



# INDIUM SENSOR

Elektronische Geräte für Industrie und Umwelt

## *Type X.5 Series*



This type is meeting higher demands in accuracy. It's equipped with a light entrance window made of flat glass (or a PMMA dome if preferred). The material is UV-penetrable and long term resistant against radiation and environmental influences, and is therefore being used eg. in submarines and aircraft cockpits as well.

Other materials (glass, quartz) can be used if required.

Flat polished glass offers the best receiving characteristics, it is tested with greatest care.

Screwed and silicone-sealed housing parts are protecting the interior.

This series is appropriate for indoor use. If required it may be upgraded for outdoor use as well.

The aluminum housing is anodized for scratch-resistance and long term use.



## UV-C measuring head type 0.5

### UV-C sensitivity

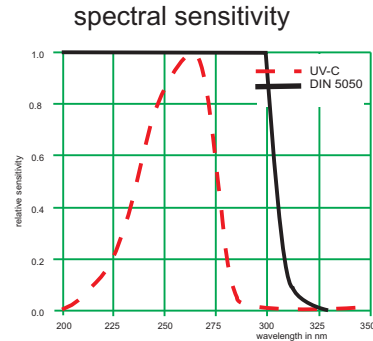
Long UV radiation (above 313 nm) makes people tan and has positive effects on the human immune system. Shorter UV-radiation in contrast may cause irreversible damage and is listed in a recommendation by CIE (Commission Internationale de l'Eclairage) which summarizes all action spectra that may cause damage to the human skin.

This recommendation is standardized in German DIN 5050.

A popular example is the UVI sunburn index.

### UVC measuring head type 0.5

Relative spectral sensitivity of this measuring head has been developed to determine UVC-radiation (mercury line, 256nm). The sensor is measuring the parts of this range which cause damage to human skin, Measuring results are allowing immediate conclusions about medically and biologically relevant connections within this band of radiation. The measuring head is used in medicine, biological research, weather information and forecast systems, in climate research and for public information in general. The measuring head type 0.1 has a weatherproof aluminum housing. The housing is made of weatherproof anodized aluminum. The values are cosine corrected.

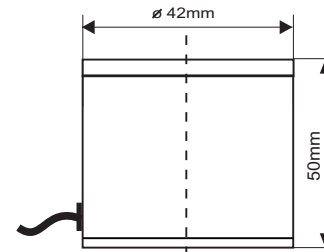


### Technical specifications

measuring range UV-C	0 - 1990 mW/m <sup>2</sup>
spectral sensitivity	220 nm - 280 nm
max. spectral sensitivity	265 nm
working temperature	0 °C - +60 °C
signal output	0 V - 2 V on request
power supply	+5 V / <750 µA
turn on time	< 1 s
turn off time	< 12 s
installation	2 screws M4 in the bottom sideward
connector	PTFE
diffusor	flat glass or PMMA
window	error f2 < 6 %
cosine correction	< 1 %
linearity	< 10 %
abs. error	< 10 mV
dark voltage (E=0)	ca. 170 g   6 oz
weight	

Specifications are subject to change without prior notice.

### Dimensions:



Indium Sensor  
Virchowstr. 7  
D - 15366 Neuenhagen

Tel: +49(0)3342 80239  
Fax: +49(0)3342 80239



## UVB measuring head type 1.5

### UVB sensitivity

Long UV radiation (above 313 nm) makes people tan and has positive effects on the human immune system. Shorter UV-radiation in contrast may cause irreversible damage and is listed in a recommendation by CIE (Commission Internationale de l'Eclairage) which summarizes all action spectra that may cause damage to the human skin.

This recommendation is standardized in German DIN 5050.

A popular example is the UVI sunburn index.

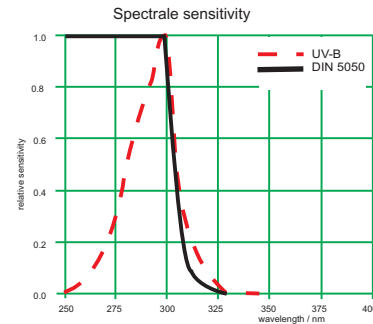
### UVB measuring head type 1.5

The relative spectral sensitivity of the detector is equal to the erythema action spectrum (DIN5050).

The UVE sensor is exactly measuring the elements of this spectral range which cause damage to human cells. The determined value is allowing conclusions about biological and medical interrelations.

