

# Calibration services

Hukseflux calibration services at your disposal

*Hukseflux is a leading manufacturer of heat flux sensors, pyranometers and thermal conductivity measuring systems. Our calibration expertise is at your disposal.*

## Introduction

Hukseflux' main area of expertise is measurement of heat transfer and thermal quantities. We are known as a leading manufacturer of heat flux sensors and radiometers. Did you know that Hukseflux offers calibration services as well?

## Services: what we do

- perform accurate calibration of heat flux, solar radiation, and longwave radiation sensors
- work according to established standards

## Why work with us

- well established and traceable calibration methods
- fast turnaround times
- including uncertainty evaluation
- calibration references for many brands and models of pyranometers, heat flux sensors and amplifiers
- calibration facilities in the EU, USA, Japan, China and Brazil

## Restrictions

- Hukseflux is ISO 9001 certified, but not an accredited testing and calibration laboratory according to ISO 17025. In some applications, for example in fire testing, end users may require accredited calibration for their local reference measurement standard.

- Hukseflux can calibrate sensors of other than Hukseflux brands. However, Hukseflux is not able to perform diagnostics and service of sensors of those brands. In case other-than-Hukseflux brand sensors need extensive servicing or repair which cannot be performed by the user, we recommend obtaining this service from the manufacturer.
- Not all brands offer access to the internal program running on their digital sensors. In case access to the sensor software is not allowed, Hukseflux will generate a "correction factor", specifying the ratio of the sensor output according to the new calibration to the output given by the sensor. It is up to the user how to treat this factor. It may be implemented into the SCADA system in which the sensor is applied. In case the correction factor differs less from the ideal factor 1 than the calibration uncertainty, most users will choose not to correct their data.

## Certificate

With its products or as part of calibration services, Hukseflux 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.



**Figure 1** calibration of all major pyranometer brands



**Figure 2** calibration certificate with each sensor documenting traceability and uncertainty evaluation

## Sensor calibration service capabilities

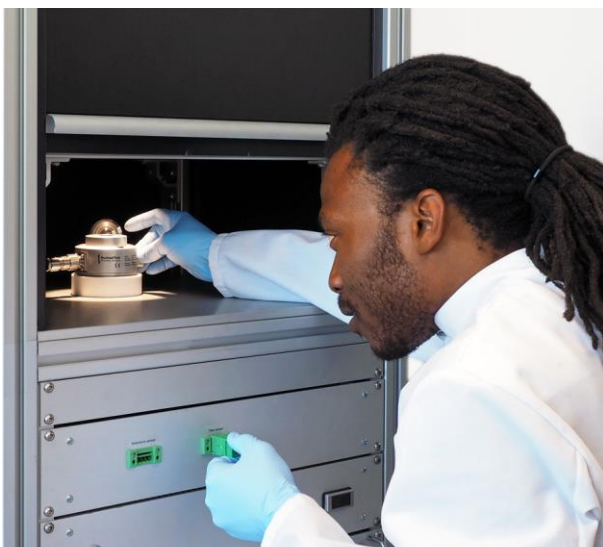
**Table 1** Hukseflux calibration services

