USER MANUAL

16106

Pyranometer

aem | LAMBRECHT meteo

Contents

Congratulations on your 16106 pyranometer. You have made an excellent choice in buying this innovative technology which offers a variety of advantages in its use. In order to avoid handling errors you should take a few minutes and read these operating instructions carefully.

When you have read these instructions you should keep them safely at a place where they can be easily accessed so that you can refer to them again at any time.

All data in this publication have been compiled and checked with utmost diligence, nevertheless errors and mistakes cannot be totally excluded. All modifications, in particular those relating to technological improvements, are reserved.

1. Safety instructions

This system is designed according to the state-of-the-art accepted safety regulations. However, please note the following rules:

- Before putting into operation please read all respective manuals!
- Please observe all internal and state-specific guidelines and/or rules for the prevention of accidents. If necessary ask your responsible safety representative.
- Use the system only as described in the manual.
- Always have the manual at hand at the installation site.
- Use the system within the specified operating condition. Eliminate influences, which might impair the safety.
- Prevent the ingress of unwanted liquids into the devices.

2. 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.

3. Introduction

This measurement system is delivered with all cables and connectors that helps to easy install and start up. Depending on the respective ordering, shipment will include different modules and extensions.

The transducer of the pyranometer is a silicon photodiode with a resistor in parallel to generate a voltage output signal. The spectral response of this diode runs from about 350 to 1100 nm wavelength. The sensor is calibrated under natural and clear sky conditions. Reference sensor is a secondary standard thermopile pyranometer which represents the highest standard for pyranometers. Therefore the pyranometer shows small deviations in comparison to thermopile sensors however at much reasonable costs.

4. Scope of delivery

When opening the packaging, please ensure that the following parts are included:

- Pyranometer 16106 with connecting cable
- Operating instructions for the pyranometer 16106 and / or wiring diagram

5. Technical data

5.1. Pyranometer 00.16106.000080 (with integrated amplifier)

Power supply:		12...24 VDC Reverse polarity, short-circuit and overload protection in the supply range
Current consumption:	Typically	7 mA
Signal output:	Analog voltage	10 V; short-circuit proof
Measuring range:	Irradiance	0...1400 W/m²
Spectral response:		350...1100 nm
Accuracy:	Against a Secondary Standard Pyranometer	< 4 % at 1000 W/m² @22 °C
Temperature drift:		< 0.1 %/K
Cosine response:	@80° inclination	< 10 %
Operating temperature:		-40...+60 °C
Housing:	Aluminum/ABS	IP67
Dimensions:	(Diameter x Height)	80 x 46 mm
Response time:		<< 1 sec.
Cable/Cable length:	PUR-cable, UV- and heat resistant up to 90 °C, UL approved	2 m
Weight:		150 g

5.2. Pyranometer 00.16106.000000

Power supply:		Not required
Current consumption:	Analog (passive out)	0...50 mV = 0...1400 W/m²
Measuring range:	Irradiance	0...1400 W/m²
Spectral response:		350...1100 nm
Accuracy:	Against a Secondary Standard Pyranometer	< 4 % at 1000 W/m² @22 °C
Temperature drift:		0.1 %/K
Cosine response:	@80° inclination	< 10 %
Operating temperature:		-40...+60 °C
Housing:	Aluminum/ABS	IP67
Dimensions:	(Diameter x Height)	80 x 46 mm
Response time:		<< 1 sec.
Cable/Cable length:	PUR-cable, UV- and heat resistant up to 90 °C, UL approved	2 m
Weight:		150 g

6. CE-Compliance

This article has been tested in accordance with EC Directive 2004/108/EC (EMVG of 1 March 2008, Electromagnetic Compatibility) and complies with the statutory regulations.

7. Functional description of pyranometer 16106

Based on a silicon photo diode the pyranometer 16106 converts incoming irradiance from 350...1100 nm wavelength into a proportional electric output signal.

The integrated precision amplifier of the pyranometer 00.16106.000080 gains this output signal at an irradiance of 0...1400W/m² to 0...10 V (max.).

7.1. Termination of pyranometer 00.16106.000080

The pyranometer 00.16106.000080 with 0...10 V output can be connected very quickly.

Red	U+
Black	U-
Brown	Signal out
Orange	Signal COM
Black/Yellow	Shield

Remark: U- and Signal COM are bridged internally.

7.2. Termination of pyranometer 00.16106.000000

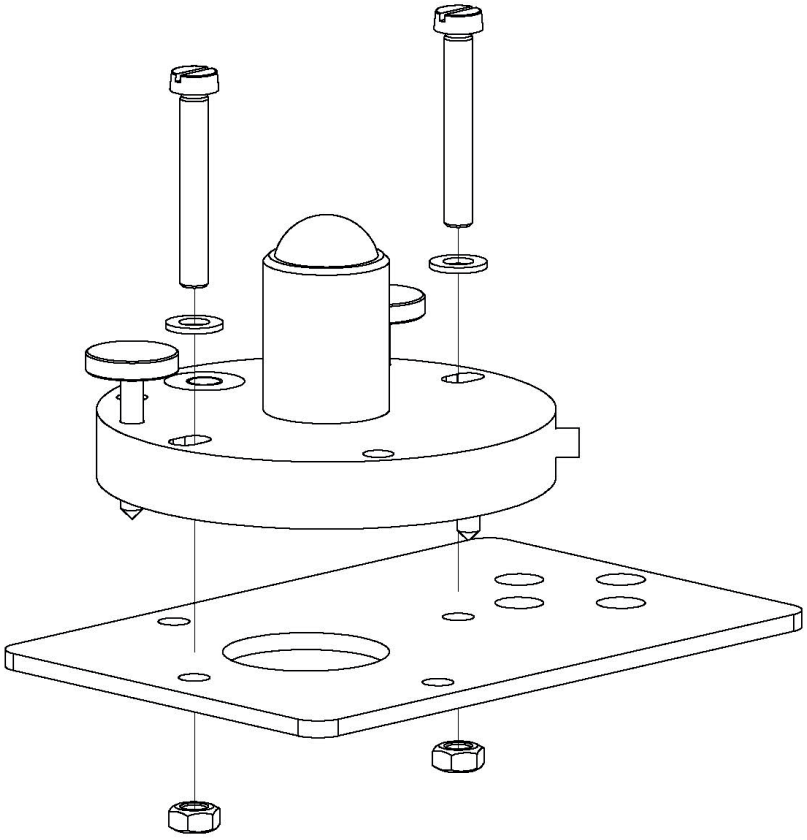
The pyranometer 00.16106.000000 can be connected as follows.

