Secondary standard pyranometers

Radiometer for solar irradiance measurement, according to ISO 9060 and WMO No. 8 (Part I, Chapter 7) standards. These sensors are classified as ISO 9060 Secondary Standard. With a total daily uncertainty of only 2%, fast response time, these sensors are ideal for users requiring high-end accuracy and reliability.

Order numb.	**DPA252** (1)	**DPA852** (1)	**DPA952** (1)
Output	µV	4÷20 mA	RS485-Modbus
Power supply	-	7÷35 Vdc	
Sensitivity	7÷25 µV/(W/m²)	NA	NA
Measuring range	See Irradiance range	0÷1600 W/m²	
Data logger compatibility	M-Log (ELO007-008) R-Log (ELR515) E/X-Log (all models)		

Common features

Secondary Standard pyranometer	*ISO 9060 classification*	Secondary Standard
	Achievable uncertainty 95% confidential level (daily totals).According to WMO manual, not considering calibration errors, for well maintened instruments on clear sky days, at mid-latitude sites	±2%
	Spectral range	285÷3000 nm
	Temperature response (50 K range)	<± 1% (-10÷40 °C) when compensated: <± 0,4% (-30÷50°C)
	Irradiance range	0÷4000 W/m²
	Response time 95%	3 s
	Directional (azimuth+cosine) error W/m² (@1000 W/m²) 0< θ <80 °	<± 10 W/m²
	Zero offset a (response to 200 W/m² net thermal radiation)	< 5 W/m² (unventilated)
	Zero offset b: Thermal change W/m² (5 °C/h)	< ± 2 W/m²
	Non linearity % (1000 W/m²)	<± 0.2 %
	Stability (% change/year)	<± 0.5 %
	Standard built-in temperature sensor	Yes
	Standard built-in heater	Yes (12 Vdc, 1,5 W)
	Data provided with each sensor	- Calibration certificate - Temperature dependence data - Directional response data
	Recommended recalibration	Every 2 years
	Mounting (pole ø 45÷65 mm)	Using DYA034 or DYA035 arms + DYA049
	Cable	See Accessories
	Housing	Anodized aluminum

continued

Accessories	Order numb.	
	**DYA035**	Tilting arm for fixing DPA252-852-952 pyranometers to DYA049 collar
	DYA034	Arm for fixing DPA252-852-952 pyranometers to DYA049 collar
	DYA049	Mast-mounting device for ø 45-65 mm pipe
	**DEA852**	Signal amplifier for Pyranometers Output: 0/4÷20 mA, 0/1÷5 V Power consumption: output + 10 mA Power supply 10÷30 Vac/dc Requires DWA5xx cable
	DEA854	Same features as DEA852. Connection: free wires terminal
	DPA250	Ventilation unit for DPA252 Power supply: 12 Vdc Operative temperature: -40÷70°C
	DWA205	Cable for DPA252-852-952 L = 5 m
	DWA210	Cable for DPA252-852-952 L = 10 m
	DWA225	Cable for DPA252-852-952 L = 25 m

First class pyranometers

Radiometer for solar irradiance measurement, according to ISO 9060 and WMO No. 8 (Part I, Chapter 7) standards. These sensors are classified as ISO 9060 First Class. With a total daily uncertainty of 5%, flat spectral response (305-2800 nm) and optimal temperature stability, this sensor represents the optimal compromise between costs and quality of irradiance measurement

Order numb.	DPA154	DPA855	DPA870
Output	µV/W/m²	4÷20 mA	RS485
Protocol			Modbus RTU® TTY-ASCII
Programmable output			max., min., ave. (1÷3600 s)
RS485 protection			Galvanic insulation (3 kV, UL1577)
RS485 speed			1200÷115 kbps
Electric Protection		Tranzorb e Emifilters	
Power supply	None	10÷30 Vac/dc	
Measuring range	See Irradiance range	0÷1500 W/m²	
Power consumption	None	0,5 W	
Other measures			Air temp. (included) Surface temp. (DLE125 sensor)
Cable	Included L = 10 m (DWA410)	Not included See accessories	
Data logger compatibility	M-Log (ELO007-008) R-Log (ELR515) X/E-Log (all models)		

Common features

Pyranometer	*Principle*	Thermopile
	ISO 9060 Classification	First class
	Spectral range	305÷2800 nm
	Sensitivity	30÷45 µV/W/m²
	Achievable uncertainty 95% confidential level. (daily totals)	±5%
	Irradiance Range	0÷2000 W/m²
	Response time (T95%)	23 s
	Zero offset: Thermal change W/m² (5 °C/h)	<± 4 W/m²
	Directional (azimuth+cosine) error W/m² (@ 1000 W/m²) 0 < θ <80°	<± 20 W/m²
	Non linearity % (@ 1000 W/m²)	<± 1 %
	Stability (% change/year)	<± 1,5 %
	Temperature response (50 K range)	<± 4 % (-10÷40 °C)
	Operative temperature	-50÷+80°C

