Pyrheliometer Kipp & Zonen CHP 1 S62210

- For unattended direct normal incidence solar radiation measurement
- Fast response time
- Excellent temperature dependence of sensitivity
- Excellent linearity

Description

A pyrheliometer is an instrument designed specifically to measure the direct beam solar irradiance with a field of view limited to 5°. This is achieved by the shape of the collimation tube, with precision apertures, and the detector design. The front aperture is fitted with a quartz window to protect the instrument and to act as a filter that passes solar radiation between 200 nm and 4000 nm in wavelength. CHP 1 includes a rain shield and integrated alignment aids. A pyrheliometer needs to be pointed at the sun at all times so that the solar disk always falls within the field of view of the instrument.

The CHP 1 is designed for high accuracy direct solar radiation measurements. The pyrheliometer fully complies with the most current ISO and WMO performance criteria for First Class Normal Incidence Pyrheliometer. Every CHP 1 is calibrated upon manufacture, and is supplied standard with a WRR (World Radiometric Reference) traceable calibration certificate. The CHP 1 is fitted with a high quality connector for easy installation and maintenance. The screw-in drying cartridge is easy to remove and the replacement desiccant is supplied in convenient refill packets. As standard CHP 1 come with both PT-100 and 10k thermistor temperature sensors. The instrument covers the total solar spectrum between 200 to 4000 nm. CHP 1 is intended for use with any model Kipp & Zonen two-axis tracker.

Applications

CHP 1 is the best all-weather pyrheliometer available for continuous measurements of direct solar radiation and exceeds the specifications for high end solar radiation networks, such as the Baseline Surface Radiation Network (BSRN). These networks need accurate and reliable long-term measurements for climate change investigations. An industrial sector with similar requirements is renewable energy. For research into photo-voltaic systems and materials, accurate direct solar irradiance data is needed. When prospecting for sites to locate solar farms, the incoming energy available throughout the year is a key part of the decision making process.

Calculation of Irradiance

$$E = U / S$$

E	[W/m²]	=	Irradiance
U	[µV]	=	Output Voltage
S	[µV/W/m²]	=	Sensitivity

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Specifications

Characteristic	Description
Classification	ISO 9060:1990 Classification First Class
Sensitivity	7 ... 14 µV/W/m² (see calibration protocol)
Spectral range (50% points)	200 ... 4000 nm
Maximum irradiance	4000 W/m²
Typical signal output for atmospheric applications	0 ... 15 mV
Response time	5 s
Zero offset due to temperature change	< 1 W/m²
Non-stability (change/year)	< 0.5 %
Non-linearity (0 ... 1000 W/m²)	< 0.2 %
Temperature dependence of sensitivity	< 0.5 % (-20 ... +50 °C)
Impedance	10 ... 100 Ω
Expected daily uncertainty	< 1 %
Full operating view angle	5 ° ± 0.2 °
Slope angle	1 ° ± 0.2 °
Required tracking accuracy	< 0.5 ° from ideal
Operating temperature	-40 ... +80 °C
Weight (without cable)	0.9 kg
Cable length	10 m Optional: 25 m and 50 m
Fitted with 10K thermistor and Pt-100 temperature sensor as standard (thermistor not connected with Meteo-40)	

Delivery includes calibration certificate.

Sensor Connection

Function	Plug Pin No.	Wire Colour (Kipp & Zonen)	Meteo-40 Analog Voltage / Current Source	Supply Sensor
Solar irradiance Output voltage	1	red	Ax	
	2	blue	Bx	
Pt-100	4	yellow	Ay	
	6	brown	I+	
	3	green	By	
	5	grey	I-	
Thermistor	7	white	not connected	
	8	black		
Shield (Housing)				Main Ground (GND)

Last Modification: 25 March 2013

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