

The HUKX logo is rendered in a bold, white, sans-serif typeface. It is positioned on the left side of the page, set against a background of a blue grid that appears to be receding into the distance, creating a sense of depth and perspective.

HUKX

Sensor
Technology

Brochure
Industrial series Class A and
Class B analog pyranometers

SR200-A1
SR100-A1

SR200-A1, SR100-A1

Industrial series Class A and Class B analog pyranometers

For PV system performance monitoring and meteorology

The analog ISO 9060 spectrally flat Class A pyranometer SR200-A1, and the spectrally flat Class B SR100-A1 are engineered to measure solar radiation with the utmost reliability and measurement accuracy. They replace the older analog millivolt output models SR20 and SR15-A1. Analog pyranometers are not only used as a replacement of similar sensors in legacy networks, but also when power consumption should be as low as possible. Hukx also offers digital versions of the SR200 and SR100, as well as the SR05-A1 Class C pyranometer with analog voltage output.

- SR200-A1 meets IEC 61724-1 Class A PV system performance monitoring for locations where dew and frost are expected for < 2 % of annual GHI hours. SR100-A1 meets IEC 61724-1 Class B PV system performance monitoring for all locations and climatic conditions
- replacement for most spectrally flat legacy Class A and Class B pyranometers with millivolt output, such as SR20 and SR15-A1, and their competitors from other brands
- industrial-level surge immunity: 1 kV (level 2)
- internal Pt100 (SR100-A1 and SR200-A1-T1) or 10 k Ω thermistor (SR200-A1-T2) for accurate instrument body temperature data
- for SR200-A1: temperature-compensated irradiance with very low temperature dependence (< ± 0.4 %). If desired, temperature measurements from the internal sensor can be used for post-acquisition temperature compensation of irradiance measurements
- passive pyranometer: lowest possible power consumption
- supported by a worldwide calibration organization

Figure 1 Industrial analog pyranometer models SR200-A1 (left) and SR100-A1 (right).



Industrial-grade, high-accuracy, and reliable

We built upon the measurement capabilities of the pyranometer models SR200-D1 and SR100-D1, and turned them into equally reliable analog instruments, tailored to their most common applications in PV system performance monitoring systems and meteorological stations.

SR200-A1 and SR100-A1 comply with industrial-grade immunity, electrical, environmental, and safety requirements for use in these outdoor and industrial environments, for the highest measurement reliability.

Internal temperature sensor

SR200-A1 has a built-in temperature sensor: Model version SR200-A1-T1 has a Pt100, the model version -T2 has a 10 k Ω thermistor. SR100-A1 has a Pt100 sensor.

SR200-A1 is compliant with ISO 9060 Class A. This means that the temperature response and directional response of every individual instrument is tested. The temperature response data are uniquely supplied as a second-degree polynomial. When measuring the instrument's body temperature, this information can be used to further reduce temperature dependence during post-processing.

Replacement of legacy instruments

Many older meteorological stations and networks still employ instruments with microvolt output. The SR200-A1 and SR100-A1 may be used to replace such "legacy" instruments, not only of the Hukx — original name was Hukseflux— brand, but also of the Kipp, Eppley, and Schenk brands. See Table 3 for our recommendations.

PV system performance monitoring: IEC 61724-1 Class A and Class B compliant

SR200-A1 complies with IEC requirements for "Class A" PV system performance monitoring, for climates in which dew and frost are not an issue. SR100-A1 complies with the requirements for Class B monitoring stations for all conditions.



Figure 2 Typical use of pyranometers at PV power plants. The above picture shows two SR200-A1 pyranometers, one tilted for Plane of Array (POA) measurement, and another mounted horizontally for Global Horizontal Irradiance (GHI) measurement.

Surge protection: immunity to high-impulse voltages & currents

SR200-A1 and SR100-A1 are designed for use in Industrial Environments. When designing a measuring system, pyranometer users may reach several levels of immunity.

To attain the required level of immunity for a given installation, some general system components should be included, such as:

- lightning protection system
- earthing and grounding network
- external surge protection system

Electrical safety in the workplace

A PV power plant is a potentially hazardous workplace environment. To comply with safety regulations, the SR200-A1 and SR100-A1 sensors feature a dedicated earthing terminal for connection to protective earth. When the pyranometer is isolated from the mounting platform, it should still be properly earthed via this terminal. Both sensors allow system designers to comply with safety regulations. These are often based on EU and US electrical safety standards, such as:

- EN-50110 Operation of Electrical Installations
- NFPA 70 National Electrical Code (NEC)

Lowest total cost of ownership

Customers prefer Hukx pyranometers for their unsurpassed measurement accuracy and lowest cost of ownership. Total ownership costs are primarily determined by installation, on-site inspection, accidental damage, and calibration.

