

## Instruction for Use

021198/11/05

### **Clima Sensor 2000**

4.9000.00.061 / 4.9001.00.061

4.9010.00.061 / 4.9011.00.061



Clima Sensor  
4.9010.00.061



Clima Sensor  
4.9000.00.061



Clima Sensor  
4.9011.00.061



Clima Sensor  
4.9001.00.061

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

Hauptstraße 76  
Box 3536 + 3541  
Phone ++551 79001-0  
www.thiesclima.com

37083 Göttingen Germany  
37025 Göttingen  
Fax ++551 79001-65  
info@thiesclima.com

## **Contents**

|   |                           |   |
|---|---------------------------|---|
| 1 | Models .....              | 2 |
| 2 | Range of Application..... | 3 |
| 3 | Function .....            | 3 |
| 4 | Installation.....         | 4 |
| 5 | Maintenance .....         | 5 |
| 6 | Pin Connection.....       | 5 |
| 7 | Technical Data.....       | 6 |

## **1 Models**

---

| <b>Order-No.</b> | <b>Wind</b> | <b>Precipitation</b> | <b>Brightness</b> | <b>Twilight</b> | <b>Temperature</b> | <b>Air Humidity</b> |
|------------------|-------------|----------------------|-------------------|-----------------|--------------------|---------------------|
| 4.9010.00.061    | X           | X                    | X                 | X               | X                  | X                   |
| 4.9000.00.061    | X           | X                    | X                 | X               |                    |                     |
| 4.9011.00.061    |             | X                    | X                 | X               | X                  | X                   |
| 4.9001.00.061    |             | X                    | X                 | X               |                    |                     |

---

## 2 Range of Application

---

The **Clima Sensor 2000** is designed to measure meteorological parameters. For further processing they are available as standard signals, e.g. for the connection to bus systems (EIB, LON) usual in the trade.

The sensor is applied in the fields of technical building equipment, control technology, green house technology, or for further processing of the acquired data to recording- and indicating instruments.

The following parameters can be measured with the **Clima Sensor 2000** :

**Wind speed, precipitation (yes/no), brightness in Eastern, Southern and Western direction, twilight, temperature and relative air humidity.**

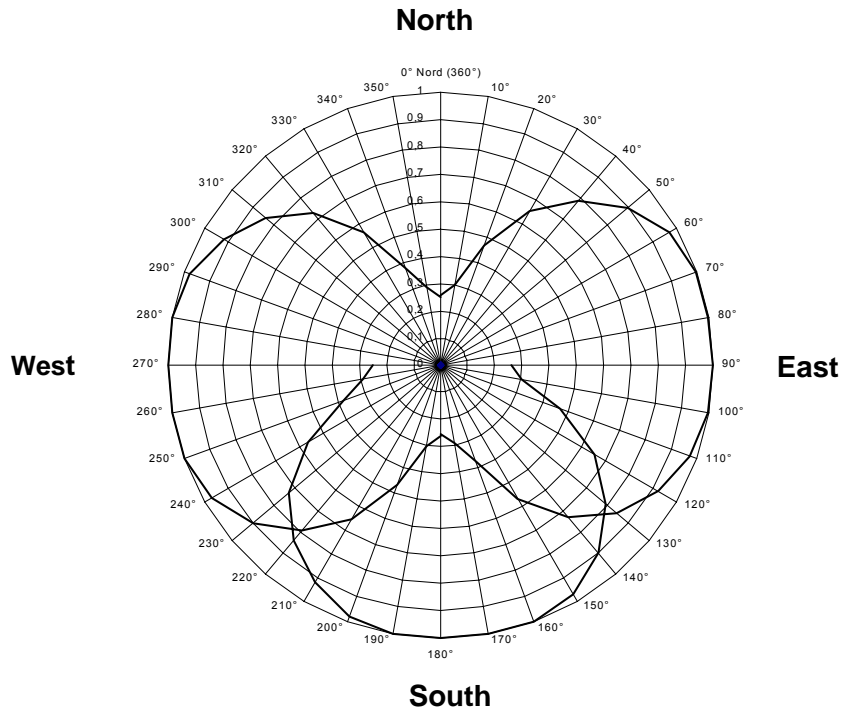
A fixing clip serves for the mounting on masts or plane surfaces – depending on the range of application.

