

## Instruction for Use

021045/11/09

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# *Silicon Pyranometer GSM 3.3*

7.1415.09.0xx



### **ADOLF THIES GmbH & Co. KG**

Hauptstraße 76                      37083 Göttingen Germany  
Box 3536 + 3541                      37025 Göttingen  
Phone +49 551 79001-0              Fax +49 551 79001-65  
www.thiesclima.com                  info@thiesclima.com

## Safety Instructions

- Before operating with or at the device/product, read through the operating instructions. This manual contains instructions which should be followed on mounting, start-up, and operation. A non-observance might cause:
  - failure of important functions
  - Endangering of persons by electrical or mechanic effect
  - Damages at objects
- Mounting, electrical connection and wiring of the device/product must be carried out only by a qualified technician who is familiar with and observes the engineering regulations, provisions and standards applicable in each case.
- Repairs and maintenance may only be carried out by trained staff or **Adolf Thies GmbH & Co. KG**. Only components and spare parts supplied and/or recommended by **Adolf Thies GmbH & Co. KG** should be used for repairs.
- Electrical devices/products must be mounted and wired only in voltage-free state.
- **Adolf Thies GmbH & Co KG** guarantees proper functioning of the device/products provided that no modifications have been made to the mechanics, electronics or software, and that the following points are observed:
- All information, warnings and instructions for use included in these operating instructions must be taken into account and observed as this is essential to ensure trouble-free operation and a safe condition of the measuring system / device / product.
- The device / product is designed for a specific application as described in these operating instructions.
- The device / product should be operated with the accessories and consumables supplied and/or recommended by **Adolf Thies GmbH & Co KG**.
- Recommendation: As it is possible that each measuring system / device / product under certain conditions, and in rare cases, may also output erroneous measuring values, it is recommended to use redundant systems with plausibility checks with **security-relevant applications**.

## Environment

- As a longstanding manufacturer of sensors Adolf Thies GmbH & Co KG is committed to the objectives of environmental protection and is therefore willing to take back all supplied products governed by the provisions of "*ElektroG*" (German Electrical and Electronic Equipment Act) and to perform environmentally compatible disposal and recycling. We are prepared to take back all Thies products concerned free of charge if returned to Thies by our customers carriage-paid.
- Make sure you retain packaging for storage or transport of products. Should packaging however no longer be required, arrange for recycling as the packaging materials are designed to be recycled.



## Documentation

- © Copyright **Adolf Thies GmbH & Co KG**, Göttingen / Germany
- Although this operating instruction has been drawn up with due care, **Adolf Thies GmbH & Co KG** can accept no liability whatsoever for any technical and typographical errors or omissions in this document that might remain.
- We can accept no liability whatsoever for any losses arising from the information contained in this document.
- Subject to modification in terms of content.
- The device / product should not be passed on without the/these operating instructions.

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## **1 Models**

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Order - No.	Measuring range	Electrical output	Operating voltage
7.1415.09.040	0...1300 W/m <sup>2</sup>	0...20 mA	9...24 V DC
7.1415.09.041	0...1300 W/m <sup>2</sup>	4...20 mA	9...24 V DC (2-leads-circuit)
7.1415.09.051	0...1300 W/m <sup>2</sup>	0...5 V	9...24 V DC
7.1415.09.061	0...1300 W/m <sup>2</sup>	0...10 V	14...24 V DC

## **2 Application**

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Global radiation is the sum of direct solar radiation and diffuse radiation reaching the surface of the earth. The spectral range extends from the short-wave-range at 300 nm (UV-B) to the long-wave-range at 5000 nm (IR).

The Pyranometer detects almost 90 % of the sunlight-spectra in the range from 400 nm to 1100 nm, and thus, comprises the uv-(ultraviolet radiation), vis-(visible radiation), and the part of the ir-(Infrared-radiation) light.

The measuring results give information about medical and biological cohesions, compared with other spectral ranges.

The Pyranometer can be used in the fields of medical and biological research, with weather information and prognosis systems, in the climatic research, in the field of agriculture, and for the general information of the population.

### 3 Construction

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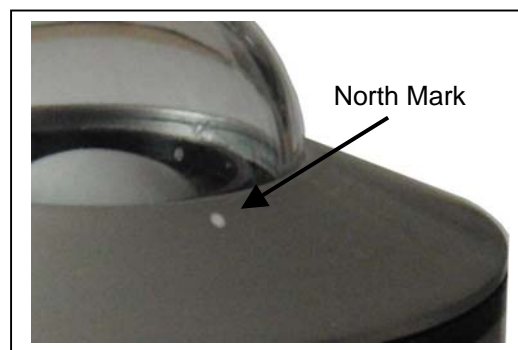
The Pyranometer is a fragile electronic-optical device. The housing is made of anodized aluminium with an uv-transparent plastics dome. The instrument is protected against jets of water and rain. A small package of silica-gel serves for drying the inner housing and protects the dome against steaming-up. The results are cosine-corrected.