- fewer external components: Internal protection and isolation reduce the requirements and costs for added external protection devices.
- minimize risk of damage: Preventive measures, such as surge protection and dome protection, lower the risk of accidental damage.
- worldwide calibration organization: Pyranometers must be calibrated every 2 years. Our worldwide calibration organization reduces calibration costs by simplifying return logistics and turnaround times. Learn more about [pyranometer calibration services](#).
- efficient O&M: Quickly install using spring-loaded leveling.

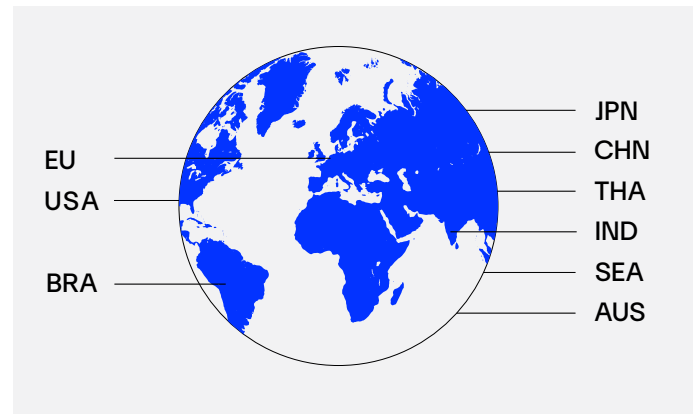


Figure 3 Lowest cost of ownership: make use of the worldwide Hukx calibration organization.

Optional accessories

We offer accessories for use with the SR200-A1 and SR100-A1, including electrical and mounting hardware options.

- **PID01** Pyranometer Insulation Disk, electrically insulating the instrument from the mounting platform, spring-loaded for easy leveling
- **LM01** spring-loaded leveling mount; a practical mount for easy mounting, leveling, and instrument exchange on flat surfaces
- **TLM01** tube leveling mount with a set of bolts
- calibration certificate including customer name and contact information
- **DP01** dome protector, set of 5 pieces
- **AMF03** albedometer fixture
- **PMF01** and **PMF02** mounting fixtures

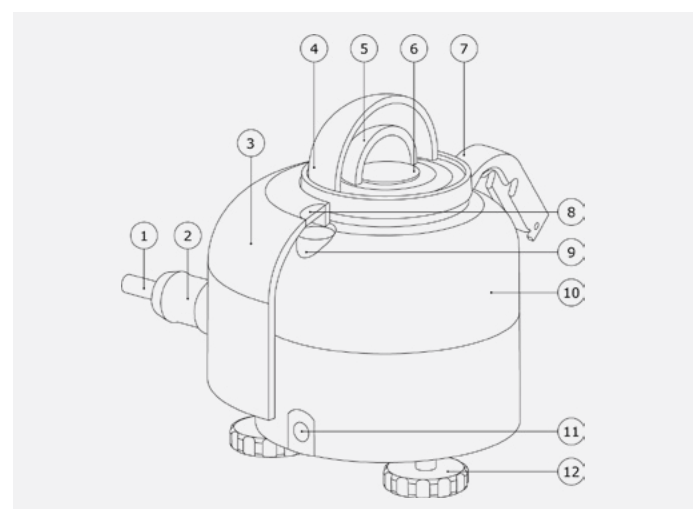


Figure 4 Overview of SR200-A1:
(1) cable, (2) 5-pole M12-A connector, (3) sun screen, (4) outer dome, (5) inner dome, (6) thermal sensor with black coating, (7) quick release system of the sun screen, (8) bubble level window, (9) bubble level, (10) instrument body, (11) earthing terminal, (12) leveling feet

Table 1 SR200-A1 and SR100-A1: main specifications compared.

Instrument specifications		
	SR200-A1	SR100-A1
ISO 9060:2018 classification	spectrally flat Class A	spectrally flat Class B
IEC 61724-1:2021 compliance for solar irradiance measurement	meets Class A PV monitoring system requirements for locations where dew and frost are expected for < 2 % of annual GHI hours	meets Class B PV monitoring system requirements for all locations and climatic conditions
manufacturer's estimate of achievable measurement accuracy for daily sums of global horizontal solar irradiance following ASTM G213 uncertainty evaluation*	2.4 %	4.6 %
instrument output	voltage (in mV range)	voltage (in mV range)
surge immunity	1 kV (all lines tested as I/O lines)	1 kV (all lines tested as I/O lines)
instrument body temperature measurement and optional correction of temperature dependence	•	-
* in summer at mid-latitudes, instruments used under rated operating conditions, expanded measurement uncertainties (k = 2)		

Table 2 SR200-A1 and SR100-A1: certificates and reports.

