lansbergen
DATE	17/10/2006 Kipp & Zonen, Delft, Holland

Notice

The calibration certificate supplied with the instrument is valid from the date of shipment to the customer. Even though the calibration certificate is dated relative to manufacture or recalibration the instrument does not undergo any sensitivity changes when kept in the original packing. From the moment the instrument is taken from its packaging and exposed to irradiance the sensitivity will deviate with time. See also the 'non-stability' performance (max. sensitivity change / year) given in the radiometer specification list.