

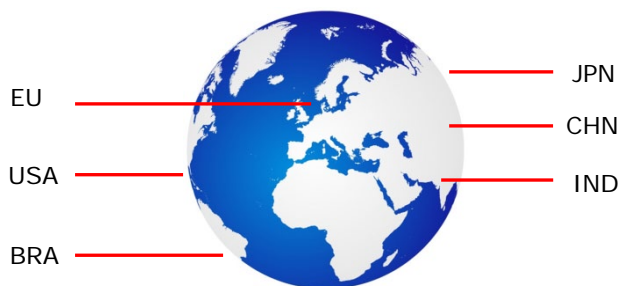
# SR30

Next level digital secondary standard pyranometer

- *Heated for best data availability: outperforming all externally ventilated pyranometers*
- *Packed with value-added features: includes a tilt sensor and an internal humidity sensor*
- *Low cost of ownership: remote diagnostics and supported by an efficient worldwide calibration and servicing organisation*
- *The right paperwork: instruments are supplied with the ISO 9060 required test certificates*



**Figure 1** SR30 digital secondary standard pyranometer



**Figure 2** SR30 users are supported by the worldwide Hukseflux calibration and servicing organisation

## Introduction

Welcome to the next level in solar radiation monitoring! The all-digital SR30 offers the highest accuracy and highest data availability: it outperforms all externally ventilated pyranometers. SR30 is the ideal instrument for use in PV system performance monitoring and meteorological networks.

SR30 measures the solar radiation received by a plane surface, in  $W/m^2$ , from a  $180^\circ$  field of view angle. SR30 is an ISO 9060 secondary standard pyranometer. It is employed where the highest measurement accuracy is required. SR30 offers several advantages over competing pyranometers.

### Heated for high data availability

High data availability is attained by heating of the outer dome using internal ventilation between the inner and outer dome. This is as effective against dew and frost as traditional external ventilation, without the hassle and large footprint.

- low power consumption: SR30 requires only 2 W, compared to 10 W for external ventilation
- low maintenance: SR30 does not require filter cleaning



**Figure 3** frost and dew deposition: clear difference between a non-heated pyranometer (back) versus SR30 (front)

### Packed with value-added features

Standard SR30 offers unique features with clear benefits. SR30 is the only pyranometer to include a tilt sensor and an internal humidity sensor, allowing fast performance analysis.



**Figure 4** SR30 showing its internal ventilation vents

### Low cost of ownership

SR30 is an affordable secondary standard instrument and is designed for low cost of ownership, which is mainly determined by costs of installation, on-site inspections, servicing and calibration:

- low demand on infrastructure: SR30 requires only 2 W power, compared to 10 W for external ventilation
- reduction of unnecessary on-site inspection by remote diagnostics
- designed for efficient servicing: easy local diagnostics.
- supported by an efficient calibration and maintenance organisation. Hukseflux offers local support in the main global economies: USA, EU, China, India, Japan and Brazil. Recalibration is recommended every 2 years, which is good practice in the industry and also recommended in the standards.

### Remote sensor diagnostics

Besides solar radiation, SR30 outputs sensor diagnostics such as:

- tilt angle
- internal ventilator speed (RPM)
- internal humidity
- heater current

This allows the sensor status to be monitored without having to send an engineer to the site.

### Liabilities covered: test certificates

As required by ISO 9060 for secondary standard classification, each SR30 is supplied with test results for the individual instrument:

- sensitivity
- directional response
- temperature response
- tilt angle measurement

### Diffuse radiation measurement

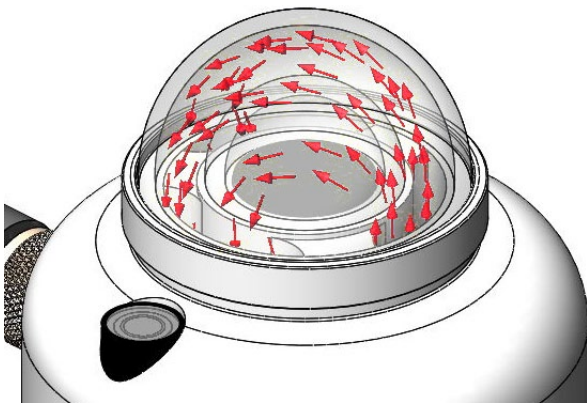
With its outstanding zero-offset specifications, SR30 also is the instrument of choice for high-accuracy diffuse radiation measurement.

