PRODUCT GUIDE 2025

EKO
Beyond Accuracy.

Thermal Flux & Heat Flux Sensors

High Precision Instruments
for Thermal Analysis

2025

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Heat Flux

HF-01S

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HF-01S

New generation of Heat Flux Sensors

The HF-01S is a small size standard plate type heat flux sensor. It is an ideal option for research and engineering applications as well as manufacturing control and monitoring processes. Manufactured in compliance with standards **ASTM C1046** and **ISO 9869**, EKO HF-01S includes a built-in thermal guard and two facings to ensure an even heat flux distribution and therefore a reliable measurement experience. The unique combination of small size, thin body, and high sensitivity, makes this sensor a perfect choice for accurate measurement of heat flux, even in low heat flux conditions. Thanks to the thin body and high thermal conductivity, the thermal resistance is kept very low to minimize the heat flux disturbance on the surface and avoid edge losses.

Sensor Specifications

Nominal Sensitivity	50 µV/W/m²
Time Constant (63%)	0.7 sec
Thermal Resistance	2.3 x10^{-3} m² K/W
Electric Impedance	xxx
Operating Temperature Range	-30 to 80°C
Heat Flux Range	±10000 W/m²
Temperature Dependancy	0.02 %/°C
Dimensions (L x W x H)	25 x 24x 2.0 mm
Sensing Area	91 mm2
Guard Width	5x thickness of the sensor
Calibration Uncertainty	±3 % (K=2)
Ingress Protection	IP67
Cable Dimensions	3m (Diameter: 2.1 mm)
Extension Cable Options	10m, 20m (Separate Connector Included)
Accessories	Thermal Adhesive, Mounting Tape