Certificates and reports	SR200-A1	SR100-A1
calibration certificate	•	•
product certificate confirming verification of specifications and classification	•	-
temperature response test of individual instrument	•	-
directional response test of individual instrument for 0 to 95 ° angle of incidence	•	-

Table 3 Recommended replacement sensors of the Hukx brand for legacy instruments of the Kipp & Zonen, Schenk, and Eppley brands.

Recommended replacement sensors	SR200-A1	SR100-A1
Eppley Black and White pyranometer model 8-48 (sensitivity $\pm (8 \text{ to } 10) \times 10^{-6} \text{ V/(W/m}^2\text{)}$)	-	•
Eppley Precision Spectral Pyranometer model PSP (sensitivity $\pm 9 \times 10^{-6} \text{ V/(W/m}^2\text{)}$)	•	-
Kipp & Zonen Class A/secondary standard pyranometer models CMP10 and CMP11 (sensitivity $\pm (7 \text{ to } 14) \times 10^{-6} \text{ V/(W/m}^2\text{)}$)	•	-
Kipp & Zonen Class A/secondary standard pyranometer model CMP21 (sensitivity $\pm (7 \text{ to } 14) \times 10^{-6} \text{ V/(W/m}^2\text{)}$) With 10 k Ω thermistor	• with option: T2	-
Kipp & Zonen Class B/first class pyranometer model CMP6 (sensitivity $\pm (5 \text{ to } 20) \times 10^{-6} \text{ V/(W/m}^2\text{)}$)	-	•
Schenk black and white pyranometers models 8101 and 8102 (sensitivity $\pm 15 \times 10^{-6} \text{ V/(W/m}^2\text{)}$)	-	•

See also

- Consult our application notes for transitioning [from SR20 to SR200-A1](#) and [from SR15-A1 to SR100-A1](#).
- Consult our [pyranometer selection guide](#).
- Learn more about our pyranometers on [our YouTube channel](#).
- Check out the [SR300-D1](#), [SR200-D1](#), [SR100-D1](#) with digital output.
- Check out the [SR05-A1 spectrally flat Class C pyranometer with analog millivolt output](#).
- View our complete [range of solar sensors](#).

Figure 5 Optional LM01 spring-loaded leveling mount (only upper part) and TLM01 tube leveling mount (upper and lower parts) for SR200-A1 and SR100-A1. Spring-loaded leveling is a major time-saver during installation.



SR200-A1 and SR100-A1 specifications

General specifications		SR200-A1	
measurand	hemispherical solar radiation	classification ISO 9060:2018	spectrally flat Class A pyranometer
analog output	voltage (in mV range)	IEC 61724-1:2021 compliance for solar irradiance measurement	meets Class A PV monitoring system requirements for locations where dew and frost are expected for < 2 % of annual GHI hours
sensitivity (nominal)	$10 \times 10^{-6} \text{ V/(W/m}^2\text{)}$		
zero offset a	< 5 W/m ²		
dome protector	included (model DP01)		
available cable lengths	3, 5, 10, or 20 m	input quantity	instrument body temperature
leveling	optional spring-loaded leveling, with/without tube mount	temperature sensor version code	T1 for Pt100 DIN Class A T2 for 10 k Ω thermistor (at 25 °C)
Surge immunity		temperature response	< $\pm 1 \%$ (-10 to +40 °C) on uncorrected signal < $\pm 0.4 \%$ (-30 to +50 °C) with correction in data-processing
test level (IEC 61000-4-5)	level 2 (up to $\pm 1 \text{ kV}$)		
		SR100-A1	
		classification ISO 9060:2018	spectrally flat Class B pyranometer
		IEC 61724-1:2021 compliance for solar irradiance measurement	meets Class B PV monitoring system requirements for all locations and climatic conditions
		input quantity	instrument body temperature
		temperature sensor	Pt100 DIN Class A
		temperature response	< $\pm 2 \%$ (-10 to +40 °C)

About Hukx

Hukx is the leading innovator in solar radiation and heat flux sensor technology. We are proud to set the standard in high-accuracy measurement, and to be working at the heart of the energy transition.

Customers worldwide rely on our bestselling pyranometers and heat flux sensors. From sensor design and selection to supply and recalibration, we support you across the entire lifecycle.

Hukx is headquartered in the Netherlands, with locally owned representative sales offices in the USA, Brazil, India, China, Southeast Asia, and Japan.

Let us help you select the best sensor for your application.
Get in touch with our experts today via: info@hukx.com

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Version 2604

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