

## Instruction for use

021505/08/06

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# *Brightness Transmitter*

7.1414.6x.000



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# 1 Models

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Order-No.	Meas. Range	Elect. - Output	Numbers of Sectors and Outputs
7.1414.60.000	0...100 000 Lux	0...10 V	8
7.1414.61.000	0...100 000 Lux	0...10 V	3

# 2 Application

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The brightness transmitter serves for the **acquisition of sun position-dependent intensities** of the daylights. The physical measuring values are output as light-proportional voltages, and are used, for ex. for sun position-dependent control of shading devices, heating- and irrigation plants.

- The measuring value “brightness” of the model 7.1414.60.000 is acquired by eight independent sensors (photo diodes) which are arranged in 45°-segments (North, NE, East, SE, South, SW, West, NW).
- The measuring value “brightness” of the model 7.1414.61.000 is acquired by three independent sensors (photo diodes) which are arranged in 90°-segments (East, South, West).

### 3 Mode of Operation

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*Brightness Transmitter 7.1414.60.000 :*

By means of eight sensors (photo diodes), and the connected electronics the incident light is transformed into eight proportional output values, which are linear to the brightness. Each electrical output corresponds to a sector of 45° degrees. The sectors are centrally related to the directions.

1. Sector: North = 337,5° - 22,5°
2. Sector: NE = 22,5° - 67,5°
3. Sector: East = 67,5° - 112,5°
4. Sector: SE = 112,5° - 157,5°
5. Sector: South = 157,5° - 202,5°
6. Sector: SW = 202,5° - 247,5°
7. Sector: West = 247,5° - 292,5°
8. Sector: NW = 292,5° - 337,5°

*Brightness Transmitter 7.1414.61.000 :*

By means of three sensors (photo diodes), and the connected electronics the incident light is transformed into eight proportional output values, which are linear to the brightness. Each electrical output corresponds to a sector of 90° degrees. The sectors are centrally related to the directions

1. Sector: East = 45° - 135°
2. Sector: South = 135° - 225°
3. Sector: West = 225° - 315°

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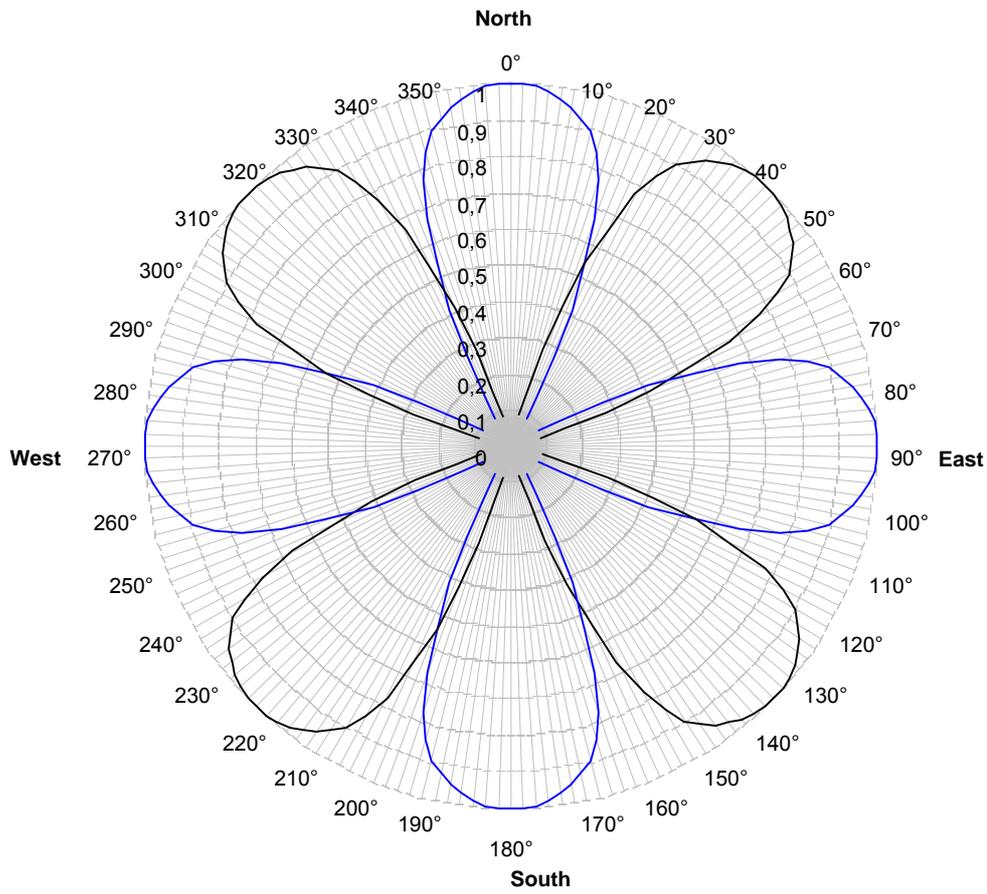
**Remark:**

