

**HUKX**

Sensor  
Technology

Brochure

Ultra-sensitive heat flux plate

**HFP03**

# HFP03

## Ultra-sensitive heat flux plate

heat flux sensor

HFP03 is an ultra-sensitive sensor for measurement of small heat fluxes in the soil as well as through walls and building envelopes. The total thermal resistance is kept small by using a ceramics-plastic composite body.

See also model [HFP01](#). Putting several HFP01 sensors electrically in series is an alternative for using HFP03.

Figure 1 HFP03 ultra-sensitive heat flux plate.

Figure 2 Opposite side of HFP03, which has a blue colored cover.



## Introduction

HFP03 measures heat flux through the object in which it is incorporated or on which it is mounted, in  $W/m^2$ .

HFP03 is specifically suitable for measurement of small flux levels, in the order of less than  $1 W/m^2$ , for instance in geothermal applications. The sensor in HFP03 is a thermopile. This thermopile measures the temperature difference across the ceramics-plastic composite body of HFP03. A thermopile is a passive sensor; it does not require power.

Using HFP03 is easy. It can be connected directly to commonly used data logging systems. The heat flux in  $W/m^2$  is calculated by dividing the HFP03 output, a small voltage, by the sensitivity. The sensitivity is provided with HFP03 on its calibration certificate.

## Calibration

HFP03 calibration is traceable to international standards. The factory calibration method follows the recommended practice of ASTM C1130.

## Standards

HFP03 can be used for on-site measurement of building envelope thermal resistance per unit area (R-value) and thermal transmittance (U-value) according to the standardized practices of ISO 9869, ASTM C1046 and ASTM 1155.

## Uncertainty evaluation

The uncertainty of a measurement with HFP03 is a function of:

- sensor properties
- calibration uncertainty
- measurement-related uncertainties, for example uncertainty caused by the temperature dependence of the sensitivity

The user should analyze his own experiment and make his own uncertainty evaluation.

More information can be found in the HFP03 manual.

## Suggested use

- extremely small heat fluxes
- geothermal heat flux

## Options

- longer cable, in multiples of 5 m, cable lengths above 20 m in multiples of 10 m

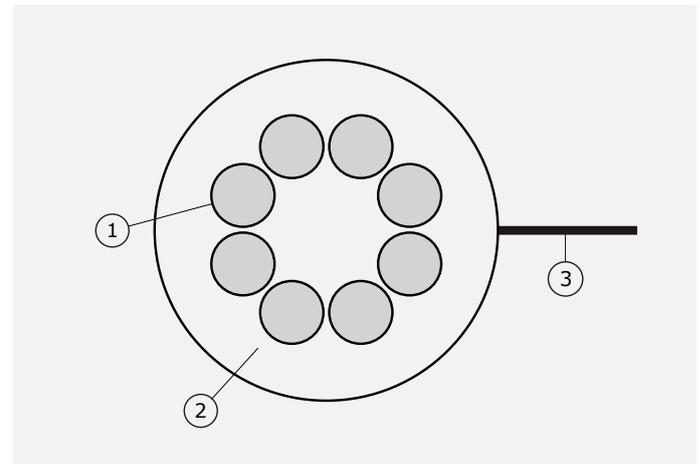


Figure 3 HFP03 heat flux plate:  
1. 8 x sensing area  
2. passive guard of ceramics-plastic composite  
3. cable, standard length is 5 m.

## See also

- Putting multiple [HFP01](#)'s in series creates a high-sensitivity measurement at a lower cost than when using HFP03. It also has the advantage of spatial averaging over a larger area.
- If measuring in soil, in case a high level of quality assurance and accuracy of the measurement is needed, consider use of model [HFP01SC](#).
- View our complete [range of heat flux sensors](#).

## HFP03 specifications

measurand	heat flux	rated operating temperature range	-30 to +70 °C
sensing area	$64 \times 10^{-4} \text{ m}^2$	IP protection class	IP67
sensor thermal resistance	$71 \times 10^{-4} \text{ K/(W/m}^2\text{)}$	standard cable length	5 m
sensor resistance range	10 to 32 $\Omega$	options	longer cable length (10, 15, 20, 30, 40 m)
sensor thickness	$5.4 \times 10^{-3} \text{ m}$		
uncertainty of calibration	$\pm 6 \% (k = 2)$		
measurement range	-2000 to 2000 $\text{W/m}^2$		
sensitivity (nominal)	$500 \times 10^{-6} \text{ V/(W/m}^2\text{)}$		

## 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](mailto:info@hukx.com)

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