Red	N/A
Black	N/A
Brown	Signal out +
Orange	Signal COM
Black/Yellow	Shield

8. Start of operation

- Immediately after power switch on, the pyranometer 16106 delivers proper measurement values. Response time to reach the final value is 1 sec. or less.
- If a connection to an indicator or data acquisition unit is desirable, the Signal out leads can directly be used for it. Any 12...24 VDC power supply (also non regulated) can be used in this case.
- For an easy and fast installation the sensor is equipped with a spirit level.

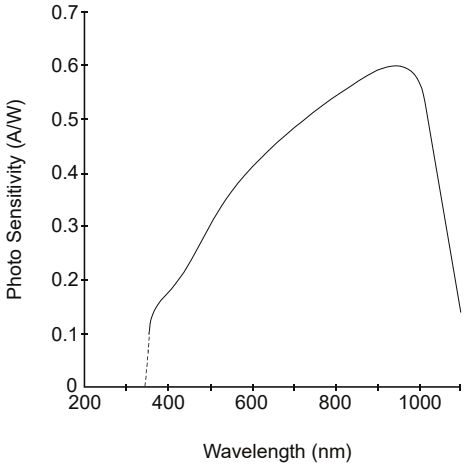
9. Assembly drawing



Mounting the pyranometer at the “Sensor Fixation Big” of the traverse system no. 14627 (not included in the scope of delivery).

10. Calibration

SPECTRAL SENSITIVITY VS. WAVELENGTH



The pyranometer 16106 is calibrated at the factory against a thermopile pyranometer (secondary standard) under natural sunlight in a cloudless sky.

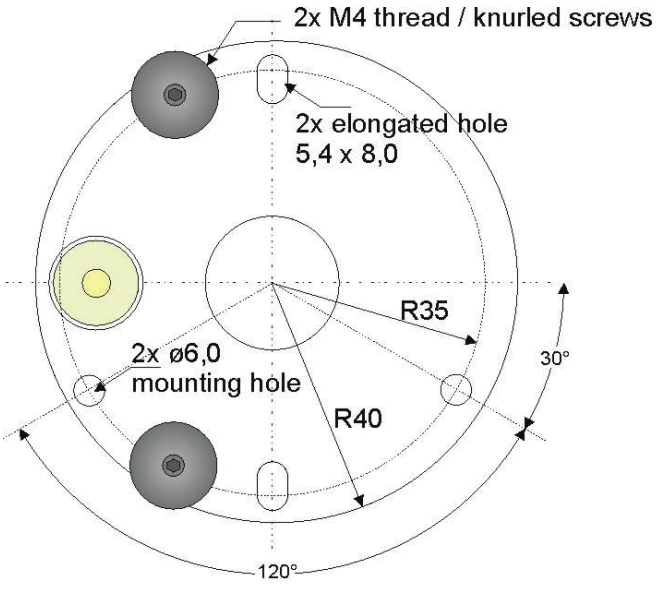
Although the 16106 pyranometer does not cover the complete spectral range of a thermopile pyranometer, the deviation is still less than 4 %.

11. Maintenance and recalibration

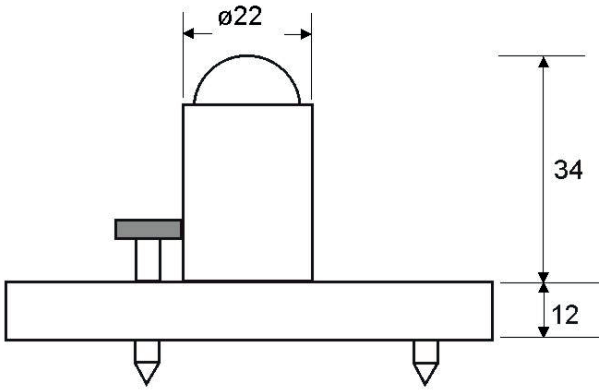
Compared to other pyranometers, maintenance work is kept to a minimum. When in use, ensure that the glass dome of the sensor is clean and free of grease. This can be achieved with a soft cloth and a little spirit (isopropanol).

We recommend recalibrating the sensor approximately every 12 months. There is a label next to the type plate on the sensor which shows the date of the last calibration.

12. Mechanical dimensions



View from above



Side view

13. Ident numbers

Pyranometer	16106 with 0…50 mV (passive) output
Id No.:	**00.16106.000000**
Pyranometer	16106 with 0…10 V output
Id No.:	**00.16106.000080**
Sensor Fixation Big	(please order separately)
Id No.:	**32.14627.003000**

Consisting of:

- 1 Holding fixture big
- 2 Screws M 8 x 16 DIN 933
- 2 Lock washer 8.4
- 2 Slot nuts M8

14. 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.

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