

Secondary Standard Pyranometers



- ▶ Spectrally flat Class A (Secondary Standard) pyranometer. Compliance with IEC 61724-1: 2017
- ▶ RVH technology: Recirculating Ventilation and Heating (DPA953.1)
- ▶ Measured sensor tilt angle (DPA953.1)
- ▶ Calibration traceability to WRR
- ▶ Outputs: irradiance in W/m^2 , instrument body temperature, tilt angle, internal humidity, internal pressure and ventilator speed (DPA953.1)
- ▶ Ideal instrument in PV plants performance monitoring and meteorological networks

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% within $0...180^\circ$ field of view, fast response time, these sensors are ideal for users requiring high-end accuracy and reliability.

Technical Specifications

PN	DPA252	DPA952	DPA953.1
			
Output	μV	RS485-Modbus 4...20 mA	RS485-Modbus
Ventilation	Not included (Yes, using DPA250)	Not included (Yes, using DPA250)	Included
Heater			YES (5 V)
Tilt measurement	-	-	YES (Acc $\pm 1^\circ$)
Power supply	-	7...35 Vdc	8...30 Vdc
Power consumption	-	$< 75 \times 10^{-3} W@12 VDC$	$< 3 W@12 VDC$
Sensitivity	7...25 $\mu V/W/m^2$	NA	NA
Irradiance range	0...4000 W/m^2	-400...4000 W/m^2	-400...4000 W/m^2
Impedance	$40 \pm 3 \Omega$	-	-
Response time	4.5 s	4.5 s	3 s
Output values	Instant value	Running average value over 4 measurements, refreshed every 0.1 s	Running average value over 4 measurements, refreshed every 0.1 s
Cable	Not included (see Accessories)	Not included (see Accessories)	Not included (see Accessories)

PN	DPA252	DPA952	DPA953.1
Output	Irradiance in W/m ²	- Irradiance in W/m² - Sensor body temperature (digital output only)	- Irradiance in W/m² - Sensor body temperature - Sensor internal RH% - Sensor internal Pressure in Pa - Instrument tilt angle - Ventilator speed in RPM - Ventilator current in A - Heater current in A
Data logger compatibility	- M-Log (ELO008) - Alpha-Log (using ALIEM module) - E-Log	Using 4...20 mA output: - M-Log (ELO008) - Alpha-Log (using ALIEM module) - E-Log	- M-Log (ELO008) using RS485->232 converter - Alpha-Log - E-Log (using RS485->232 converter)

Common Technical Specifications

Secondary Standard Pyranometers	ISO 9060 2018 classification	Spectrally flat Class A (Secondary Standard)
	IEC 61724-1: 2017 classification	Class A (DPA252 e DPA952 only with DPA250)
	WMO performance level	High quality pyranometer
	WMO estimate on achievable accuracy for daily sums	±2%
	Spectral range	285...3000 nm
	Non-stability	<± 0.5% change per year
	Directional response	<±10 W/m ²
	Tilt response	<± 0.2% (0...90° at 1000 W/m ²)
	Temperature response	<± 0.4% (-30...50°C)
	Zero offset a (response to 200 W/m ² net thermal radiation)	<5W/m ² (unventilated) < 2 W/ m ² (DPA953.1)
	Zero offset b (response to 5K/h change in ambient temperature)	<±2 W/m ²
	Non linearity	<± 0.2 % (100...1000 W/m ²)
	Stability (% change/year)	<± 0.5 %
	Standard built-in temperature sensor	YES (DPA952-953.1 only)
	Standard built-in heater	YES (12 Vdc, 1.5 W) (DPA953.1 only)
	Standard built-in bubble level	YES, including adjusting leveling screws (on mounting arm)
	Data provided with each sensor	- Calibration certificate - Temperature dependence data - Directional response data

General Information	Operative temperature	-40...80°C
	Calibration traceability	To WRR
	Housing	Anodized aluminum
	Recalibration	Every 2 years
	Mounting (pole Ø 45...65 mm)	Using DYA034 (horizontal) or DYA035 (tilting) arms + DYA049 collar
	Weight	0.5 kg
	Protection rate	IP66
	Anti-radiation shield	Included

