

# Пиранометры DELTA OHM LPPYRA10

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# Spectrally Flat Class A Pyranometer

## LPPYRA10

### ○ ACCORDING TO THE STANDARD

Follows recommendations of the WMO  
fully compliant with ISO 9060:2018

### ○ GREAT FLEXIBILITY

Wide availability of standard output signals  
for **easy integration** in any installation

### ○ EASY TO SET UP AND QUICK TO INSTALL

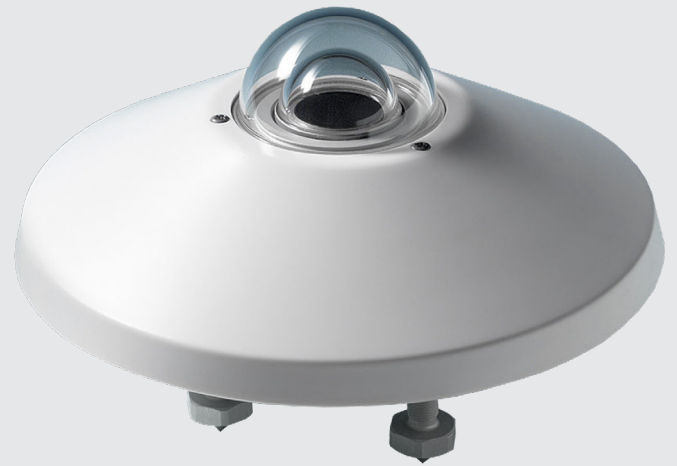
**Rugged housing** with low temperature response  
Integrated **levelling device** for perfect positioning

### ○ ACCURATE AND RELIABLE SYSTEM

High reliability - 6 year warranty  
**Individual Calibration Reports** for each instrument

### ○ HIGH IMMUNITY AGAINST INTERFERENCE

**Protected** against overpower and **fully electrically isolated** from any mounting surface



### Main Applications

Environmental studies  
Research  
Meteorology  
PV monitoring

## Research grade high performance pyranometer

The **LPPYRA10** series has been designed especially for those applications where the best performance is a must. This research grade pyranometer is fully compliant to the highest possible classifications according to ISO 9060:2018.

The pyranometers in this series are all based on the thermopile principle, **very precise**. This principle provides a  $\mu\text{V}$  signal without the need of an external power supply. To be able to transfer the signal over a longer distance and to prevent interference, mostly types are equipped with an integrated transmitter. When using a 4-20 mA, 0-10 VDC or RS485 Modbus-RTU output, an external active power supply is necessary. The output of these series is always related to  $\text{W}/\text{m}^2$ , making it possible to have a relation to the total solar panel surface.

All our pyranometers are made in a way that the electrical system is totally isolated from the housing, making it possible to mount the pyranometer on any surface, including metal ones, without the need of isolation.

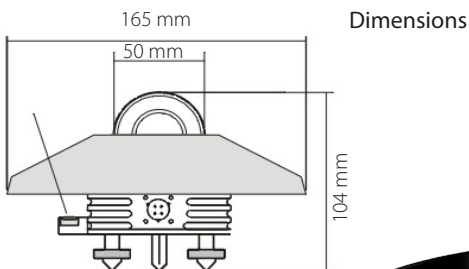
Delta OHM is one of the main pyranometer producers worldwide. We produce a full range of pyranometers according to the **ISO 9060: 2018 - Spectrally Flat Class A, B and C**.

Each of our pyranometers is **calibrated separately** during production; all are supplied standard with a Report of Calibration in accordance with the ISO 9847:1992. Next to this, we are the only pyranometer producer that has invested in a full range of 6 accredited ISO 17025 calibration laboratories.

Pyranometers can be used **as stand-alone or in combination with our weather stations**. Delta OHM provides a full range of data loggers with integrated GSM/3G/4G modem to read and transfer measured data to any database or Cloud solution.