### 4 Installation

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The mounting shall be effected with greatest care. The Pyranometer is fixed with two screws M4 onto a suited holder, and should be exactly in horizontal position. The mounting site should be selected in a way, that the sun radiation reaches the surface of the sensor all day. The Pyranometer must have a free horizon into all directions. The instrument marking must indicate to Northern direction.

- Instruments without north marking shall not be aligned.



For the data transmission please use the cable available. For the connector pin assignment please refer to chapter 6. When connecting the cable coupling to the Pyranometer please take care that the mounting notches of coupling and plug coincide. The cap nut is to be screwed tightly.

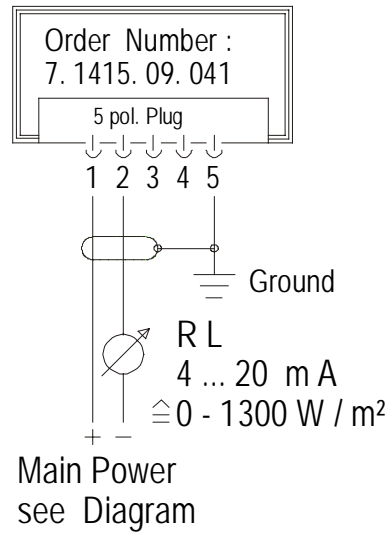
### 5 Maintenance

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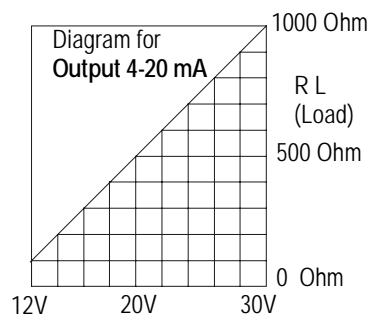
The electronic-optical part of the Pyranometer needs no service. A check of the calibration is possible acc. to the customer's request. The dome, and the housing are to be cleaned, if necessary, with a soft and wet cloth twice a year. Please use only liquid cleaning agents without abrasive additives or solvents. The outer cleaning should be done with clear water or possibly with washing-up liquid.

