Hukseflux
Thermal Sensors

Pyranometer calibration – cost effective - worldwide

Customers prefer Hukseflux pyranometers because our affordable calibration services result in lowest total cost of ownership

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 helps you to reduce these costs. Pyranometer users prefer Hukseflux pyranometers for their unsurpassed measurement accuracy and their lowest total cost of ownership.

Worldwide calibration services

Did you know that Hukseflux offers worldwide calibration services for pyranometers? Users prefer Hukseflux instruments not only for their quality, but also for this cost-saving support.

Requirements of ISO, IEC and WMO

Quality management systems such as ISO 9001 require regular calibration of all traceable measuring instruments. IEC 61724-1, a standard covering PV system performance monitoring, requires pyranometer calibration every 2 years. The WMO manual, describing best practice in meteorological observations, requires the same.

Calibration determines cost-over-life

High-accuracy calibration of pyranometers is not easy. Also, high-accuracy calibration requires transport to a specialised service provider; it is therefore expensive. Hukseflux helps you to reduce costs.

A total cost of EUR 500 for handling, transport plus calibration is a realistic estimate for calibration of a single pyranometer with a better than 1.5 % uncertainty. Over a 15-year life, the cost of 7 calibrations totals EUR 3500 - comparable to the instrument purchase costs. We help you attain lowest total cost of ownership in 2 ways:

- Hukseflux has calibration facilities in the main global economies. In many cases it is possible to avoid cross-border transport, and all associated paperwork, for example to get permission for tax-free export and import
- attractive quantity discounts

Figure 1 *Pyranometer users are supported by the worldwide Hukseflux calibration and servicing organisation.*

Figure 2 *Calibration of all major pyranometer brands and models.*

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Pyranometer and pyrheliometer calibration service capabilities

Table 1 *Hukseflux' most popular calibration services.*

HUKSEFLUX' MOST COMMON CALIBRATION SERVICES			
calibration item	**brand and model**	**calibration method**	**comment**
pyranometers, albedometers and pyrheliometers	Hukseflux LP, SR, DR series Kipp & Zonen CMP, SMP, CHP, SHP series	Pyranometers: conform ISO 9847:2023 Solar energy - Calibration of field pyranometers by comparison to a reference pyranometer, type A1 (1 albedometer = 2 pyranometers) Pyrheliometers: Internal method DRC, similar to pyranometer calibration.	Hukseflux has limited repair capability for other-than-Hukseflux-brand sensors.
amplifiers	Hukseflux –TR amplifiers Kipp & Zonen AMPBOX series	Calibration and re-programming.	

Checklist / requirements for recalibration of pyranometers and pyrheliometers

Table 2 *Checklist for calibration services.*

HUKSEFLUX CALIBRATION SERVICES		
subject	**responsible party**	**Responsibility**
contact our Service desk / Service form	customer	Before service, contact service@hukseflux.com. Complete the Service (RMA) form and email it to us. We need to know the sensor model(s), quantity and serial number(s), the sensor condition, and information what servicing is needed; this may not only be calibration but also repair.
prices / quantity discounts	customer and Hukseflux	Increase efficiency; ask for our quantity discounts for batches of 3 or more pyranometers of the same make and model in one order. Please note that your shipment costs per instrument also benefit from batch processing. Cost of calibration for other-than-Hukseflux-brand sensors may be higher than that of Hukseflux brand sensors.
calibration: list of permissible sensors	customer	Hukseflux can calibrate all of the Hukseflux brand, except for DR01 with serial number < 8200 and the discontinued model DR03. In case of other-than-Hukseflux-brand sensors only: transmit the brand name and a scanned copy of the previous calibration certificate. Hukseflux may (not) be capable of calibrating your sensor. Wait for our reply. We can calibrate the following pyranometer models of the Kipp & Zonen brand: CMP10, CMP11, CMP21, CMP3, CMP6, SMP10, SMP11, SMP21, SMP3, SMP6 - produced after 01-01-2008 and the following pyrheliometer models of the Kipp & Zonen brand: CHP1, SHP1 - produced after 01-01-2011 Please contact us in case your sensor is produced before the production dates mentioned above.
options	customer	As an option, you may order a certificate including your name and contact information.
logistics: supply	customer	Specify shipment responsibility. Usually the customer will be responsible for shipment both ways.
quotation	Hukseflux	The quotation will include a reference number. Possibly, in case of unclear condition of the sensor, the quotation includes a diagnostics fee. This fee must also be paid in case the sensor is irreparable. In case sensors are not clean, a cleaning fee may be charged per sensor.
order	customer	Include the Hukseflux reference number (usually our quotation/proforma invoice number)
confirmation	Hukseflux	Hukseflux will issue a confirmation with an estimated delivery time
calibration	Hukseflux	Typical processing time is 15 working days. This can be shortened upon request.
logistics: pickup	customer	Please follow Hukseflux shipment directions.

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Figure 3 *A typical calibration system at Hukseflux.*

Services: what we do

- perform accurate calibration of solar radiation sensors
- work according to established standards
- calibrate major brands
- in EU and USA we also calibrate pyrheliometers

Albedometer calibration

An albedometer consists of 2 pyranometers mounted back-to-back. At Hukseflux we disassemble the albedometers en calibrate the two pyranometers individually. After that we put the albedometer back together again.

Capabilities and restrictions

See the tables on the previous page for solar sensor calibration capabilities and restrictions. Please contact us for more details. In case other-than-Hukseflux brand sensors need extensive servicing or repair which cannot be performed by the end user, we recommend obtaining this service from the manufacturer.

Certificate

With its products or as part of calibration services, Hukseflux Delft issues calibration certificates with content limited as per ISO/IEC 17025-7.8.1.3. Such a certificate contains the calibration result, an uncertainty, a description of the calibration procedure and the traceability. In case an earlier certificate is supplied with the instrument, we include a reference in our calibration certificate to this earlier certificate. As an option, a certificate including name and contact information of the customer may be ordered.

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. Customers are served through the main office in the Netherlands, and locally owned representations in the USA, Brazil, India, China, Southeast Asia and Japan.

Would you like more information?
E-mail us at: info@hukseflux.com