



Specials

- Water-proof, pluggable cable connection for easy maintenance and installation
- Good viewable humidity indicator for better visualisation of time to change the drying cartridge
- Innovative drying cartridge system with higher capacity for a longer application period and easy exchangeable
- Glass cylinder (instead of plastics) for improved resistance to mechanical influences on the surface

Description

The sensor (16203) is designed to measure the sunshine duration. The sunshine duration is defined as the time interval, in which the direct sun radiation surpasses the value of 120 W/m^2 .

The sensor features are according to reference instruments of the WRR (=World Radiometric Reference).

Application fields e.g.

- Agricultural meteorology, e.g. for evaporation determination
- Weather services, e.g. for touristic information like amount of sunshine hours
- Health care, e. g. for climatic grading of health resorts

Please note the loss of warranty and non-liability by unauthorised manipulation of the system. You need a written permission of the LAMBRECHT GmbH for changes of system components. These activities must be operated by a qualified technician.

The warranty does not cover:

1. Mechanical damages caused by external impacts (e. g. icefall, rockfall, vandalism).
2. Impacts or damages caused by over-voltages or electromagnetic fields which are beyond the standards and specifications in the technical data.
3. Damages caused by improper handling, e. g. by wrong tools, incorrect installation, incorrect electrical installation (false polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.

Features and advantages

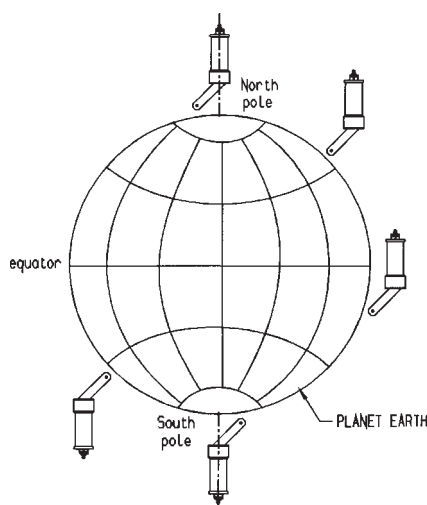
- No moving parts, resultant no mechanical wear and long lifetime
- High-quality photodiodes as measuring elements provide save and accurate results
- Large operating temperature range provide flexible applications at all latitudes
- Integrated heating with 2 practice optimised heating levels provide operations irrespective of seasons (option)
- Low power consumption, particular by inactive heating, provide efficient operation at automatic weather stations

The integrated heating is especially important for climatic environments, in which the data acquisition can be influenced by dew, frost, ice or snow on the sensor surface.

Two heating levels can be controlled ideally for melting of dew or snow, thus the reliability of the measuring results is increased.

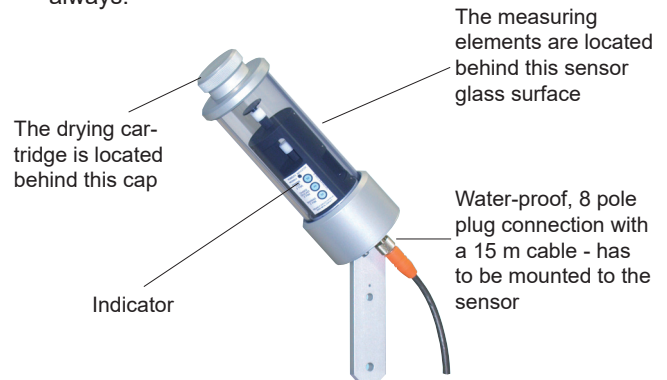
Installation

- The sensor (16203) can be installed in all geographical areas.
- Minimum preconditions for correct results are:
 - Unobstructed irradiation to the sensor.
 - The distance to the next obstacle should be 10 time larger than its height.
 - The mast mounting has to be carried out on stable surface.
 - The mounting device should provide only minimal influences of airflow.
- The alignment of the sensor has to be parallel to the north-south axis.
- The sensor has to be mounted in upright position first, afterwards it has to incline at angle equal latitude within $\pm 1^\circ$.
- The sensor has to be orientated towards nearest pole within $\pm 5^\circ$.



Maintenance

- The sensor must to be orientated parallel to the earth-axis always.



- The measuring elements are located behind this sensor glass surface. They must not be hindered by dirt, dust, ice or snow, in order to absorb sunshine radiation all time. Therefore keep the glass clean always by using water or alcohol or by using the heating for melting of a film due to coldness.