## 3 Function

---

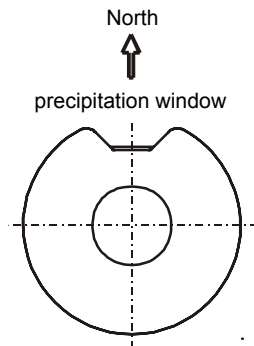
|                                  |                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Wind Speed</b>                | A cup star, the revolution number of which is linear-proportional to the wind speed, supplies a frequency, through a Reed-contact, to a connected frequency-voltage-converter. This frequency is proportional to the revolution number.                                                                                                      |
| <b>Precipitation - Detection</b> | The detection is carried out optically acc. to the reflection-method with modulated infrared-light. The analysis is done after a phase-sensitive filtering so that disturbances, caused by static or dynamic outside light-sources, such as sunlight or electric illumination, can definitely be avoided.                                    |
| <b>Brightness Detection</b>      | The brightness is detected by means of three independent photo-diodes, which are arranged in 90°-segments, and are available through current/voltage-converters at three independent outputs as voltages which are linear-dependent from the brightness.                                                                                     |
| <b>Twilight</b>                  | The twilight is detected by a photodiode. A converter transforms the signal into an output voltage which is linear to the twilight range.                                                                                                                                                                                                    |
| <b>Temperature Measurement</b>   | The temperature sensor is a platinum-sensor Pt 100 of long-term stability. A current source with negative internal resistance eliminates the square part of the Pt 100-characteristic in order to achieve an excellent linearity and measurement accuracy.                                                                                   |
| <b>Humidity Measurement</b>      | The measurement is carried out through a capacitive humidity sensor, which changes its capacity in accordance with the relative air humidity. An analysing circuit converts the capacity changes of the sensor into an analogue output signal and, at the same time, compensates the non-linearity and temperature-dependency of the sensor. |

## Horizontal direction depending of the brightness



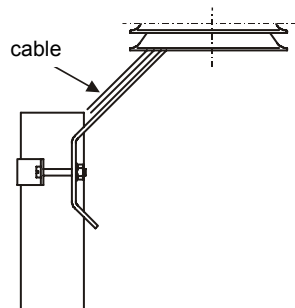
## 4 Installation

---



### Alignment of Sensor

The sensor is to be aligned by means of a compass so that the precipitation window points north. Thus the brightness sensors detect clearly the irradiation range of the sun course, and their assignment according to direction is guaranteed.



### Mounting

The sensor is designed for mounting on a mast tube ( $\varnothing$  35 ... 50 mm). This way of mounting facilitates the above-mentioned alignment of the sensor without problems. Please take care that the sunshine reaches the sensor all-day without shadow. The mounting near buildings or trees can affect the measuring value in a negative manner.

In case of wall mounting please care for a distance to the wall of at least 0,5 m, so that the function of the precipitation-/brightness sensors is not interfered.

## 5 Maintenance

Please take care that the lamella of the **Clima Sensor 2000** are always kept clean, so that the radiation reflection is guaranteed, and a warming-up inside the instrument is avoided. Moreover, the area of the brightness- and precipitation sensors (the dark part of the instrument) should possibly be free of dust so that the measuring values are not affected in a negative manner. A layer of dirt as a result of atmospheric pollution is usually washed off by the precipitation.

The cup star must rotate already at a low starting velocity in order to guarantee an accurate wind speed measurement. This can be checked visually with slight wind flow. In case the cup star seems not to start or to start only with higher wind speeds, please contact the manufacturer for maintenance.

## 6 Pin Connection

| Order-No.            | Core - No. cable 12 x 0,14 mm <sup>2</sup>                                       |   |          |      |                 |                |                |          |          |          |           |      |                 |
|----------------------|----------------------------------------------------------------------------------|---|----------|------|-----------------|----------------|----------------|----------|----------|----------|-----------|------|-----------------|
|                      | 1                                                                                | 2 | 3        | 4    | 5               | 6              | 7              | 8        | 9        | 10       | 11        | 12   |                 |
|                      | ~                                                                                | ~ | +        | AGND | +               | +              | +              | +        | +        | +        | +         | AGND |                 |
| <b>4.9010.00.061</b> | <b>Supply</b><br>15 – 24 V AC<br>or<br>15 – 28 V DC<br><br>Reserve<br>Protection |   | <b>P</b> | AGND | <b>B</b> (West) | <b>B</b> (Süd) | <b>B</b> (Ost) | <b>W</b> | <b>T</b> | <b>H</b> | <b>Tw</b> | AGND | Grounding gnyje |
| <b>4.9000.00.061</b> |                                                                                  |   | <b>P</b> | AGND | <b>B</b> (West) | <b>B</b> (Süd) | <b>B</b> (Ost) | <b>W</b> | NC       | NC       | <b>Tw</b> | AGND |                 |
| <b>4.9011.00.061</b> |                                                                                  |   | <b>P</b> | AGND | <b>B</b> (West) | <b>B</b> (Süd) | <b>B</b> (Ost) | NC       | <b>T</b> | <b>H</b> | <b>Tw</b> | AGND |                 |
| <b>4.9001.00.061</b> |                                                                                  |   | <b>P</b> | AGND | <b>B</b> (West) | <b>B</b> (Süd) | <b>B</b> (Ost) | NC       | NC       | NC       | <b>Tw</b> | AGND |                 |

|             |   |                      |          |   |                   |
|-------------|---|----------------------|----------|---|-------------------|
| <b>P</b>    | = | <b>Precipitation</b> | 0 / 10 V | = | Rain yes / no     |
| <b>B</b>    | = | <b>Brightness</b>    | 0 - 10 V | = | 0 - 100 k Lux     |
| <b>Tw</b>   | = | <b>Twilight</b>      | 0 – 10 V | = | 0 – 250 Lux       |
| <b>W</b>    | = | <b>Wind Speed</b>    | 0 - 10 V | = | 0 - 40 m/s        |
| <b>H</b>    | = | <b>Humidity</b>      | 0 - 10 V | = | 0 - 100 % rel. F. |
| <b>T</b>    | = | <b>Temperature</b>   | 0 - 10 V | = | -20 - +60 °C      |
| <b>AGND</b> | = | <b>Analog Ground</b> |          |   |                   |
| <b>NC</b>   | = | <b>not connected</b> |          |   |                   |