EKO
HF-01S
HEAT FLUX SENSOR


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HF-01S
HEAT FLUX SENSOR


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HF-01S
HEAT FLUX SENSOR

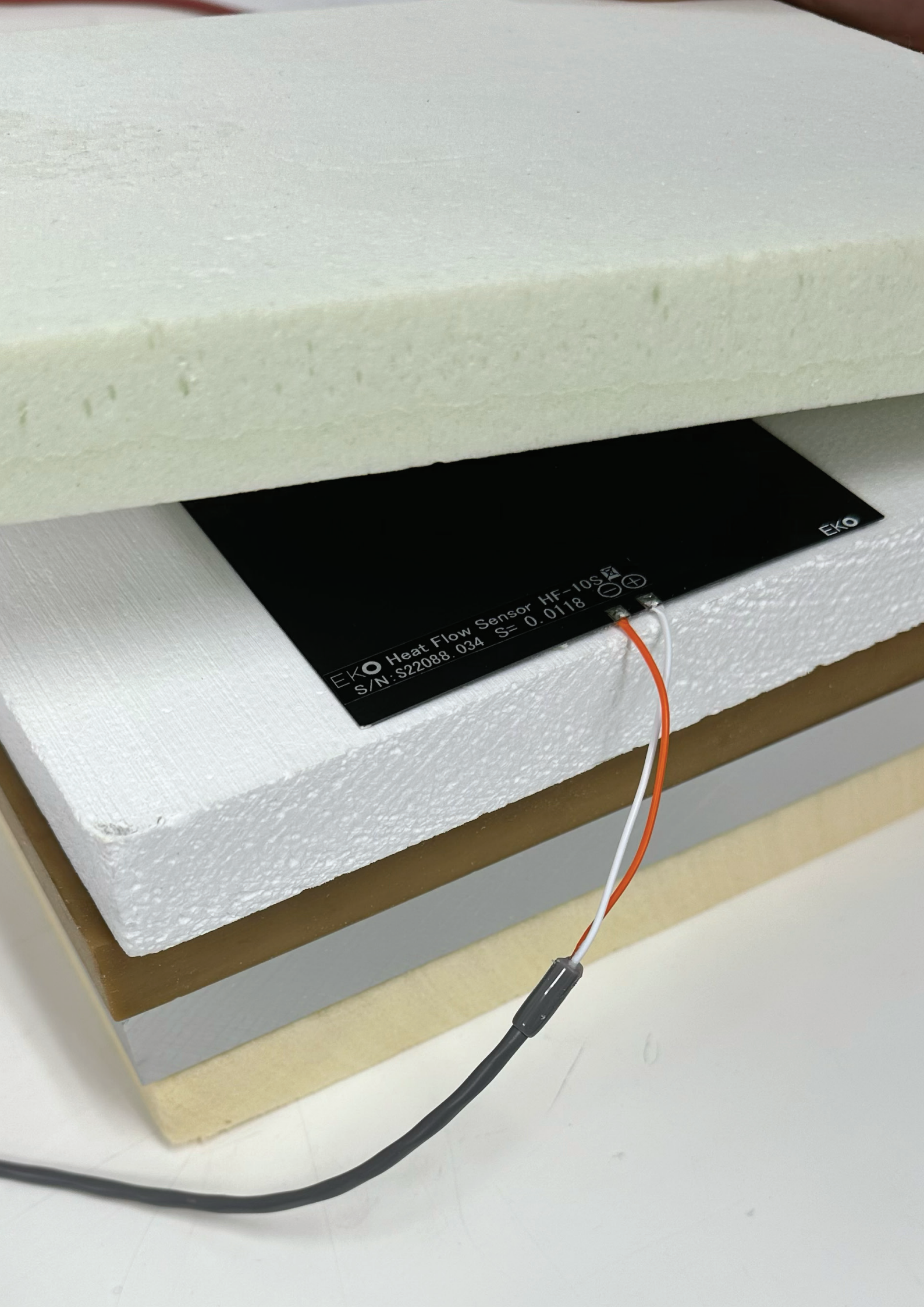
HF-10S

Thin Plate Heat Flux Sensor

The HF-10S, only 0.5mm thick, is a super-thin heat flux plate option for applications where the sensor's thermal resistance must be minimal, ideal for a variety of research applications and manufacturing control processes. The thin flat body of the sensor allows it to slide between layers of material to control and monitor heat flux. This includes insulation layer monitoring and heat flow management.

Sensor Specifications

Response time 95%	25 sec
Nominal sensitivity	12 µV/W/m²
Thermal resistance	0.0016 °C/(W/m²)
Impedance	90 to 180 Ω
Operating temperature range	-30 to 120°C
Cable lenght	10m (20 or 30m also available)
Dimensions (L x W x H) mm	100 x 100 x 0.5
Weight	0.04 kg
Substrate	Glass epoxy
Cladding	Epoxy
Ingress protection	-


EKO Heat Flow Sensor HF-10S
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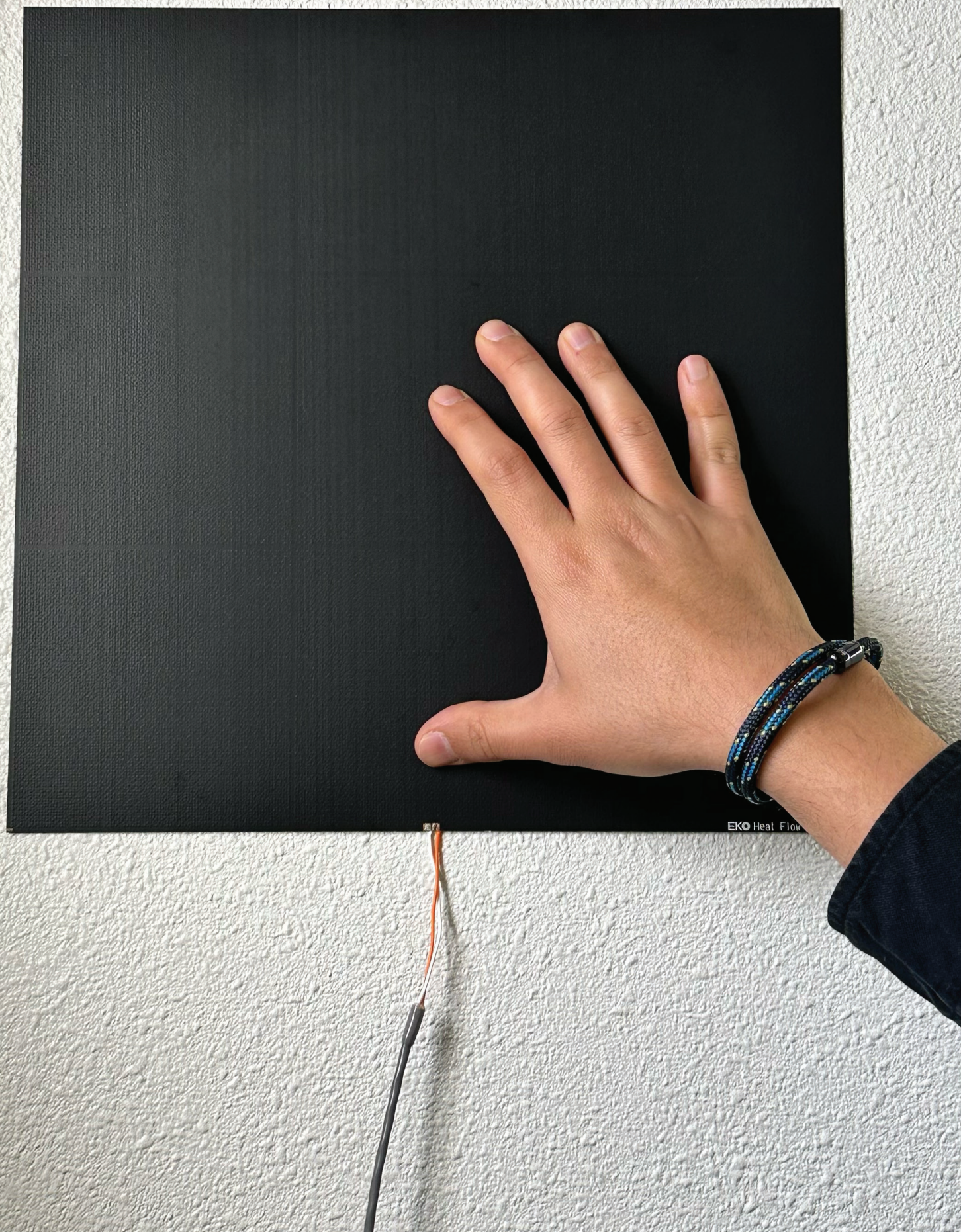
HF-30S