■ *Due to the special construction the sensors (photo diodes) are aligned to a medium elevation angle (altitude).*

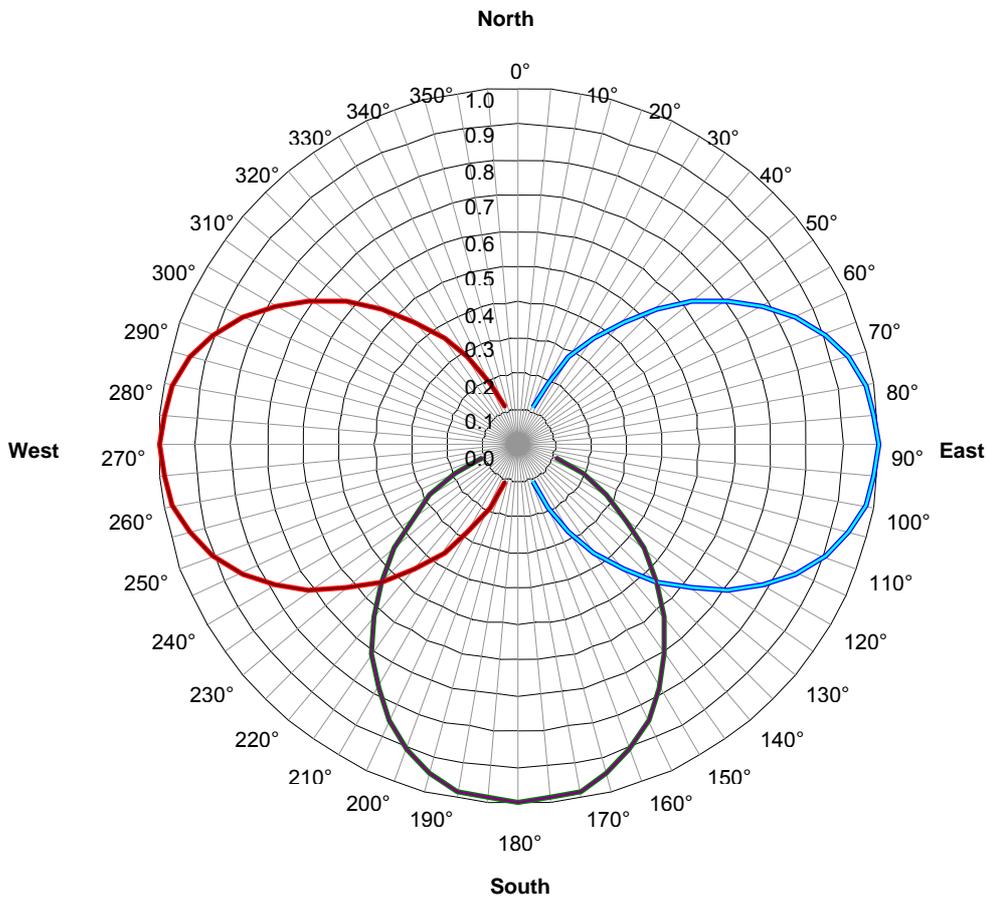
*In order to avoid a possible dewing the brightness transmitters are equipped with a heating device.*