### Operation in low power mode

Heater and ventilation may be remotely switched on and off; operation at < 0.1 W is possible by switching both the internal ventilator and heater off. The zero offset will then increase, but overall performance will still comply with secondary standard accuracy classification.

### SR30 design

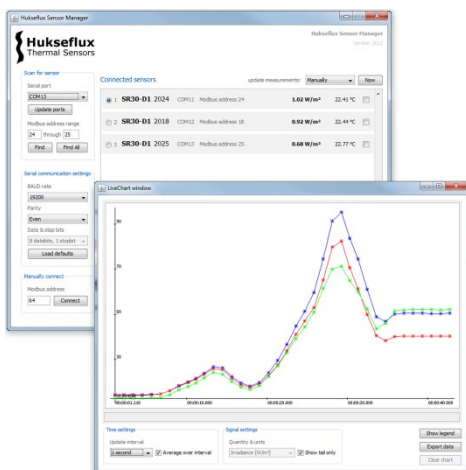
SR30 pyranometer employs a state-of-the-art thermopile sensor with black coated surface, two domes and an anodised aluminium body. It offers a digital output via Modbus RTU over 2-wire RS-485. The pyranometer dome is heated by ventilating the area between the inner and outer dome. This way of heating is much more efficient than traditional external ventilation, where most of the heat is carried away with the ventilation air. Internal ventilation is as effective against dew and frost at 2 W as external ventilation at 10 W. It also leads to a reduction of zero offsets.



**Figure 5** How it's done: internal ventilation between the inner- and outer dome is much more power efficient than conventional external ventilation

### Hukseflux Sensor Manager software

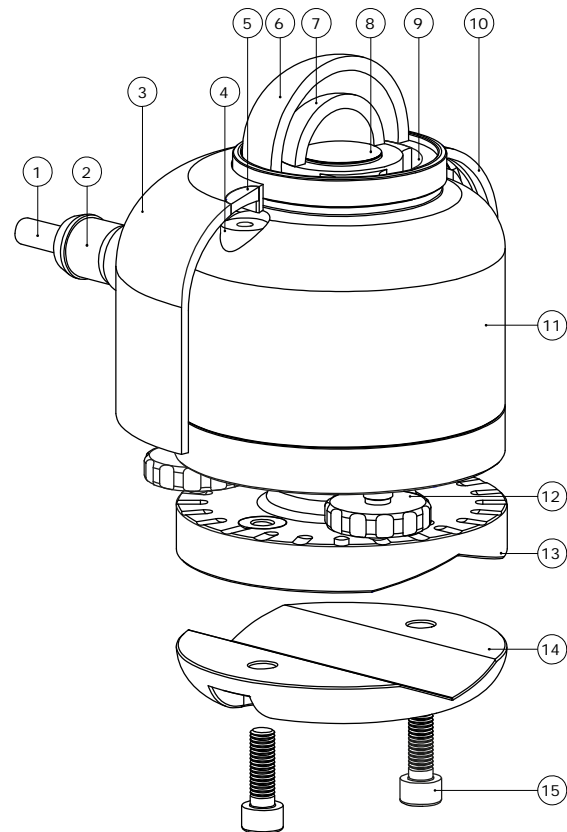
For communication between a PC and SR30, the Hukseflux Sensor Manager software is included. It allows the user to plot and export data, and change the SR30 Modbus address and communication settings. Also, the digital outputs may be viewed for sensor diagnostics.



