

Piranometro Spectrally Flat Class A (secondary standard)



Description

PCTRA072 pyranometer is intended for solar radiation measurement on a plane/level surface (Watt/m²). The radiation measured is the sum of direct sun and of diffuse irradiance (global radiation).

PCTRA072 uses a ISO 9060 Secondary standard pyranometer and it complies with WMO publication "Guide to meteorological Instruments and Methods of Observation", 5th edition (1983).

The pyranometer is based on a thermopile sensor. The sensing surface of the thermopile is coated with an opaque black paint providing a flat spectral response for the full wavelength range. The pyranometer spectral range is determined by the transmission of the dome made of special material that allows an extension of the spectral range up to 283nm.

The irradiance energy is absorbed by the blackened surface of thermopile providing a temperature difference between the centre of the sensor (hot junction) and the body of pyranometer (cold junction). This difference is then converted to a voltage according to the Seebeck effect.

PCTRA072 has two domes with 50 and 30 mm external diameter to guarantee correct thermal insulation from wind and to reduce sensitivity to thermal radiation. The dome protects the thermopile from dust which could modify spectral sensitivity. PCTRA072 is then provided with a bubble level for the correct levelling of the sensor.

A second thermopile is mounted inside the instrument and not accessible by light. This second thermopile, connected antiserries with respect to the sensor exposed to light, reduces the signals of the pyranometers caused by sudden temperature changes (thermal shock).

In order to minimize variations of sensitivity according to the temperature, the sensor are equipped with a passive compensation circuit.

To avoid condense formation on the inner surface of the dome, moisture absorbing silica-gel is put inside the pyranometer.



Spectrally Flat Class A pyranometer



Pyranometer with ring shield

Technical specifications may be varied without prior notice

Technical specifications

Sensor type	Thermopile
Sensitivity (typical)	6 ...11 μ V/(W/m ²)
Impedance	5 Ω 50 Ω
Measuring range	0 ... 2000W/m ² (4000W/m ² option)
Viewing range	2 π sr
Spectral range (dome transmission)	283nm ... 2800nm
Operating temperature	-40 ... 80°C
Protection rate	IP67
Response time (95%)	<5sec
Zero off-set	- Response to 200W/m ² thermal radiation: < \pm 7 W/m ² - Response to 5K/h change in ambient temperature: < \pm 2 W/m ² - Total zero off-set including the effects a), b) and other sources: < \pm 10 W/m ²
Long-term instability (1 year)	< \pm 0,5 %
Non-linearity	< \pm 0,2 %
Cosine response	< \pm 10 W/m ²
Spectral error	< \pm 0,2 %
Response depending on the temperature(-10...+40 °C)	< 1 %
Tilt response	< \pm 0,2 %

Ordering codes

Spectrally Flat Class A pyranometer with μ V output	PCTRA072
Spectrally Flat Class A pyranometer with 0 ... 1V output (0 ... 2000W/m ²)	PCTRA074
Spectrally Flat Class A pyranometer with 4 ... 20mA output (0 ... 2000W/m ²)	PCTRA073
Spectrally Flat Class A pyranometer with Modbus RS485 output	PCTRA089
Spectrally Flat Class A pyranometer with μ V output with adjustable shield ring to measure the diffuse component only	PCTRA076
Spectrally Flat Class A pyranometer with 4 ... 20mA output (0 ... 2000W/m ²) + Modbus RS485	PCTRA104

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