*A parallel connection of the outputs is possible. Thereby, free selectable acquisition ranges can be generated by more than one direction elements (for ex. monitoring ranges from N+NE+E). The highest value is delivered at the shared output.*

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**Figure 1:** Horizontal (Azimuth) direction-dependency of the brightness with model 7.1414.60.000



**Figure 2:** Horizontal (Azimuth) direction-dependency of the brightness with model 7.1414.61.000

## 4 Installation

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### **Remark:**

When mounting the instrument, please take into consideration that the sensor evaluates also reflected light, and accumulates it to the direct incident sun light. At locations with reflecting surfaces the measuring values are considerably higher than they would be in the free field, or in front of a hardly reflecting surface.

The instrument must not be installed in the shades of buildings, parts of buildings, masts, antennas, trees, bushes etc., as otherwise the proper ambient brightness or the direct sun radiation is not acquired correctly.

### **Attention:**

*The electrical connection must be carried out only by a qualified expert.*

*The instrument must be opened only in dry conditions.*

*The uncovered electronics must not be damaged.*

### 4.1 Mechanical Mounting

The brightness transmitter is designed to be mounted to a horizontal surface out-of-doors. It is recommended to carefully choose a location which is free of shades and reflections.

For installation please unscrew and remove the housing cover. Through the now accessible mounting boreholes the instrument is fastened by the respective screws.

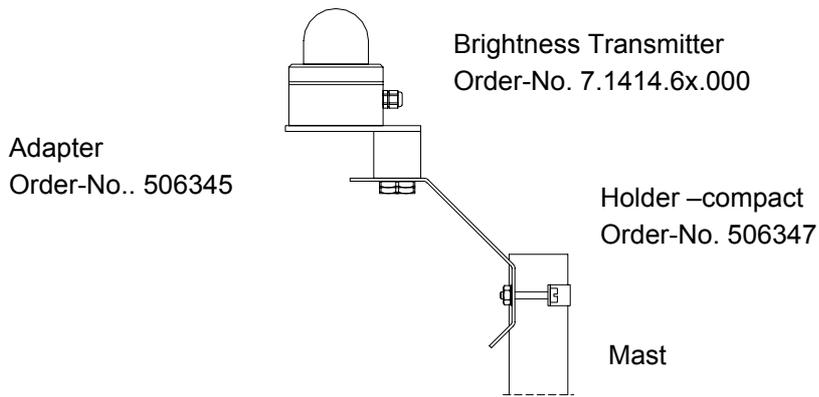
For the optimum acquisition of the sun position the brightness transmitter is aligned by means of a compass, so that the side of the housing with the north marking indicates to the (geographical) Northern direction.



