

LPPIRG01



LPPIRG01 / LPPIRG01S - PYRGEOMETER

The pyrheliometer LPPIRG01 is used to measure the far infrared radiation (FIR). The measures are referred to radiations with wavelength greater than $4.5 \mu\text{m}$.

The far infrared radiation derives from the measure of the thermopile output signal and from the knowledge of the instrument temperature. The temperature measure is performed by a $10\text{k}\Omega$ NTC inserted in the body of the pyrheliometer.

The pyrheliometer can be used also for the study of energy balance. In this case, besides another pyrheliometer which measures infrared radiation upwards, it is necessary an albedometer (LPS11..., LPS06... or LPS05...) to measure short wavelengths radiation ($<3 \mu\text{m}$).

The pyrheliometer is available in the following versions:

- **LPPIRG01:** Passive
- **LPPIRG01S:** With RS485 Modbus-RTU output.

The pyrheliometer is supplied factory calibrated and with a calibration report. The calibration is carried out outdoors, for comparison with a reference standard pyrheliometer calibrated at WRC (World Radiation Center). The two instruments are kept outdoors for at least one night in the presence of clear sky. The data acquired by a data logger are then processed to obtain the calibration factor.

Technical specifications	
Sensor	Thermopile
Typical sensitivity	$5...10 \mu\text{V}/(\text{W}/\text{m}^2)$
Impedance	$33 \Omega...45 \Omega$
Measuring range	$-300...+300 \text{ W}/\text{m}^2$
Viewing angle	160°
Spectral range (50%)	$5.5...45 \mu\text{m}$
Operating temperature	$-40^\circ\text{C}...80^\circ\text{C}$
Output	LPPIRG01 - passive in mV LPPIRG01S - RS485 Modbus-RTU
Power supply	LPPIRG01 - No power required LPPIRG01S - $5...30 \text{ Vdc}$
Consumption	LPPIRG01S - 2 mA @ 24 Vdc
Connection	8-pole M12
Weight	0.9 kg approx
Operating conditions	$-40...+80^\circ\text{C}$ / $0...100\% \text{ RH}$ / Max. altitude 6000 m
Bubble level accuracy	$< 0.1^\circ$
Protection degree	IP 67
Materials	Housing: anodized aluminium Screen: ASA Sensitive area window: silicon
MTBF	> 10 years

Technical specifications according to ISO 9060:2018

Response Time	$< 28 \text{ s}$
Zero offset (type B) a) response to a $5 \text{ K}/\text{h}$ change in ambiente temperature	$< \pm 4 \text{ W}/\text{m}^2$
Long-term instability (1 year)	$< \pm 1.5 \%$
Non-linearity	$< \pm 1 \%$
Spectral selectivity	$< \pm 5 \%$
Temperature response	$< 3 \%$
Tilt response	$< \pm 2 \%$

ORDERING CODES

Pyrheliometers are supplied radiation protection screen, silica-gel cartridge, 2 spare sachets, bubble level, M12 female free connector (only if the optional cable is not ordered) and calibration report. Cables and fixing accessories must be ordered separately.

LPPIRG01: Pyrheliometer, output in $\mu\text{V}/\text{Wm}^{-2}$

LPPIRG01S: Pyrheliometer, output in RS485 Modbus-RTU.

LPS1: Fixing bracket for $\varnothing 30...50 \text{ mm}$ mast. Installation on horizontal or vertical mast.

CPM12AA8PG.x: Cable with 8-pole M12 connector on one end, open wires on the other end. Available lengths: 5, 10 m. **For LPPIRG01.**

CPM12-8D.x: Cable with 8-pole M12 connector on one end, open wires on the other end. Available lengths: 5, 10 m. **For LPPIRG01S.**

CP24: PC connecting cable for the RS485 MODBUS parameters configuration of the LPPIRG01S pyrheliometer. With built-in RS485/USB converter. 8-pole M12 connector on instrument side and A-type USB connector on PC side. **For LPPIRG01S.**

LPSP1: UV-resistant solar radiation protection screen.

LPG: Silica-gel (5 sachets).

LPSG: Cartridge with desiccant silica-gel crystals, complete with O-ring and cap.