

SR20

Analogue Class A (secondary standard) pyranometer

SR20 is a solar radiation sensor of the highest category in the ISO 9060 classification system: spectrally flat Class A. SR20 pyranometer should be used where the highest measurement accuracy is required. It is often used with dataloggers that can directly accept its analog voltage output.



Figure 1 SR20 spectrally flat Class A pyranometer.



Figure 2 Dual setup in PV system performance monitoring.

Introduction

SR20 measures the solar radiation received by a plane surface, in W/m^2 , from a 180° field of view angle. SR20 enables you to attain the highest measurement accuracy and excels in demanding applications. After a thorough programme of acceptance testing, SR20 spectrally flat Class A was released in February 2013; it is now a household name.

Improved measurement accuracy

In order to improve overall measurement accuracy, Hukseflux effectively targeted two major sources of measurement uncertainty: calibration and “zero offset a”.

The initial calibration uncertainty is reduced to less than 1.2 %, an improvement of 15 % relative to competing models. The “zero offset a” specification of SR20 is $< 5 W/m^2$ unventilated. Ventilated (with **VU01**) it is just $2.5 W/m^2$.

Low total cost of ownership

Customers prefer Hukseflux pyranometers for their unsurpassed measurement accuracy and their lowest total cost of ownership. Total costs are mainly determined by costs of calibration. Pyranometers must be calibrated every 2 years. Such recalibration is considered good practice for any measuring instrument and is required by ISO, IEC and WMO standards covering PV system performance – and meteorological monitoring. Cost of recalibration however can be high. Hukseflux' worldwide calibration network will help you reduce these costs. Learn more about Hukseflux [pyranometer calibration services](#).



Figure 3 To reduce total cost of ownership: use the worldwide Hukseflux calibration organisation.

Demanding applications

SR20's low temperature dependence makes it an ideal candidate for use under very cold and very hot conditions.

The temperature dependence of every individual instrument is tested and supplied as a second degree polynomial. This information can be used for further reduction of temperature dependence during post-processing.

The incorporated heater reduces measurement errors caused by early-morning dew and frost deposition.

Compliant with IEC 61724-1:2020, Class A

SR30-A1 complies, without the need for additional accessories, with IEC requirements. It includes heating for dew and frost mitigation.

SR20 design

SR20 pyranometer uses a state of the art thermopile sensor with black coated surface, two domes and an anodised aluminium body. The connector, desiccant holder and sun screen fixation are ultra robust and designed for industrial use. All parts are specified for use across SR20's entire rated operating temperature range.

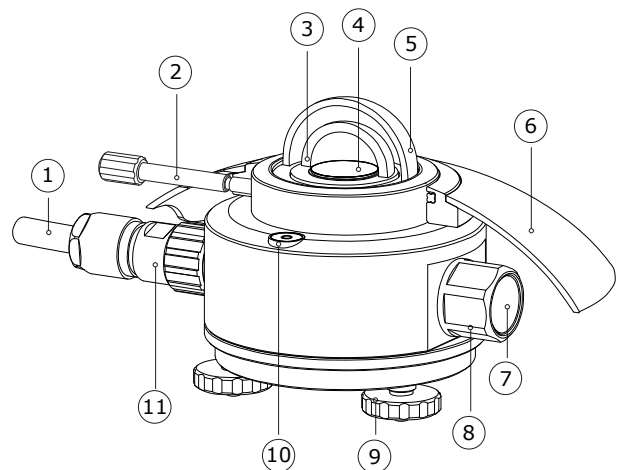


Figure 4 Overview of SR20:

(1) cable, (2) fixation of sun screen, (3) inner dome, (4) thermal sensor with black coating, (5) outer dome, (6) sun screen, (7) humidity indicator, (8) desiccant holder, (9) levelling feet, (10) bubble level, (11) connector.



Figure 5 SR20 with its sun screen removed.