First Class Pyranometers



- ▶ Spectrally flat Class B (First Class) pyranometer. Compliance with IEC 61724-1: 2017
- ▶ Electrical insulated (DPA855-980), Galvanic insulated (DPA980)
- ▶ Calibration traceability to WRR
- ▶ Modbus register for Instant value, Ave/Min/Max values over programmable time base (DPA980)
- ▶ 10...30 Vac/dc power supply (DPA855/980)
- ▶ Ideal instrument in PV plants performance monitoring and meteorological networks

Radiometer for solar irradiance measurement, according to ISO 9060 and WMO No. 8 (Part I, Chapter 7) standards. These sensors are classified as ISO9060 First Class. With a total daily uncertainty of 5% within 0...180° field of view, flat spectral response (285-3000 nm) and optimal temperature stability, this sensor represents the optimal compromise between cost and quality of irradiance measurement.

Technical Specifications

PN	DPA154	DPA855	DPA980
Output	μV	4...20 mA	RS485-Modbus
Protocol	-	-	Modbus RTU®, TTY-ASCII
Programmable output	-	-	Inst, max/min/ave (1...3600 s)
RS485 protection	-	-	Galvanic insulation (3 kV, UL1577)
RS485 speed	-	-	1200...115 kbps
Power supply	-	10...30 Vac/dc	10...30 Vac/dc
Max. Load	-	300 Ohm	300 Ohm
Power consumption	-	0.5 W	0.5 W
EMC	-	EN 61326-1: 2013	EN 61326-1: 2013
Sensitivity	10...15 μV/W/m ²	NA	NA
Measuring range	0...4000 W/m ²	0...1500 W/m ²	0...1500 W/m ²
Impedance	40 ± 3 Ω	-	-
Calibration certificate	Not included (see Accessories)		
Cable	Not included (see Accessories)		
Data logger compatibility	• M-Log (ELO008) • Alpha-Log (using ALIEM module) • E-Log	• M-Log (ELO008) • Alpha-Log (using ALIEM module) • E-Log	• M-Log (ELO008) using RS485->232 converter • Alpha-Log • E-Log. Using RS485->232 converter

Common Technical Specifications

First Class pyranometer	ISO 9060 2018 classification	Spectrally flat Class B (First Class)
	IEC 61724-1: 2017 classification	Class B (except for heating)
	WMO performance level	Good quality pyranometer
	WMO estimate on achievable accuracy for daily sums	±5%
	Spectral range	285...3000 nm
	Non-stability	<± 1% change per year
	Response time	20 s
	Non linearity	<± 1% (100...1000 W/m ²)
	Directional response (0...180°C field of view)	<±20 W/m ²
	Tilt response	<± 2%
	Temperature response	<±2% (-15...35°C)
	Zero offset a (response to 200 W/m ² net thermal radiation)	<12W/ m ²
	Zero offset b (response to 5K/h change in ambient temperature)	<±3 W/m ²
	Built-in bubble level	YES
	Operative temperature	-40...80°C
	Calibration traceability	To WRR
General Information	Housing	Anodized aluminum
	Recalibration	Every 2 years
	Mounting (pole Ø 45...65 mm)	Using DYA034 (horizontal) or DYA035 (tilting) arms + DYA049 collar
	Protection rate	IP66
	Anti-radiation shield	Included

Second Class Pyranometers



- ▶ Spectrally flat Class C (Second Class) pyranometer. Compliance with IEC 61724-1: 2017
- ▶ Electrical insulated (DPA863-873), Galvanic insulated (DPA983)
- ▶ Calibration traceability to WRR
- ▶ Modbus register for Instant value, Ave/Min/Max values over programmable time base (DPA983)
- ▶ Ideal instrument in PV plants performance monitoring and meteorological networks

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.