**Figure 6** user interface of the Sensor Manager, showing sensor diagnostics



**Figure 7** SR30 secondary standard pyranometers with digital output for GHI (global horizontal irradiance) and POA (plane of array) measurements



**Figure 8** overview of SR30: (1) cable, (2) connector, (3) sun screen, (4) bubble level, (5) bubble level window, (6) outer dome, (7) inner dome, (8) thermal sensor with black coating, (9) internal ventilation vents, (10) quick release system of sun screen, (11) instrument body, (12) levelling feet, (13) optional spring-loaded levelling mount, (14) optional tube mount, (15) screws included with tube mount

## Levelling mount

There are 2 mounting options available for SR30. They allow for simplified mounting, levelling and instrument exchange on a flat surface or a tube.



**Figure 9** optional spring-loaded levelling and tube mount for SR30

## Suggested use

- PV system performance monitoring
- scientific meteorological observations

## See also

- **SR05**, an economical solution often used for monitoring small scale PV systems
- consult our pyranometer selection guide
- view our complete [range of solar sensors](#)

## About Hukseflux

Hukseflux Thermal Sensors offers measurement solutions for the most challenging applications. We design and supply sensors as well as test & measuring systems, and offer related services such as calibration, engineering and consultancy. Our main area of expertise is measurement of heat transfer and thermal quantities such as solar radiation, heat flux and thermal conductivity. Hukseflux is ISO 9001:2008 certified. Hukseflux sensors, systems and services are offered worldwide via our office in Delft, the Netherlands and local distributors.

Are you interested in this product?  
E-mail us at: [info@hukseflux.com](mailto:info@hukseflux.com)

## SR30 specifications

Measurand	hemispherical solar radiation
ISO classification	secondary standard pyranometer
Calibration uncertainty	< 1.2 % (k = 2)
Measurand	sensor tilt angle
Tilt measurement uncertainty	$\pm 1^\circ$ (0 to 90 °)
Heating	included
Ventilation	included
Standard operating mode	heated and ventilated
Power consumption	< 2.3 W at 12 VDC
Zero offset a	< 2 W/m <sup>2</sup>
Calibration traceability	to WRR
Calibration registers	accessible to users
Spectral range	285 to 3000 x 10 <sup>-9</sup> m
Rated operating temperature range	-40 to +80 °C
Temperature response	< $\pm 0.4$ % (-30 to +50 °C)
Temperature response test of individual instrument	report included
Directional response test of individual instrument	report included
Tilt sensor test of individual instrument	report included
Standard cable length	5 m
Rated operating voltage range	5 to 30 VDC

## Optional operation in low power mode

Operating condition	heater and ventilator [OFF]
Zero offset a	5 W/m <sup>2</sup> (unventilated)
Power consumption	< 0.1 W at 12 VDC

## Digital output

Output	- irradiance in W/m <sup>2</sup> - instrument body temperature in °C - tilt angle in ° - internal humidity in % - ventilator speed in RPM
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Communication protocol Modbus / over 2-wire RS-485

Transmission mode RTU

## Options

- spring-loaded levelling; a practical mount for easy mounting, levelling and instrument exchange on flat surfaces
- tube levelling mount with set of bolts
- longer cable; 10 and 20 metres
- 20 metres extension cable with 2 connectors



# SR30 next level digital secondary standard pyranometer

Nowadays, the best pyranometers are made by Hukseflux Thermal Sensors. This overview of features and benefits of SR30 gives you some of the reasons why! Whatever your application is, Hukseflux offers the highest accuracy in every class at the most attractive price level.



## Best data availability

- heated domes
- suppresses dew and frost deposition
- no external ventilator needed
- low power consumption



## Best measurement accuracy

- lowest zero offsets
- lowest calibration uncertainty
- best temperature dependence



## Best levelling

- window for visible bubble level
- with optional spring-loaded levelling mount
- easy mounting, levelling and instrument exchange



## Best paperwork

- all ISO required reports with every individual sensor
  - temperature response testing -30 to 50 °C
  - full directional response testing
    - tilt sensor testing



## Best diagnostics

- tilt angle
- humidity
- temperature
- ventilator speed (RPM)



## Best worldwide support

- efficient calibration support
- fast servicing organisation
- local stock of spare parts