<b>HUKSEFLUX CALIBRATION SERVICES</b>			
<b>calibration item</b>	<b>brand and model</b>	<b>calibration method</b>	<b>comment</b>
heat flux sensors (high flux)	Hukseflux SBG series  Medtherm Schmidt Boelter and Gardon type sensor	ISO TS 14934 Fire tests - calibration of heat flux meters - Part 3 secondary calibration method. Transfer calibration by comparison to a secondary standard under a radiant source calibration may be performed at multiple flux levels, also for one sensor. Calibration up to $200 \times 10^3 \text{ W/m}^2$	Hukseflux is not an ISO 17025 accredited laboratory; users may need calibration of their local reference measurement standard at an accredited laboratory for certified fire testing: <a href="https://www.ri.se/en">https://www.ri.se/en</a>  Hukseflux' calibration reference standard is calibrated up to $75 \times 10^3 \text{ W/m}^2$
heat flux sensors (low flux)	Hukseflux HFP series	Hukseflux internal method HFPC. This method is validated against ASTM C1130 Standard Practice for Calibrating Thin Heat Flux Transducers	
pyranometers	Hukseflux LP, SR series  Kipp & Zonen CMP, SMP series	ISO 9847:1992 Solar energy - Calibration of field pyranometers by comparison to a reference pyranometer ASTM G207 - 11 Standard Test Method for Indoor Transfer of Calibration from Reference to Field Pyranometers	Servicing and repair or desiccant replacement of other-than-Hukseflux brands cannot be carried out by Hukseflux Reprogramming the SMP-series sensors cannot be carried out by Hukseflux; the user obtains a correction factor.
pyrheliometers	Hukseflux DR series	Hukseflux internal method DRC. This laboratory-developed method is validated against ISO 9059:1990 Solar energy - Calibration of field pyrheliometers by comparison to a reference pyrheliometer and ASTM E 816 Standard Test Method for Calibration of Pyrheliometers by Comparison to Reference Pyrheliometer	
pyrgeometers	Hukseflux IR series  Kipp & Zonen CG series	Hukseflux internal laboratory-developed method IRC. Under a blackbody source relative to a reference traceable to WRR. For other-than-Hukseflux brand sensors: under outdoor clear sky conditions relative to a reference traceable to WRR	There is no standard practice available from ISO or ASTM for pyrgeometer calibration
net radiometers	Hukseflux NR01	See pyranometers and pyrgeometers	NR01 consists of 2 pyranometers and 2 pyrgeometers
thermal conductivity sensors and measuring systems	Hukseflux TP, THA, TH1, FTN, MTN series	Separate calibration of electronics and probe / measuring system.	Quotations and description of calibration method on request
amplifiers	Hukseflux -TR amplifiers  Kipp & Zonen AMPBOX series	Calibration and re-programming. Calibration traceable to traceable voltage and current standards.	

## Checklist / requirements for recalibration of sensors

**Table 2** Checklist for calibration services

<b>HUKSEFLUX CALIBRATION SERVICES</b>		
<b>subject</b>	<b>responsible party</b>	<b>responsibility</b>
RMA form	customer	Products and calibration items may only be returned or sent for calibration to Hukseflux after obtaining a Return Materials Authorisation and the accompanying RMA number. To obtain such authorisation, please request and complete the RMA form and e-mail it to <a href="mailto:info@hukseflux.com">info@hukseflux.com</a> . A completed RMA form contains the sensor model(s), quantity and serial number(s), the sensor condition, in particular if additional servicing is needed or not.
list of permissible sensors	customer	Hukseflux can calibrate all sensors of the Hukseflux brand. In case of other-than-Hukseflux brand sensors only: transmit the brand name and a scanned copy of the original calibration certificate. Hukseflux may not be capable of calibrating your sensor. Wait for our quotation. We can calibrate the following pyranometer models of the Kipp & Zonen brand: CMP/SMP 10, 11, 21 produced after 01-01-2008 or calibrated at the manufacturer with the following references: CMP21 70114 and 70115 CM/CMP/SMP 3, 4, 6 produced after 01-01-2006 or calibrated at the manufacturer with the following references CMP6 910012, CMP3 60193 and 71176 and the following pyrhemliometer models of the Kipp & Zonen brand: CH/CHP/SHP 1, only produced after 01-01-2011 or calibrated at the manufacturer with the following references: CHP1 ref 1 and ref 2. We can calibrate most heat flux sensors (gardon gauges and Schmidt-Boelter gauges) of the Medtherm brand; please supply us with the model number and a photograph. Other sensors are treated on a case-by-case basis.
references	customer	Only if different-than-usual calibration reference condition are required: specify required calibration reference conditions.
logistics: supply	customer	Specify shipment responsibility. Usually the customer will be responsible for shipment both ways.
quotation, RMA authorisation, RMA number	Hukseflux	The quotation will include an RMA 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 RMA number.
calibration	Hukseflux	A typical calibration has a processing time of 15 working days. This can be shortened upon request.
logistics: pickup	customer	Please follow Hukseflux shipment directions.



**Figure 3** a typical calibration system at Hukseflux

### About Hukseflux

Hukseflux Thermal Sensors offers measurement solutions for the most challenging applications. With our laboratory facilities, we provide testing services including material characterisation and calibration. Hukseflux is ISO 9001:2015 certified. Hukseflux sensors, systems and services are offered worldwide via our office in Delft, the Netherlands and distributors in your region. Contact Hukseflux for calibration. If we cannot offer you an acceptable solution ourselves, we will tell you who can.

Would you like more information?  
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