Standards

Applicable instrument classification standards are ISO 9060 and WMO-No. 8. Included in delivery as required by ISO 9060: test certificates for temperature response and directional response. Calibration is according to ISO 9847. PV related standards are ASTM E2848 and IEC 61724.

Choosing the right instrument

Pyranometers are subject to classification in three classes according to ISO 9060.

From Class C to Class B and from Class B to Class A, the achievable accuracy improves by a factor 2.

Measurement accuracy does not only depend on instrument properties, but also on measurement conditions. A very accurate instrument will quickly underperform without a regular schedule of maintenance.

Our [pyranometer selection guide](#) assists you in choosing the right instrument.

Whatever your application is: Hukseflux offers the highest accuracy in every class at the most attractive price level.

Suggested use

- PV system performance monitoring
- scientific meteorological observations
- reference instrument for comparison
- extreme climates (tropical / polar)



Figure 6 SR20 side view.

See also

- [SR20-D2](#) digital spectrally flat Class A pyranometer with Modbus RTU and 4-20 mA output
- alternative instruments: [SR15](#) and [SR05](#) series for lower accuracy measurements
- [PMF01](#) and [PMF02](#) pyranometer mounting fixtures, also for POA (Plane of Array)
- the making of SR20 [documented](#)
- view our complete [product range of solar sensors](#)

SR20 specifications

Measurand	hemispherical solar radiation
ISO classification ISO 9060:2018	spectrally flat Class A pyranometer
ISO 9060:1990	secondary standard pyranometer
WMO performance level IEC 61724-1 compliance	high quality pyranometer meets Class A PV monitoring system requirements
Calibration uncertainty	< 1.2 % (k = 2)
Zero offset a	< 5 W/m ² unventilated
Zero offset a	2.5 W/m ² ventilated
Calibration traceability	to WRR
Spectral range	285 to 3000 × 10 ⁻⁹ m
Sensitivity (nominal)	15 × 10 ⁻⁶ V/(W/m ²)
Rated operating temperature range	-40 to +80 °C
Temperature response	< ± 1 % (-10 to +40 °C) < ± 0.4 % (-30 to +50 °C) with correction in dataprocessing report included
Temperature response test of individual instrument	report included to 95 °
Directional response test of individual instrument	report included to 95 °
Temperature sensor	Pt100 or 10 kΩ thermistor
Heater	1.5 W at 12 VDC
Standard cable length	5 m

Options

- longer cable, in multiples of 5 metres
- ventilated with [VU01](#) ventilation unit

About Hukseflux

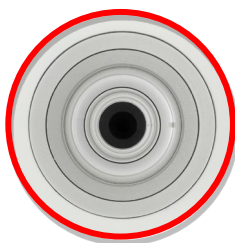
Hukseflux is the leading expert in measurement of energy transfer. We design and manufacture sensors and measuring systems that support the energy transition. We are market leaders in solar radiation- and heat flux measurement.

Hukseflux products and services are offered worldwide via our office in Delft, the Netherlands and local distributors.

Interested in this product?
E-mail us at: info@hukseflux.com

SR20 analogue Class A (secondary standard) pyranometer

This overview summarises the main features and benefits of SR20. Customers prefer Hukseflux pyranometers for their unsurpassed measurement accuracy and their lowest total cost of ownership.



Best measurement accuracy

- spectrally flat
- lowest zero offsets
- lowest calibration uncertainty
- best temperature dependence
- heated: compliant with IEC 61724 ClassA

Lowest total cost of ownership

- efficient worldwide calibration support
 - ISO/IEC 17025 calibration available
 - fast servicing organisation
 - local stock of spare parts



Best connector

- interchangeable cables
- IP67 grade
- for industrial use

Best desiccant cartridge

- visible indicator of instrument health
- rugged aluminium design
- serviceable by user



Best sun screen

- sealed
- corrosion protection of body
- no dry-cooking of bubble level

Best humidity protection

- wrench-operated
- o-ring compressed to spec
- desiccant service interval > 2 years