The measuring head is used in medicine, biological research, weather information and forecast systems, in climate research and for public information, especially in solariums/tanning beds and for suntanning.

The device has a housing made of aluminum and is developed to be used with our handheld device type 6.4.

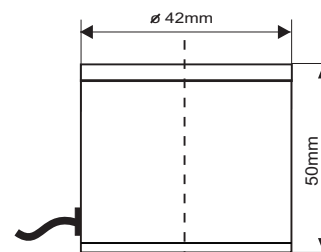


### Technical specifications

Measuring range UVB	0 - 50 $\mu\text{W}/\text{m}^2$
spectr. sensitivity UVB	265 nm - 315 nm
max.spectral sensitivity UVB	297 nm
working temperature	-20°C - +60°C
signal output	0V-5V or similar
power supply	+9V - 18V / <750 $\mu\text{A}$
turn on time	< 1 s
turn off time	< 12 s
installation	2 screws M4 in the bottom
connector	sideward
diffusor	PTFE
dome	PMMA/flatglass or quartz
cosine correction	error f2 < 6 %
linearity	< 1%
abs. error	< 10% ( < 0,2%/K)
dark voltage (E=0)	< 10mV
weight	ca. 170 g   6 oz

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D - 15366 Neuenhagen

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## UVA/UVB measuring head type 2.5

### UVB sensitivity

Long UV radiation (above 313 nm) makes people tan and has positive effects on the human immune system. Shorter UV-radiation in contrast may cause irreversible damage and is listed in a recommendation by CIE (Commission Internationale de l'Eclairage) which summarizes all action spectra that may cause damage to the human skin.

This recommendation is standardized in German DIN 5050.

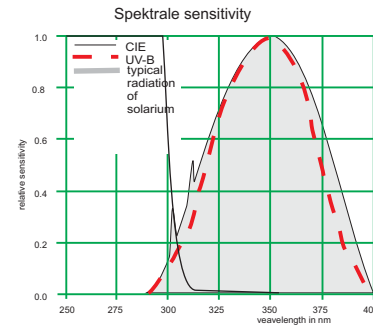
A popular example is the UVI sunburn index.

### UVB measuring head type 2.5

The measuring head independently determines UV-A-radiation (global, from 315nm - 400nm).

Measuring results are allowing immediate conclusions about medically and biologically relevant connections within this band of radiation. The measuring head is used in medicine, biological research, weather information and forecast systems, in climate research and for public information in general.

The device has a housing made of aluminum and is developed to be used with our handheld device type 6.4.

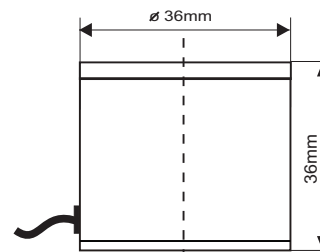


### Technical specifications

Measuring range UVA	0 - 50 W/m <sup>2</sup>
spectr. sensitivity UVA	310 nm - 400 nm
max.spectral sensitivity UVA	335 nm
working temperature	-20°C - +60°C
signaloutput	04 mA .. 20 mA
power supply	+6V -24 V/ <750µA
turn on time	< 1 s
turn off time	< 12 s
installation	2 screws M4 in the bottom
connector	sideward
diffusor	PTFE
dome	PMMA
cosine correcture	error f2 < 6 %
linearity	< 1%
abs. error	< 10% ( < 0,2%/K)
voltage (E=0)	< 10mV
weight	ca. 170 g   6 oz

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D - 15366 Neuenhagen

Tel: (03342) 80239  
Fax: (03342) 80239



# INDIUM SENSOR

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## Global radiation measurement head type 3.5

### Global radiation

All diffuse and direct solar radiation reaching the surface of the earth is called global radiation.

It ranges from short (300nm (UV-B) ) to long (5000 nm (IR)) wavelength.

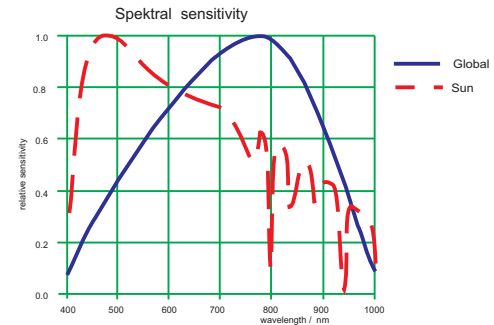
### Global measuring head type 3.5

The sensor detects almost 90% of sunlight in the range of wavelength between 400 nm and 1100 nm and is covering the range of the uv-, vis- and some of the ir-light.