### **Remark:**

The indication of cores is always the same with all models of the Clima Sensor 2000, however, the connection depends on the instrument model, see „Pin Connection“.

## 7 Technical Data

|                                  |                   |                                                                                                     |
|----------------------------------|-------------------|-----------------------------------------------------------------------------------------------------|
| <b>Wind Speed</b>                | Meas. range       | 1... 40 m/s                                                                                         |
|                                  | Accuracy          | ≤ 0,5 m/s                                                                                           |
|                                  | Electr. output    | 0 ... 10 V (= 0..40 m/s)                                                                            |
|                                  | Load resistance   | ≥ 10 kΩ                                                                                             |
| <b>Precipitation - Detection</b> | Meas. range       | Precipitation yes / no                                                                              |
|                                  | Electr.. output   | 0 V at precipitation; 10 V no precipitation                                                         |
|                                  | Sensitivity       | Drizzle                                                                                             |
|                                  | Switch-off delay  | approx. 2 min.                                                                                      |
|                                  | Load resistance   | ≥ 100 kΩ                                                                                            |
| <b>Brightness Detection</b>      | Meas. range       | 0 ... 100 k Lux                                                                                     |
|                                  | Spectral range    | 700 ... 1050 nm                                                                                     |
|                                  | Accuracy          | ± 10 % of meas. value                                                                               |
|                                  | Electr. output    | 3 x 0 ... 10 V (= 0..100 K Lux)<br>Eastern, Southern and Western Direction                          |
|                                  | Load resistance   | ≥ 10 kΩ                                                                                             |
| <b>Twilight</b>                  | Meas. Range       | 0 ... 250 Lux                                                                                       |
|                                  | Electr. output    | 0 ... 10 V                                                                                          |
|                                  | Load resistance   | ≥ 10 kΩ                                                                                             |
| <b>Temperature</b>               | Meas. Range       | - 20 ... + 60 °C                                                                                    |
|                                  | Meas. element     | Pt100 1/3 DIN                                                                                       |
|                                  | Accuracy          | ± 0,15 °C bei 0 °C                                                                                  |
|                                  | Electr. output    | 0 ... 10 V (= -20..+60°C)                                                                           |
|                                  | Load resistance   | ≥ 10 kΩ                                                                                             |
| <b>Humidity</b>                  | Meas. Range       | 0 ... 100 % rel. humidity                                                                           |
|                                  | Accuracy          | ± 3 % in the range 10 ... 90 % rel.h.                                                               |
|                                  | Electr. output    | 0 ... 10 V (= 0...100% r. F.)                                                                       |
|                                  | Load resistance   | ≥ 10 kΩ                                                                                             |
| <b>General</b>                   | Operating Voltage | 15 - 24 V AC ; or 15 – 28 V DC                                                                      |
|                                  | Current load      | ≤ 150 mA                                                                                            |
|                                  | Temperature range | - 40 °C... + 60 °C                                                                                  |
|                                  | Connecting cable  | 10 m long ; LiYCY 12 x 0,14, mm <sup>2</sup> UV-resistant<br>max. 100 m at supply with nominal 24 V |
|                                  | Mounting          | Niro-holder clamp on mast or wall                                                                   |
|                                  | Weight            | max. 1,5 kg                                                                                         |
|                                  | EMV               | EN 61326-1 with ENV61000-4-3                                                                        |
| <b>Dimensions</b>                | 4.9010.00.061     | Ø130 x 430 mm                                                                                       |
|                                  | 4.9000.00.061     | Ø130 x 335 mm                                                                                       |
|                                  | 4.9011.00.061     | Ø130 x 310 mm                                                                                       |
|                                  | 4.9001.00.061     | Ø130 x 215 mm                                                                                       |

|                                                                                    |                                                                                                                                                                                        |  |                                                                                      |                                                                                       |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  | <b>ADOLF THIES GmbH &amp; Co. KG</b>                                                                                                                                                   |  |  |  |
|                                                                                    | Hauptstraße 76      37083 Göttingen Germany<br>P.O. Box 3536 + 3541      37025 Göttingen<br>Phone ++551 79001-0      Fax ++551 79001-65<br>www.thiesclima.com      info@thiesclima.com |  |                                                                                      |                                                                                       |

- Alterations reserved -