Kipp & Zonen

CSD 3

SUNSHINE DURATION SENSOR

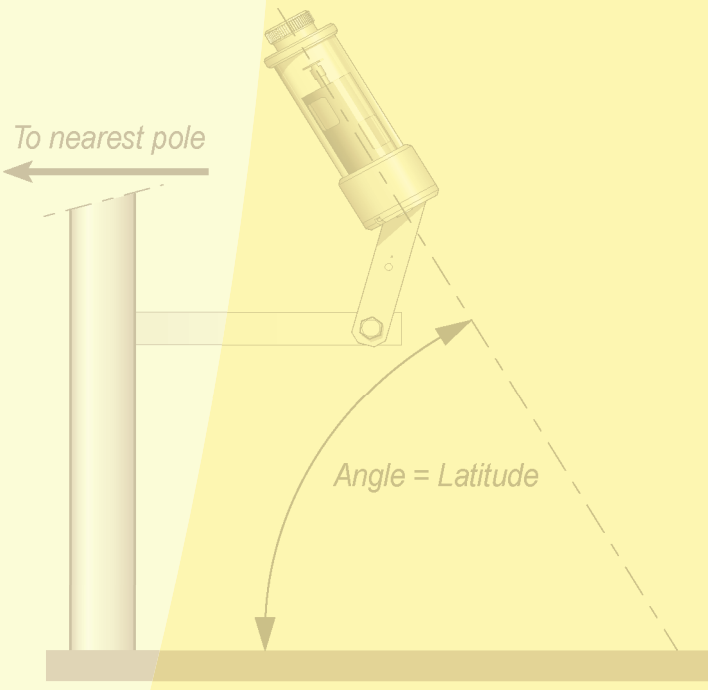
- No moving parts.
- Large drying cartridge for low maintenance at long intervals.
- Glass tube for improved resistance to scratching by storm-blown sand and ice.
- Low power consumption, suitable for remote stations.
- Two heater levels, increasing accuracy and reliability.

CSD 3 measures sunshine duration. Sunshine duration is defined by the World Meteorological Organisation as the time during which the direct solar radiation exceeds 120 W/m². It has no moving parts and uses 3 photo-diodes with specially designed diffusers to make an analogue calculation of when it is sunny. The output is switched high or low to indicate sunny or not sunny conditions. The calculated direct irradiance value is available as a voltage output.

The instrument is designed for continuous outdoor use and the waterproof plug-and-socket cable connection provides for easy installation and servicing. A humidity indicator progressively changes colour to show when it is necessary to change the drying cartridge, which is located under a screw-on cover. The recommended recalibration interval is 2 years.

CSD 3 operates from 12 VDC power and has two levels of built-in heating. Level 1 is to prevent the formation of dew. Level 2 prevents frost, and even ice, forming on the instrument. The heaters are normally switched externally but an optional internal thermostat control is available.

Sunshine Duration Sensors are widely used in weather networks and holiday resorts to provide the number of sunshine hours per day for tourist information. In health spas and clinics they contribute to the measurements used in treatment and recovery. In agronomy the amount of sunshine received by crops can be used to help forecast yields. In building automation the CSD 3 can be used as an input to the systems for the control of the internal environment, such as the deployment of sun blinds.



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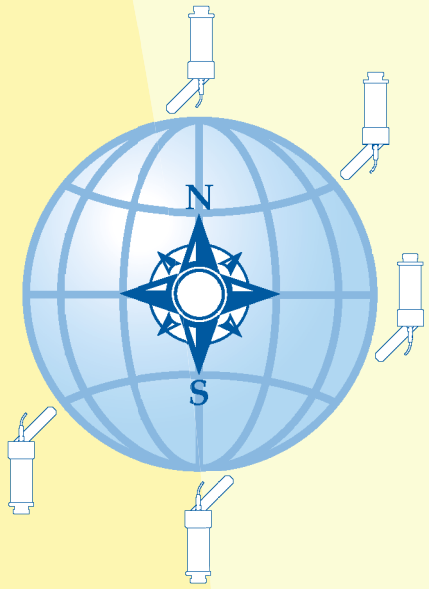
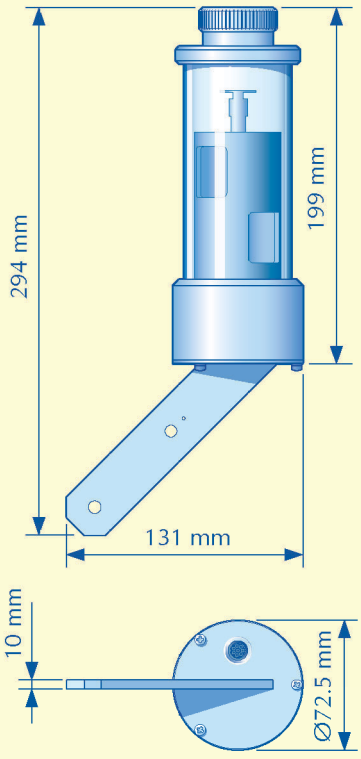


CSD 3 is installed at an orientation parallel to the north-south plane, pointing towards the nearest pole, at an angle from horizontal equal to the latitude of the measurement location.

SPECIFICATIONS

Spectral range	400 – 1100 nm
Sunshine YES output	1.0 ±0.1 V if direct irradiance > 120 W/m²
Sunshine NO output	0.0 to 0.1 V if direct irradiance < 120 W/m²
Accuracy of sunshine hours	>90 % in monthly total
Direct radiation output	1 mV per W/m²
Accuracy of direct output	>90 % for clear sky
Non-stability	<2 % change per year
Response time	<1 ms
Impedance	1 kΩ
Power supply	9 to 15 VDC, 0.1 Watt
Heater level 1 to avoid dew	9 to 15 VDC, 1 Watt
Heater level 2 ice and snow removal above -15 °C and wind speed <1 m/s	9 to 15 VDC, 10 Watt
Thermal switch (optional)	Heater level 2 on if case temp. <6 °C ±3 °C Heater level 2 off if case temp. >14 °C ±3 °C
Humidity	0 to 100 %
Operating temperature	-40 °C to +70 °C
Weight without cable	930 g.
Cable length	15 m. standard, 25 m. optional



CSD 3 SUNSHINE DURATION SENSOR

SOLAR & ATMOSPHERIC SCIENCE

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