USER MANUAL

16203

Sunshine Duration Sensor

aem | LAMBRECHT meteo

Warranty

Please note the loss of warranty and non-liability by unauthorized manipulation of the system. You need a written permission of the LAMBRECHT meteo 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 (e.g. false polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.

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).

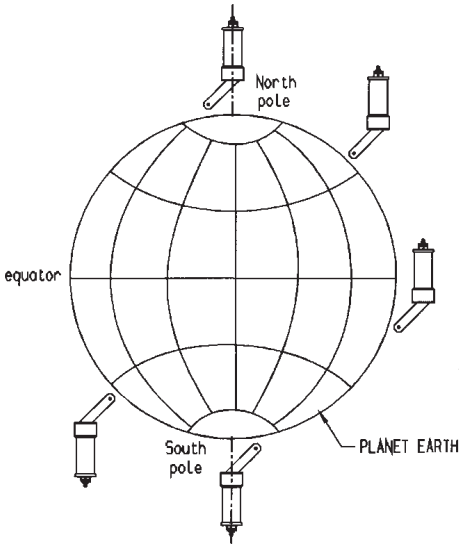
Features

- Waterproof, pluggable cable connection for easy maintenance and installation work
- Good viewable humidity indicator for better visualization 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
- Low power consumption, particular by inactive heating, provide efficient operation at automatic weather stations
- Integrated heating with 2 practice optimized heating levels provide operations irrespective of seasons (option)

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 can be installed in all geographical areas.
- Minimum preconditions for correct results are:
  1. Unobstructed irradiation to the sensor.
  2. The distance to the next obstacle should be 10 time larger than its height.
  3. The mast mounting has to be carried out on stable surface.
  4. 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 ±1°.
- The sensor has to be orientated towards nearest pole within ± 5°.



Disposal

LAMBRECHT meteo GmbH is listed and registered at the Stiftung Elektro-Altgeräte Register ear under:

WEEE-Reg.-Nr. DE 45445814

In the category of monitoring and control instruments, device type: “Monitoring and control instruments for exclusively commercial use”.

Within the EU

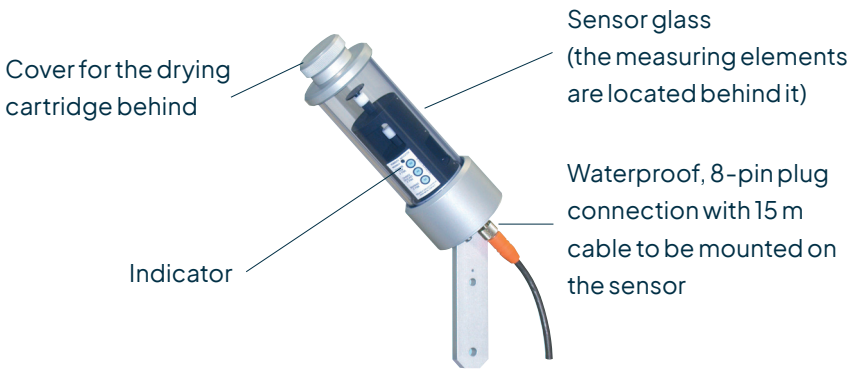
The device has to be disposed according to the European Directives 2002/96/EC and 2003/108/EC (Waste Electrical and Electronic Equipment). Do not dispose the old device in the household waste! For an environmentally friendly recycling and disposal of your old device, contact a certified disposal company for electronic waste.

Outside the EU

Please follow the regulations in your country regarding the appropriate disposal of waste electronic equipment.

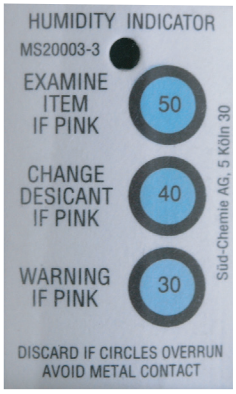
Maintenance

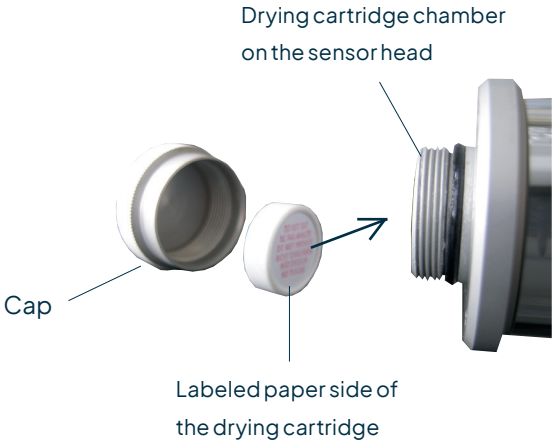
- The sensor must to be orientated parallel to the earth-axis always.



- 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 color 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 color of the indicator is blue again.