Extra Large Thin Plate Heat Flux Sensor

The HF-30S is a thin foil extra-large heat-flow sensor covering 30 x 30 cm². Its size ensures properly averaging the thermal distribution, minimizing the potential risk of missing local hot spot effects or thermal bridges. The sensor is used widely in applications such as Heat Flow Meter (HFM) Apparatus where large even area is monitored with heat flux changes. Thanks to the large area, the sensitivity of this senor is kept high.

Sensor Specifications

Response time 95%	28 sec
Nominal sensitivity	100 µV/W/m²
Thermal resistance	0.0016 °C/(W/m²)
Impedance	400 to 800 Ω
Operating temperature range	-30 to 120°C
Cable lenght	10m (20 or 30m also available)
Dimensions (L x W x H) mm	300 x 300 x 0.5
Weight	0.12 kg
Substrate	Glass epoxy
Cladding	Epoxy
Ingress protection	-


EKO Heat Flow

Thermal Analysis

QHT-10

HC-10

QHT-10

Thermal Monitoring Kit

The **QHT-10 Thermal Monitoring Kit** is a flexible heat flux and temperature monitoring solution, an ideal option for research and engineering applications as well as manufacturing control and monitoring processes.

Easy to set up and use, the QHT-10 comes housed in a weather-resistant case and is equipped with a long-life battery and an ultra-high-resolution data logger that can store up to 4 million data points.

Including EKO HF-01S Heat Flux Sensors and highly accurate 4-wire RTD Temperature Sensors, the QHT-10 comes in three configurations; the dual 'Heat Flux' model 'HH', the dual temperature model 'TT' and the mixed model 'HT'.

Sensor Specifications

Thermal Conductivity Range (VIP Sample)	0.001 to 0.015 W/m·K
Thermal Conductivity Range (Homogeneous sample)	0.03 to 5.00 W/m·K
Method	Non-static transient heating method
Calibration Requirements (VIP Sample)	3 or 4 reference samples of the same structure but different thermal conductivity
Calibration Requirements (Homogeneous sample)	3 or 4 different standard reference samples
Repeatability	± 5%
Evaluation	Thermal Conductivity of a sample can be classified (A, B or C) depending on the measurement result by setting TC thresholds (ⓟ1 & ⓟ2)
Operating Temperature Range	+10°C to +40°C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HF-01S
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HC-10

Quick λ Thermal Conductivity Tester

The **HC-10 Quick λ Thermal Conductivity** tester is super fast, reliable, and portable, designed to measure the thermal conductivity of a wide range of homogeneous samples and vacuum insulator panels (VIP) in only just 60 seconds.

It works by measuring heat loss at the surface layer against a standard reference sample with a known thermal conductivity value, or one measured by another thermal conductivity measuring device. By comparing the calibration curve based on the reference sample and the output value from the sensor, the HC-10 achieves unprecedented measurement results and repeatability. In contrast with most thermal conductivity testers taking more than hours to measure a sample, the HC-10 drastically shortens the testing and production time of VIP. It's a straightforward, but powerful tool in the lab, adding speed and accuracy to research and development.