continued

General information	*Housing*	Anodized aluminum
	Recalibration	Every 2 years
	Mounting (pole ø 45÷65 mm)	Using DYA034 (horizontal) or DYA035 (tilting) arms + DYA049 collar
Accessories	**Order numb.**	
	**DYA035**	Tilting arm for fixing DPA154-855-870 pyranometers to DYA049 collar
	DYA034	Horizontal arm for fixing DPA154-855-870 pyranometers to DYA049 collar
	DYA049	Mast-mounting device for ø 45-65 mm pipe
	**DEA852**	Signal amplifier for Pyranometers Output: 0/4÷20 mA, 0/1÷5 V Power consumption: output + 10 mA Power supply 10÷30 Vac/dc Requires DWA5xx cable
	DEA854	Same features as DEA852 Connection: free wires terminal
	DWA410	Cable for DPA154-855-870 L = 10 m
	DWA425	Cable for DPA154-855-870 L = 25 m
	DWA426	Cable for DPA154-855-870 L = 50 m
	DWA427	Cable for DPA154-855-870 L = 100 m
	**DPA245**	Occultation band for diffuse radiation

Second Class Pyranometers

Radiometer for solar irradiance measurement, according to Second class as ISO 9060 and WMO No. 8 standards. This sensor is a good compromise for basic meteorological, agrometeorological and solar energy applications.

Order numb.	DPA053 (1)	DPA863 (2)	DPA873 (2)
Output	µV/W/m²	4÷20 mA	RS485
Protocol	-	-	Modbus RTU®, TTY-ASCII
Programmable data output	-	-	max.min.ave. (1÷3600 sec)
RS485 protection	-	-	Galvanic insulation (3 kV, UL1577)
RS485 speed	-	-	1200÷115 kbps
Protection	-	Tranzorb and Emifilters	
Power supply	-	10÷30 Vac/dc	
Power consumption	-	0,5 W	
Mesurement range	See “Irradiance range”	0÷1500 W/m²	
Sensitivity	10÷15 µV/W/m²	NA	
Response time (T90%)	16 s	18 s	
Cable	L = 5 m	Not included (see Accessories)	
Installation (on ø 50 mm pole)	DYA032 arm + DYA049 collar (horizontal) DYA048 plate + DYA035 arm + DYA049 collar (tilting)	DYA034 (horizontal) or DYA035 (tilting) arms + DYA049 collar	
Data logger compatibility	M-Log (ELO007-008) R-Log (ELR515) E/X-Log (all models)	-	-

Common features

Pyranometer	*Principle*	Thermopile
	ISO 9060 Classification	Second class
	Spectral range	305÷2800 nm
	Irradiance range	0÷2000 W/m²
	Achievable uncertainty 95% confidential level (daily totals)	10%
	Temperature response (50°K range)	<7% (-10÷40 °C) (0,14%/°C)
	Operative temperature	-40÷80°C
General information	*Housing*	Anodized aluminum
	Recalibration	Every 2 years

continued

Accessories	Order numb.	
	**DYA035**	Tilting arm for fixing DPA863-873 pyranometers to DYA049 collar For DPA053 add DYA048 plate
	DYA032	Horizontal arm for fixing DPA053 to DYA049 collar
	DYA034	Horizontal arm for fixing DPA863-873 to DYA049 collar
	DYA049	Mast-mounting device for ø 45-65 mm pipe
	DYA048	Plate for levelling DPA053 on DYA034 or DYA035 arm
	DYA120	Radiant shield for DPA053
	**DEA852**	Signal amplifier for Pyranometers Output: 0/4÷20 mA, 0/1÷5 V Power consumption: output+ 10 mA Power supply 10÷30 Vac/dcRequires DWA5xx cable
	DEA854	Same features as DEA852. Connection: free wires terminal
	DWA410	Cable for DPA863-873 L = 10 m
	DWA425	Cable for DPA863-873 L = 25 m
	DWA426	Cable for DPA863-873 L = 50 m
	DWA427	Cable for DPA863-873 L = 100 m

Calibrated Cell

DPA048 is a high-performance calibrated cell. What really sets itvapart from the rest of the market is the fact that this sensor is available in different cell technologies (Monocristalline, policristalline, amorphous) – the user can select the technology that fits his own application. Furthermore, the calibration of every sensor is achieved by a reference element (quality grade A, constructed in an identical fashion) from an accredited test laborator in W/m². A calibrating printout similar to EN DIN 17025 documents the product specific parameters.

Order numb.	DPA048.1	DPA048.2	DPA048.3
Technology	Monocristalline	Polycristalline	Amorphus
Accuracy	4%	5%	
Output	~100 mV /1000 W/m² @25°C		
Temperature sensor	Pt 1000, laminated or bonded centrally under the cell		

Common features

General information	*Cable*	Shielded L = 3m
	Housing	Aluminum
	Mounting	Bolts M 5 backside
	Operative temperature	-25°÷80° C
	Mounting	On surfaces
	Data logger compatibility	M-Log (ELO007-008) R-Log (ELR515) E/X-Log (all models)