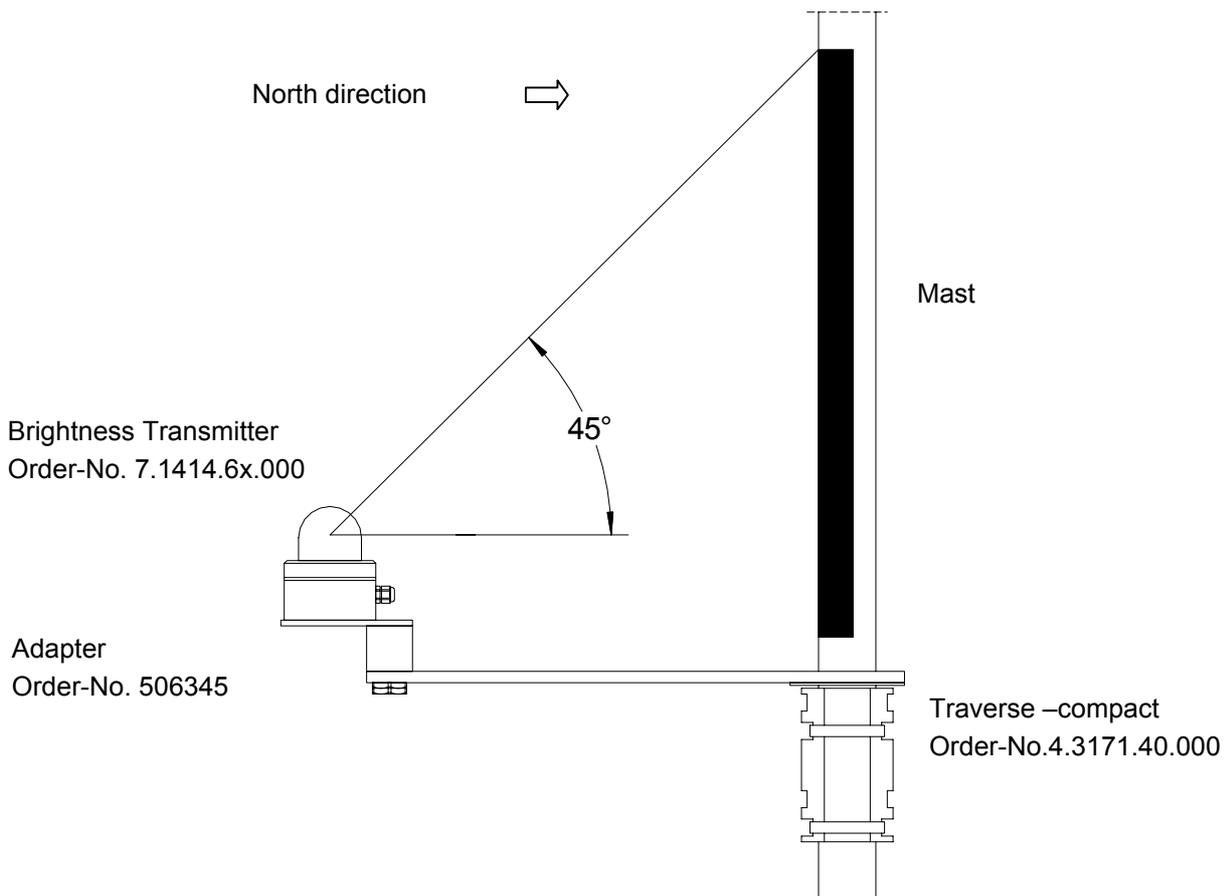
Figure 3: North marking

#### 4.1.1 Examples for Mounting Alternatives

- Mounting of the brightness transmitter at a mast top through holder, and adaptor.



- Mounting of the brightness transmitter below a mast top through traverse and adaptor.  
In order to minimize reflections it is recommended to blacken the mast, above the traverse, acc. to the length of the traverse.



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*Remark:  
Mast, holder, traverse, and adaptor are not included in delivery*

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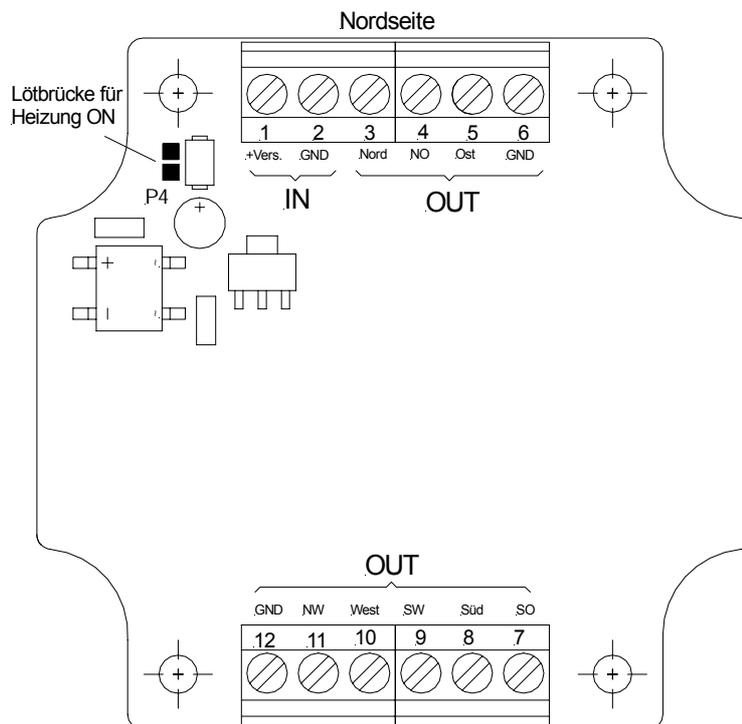
## 4.2 Electrical Mounting