The measuring results are allowing conclusions about medical and biological connections by comparing to other spectral ranges.

The measuring head can be used in medical and biological research, in weather information and forecast systems, in climate research, in agriculture and for public information in general.

The measuring head type 3.5 has a weatherproof aluminum housing. The results are cosine corrected. The dome is made of plastic or flat glass. This device can be equipped with 4 different output signal variations.



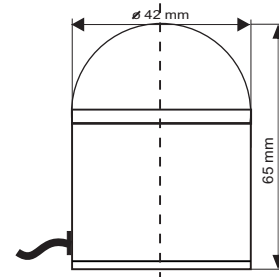
### Technical specifications

Measuring range global	0 - at 1600 W/m <sup>2</sup>
spectr. sensitivity	400 nm - 1100 nm
max. spectr.sensitivity	780 nm
working temperature	-20°C - +60°C
power supply	0V - 5V or +10V - +24V

installation	2 screws M4 in the bottom
connector cable	sideward
diffusor	PTFE
dom	PMMA/ flat glass
cosine correction	error f2 < 6%
linearity	< 1%
abs. error	< 10 %
voltage (E=0)	< 20 mV
weight	ca. 170 g   6 oz

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15366 Neuenhagen  
Germany  
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# INDIUM SENSOR

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## Visual radiation sensor type 4.5

### V-lambda-radiation

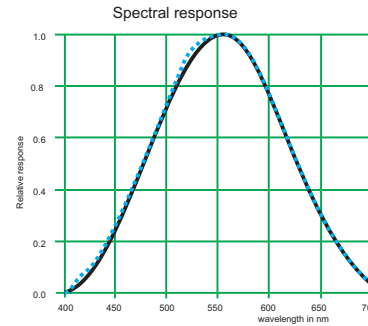
The spectral range of light visible to the human eye is called V-Lambda-Radiation.

The measured value is a depiction of the subjectively perceived brightness. Spectral range extends from the end of UV-light at 400nm to the start of IR-light at 720nm with a maximum at 555nm. The measured value of illuminance in  $W/m^2$  can easily be converted into Lux.

Measuring results are important for any projects involving the human perception of light and the illumination of workplaces.

### V-lambda radiation sensor type 4.5

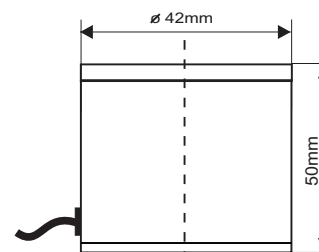
The measuring head may be used in medical and biological research, weather information and forecast systems, climate research, agriculture and engineering. The measuring head type 4.5 has a weatherproof aluminum housing. The dome is made of plastic or flat glass. The values are cosine corrected.



Measuring range V-lambda	0 - ca. 20 klux or o.
spektr. sensitivity	360 nm - 760 nm
max. spectral sensitivity	550 nm
working temperature	-20°C - +60°C
signal output	0 V .. 5 V or similar
power supply	+6V - +24V / <500µA
turn on time	< 1 s
turn off time	< 12 s
installation	2 screws M4 in the ground of body
connector	sideward
diffusor	PTFE
dome	PMMA/flat glass
cosine correction	error f2 < 6%
linearity	< 1 %
abs. error	< 10 %
voltage (E=0)	< 10 mV
weight	ca. 170 g   6 oz

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# INDIUM SENSOR

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## Photosynthetically active radiation sensor type 5.5

### Photosynthesis activity

The ability to absorb light radiation is required for herbal life, chlorophyll has a special significance in that process.

If the intensity of light is too low, the plant will not get enough energy to grow, if the intensity is too high the plant will emit energy as fluorescence. This is an indication for the growth conditions of a plant.

If the light is too strong the plant will get dry and burned.

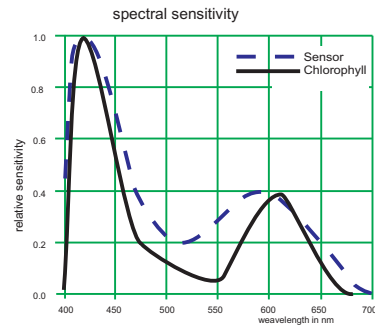
### Photosynthesis (PAR) sensor type 5.5

Sensitivity corresponds to the absorption spectrum of chlorophyll. Measuring results are allowing immediate conclusions about the conditions for plant growth.

