



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.

The information and data contained in these operating instructions may be modified without prior notice. No part of this documentation may be reproduced or transmitted for any purpose whatever, regardless of the mode or the means, electronically or mechanically, without the prior permission in writing of LAMBRECHT meteo GmbH.

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.

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## 1 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.

### 1.1 Packing list

Please assure that after opening the Pyranometer packaging, the following items are enclosed:

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

## 2 Technical data

### 2.1 Pyranometer 00.16106.000080 (with integrated amplifier)

Power supply U:		12...24 VDC short circuit, inverse polarity and over- voltage protected up to U
Current consumption:	typical	7 mA
Signal output:	Analog voltage	0...10 V reverse polarity protected
Measurement range:	Irradiance	0...1400 W/m <sup>2</sup>
Spectrale response:		350...1100 nm
Accuracy:	against secondary standard pyranometer	<4 % at 1000 W/m <sup>2</sup> @22 °C
Temperature drift:		<0.1 %/K
Cosine response:	@80° inclination	<10 %
Operating temperature:		-40...60 °C
Housing:	Aluminium/ABS	IP67
Dimension:	(Diameter x Height)	80 x 66 mm
Response time:		<<1 sec.
Cable/Cable length:	PUR-cable, UV- and heat resistant up to 90°C	2 m
Weight:		150 gr.

### 2.2 Pyranometer 00.16106.000000

Power supply:		not required
Signal output:	Analog (passive out)	0..50 mV = 0..1400 W/m <sup>2</sup>
Measurement range:	Irradiance	0..1400 W/m <sup>2</sup>
Spectrale response:		350..1100 nm
Accuracy:	against secondary standard pyranometer	<4 % at 1000 W/m <sup>2</sup> @22° C
Temperature drift:		<0,1 %/K
Cosine response:	@ 80° inclination	<10 %
Operating temperature:		-40° C..60° C
Housing:	Aluminium/ABS	IP67
Dimension:	(Diameter x Height)	80 x 66 mm
Response time:		<<1 sec.
Cable/Cable length:	PUR-cable, UV- and heat resistant up to 90 °C	2 m
Weight:		150 g

### 3 CE-Compliance

This measurement device is approved according to CE guideline 2004/108/EG (EMVG from Feb. 26, 2008, Electromagnetic compatibility).

### 4 Functional description of 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/m<sup>2</sup> to 0...10 V (max.).

#### 4.1 Termination Pyranometer 00.16106.000080

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

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

Remark: U- and Signal COM are bridged internally.

#### 4.2 Termination Pyranometer 00.16106.000000

The pyranometer type 00.16106.000080 with passive 0...50 mV output can be connected very easily.

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

### 5 Set to operation

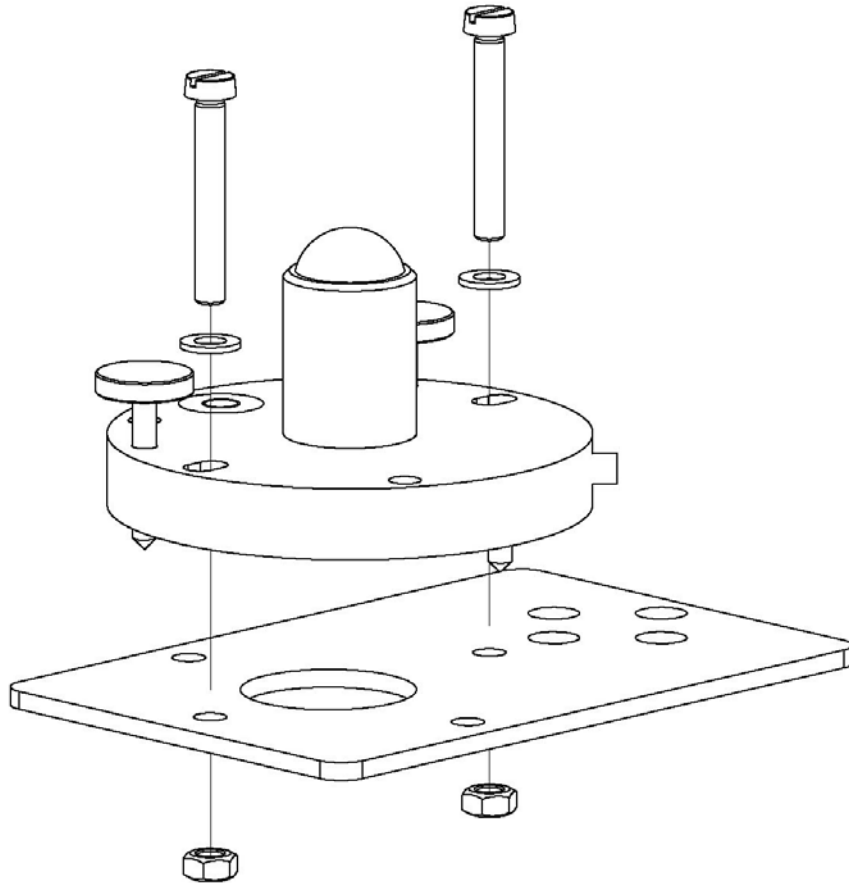
Immediately after power switch on, the pyranometer 16106 delivers proper measurement values. Response time to reach the final value is 1 sec. or less.