Use a shielded LiYCY 12 x 0,25 mm<sup>2</sup> (6 x 0,25 mm<sup>2</sup>) cable to connect the instrument electrically. Lead the cable through the screwed cable gland and place it on the terminal strip as shown in the connecting diagram. Ground the shielding.

After wiring of the instrument the nut of the cable gland, and screws of the housing cover are to be screwed tightly together with the base part of the housing.

## 4.3 Setting of the Heating Device

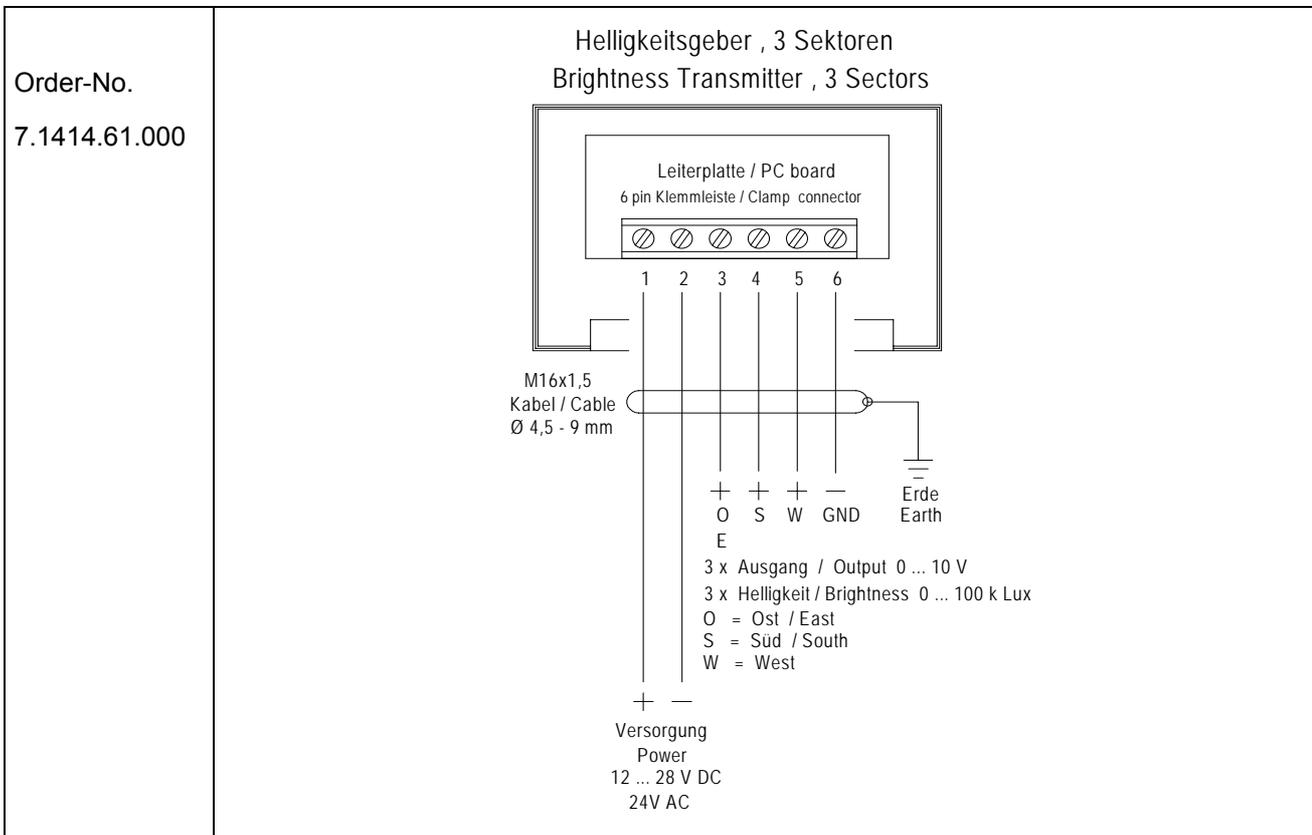
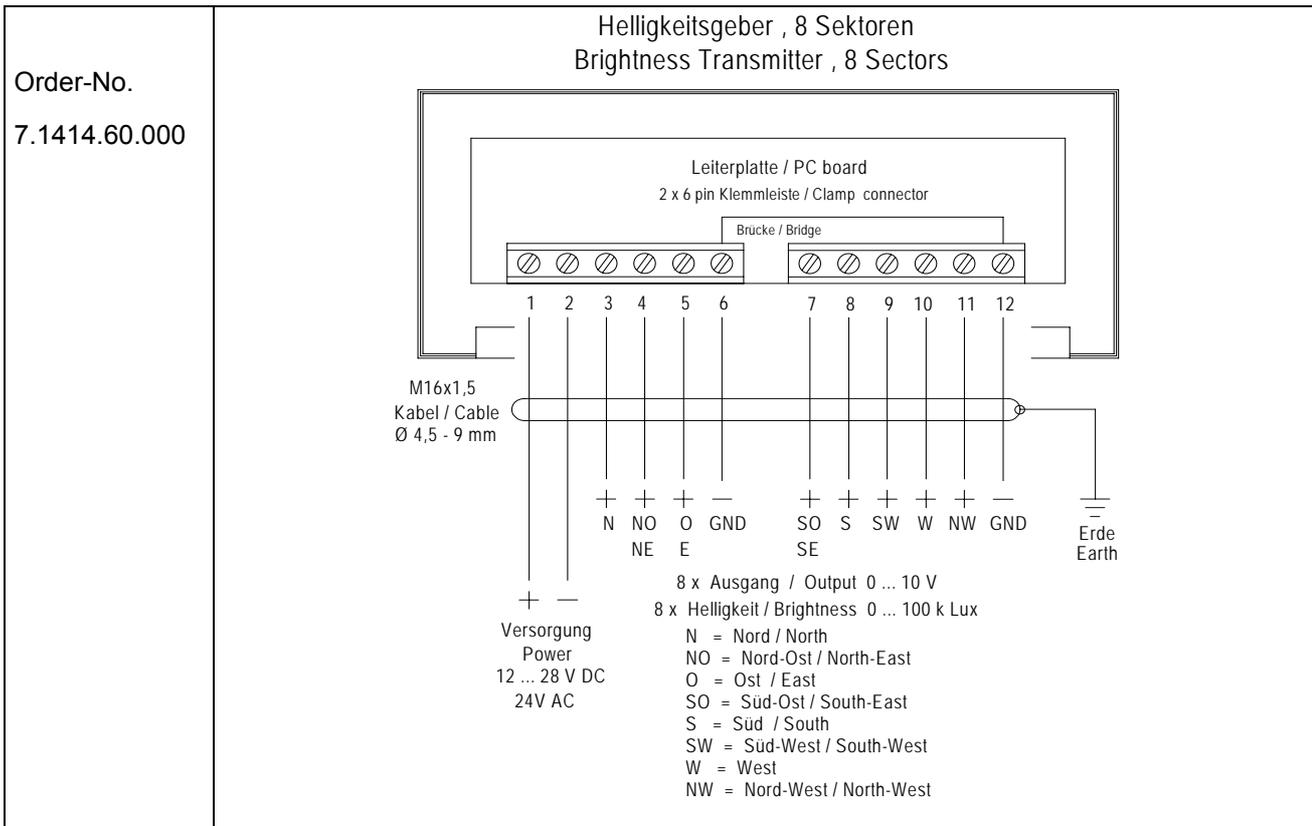
On status of delivery the heating is activated. In case a deactivation should be carried out please unscrew and remove the housing cover. Open the bridge P4 on the pc-board which is now visible.