## Technical Specifications

Sensor	Thermopile
Typical Sensitivity	6 ÷ 11 $\mu\text{V}/\text{Wm}^{-2}$
Impedance	5 $\Omega$ ÷ 50 $\Omega$
Measuring range	0 ÷ 2000 / 4000 $\text{W}/\text{m}^2$
Viewing angle	2 $\pi$ sr
Spectral range (50%)	283 ÷ 2800 nm
Operating temperature/ humidity	-40 ÷ 80 °C 0 ÷ 100 % RH
Output	Depending on the model: - Analog in $\mu\text{V}/\text{Wm}^{-2}$ - Analog 4 ÷ 20 mA - Analog 0 ÷ 1 V, 0 ÷ 5 V or 0 ÷ 10 V - Double output: Analog 4 ÷ 20 mA + digital RS485 Modbus-RTU - Digital RS485 Modbus-RTU - Digital SDI-12
Power supply	10 ÷ 30 Vdc (4 ÷ 20 mA - 0 ÷ 1 V - 0 ÷ 5 V outputs) 15 ÷ 30 Vdc (0 ÷ 10 V output) 5 ÷ 30 Vdc (RS485 Modbus-RTU) 7 ÷ 30 Vdc (SDI-12)
Consumption	< 200 $\mu\text{A}$ for SDI-12 version
Connection	- 4-pole M12 connector for analog output models - 8-pole M12 connector for digital and double output models
Accuracy of levelling device	< 0.1°
Protection Degree	IP 67
MTBF	> 10 years



Dimensions

LPPYRA10 is also available in the **version with shadow-ring**. This measures the diffuse solar radiation eliminating the contribution of direct irradiance. Find our specific documentation as LPPYRA13.



## ISO 9060:2018 Technical Specifications

Classification	Spectrally Flat Class A	
Response time (95%)	< 5 s	
Zero offset	a) response to a 200 $\text{W}/\text{m}^2$ thermal radiation	< $ \pm 7  \text{ W}/\text{m}^2$
	b) response to a 5 K/h change in ambiente temperature	< $ \pm 2  \text{ W}/\text{m}^2$
	c) total zero off-set including the effects a), b) and other sources	< $ \pm 10  \text{ W}/\text{m}^2$
Long-term instability (1 year)	< $ \pm 0.5  \%$	
Non-linearity	< $ \pm 0.2  \%$	
Response according to the cosine law	< $ \pm 10  \text{ W}/\text{m}^2$	
Spectral error	< $ \pm 0.2  \%$	
Temperature response (-10...+40 °C)	< 1 %	
Tilt response	< $ \pm 0.2  \%$	

## Ordering Codes

LPPYRA10

Blank = 0...2000  $\text{W}/\text{m}^2$   
4 = 0...4000  $\text{W}/\text{m}^2$   
Only for AC - AV - ACS models

Blank = Analog in  $\mu\text{V}/\text{Wm}^{-2}$   
AC = Analog 4 ÷ 20 mA  
AV = Analog 0 ÷ 1 V, 0 ÷ 5 V or 0 ÷ 10 (to be defined when ordering)  
ACS = Analog 4 ÷ 20 mA + digital Modbus-RTU  
S = Digital RS485 Modbus-RTU  
S12 = Digital SDI-12

All pyranometers are supplied with shade disk, cartridge for silica-gel crystals, 2 spare sachets, levelling device, Calibration Report.

### Accessories

LPS1	Fixing bracket for mast $\varnothing 40 \div 50$ mm.
LPRING02	Base with levelling device and adjustable holder.
LPRING04	Adjustable holder for mounting the pyranometer a $\varnothing 40$ mm mast in an inclined position.
HD2003.79K	Kit to install the pyranometer on a transverse mast.
HD2003.85K	Kit with adjustable height to mount on a $\varnothing 40$ mm mast.
LPS6	Installation kit including: 750 mm mast, base fitting, graduated support plate, bracket for pyranometers.
CPM12AA4.xx	Cable for LPPYRA10 / 10AC / 10AV models. M12 connector on one end, open wires on the other end (2, 5 or 10 m).
CPM12-8D.xx	Cable for LPPYRA10S / 10S12. M12 connector on one end, open wires on the other end (2, 5 or 10 m).
CPM12-8DA.xx	Cable for LPPYRA10ACS. M12 connector on one end, open wires on the other end (2, 5 or 10 m).
CP24	PC connecting cable for the RS485 MODBUS parameters configuration (only for models with RS485 output).

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