Technical Specifications

PN	DPA053A	DPA863	DPA983
			
Output	μV	4...20 mA	RS485-Modbus
Protocol	-	-	Modbus RTU®, TTY-ASCII
Programmable output	-	-	Ist., max/min/ave. (1...3600 s)
RS485 protection	-	-	Galvanic insulation (3 kV, UL1577)
RS485 speed	-	-	1200...115 kbps
Power supply	-	10...30 Vac/dc	10...30 Vac/dc
Power consumption	-	0.5 W	0.5 W
EMC	-	EN 61326-1: 2013	EN 61326-1: 2013
Sensitivity	10...15 $\mu\text{V/W/m}^2$	NA	NA
Measuring range	See Irradiance range	0...1500 W/m^2	0...1500 W/m^2
Impedance	40 $\pm$ 3 Ω	-	-
Calibration certificate	Included	Not included (see Accessory)	Not included (see Accessory)
Cable	L= 5 m included	Not included (see Accessories)	Not included (see Accessories)
Built-in bubble level	NO (Yes, using DYA048 plate)	YES	YES

PN	DPA053A	DPA863	DPA983
Mounting	- DYA032 arm + DYAO49 collar (horizontal) - DYA048 plate + DYAO35 arm + DYAO49 collar (tilting)	DYA034 (horizontal) or DYAO35 (tilting) arms + DYAO49 collar	
Data logger compatibility	- M-Log (ELO008) - Alpha-Log (using ALIEM module) - E-Log	- M-Log (ELO008) - Alpha-Log (using ALIEM module) - E-Log	- M-Log (ELO008) using RS485->232 converter - Alpha-Log - E-Log (using RS485->232 converter)

Second Class pyranometer	ISO 9060 2018 classification	Class C (Second Class)
	IEC 61724-1: 2017 classification	Class C
	WMO performance level	Moderate Quality
	WMO estimate on achievable accuracy for daily sums	±10%
	Spectral range	285...3000 nm
	Temperature response	<± 0.7% (-10...40°C)
	Irradiance range	0...2000 W/m ²
	Recommended recalibration	Every 2 years
	Operative temperature	-40...80°C
	Calibration traceability	To WRR
General Information	Housing	Anodized aluminum
	Protection rate	IP66
	Anti-radiation shield	Included

Accessories

	DYA030	Tilting arm for two pyranometers
	DYA032	Horizontal arm for fixing DPA053A to DYA049 collar
	DYA034	Horizontal arm for fixing DPA252-952-953-154-855-980-863-983 pyranometers to DYA049 collar Length 440 mm
	DYA034.1	Horizontal arm for fixing DPA252-952-953-154-855-980-863-983 pyranometers to DYA049 collar Length 650 mm
	DYA035	Tilting arm for fixing DPA252-952-953-154-855-980-863-983 pyranometers to DYA049 collar
	DPA245	Occultation Shadow band for diffuse radiation
	DPA250	External module for heating and ventilation for DPA252 and DPA952. Weight: 1 kg
	DEA420.1 DEA420.2	Signal amplifier for Pyranometers. Output: 4...20 mA Programmable pyranometer sensitivity ($\mu\text{V}/\text{Wm}^2$) Power supply 10...30 Vac/dc For more technical information, see MW9008 catalogue
	MDMMA1010.1	Same features as DEA420.1 but: Output: RS-485 Modbus-RTU

Accessories

	SVICA4001	Calibration certificate. Under the sun. ISO9001 (Global radiation)
	SVICA4701	Calibration certificate. Under the lamp. ISO9001 (Global radiation)
	DYA049	Collar for fixing DYA032-034-035 to Ø 45...65 mm pole
	DWA205	Cable for DPA252-952. L=5 m
	DWA210	Cable for DPA252-952. L=10 m
	DWA225	Cable for DPA252-952. L=20 m
	DWA205.1	Cable for DPA953.1 L=5 m
	DWA210.1	Cable for DPA953.1 L=10 m
	DWA220.1	Cable for DPA953.1 L=20 m
	DWA605A	Cable for DPA154. L=5 m
	DWA610A	Cable for DPA154. L=10 m
	DWA625A	Cable for DPA154. L=25 m
	DWA626A	Cable for DPA154. L=50 m
	DWA410A	Cable for DPA855-980-863-983. L=10 m
	DWA425A	Cable for DPA855-980-863-983. L=25 m
	DWA426A	Cable for DPA855-980-863-983. L=50 m
	DWA427A	Cable for DPA855-980-863-983. L=100 m
	DYA048	Plate for levelling DPA053A on DYA034 or DYA035 arm. Including bubble level
	DYA120	Spare anti-radiant shield for DPA053A
	MC1177.R	Spare anti-radiant shield for DPA863-983 and DPA154-855-980