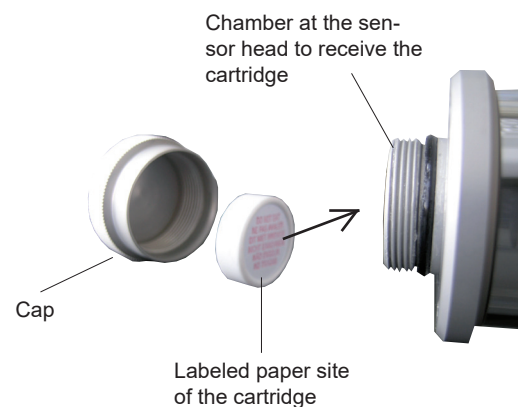
- One drying cartridge has to be integrated into the sensor head.

- The colour of the indicator is BLUE if it is ready to work.

- The drying cartridge has to be exchanged, if the colouration of the indicator becomes 40%-PINK.

- To exchange or insert the drying cartridge first screw off the cap and remove the old cartridge. Insert the new cartridge so, that the labeled site, made from paper, is orientated to the sensor. Afterwards screw the cap on the sensor head again.

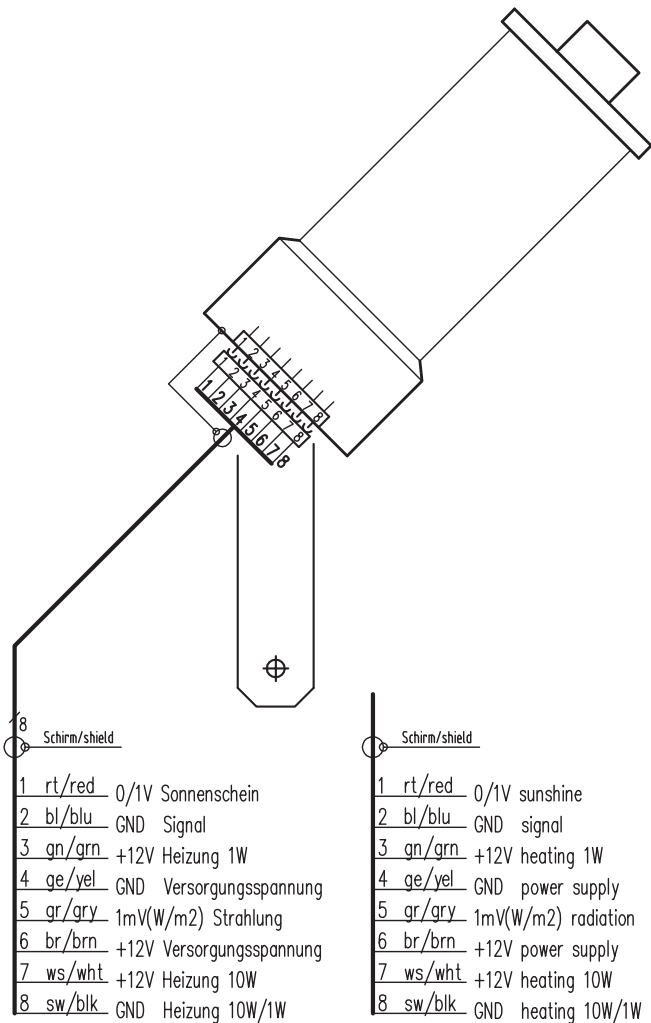
- Approx. 1 day after changing the cartridge the colour of the indicator is blue again.



- A recalibration of the sensor every 2 years by the supplier is recommended. For this reason keep the original packaging.

Electrical connection

Plug-Pin-assignment



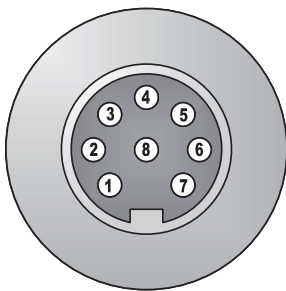
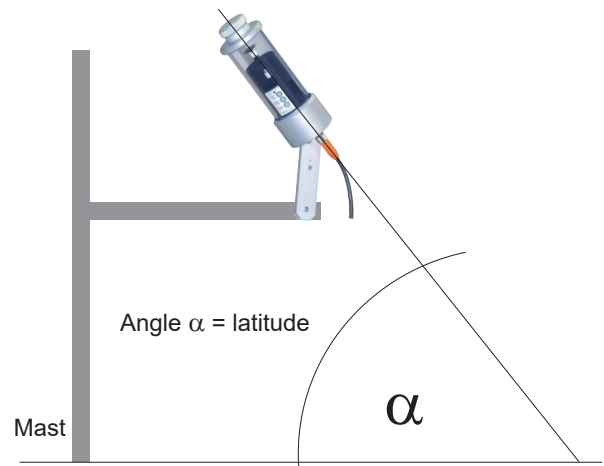
Analog output for the direct irradiance

An additional signal can be given, which represents the direct irradiance. This signal is equivalent 0 V, if no direct irradiance is present and changes linear to the irradiance. The calibration factor is factory set at 1 mV (1 W/m² corresponds).