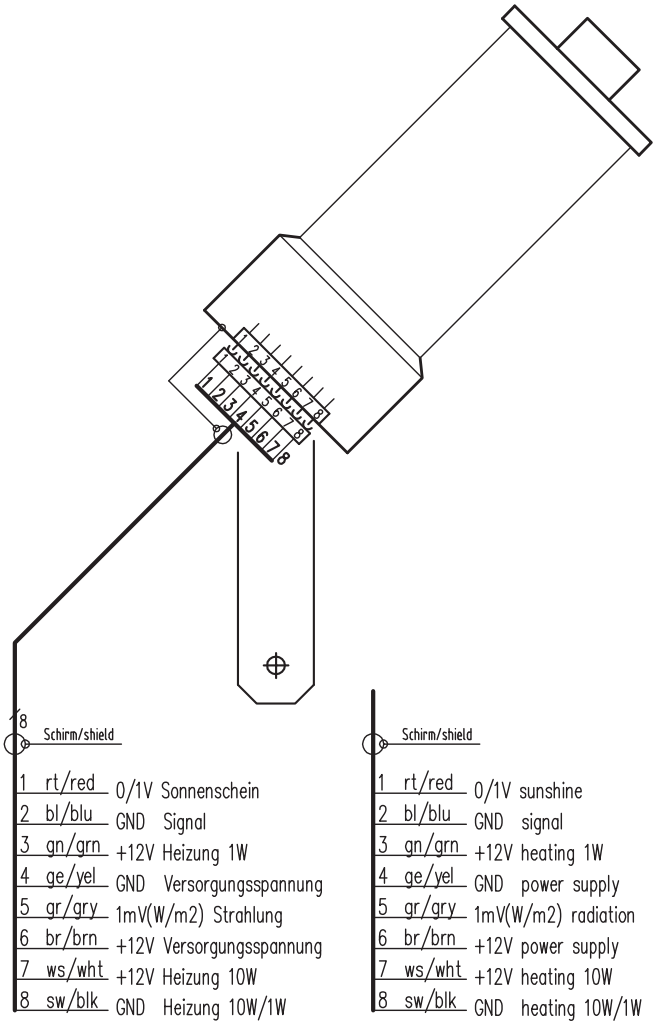


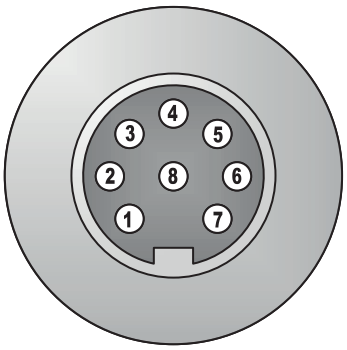


- A recalibration of the sensor every 2 years by the supplier is recommended. For this reason keep the original packaging.

Electrical connection

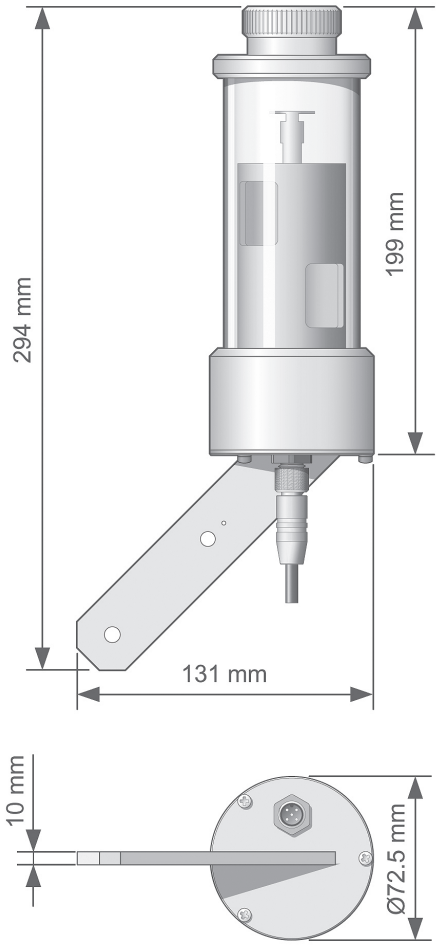
PLUG PIN ASSIGNMENT





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/m²	1 mV (W/m²) 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

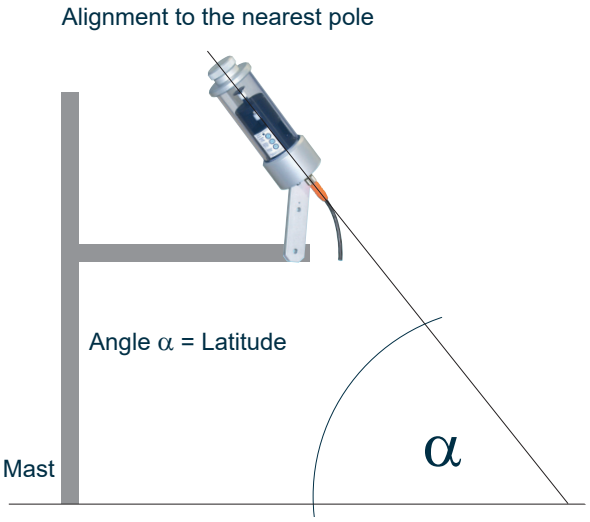
Dimensional drawing



Analog output for direct radiation

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.



Technical data

Sunshine Duration Sensor 16203	
Id-No.	00.16203.110004
Measuring elements	Photo diodes
Measuring range	Sun yes/no; max. 1500 W/m²; 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 VDC: No sunshine; radiation density < 120 W/m² 1 ± 0.1 VDC: No sunshine, radiation density > 120 W/m²
Power consumption with supply voltage of 12 VDC	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 ice and snow removal at temperatures > -15 °C and wind speeds < 1 m/s Thermostat switches heating level 2 on: at < 6 °C ± 3 °C Thermostat switches heating level 2 off: at > 14 °C ± 3 °C
Protection class	IP 67
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 an 8-pole plug for waterproof connection to the sensor; 2 replacement drying cartridges *); 1 specific test report
VERSION	
Id-No. 00.16203.010004	Technical specifications as sensor **00.16203.110004**, but without integrated thermostat for heating control

*) replacement drying cartridges

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LAMBRECHT meteo GmbH
Friedländer Weg 65
37085 Göttingen
Germany

Tel +49-(0)551-4958-0
Fax +49-(0)551-4958-312
E-Mail info-lambrecht@aem.eco
Internet www.lambrecht.net