PYRAsense

A new family of pyranometers with diagnostic features and tilt sensor

SMART TECHNOLOGY

Internal diagnostic sensors to keep operating conditions always under control.

Operating days counter for scheduling maintenance activities.

LOW MAINYTENANCE

Thanks to diagnostics, you always know when you need to take actions.

Average life span greater than 10 years.

ACCORDING TO THE STANDARD

Spectrally Flat Class A/B/C according to ISO 9060.

WMO recommendations & IEC 61724-1 requirements fully compliant.

EASY TO SET UP AND QUICK TO INSTALL

Integrated bubble level and optional tilt sensor to ensure accurate installation in any position.

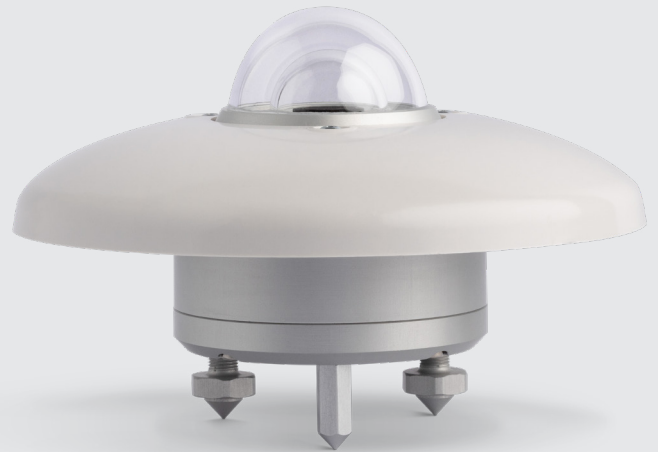Configuration and real time data monitoring via software.

GREAT FLEXIBILITY

RS485 Modbus-RTU output galvanically isolated + optional analog output, user configurable

ACCURATE AND RELIABLE

Supplied factory calibrated with individual Calibration Report.

ISO 17025 Calibration Certificate available upon request.

INTRODUCTION

PYRAsense is our new family of pyranometers that brings **solar global radiation measurement** to a higher level!
Depending on the model and according to ISO 9060:2018 and WMO (World Meteorological Organization) recommendations, they are classified as:

- **"Spectrally Flat" Class A** (High quality)
- **"Spectrally Flat" Class B** (Good quality)
- **"Spectrally Flat" Class C** (Moderate quality)

The pyranometers are based on an accurate thermopile sensor and have been designed to meet multiple needs: from the best economical solution for measuring solar efficiency (Class C) to the solution for those applications where the best possible performance is a must (Class A).

FEATURES

Internal diagnostic sensors

To measure temperature, relative humidity, and pressure. You can keep an eye on the operating condition of your pyranometer and predict any maintenance work in advance, thus always ensuring reliable measurements.

Integrated bubble level

To ease horizontal positioning during installation.
Moreover, the pyranometer can be equipped with an optional tilt sensor which allows continuous monitoring of the correct installation.

Protection screen

To resist UV solar radiation.

CONFIGURATION & MEASUREMENT

The sensors

Using the PC application software DATAsense, it is possible to configure the sensor (e.g., Modbus parameters, measuring range for the analog output, etc.), monitor the measurements in real time and save the values detected during the connection in a file. RS485 Modbus-RTU isolated output + optional additional analog output Configurable 0...10 V, 0...5 V, 0...1 V, 4...20 mA or 0...20 mA.

The irradiance range

It is configurable for the analog output.

Calibration report

The pyranometers are supplied factory calibrated according to ISO 9847:2023 (Type A1) standard and with an individual Calibration Report
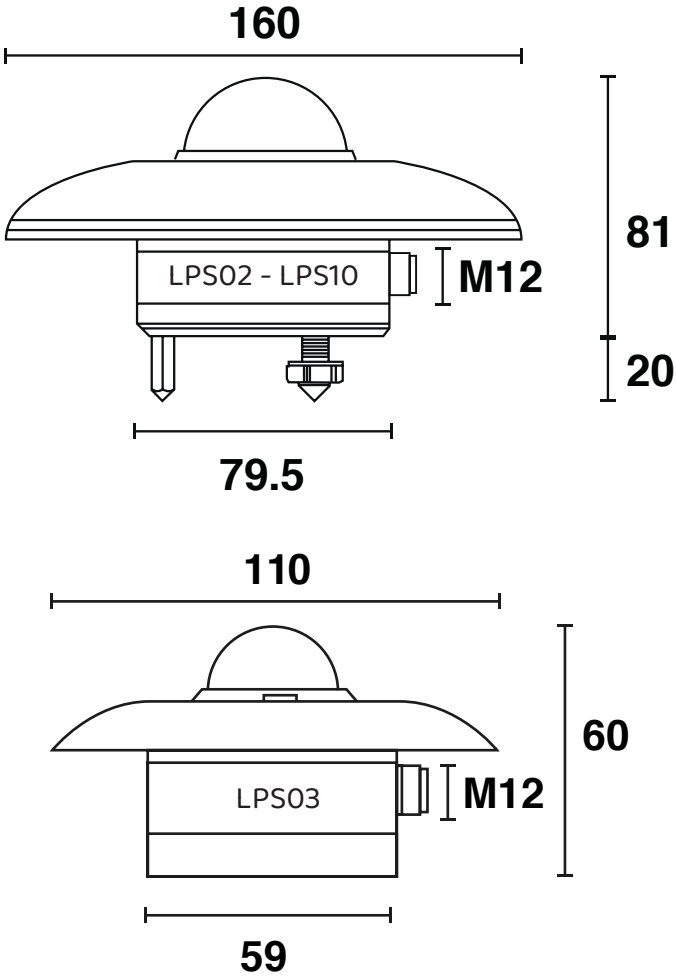
TECHNICAL SPECIFICATION