The PAR measuring head may be used for optimizing photochemical processes of open-land and greenhouse agriculture.

The sensor is used in agricultural research, gardening, agriculture as well as in education.

The housing is made of weatherproof anodized aluminum. Results are cosine corrected. The dome is made of plastic (PMMA) or flat glass.

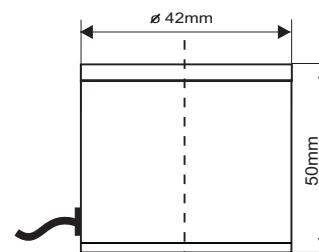


### Technical specification

measuring range	0 - ca. 250 W/m <sup>2</sup>
spectr. sensitivity	380 nm - 700 nm
max. spectr. sensitivity	420 nm und 600 nm
working temperature	-20°C - +60°C
signal output	0V - 2V or similar
power supply	+9V - +24V / < 750µA
turn on time	< 1 s
turn off time	< 12 s
installation	2 screws M4 in the bottom
connector	sideward
diffusor	PTFE
dome	PMMA/flat glass
cosine correction	error f2 < 6%
linearity	< 1 %
abs. error	< 10 %
voltage (E=0)	< 10 mV
weight	ca. 170 g   6 oz

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# INDIUM SENSOR

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## Quantum radiation sensor type 6.5

### Quantum Radiation

The ability to absorb light radiation is required for herbal life, chlorophyll has a special significance in that process.

If the intensity of light is too low, the plant will not get enough energy to grow, if the intensity is too high the plant will emit energy as fluorescence. This is an indication for the growth conditions of a plant.

If the light is too strong the plant will get dry and burned.

### Quantum sensor type 6.5

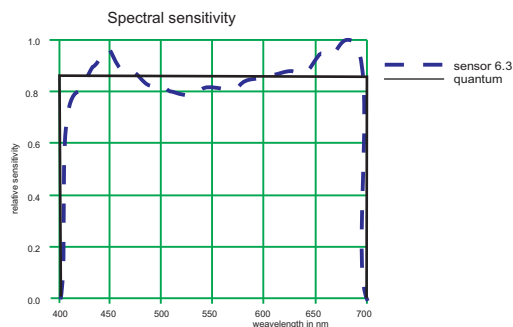
Sensitivity corresponds to the absorption spectrum of chlorophyll. Measuring results are allowing immediate conclusions about the conditions for plant growth.

The quantum measuring head may be used for optimizing photochemical processes of open-land and greenhouse agriculture.

The sensor is used in agricultural research, gardening, agriculture as well as in education.

The housing is made of weatherproof anodized aluminum. Results are cosine corrected. The dome is made of plastic (PMMA) or flat glass.

Daylight	type 6.5 new	type 6.5	type 5.5	glob. rad.
Daylight	4,04 W/m <sup>2</sup>	3,38 W/m <sup>2</sup>	0,858 W/ m <sup>2</sup>	8 W/m <sup>2</sup>
Daylight	18,62 μmol/sm <sup>2</sup>	15,55 μmol/sm <sup>2</sup>	3,95 μmol/sm <sup>2</sup>	

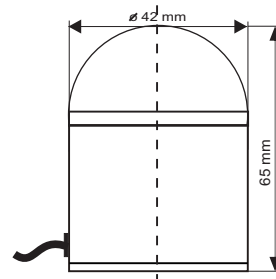


### Technical specification

Measuring range	0 - ca. 650 W/m <sup>2</sup>
spectr. sensitivity	380 nm - 700 nm
max. spectr. sensitivity	420 nm and 600 nm
working temperature	-20°C - +60°C
signal output	0V - 5V or other
power supply	+10V - +24V / < 750 μA
turn on time	< 1 s
turn off time	< 12 s
installation	2 screws M3 in the bottom sideward
connector	PTFE
diffusor	PMMA or flat glass
dome	error f2 < +/-6%
cosine correction	< +/-1 %
linearity	< +/-10 %
abs.error	< 10 mV
voltage (E=0)	ca. 170 g   6 oz
weight	

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Dimensions:



Indium Sensor  
Virchowstr. 7  
15366 Neuenhagen  
Germany  
Tel: +49(0)3342 80238  
Fax: +49(0)3342207886





# INDIUM SENSOR

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## Global radiation measuring head type 7.5

### Global radiation

The complete direct and diffuse sun radiation hitting the ground is called global radiation. The spectral range extends from the short-wave range at 300 nm (UV-B) to the long-wave range at 5000 nm (IR). The radiation energy above 1000nm however is less than 10% only.