Design-caused this signal breaks in however over the midday significantly. Please note, therefore this output signal for the direct irradiance cannot replace the measurement with a Pyranometer or a Pyrheliometer.

Alignment to the nearest pole



PIN	Wire	Function	Connect with
1	red	signal sunshine 0/ 1 Volt	0/ 1 V sunshine
2	blue	signal ground	GND signal
3	green	heater 1 W	+12 V heating 1 W
4	yellow	power supply ground	GND power supply
5	grey	direct irradiance 1 mV = 1 W/m ²	1 mV (W/m ²) radiation
6	brown	power supply	+12 V power supply
7	white	heater 10 W	+12 V heating 10 W
8	black	heater ground	GND heating 10 W/1 W



Technical data

(16203)	Sunshine duration sensor
Id-No.	00.16203.110 004
Meas. elements	Photodiodes
Meas. range	Sunshine yes/ no • max. 1500 W/m ² Spectral range 400...1100 nm
Accuracy	> 90% in monthly total
Range of application	-40...+70°C
Response time	< 1 ms
Stability	< 2% / year
Impedance	1 kΩ
Output signal	0 ± 0.1 V _{DC} : no sunshine direct irradiance < 120 W/m ² 1 ± 0.1 V _{DC} : sunshine yes direct irradiance > 120 W/m ²

Thermostat switches heating level 2 on: at < 6°C ± 3°C
 Thermostat switches heating level 2 off: at > 14°C ± 3°C

Power requirement at supply voltage of 12 V_{DC}:

- without heating use: < 0.1 W
- with heating use level 1: 1 ± 0.1 W (nominal)
- with heating use level 2 : 10 ± 1 W (nominal)
for melting of ice or snow at
> -15°C and wind < 1 m/s

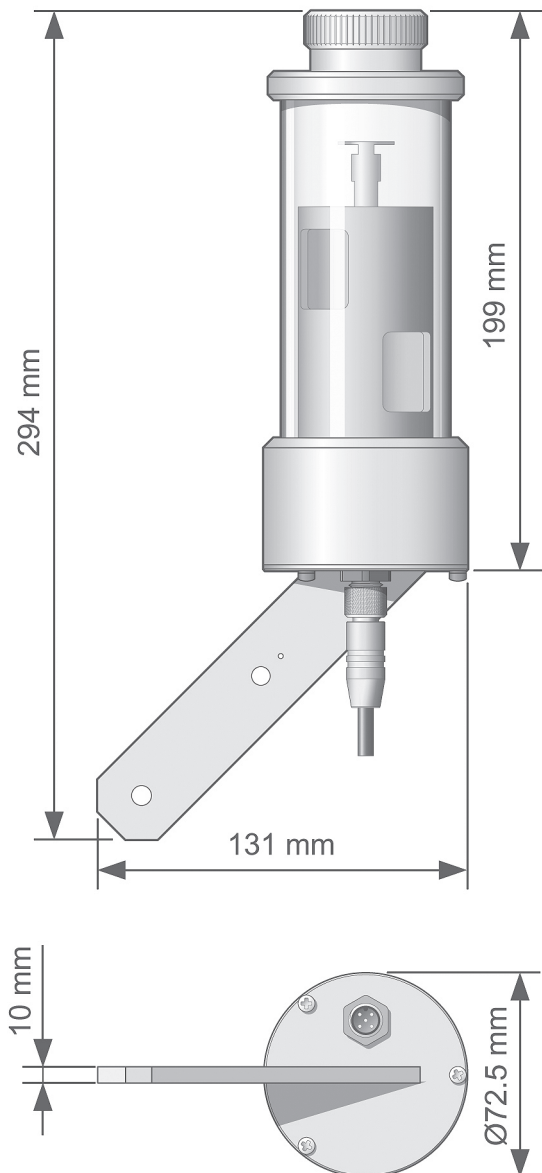
Protection class	IP67
Dimensions:	See dimensional drawing
Weight:	Approx. 0.9 kg
Standards	EU/CE 89/336/EEC · 73/23/EEC
Scope of delivery:	• 1 sensor (16203) • 1 cable, 15 m with 8 pole plug for water-proof plug-connection to the sensor • 2 spare drying cartridges • 1 specific test report

Version:

(16203)	Sunshine duration sensor
Id-No.	00.16203.010 004

Technical data like sensor **00.16203.110 004** but without integrated thermostat for the heating control:

Dimensional drawing



Spare drying cartridge and its packaging



Quality System certified by DQS according to
 DIN EN ISO 9001:2015 Reg. No. 003748 QM15

Subject to change without notice.

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