## 5 Maintenance

Clean the light dome at regular intervals – depending on the extent of soiling – with a soft cloth and pure water (no additives).

## 6 Connecting Diagrams



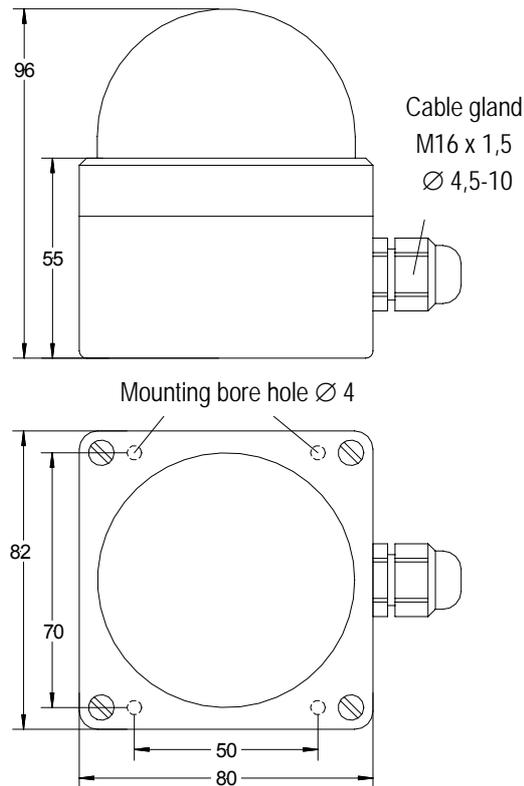
## 7 Technical Data

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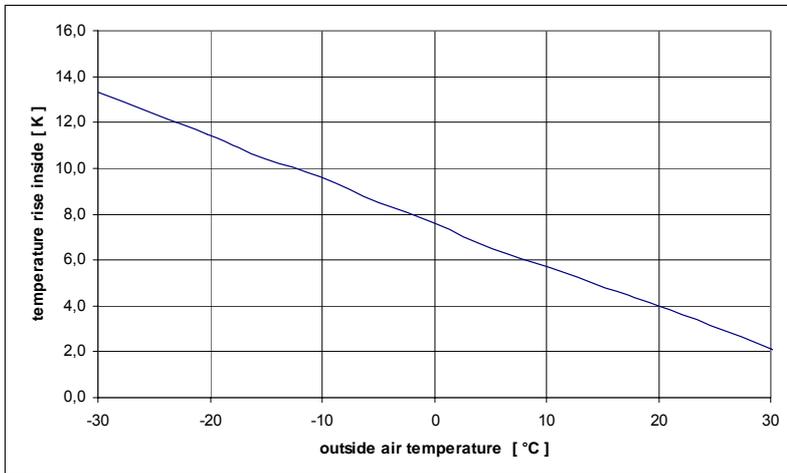
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Measuring range	0 ... 100 kLux
Sensor	SFH 206 K
Spectral range	400... 1100 nm
Accuracy	± 2% of the final value of measuring range
Acquisition angel with 7.1414.60.000	
Elevation	0... 90°
Azimuth	8 x ± 22,5°
Acquisition angel with 7.1414.61.000	
Elevation	0... 90°
Azimuth	3 x ± 45°
Electrical output	0...10 V per Sector; the outputs are shortcut-safe; the outputs can be connected in parallel ; voltage-limited to ≤ 10,5V
Operating voltage	12...28 VDC / 24VAC
Load resistance	≥ 1000 Ω
Operating current	ca. 10 mA w/o heating / max. 200 mA with heating w/o signal currents
Ambient temperature	- 30...+ 70° C
Protection	IP 65
Weight	150g
Connection	through screwed cable gland

## 8 Dimensional Drawing



## 9 Diagram – Heating



Inside - outside – difference temperature by using the heating.

- When the outside temperature is falling the heating capacity raises.
- At a power supply of 24 V the heating current is flowing as follows  
+30°C approx. 20 mA  
-30 °C approx. 140mA
- The raised inside temperature prevents the light dome from being moistened by dew.



- Alterations reserved -