




Secondary Standard Pyranometers



- ▶ Spectrally flat Class A (Secondary Standard) pyranometer. Compliance with IEC 61724-1: 2017
- ▶ RVH technology: Recirculating Ventilation and Heating (DPA953)
- ▶ Measured sensor tilt angle (DPA953)
- ▶ Calibration traceability to WRR
- ▶ Outputs: irradiance in W/m^2 , instrument body temperature, tilt angle, internal humidity, internal pressure and ventilator speed (DPA953)
- ▶ 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 $0\div 180^\circ$ field of view, fast response time, these sensors are ideal for users requiring high-end accuracy and reliability.

Technical Specifications

PN	DPA252	DPA952	DPA953
			
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± 1°)
Power supply	-	7÷35 Vdc	5÷30 Vdc
Power consumption	-	$< 75 \times 10^{-3} W@12 VDC$	$< 2,3 W@12 VDC$
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 ± 3 Ω	-	-
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
Output	Irradiance in W/m ²	<ul style="list-style-type: none"> Irradiance in W/m² Sensor body temperature (digital output only) 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> M-Log (ELO008) Alpha-Log (using ALIEM module) E-Log 	Using 4÷20 mA output: <ul style="list-style-type: none"> M-Log (ELO008) Alpha-Log (using ALIEM module) E-Log 	<ul style="list-style-type: none"> 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)
	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 only)
	Standard built-in heater	YES (12 Vdc, 1,5 W) (DPA953 only)
	Standard built-in bubble level	YES, including adjusting leveling screws (on mounting arm)
Data provided with each sensor	<ul style="list-style-type: none"> Calibration certificate Temperature dependence data Directional response data 	

	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

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 sec)
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	Included	Not included (see Accessories)	Not included (see Accessories)
Cable	L=10 m included	Not included (see Accessories)	Not included (see Accessories)
Data logger compatibility	<ul style="list-style-type: none"> • M-Log (ELO008) • Alpha-Log (using ALIEM module) • E-Log 	<ul style="list-style-type: none"> • M-Log (ELO008) • Alpha-Log (using ALIEM module) • E-Log 	<ul style="list-style-type: none"> • 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	<± 4% (-10÷40°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



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	DPA053	DPA863	DPA983
			
Output	μV	4÷20 mA	RS485-Modbus
Protocol	-	-	Modbus RTU®, TTY-ASCII
Programmable output	-	-	Ist., max/min/ave. (1÷3600 sec)
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 ± 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	DPA053	DPA863	DPA983
Mounting	<ul style="list-style-type: none"> DYA032 arm + DYA049 collar (horizontal) DYA048 plate + DYA035 arm + DYA049 collar (tilting) 	DYA034 (horizontal) or DYA035 (tilting) arms + DYA049 collar	DYA034 (horizontal) or DYA035 (tilting) arms + DYA049 collar
Data logger compatibility	<ul style="list-style-type: none"> M-Log (ELO008) Alpha-Log (using ALIEM module) E-Log 	<ul style="list-style-type: none"> M-Log (ELO008) Alpha-Log (using ALIEM module) E-Log 	<ul style="list-style-type: none"> 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

Accessories

	DYA030	Tilting arm for two pyranometers
	DYA032	Horizontal arm for fixing DPA053 to DYA049 collar
	DYA034	Horizontal arm for fixing DPA252-952-953-154-855-980-863-983 pyranometers to DYA049 collar
	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
	DEA420.1 DEA420.2	Signal amplifier for Pyranometers. Output: 4±20 mA Programmable pyranometer sensitivity (µV/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. L=5 m
	DWA210.1	Cable for DPA953. L=10 m
	DWA220.1	Cable for DPA953. L=20 m
	DWA410	Cable for DPA154-855-980-863-983. L=10 m
	DWA425	Cable for DPA154-855-980-863-983. L=25 m
	DWA426	Cable for DPA154-855-980-863-983. L=50 m
	DWA427	Cable for DPA154-855-980-863-983. L=100 m
	DYA048	Plate for levelling DPA053 on DYA034 or DYA035 arm. Including bubble level
	DYA120	Radiant shield for DPA053
	MC1177	Radiant shield for DPA863-983