Sensor Specifications

Number of measurement points 2	2
Logger operating temperature range	-40 to +90°C
Data storage	4 Million Data points
Datalogger battery life	Interval: >1min : 4 years - 10s : 230 days
Battery type of the data logger	Lithium type SL-750/S
Interface	USB to PC
Software	InfraLog 5
Measurement unit IP level	IP66, IP68
Transport case IP level	IP67
Weight (measurement unit)	0.335 kg
Weight (incl transport case)	1.55 kg
Dimensions (measurement unit)	113 x 80 x 60 mm
Dimensions (transport case)	270 x 240 x 120 mm


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Applications

Thermal Analysis of Glazing and Windows

PV Panel Monitoring

Building Physics

Insulation Monitoring

Thermal Analysis of Glazing and Windows

In the quest for energy efficiency, double glazing windows have globally become a popular choice for facade insulation. The performance of these windows however, can vary significantly due to factors such as thermal bridges, manufacturing defects, and installation quality decay. To optimize the insulation performance of windows, understanding the heat flux patterns across the window is crucial. EKO HF-01S is the perfect tool for performing full-scale measurements and understanding the pattern of heat flux on the surface of glazing.

Traditional methods like temperature measurement and IR thermography provide surface temperature data though fall short in offering a complete picture as well as the rate of heat transfer, missing critical insights into insulation performance. On the contrary, heat flux measurements using heat flux sensors provide precise and quantitative data regarding the heat transfer rate, allowing for the identification of weak points in insulation that might not be apparent through temperature measurement alone. By placing these sensors at strategic points, such as the center and edges of the window, one can find the heat flux mapping and gather detailed information on heat transfer patterns. Identifying insulation weak points with in-situ data promotes cost savings by pinpointing energy loss.

PV Panel Monitoring

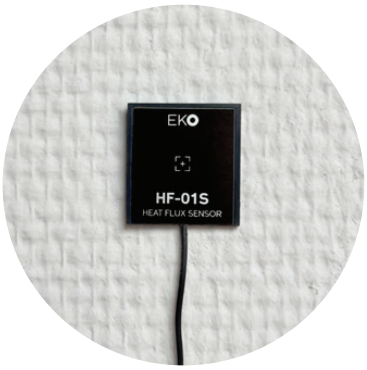
Promotion of energy conversion using renewable energy resources is essential for sustainability and environment. Photo- voltaic (PV) panels are for instance, widely used to convert solar power into electricity. This process generates significant amount of heat, which transfers to the surfaces on which the panels are installed. When it comes to PV panel monitoring, heat flux sensors therefore offer substantial benefits by providing a deep understanding of the thermal dynamics at play and can be key to thermal management.

By Installing a combination of sensors (EKO HF-01S, PT-1000 Temperature sensor, and EKO ML-02 Pyranometer) on a PV panel, the thermal performance of the panel can be depicted. The HF-01S sensors measure heat flux towards the roof and the heat flux from the back of the solar panel to capture the dynamaics and energy changes. Additionally, the HF-01S can capture the heat balance between the two surfaces (the back of the PV panel and the surface of the roof) and can be used for optimal thermal management such as insulation application and PV cooling.

Building Physics

"Rapid depletion of fossil fuels necessitates an enhanced focus on energy management in the field of built environment. Consequently, energy efficiency measures are being actively implemented and continuously developed. Among the critical threats related to energy conservation is the high levels of heat loss in buildings, which can be effectively quantified using heat flux sensors. EKO HF-01S heat flux sensor is used widely to measure the heat flux from or towards a surface of interest. It also aids in the precise determination of in-situ thermal resistance R-Value and thermal transmittance U-Value, which are known to often depart from their nominal values. This helps evaluate the insulation performance. Install the sensor on specific points, such as building façades, floors, roofs, doors, windows and any surface where the heat transfer rate is to be determined.

By capturing real-world conditions, heat flux sensors provide insights into the actual thermal performance of building components, aiding in informed decisions regarding energy efficiency improvements, insulation upgrades, and overall building envelope design. A wall's insulation level, for instance, can be evaluated qualitatively by observing the heat flux data on the surface."



Insulation Monitoring

In the process of quality control, when ensuring the thermal efficiency of insulated containers, pinpointing the exact areas of heat loss is crucial. While traditional temperature sensors and IR thermography barely provide basic insights, they often fall short in quantifying insulation problems accurately. EKO HF-01S heat flux sensor, however, excels in this domain. It not only measures the rate of heat transfer but can also help one to identify specific areas where insulation is compromised.

The traditional methods include monitoring internal temperature, which take significantly longer time to show small variations, despite the loss of insulation effects. This leads to a long delay and difficulties in addressing the insulation problems. Heat flux data on the contrary, shows significant difference, at multiple orders of magnitude, from the very beginning of the process, aiding in qualifying the insulation condition and quantifying the heat loss level. Such large deviations cannot be observed by IR camera or temperature sensors.

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