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.

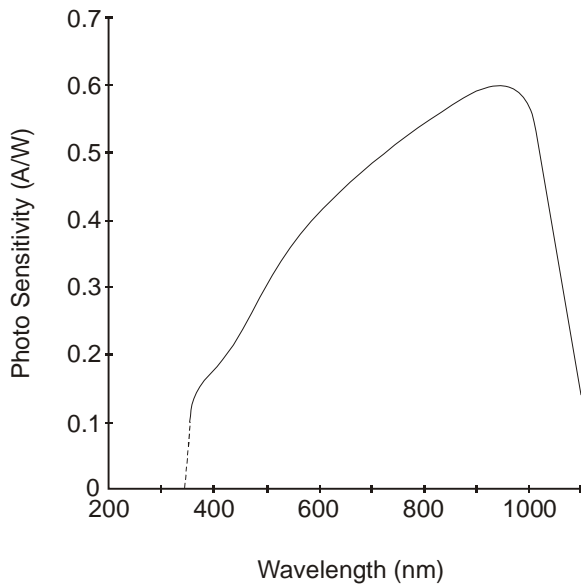
**Assembly drawing**



Assembly of the Pyranometer at the Sensor Fixation Big\* of the traverse system no. 14627.

\*) not included in scope of delivery

## 6 Calibration



16106 is calibrated by the factory against a precise secondary standard thermopile Pyranometer under natural and clear sunlight conditions. Although the 16106 covers not the complete spectrum response of a thermopile sensor, but the error caused by this deviation is less than 4 %.

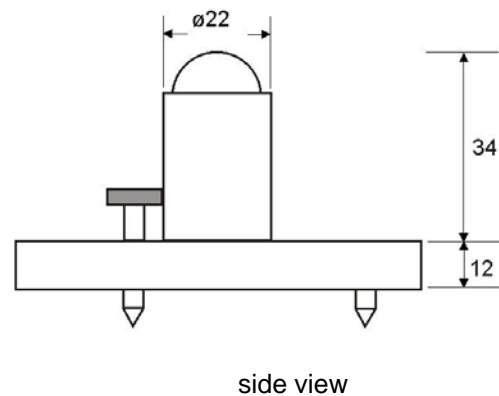
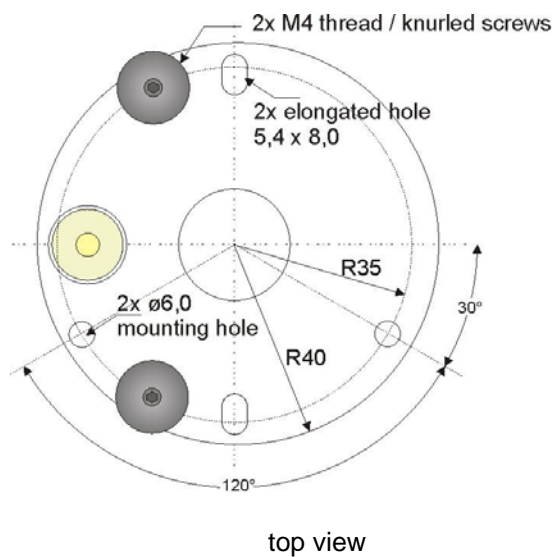
Spectral response vs. wavelength

## 7 Recalibration

In comparison to other pyranometers, service and maintenance is cut down to an absolute minimum. During use, the glass dome of the sensor should be kept free of dust and oil. This can be done by using a piece of duster soaked with a little spirit (alcohol).

Recalibration should be performed by the factory. A time frame of more than 12 months should not be exceeded. At the housing of the sensor a small label shows the date of the last calibration.

## 8 Mechanical Dimension



## 9 Ordering Code

Pyranometer 16106 with 0...50 mV (passive) output  
Id-No.: 00.16106.000 000

Pyranometer 16106 with 0...10 V output  
Id-No.: 00.16106.000 080

Sensor Fixation Big (please order separately)  
Id-No.: 32.14627.003 000

Consisting of:

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

## 10 Warranty

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