CALIBRATION CERTIFICATE
PYRGEOMETER

CALIBRATION DATE	:	29 October 2004
PYRGEOMETER MODEL	:	CG 4
SERIAL NUMBER	:	040740
BODY TEMPERATURE SENSOR	:	YSI44031
SENSITIVITY	:	7.39 µV/W/m^2
AMBIENT TEMPERATURE	:	Between 10.2 ºC and 12.5 ºC, average 11.1 ºC

CALIBRATION PROCEDURE

The pyrgeometer is calibrated outdoors at Kipp & Zonen under a mainly clear sky during nighttime. The instrument is installed on a horizontal platform next to the reference CG 4. Both the pyrgeometer thermopile output (Uemf) and body temperature (T_b) are measured at one second intervals and compressed to a one-minute average.

The calibration factor of the pyrgeometer is determined by the method of the best curve fit to the CG 4 reference signal. The downward longwave radiation is calculated using the pyrgeometer algorithm (Ld = Uemf/C + σTb^4). Special measurement criteria are taken into account to calculate the best curve fit, under which:

- The sum of all measurement periods must be at least 6 hours.
- Net radiation exchange with the atmosphere, at least -40 W/m² .
- Standard deviation (3σ) representing absolute values, ±0.2 μV/W/m^2 .
- Standard deviation (3σ) representing relative values, 3 %.
- Deviation of downward longwave radiation (Ld) to reference is ±5 W/m^2 maximum.
- Body temperature (Tb) difference with respect to the reference pyrgeometer is ±0.5 ºC maximum.

HIERARCHY OF TRACEABILITY

REFERENCE PYRGEOMETER: Kipp & Zonen CG 4 sn FT001 active from 20 May 2004

The CG 4 sn FT001 participated in a BSRN pyrgeometer comparison at Oklahoma in 1999. A sensitivity of µV/W/m² was found for this CG 4.

IN CHARGE OF TEST: M. Veenstra Date: 29 October 2004 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 it's packaging and exposed to irradiance the sensitivity will deviate slightly with time. See also the 'non-stability' performance (max. sensitivity change / year) given in the radiometer specification list.