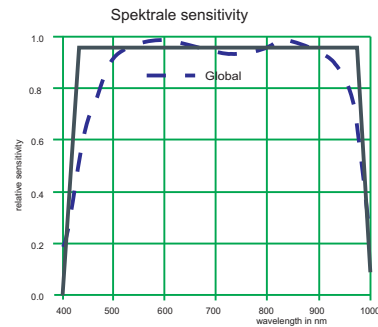
### Global measuring-head type 7.5

The sensor is able to detect almost 90% of the sunlight in the range between 400 nm and 1100 nm and includes UV, VIS and some of IR.

Measuring results are allowing immediate conclusions about medically and biologically relevant connections by comparing them to other spectral ranges.

The measuring head may be used in medicine, biological research, weather information and forecast systems, in climate research and for public information in general.

The measuring head of type 7.5 has a weather resistant case, made of aluminium. The measuring results are cosine corrected. The dome is made of plastic (PMMA) or flat glass.

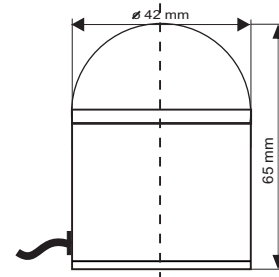


### Technical specifications

Measuring range global	0 - at 1300 W/m <sup>2</sup>
spectr. sensitivity	400 nm - 1100 nm
max. spectr.sensitivity	780 nm
working temperature	-20°C - +60°C
power supply	0V - 5V a.o. +10V - +24V
installation	2 screws M4 in the bottom
connector cable	sideward
diffusor	PTFE
dome	PMMA/ flat glass
cosine correction	error f2 < 6%
linearity	< 1%
abs. error	< 10 %
voltage (E=0)	< 20 mV
weight	ca. 170 g   6 oz

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D - 15366 Neuenhagen

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## Infrared measuring head type 8.5

### Infrared radiation

The direct and diffuse solar radiation in the range from 700 nm up to 5000 reaching the ground is called infrared radiation.

### Infrared measuring head type 8.5

The sensor detects almost 30 % of the sunlight in the range of 800 nm to 1100 nm including the most relevant part of IR.

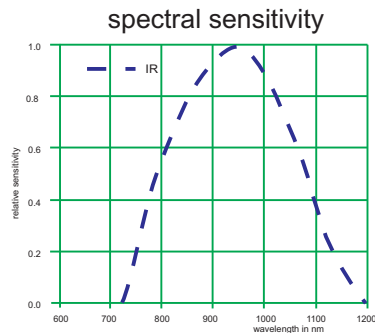
Measuring results are allowing immediate conclusions about medically and biologically relevant connections by comparing them to other spectral ranges.

The measuring head may be used in medicine, biological research, weather information and forecast systems, in climate research and for public information in general.

The measuring head may be used in medicine, biological research, weather information and forecast systems, in climate research and for public information in general.

The aluminum housing is weatherproof, the dome is made of plastic or flat glass.

The measuring results are cosine corrected.

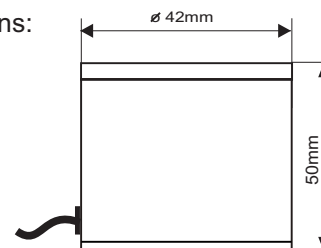


### Technical specifications

measuring range global	0 - approx. 400 W/m <sup>2</sup>
spectral sensitivity	800 nm - 1100 nm
max. spectral sensitivity	950 nm
working temperature	-20 °C - +60 °C
signal output	0 V - 2 V or other
power supply	+5 V - +18 V
installation	2 screws M4 in the bottom of the case sideward
connector	PTFE
diffusor	PMMA/flat glass
dome	error f2 < 6 %
cosine correction	< 1 %
linearity	< 10 %
abs. error	< 10 mV
dark voltage (E=0)	ca. 170 g   6 oz
weigh	

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