

METEOROLOGY HYDROLOGY ENVIRONMENTAL MONITORING

Sunshine duration sensor

Description

The Sunshine Duration sensor PCTEL004 measures sunshine status and duration. The WMO (World Meteorological Organization) defines the sunshine duration as the time during which the direct solar radiation exceeds the level of 120 W/m². The PCTEL004 performs the measure of radiation with an array of photodiodes arranged in a particular geometry which allows to obtain an accurate measurement in any weather conditions. This solution avoids the use of mechanical moving parts and ensures high reliability over time. The instrument, besides indicating the presence of sun as required by the WMO, measures also direct radiation (SRD), therefore it can be used as a low cost alternative to a pyrheliometer, which use is bound to a solar tracker.

The PCTEL004 is equipped with a separately heating element powered and galvanically isolated, which prevents the formation of condensation on the glass surface onto which the sensitive elements are placed. For harsh climates, the abovementioned versions are available with a second heating element (option R), which prevents the formation of ice and prevents snow from settling. The instrument does not need any positioning adjustment during the year and it can be installed on a mast or on a proper fixing base (optional). The application fields are multiple: from the agronomy (agricultural science) to the study the growth of crops, to photovoltaic systems for verifying their performance, to building automations for automatic opening/closing of blinds, shutters and, in general, to all those areas where it is necessary to monitor the presence of sunlight.

Operating Principle: The Sunshine Duration PCTEL004 is based on the use of 16 sensors arranged in such a way that, in the presence of sun, at least one of the photo-detectors is exposed to sun light directly from the sun (besides the diffu-sion component). Those sensors which are not directly illuminated by the sun are used for the measurement of the diffused light that is subtract-ed from the measurement of the sensor which sees the sun directly, to get direct radiation. The cylindrical glass protects the sensors and the internal circuits of the instrument from the weather and at the same time provides an excellent transparency to sunlight. In order to avoid the formation of condensation inside the instrument, in addition to the heating element, the PCTEL004 is supplied with a cartridge that must be loaded with desiccant material in colloidal silica (Silica-gel).



Technical specifications may be varied without prior notice





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Technical specifications

Sensor Type	Sunshine duration sensor
Sensitive elements	16 Silicon photodiodes
Spectral range	360 1100nm
Direct radiation SRD measuring range	0 2000W/m²
Accuracy of the measurement of direct radiation	Better than 90% on the monthly total
Accuracy of the measurement of the sunshine duration sensor	Better than 90% on the monthly total
Response time	<1s
Threshold value	120W/m ²
Sunshine duration resolution	1s
Power supply	7 30Vdc
Consumption	5mA @ 12V
Heating system: power supply	12 15Vdc
Anti-condensation device consumption	1W @ 12V
Antifreeze device consumption	5W @ 12V ON for internal Temp. <6°C OFF for internal Temp. > 10°C
Internal temperature	Measuring range: -40 +80°C; Accuracy ±0,5°C
Operating temperature	-40 +80°C
Weight	0,9Кд
Protection degree	IP66
Output	RS485 MODBUS-RTU Galvanically isolated contact: • closed = SRD \ge 120 W/m ² • open = SRD < 120 W/m ²

Ordering codes

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