## 6 Connecting Diagram

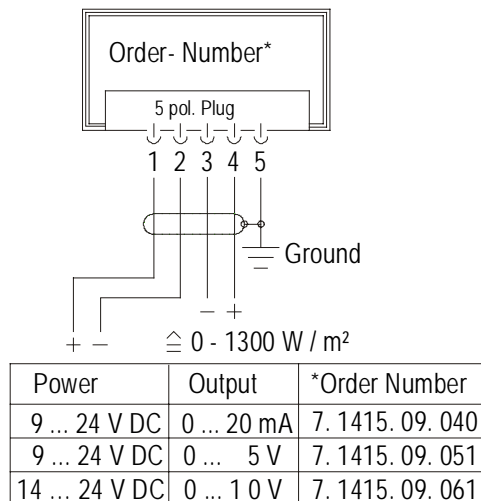
Order – No.  
7.1415.09.041



RL- Function of the Main Power

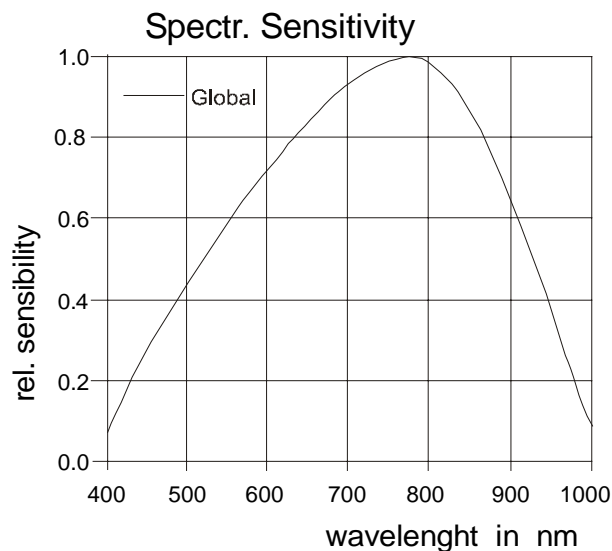


Order – No.  
7.1415.09.040  
7.1415.09.051  
7.1415.09.061



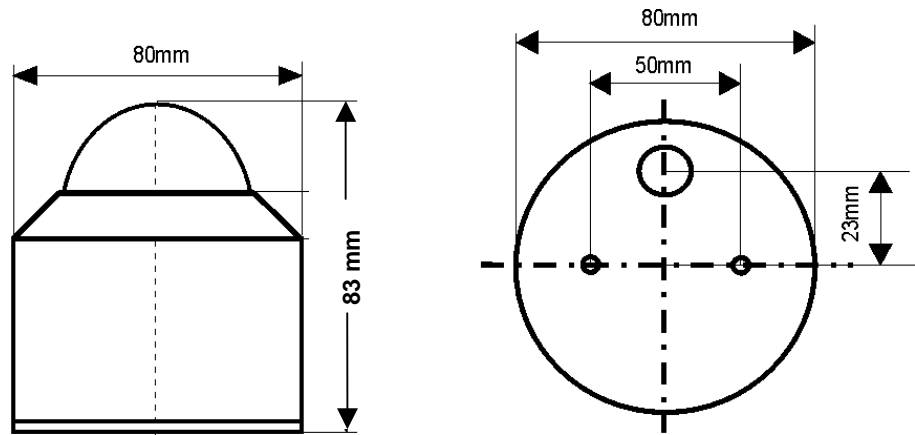
## 7 Technical Data

Global measuring range	0...1300 W/m <sup>2</sup>	
Spectral range	380...1100 nm	
Max. spectral sensitivity	780 nm	
Operating temperature	-20°C...+60°C	
Output	Electrical Output:	Load:
7.1415.09.040	0...20 mA	see RL- Diagram
7.1415.09.041	4 20 mA	see RL- Diagram
7.1415.09.051	0... 5 V	>10KOhm
7.1415.09.061	0...10V	>10KOhm
Power supply	Operation voltage:	Power consumption:
7.1415.09.040	9...24 V DC	typ. 3 mA + I out / max. 6 mA + I out
7.1415.09.041	9 30 V DC , 2-leads-circuit	I out (4-20 mA)
7.1415.09.051	9 24 V DC	typ. 3 mA / max. 6 mA
7.1415.09.061	14...24 V DC	typ. 3 mA / max. 6 mA
Sensor type	Silicon- photodiode	
Diffuser material	PTFE	
Dome	Plastics (PMMA)	
Cosine correction	fault f2 < ±3%	
Linearity	< ±5%	
Abs. fault	< ±10%	
Installation	2 screws M4 in the ground of housing	
Kind of connection	Plug with 5 m cable	
Weight	approx. 0.3 kg	
Protection	IP67	



## 8 Dimension diagram

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# 9 EC-Declaration of Conformity

Document-No.: 000319

Month: 06 Year: 08

Manufacturer: **ADOLF THIES GmbH & Co. KG**

Hauptstr. 76  
D-37083 Göttingen  
Tel.: (0551) 79001-0  
Fax: (0551) 79001-65  
email: Info@ThiesClima.com

Description of Product: **Pyranometer; Silicon Pyranometer; UVAB Sensor; UVB Sensor; Silicon-Sensor PAR; Sunshine Indicator**

Article No.	7.1415.05.040	7.1415.05.041	7.1415.05.051	7.1415.05.061
7.1415.09.040	7.1415.09.041	7.1415.09.051	7.1415.09.061	7.1416.10.040
7.1416.10.041	7.1416.10.051	7.1416.10.061	7.1416.20.040	7.1416.20.041
7.1416.20.051	7.1416.20.061	7.1418.00.040	7.1418.00.041	7.1418.00.051
7.1418.00.061	7.1420.00.000			

specified technical data in the document: **021430/12/04; 021006/07/01; 021052/11/03; 021054/05/02; 021051/01/06; 021049/05/04**

The indicated products correspond to the essential requirement of the following European Directives and Regulations:

- 2004/108/EC DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC
- 2006/95/EC DIRECTIVE 2006/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits
- 552/2004/EC Regulation (EC) No 552/2004 of the European Parliament and the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (the interoperability Regulation)

The indicated products comply with the regulations of the directives. This is proved by the compliance with the following standards:

Reference number	Specification
IEC 61000-6-2: 2005	Electromagnetic compatibility Immunity for industrial environment
IEC 61000-6-3: 2006	Electromagnetic compatibility Emission standard for residential, commercial and light industrial environments
IEC 61010-1: 2001	Safety requirements for electrical equipment for measurement, control and laboratory use. Part 1: General requirements

Place: Göttingen

Date: 26.06.2008

Legally binding signature:

issuer:

.....  
Wolfgang Behrens, General Manager

.....  
Joachim Beinhorn, Development Manager

This declaration certifies the compliance with the mentioned directives, however does not include any warranty of characteristics. Please pay attention to the security advises of the provided instructions for use.







## **ADOLF THIES GmbH & Co. KG**

Hauptstraße 76 37083 Göttingen Germany  
P.O. Box 3536 + 3541 37025 Göttingen  
Phone +49 551 79001-0 Fax +49 551 79001-65  
www.thiesclima.com info@thiesclima.com



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