	Digital models	Analog models
Sensor	Thermopile	
Measuring range	-200...4000 W/m² The irradiance range for the analog output is user configurable (default 0...2000 W/m²)	
Resolution	0.1 W/m²	
Viewing angle	2π sr	
Spectral range (50%)	283 ÷ 2800 nm - 300 ÷ 2800 nm (LPS03)	
Output	RS485 Modbus-RTU (isolated) Optional additional analog output configurable 4...20 mA (default), 0...20 mA, 0...1 V, 0...5 V or 0...10 V	• mV • 2-wire (current loop) 4...20 mA
Power supply	7...30 Vdc for RS485 output 10...30 Vdc for analog output (except 0...10 V) 15...30 Vdc for 0...10 V output	• mV= no power required • Current loop = 10...30 Vdc
Consumption	15 mA @ 24 Vdc	• mV = no power required • Current loop = equal to output signal (4...20 mA)
Connection	5-pole M12 (version with only RS485 Modbus-RTU output) 8-pole M12 (version with additional analog output)	5-pole M12
Weight	620 g approx. - 230 g approx. (LPS03)	
Operating conditions	-40...+80 °C / 0...100 %RH	
Bubble level accuracy	< 0.2°	
Protection Degree	IP67	
MTBF	> 10 years	
Materials	Housing: anodized aluminium / Screen: ASA / Dome: optical glass	

TECHNICAL SPECIFICATION ACCORDING TO ISO 9060:2018

	LPS10	LPS02	LPS03
ISO 9060:2018 classification	Spectrally Flat Class A	Spectrally Flat Class B	Spectrally Flat Class C
Response time (95%)	< 2 s	< 10 s	< 18 s
Zero offset — a) response to a 200 W/m² thermal radiation	< | ± 7 | W/m²	< | ± 10 | W/m²	< | ± 15 | W/m²
Zero offset — b) response to a 5 K/h change in ambient temperature	< |±2| W/m²	< | ±4 | W/m²	< | ±4 | W/m²
Zero offset — c) total zero offset including the effects a), b) and other sources	< |±10| W/m²	< | ±15 | W/m²	< | ±20 | W/m²
Long-term instability (1 year)	< | ± 0.5 | %	< | ± 1 | %	< | ± 1 | %
Non-linearity	< | ± 0.2 | %	< | ± 1 | %	< | ± 1 | %
Directional response (up to 80° with 1000 W/m² beam)	< | ± 10 | W/m²	< | ± 18 | W/m²	< | ± 20 | W/m²
Spectral error	< | ± 0.2 | %	< | ± 0.5 | %	< | ± 1 | %
Temperature response (-10…+40°C)	< | ± 0.5 | %	< | ± 1.5 | %	< | ± 2 | %
Tilt response	< | ± 0.2 | %	< | ± 1 | %	< | ± 1.5 | %

ADDITIONAL MEASUREMENTS IN DIGITAL MODELS

Internal Temperature	range	-40…+80 °C
	resolution	0.1 °C
	accuracy	± 0.5 °C (0…60 °C)
Internal Relative Humidity	range	0…100 %RH
	resolution	0.1%RH
	accuracy	± 3%RH @25 °C (20…80 %RH)
Internal Pressure	range	300…1100 hPa
	resolution	0.1 hPa
	accuracy	± 1 hPa (0…60 °C)
Tilt	range	0°…+180°
	resolution	0.1°
	accuracy	< 0.5°

160

81

LPS02 – LPS10   **M12**

20

79.5

110

60

LPS03   **M12**

59

ORDERING CODES

DIGITAL MODELS   LPS

xx	M	x	x
			Tilt sensor 0 = no T = yes
		Analog output 0 = none A = additional standard analog output	
	RS485 Modbus output M = yes		
Classification according to ISO 9060:2018 03 = Spectrally Flat Class C 02 = Spectrally Flat Class B 10 = Spectrally Flat Class A			

ANALOG MODELS   LPS

xx	0	x	0
			Tilt sensor 0 = no
		Analog output C = 2-wire 4...20 mA output P = mV output	
	RS485 Modbus output 0 = no		
Classification according to ISO 9060:2018 03 = Spectrally Flat Class C 02 = Spectrally Flat Class B 10 = Spectrally Flat Class A			

ACCESSORIES

LPS1	Fixing bracket for Ø 40...50 mm mast. Installation on horizontal or vertical mast
LPS5	Adjustable holder for mounting the pyranometer in an inclined position on Ø 40...50 mm mast.
CPM12-5...	5 or 10 m cable with 5-pole M12 connector on one end, open wires on the other end- For LPSxxM00 and LPSxxM0T.
CPM12-8...	5 or 10 m cable with 8-pole M12 connector on one end, open wires on the other end- For LPSxxMA0 and LPSxxMAT.
CP24B-5	PC connecting cable RS485/USB converter. 5-pole M12 connector on sensor side and A-type USB on PC side. For LPSxxM00 and LPSxxM0T.
CP24B-8	PC connecting cable RS485/USB converter. 8-pole M12 connector on sensor side and A-type USB on PC side. For For LPSxxMA0 and LPSxxMAT.

In order to ensure the quality of our instruments, we are constantly re-evaluating our products. Improvements can imply changes in specification; we advise you to always check our website for the newest version of our documentation.