

**HUKX**

Sensor  
Technology

Brochure  
Industrial heat flux sensor

**IHF01**

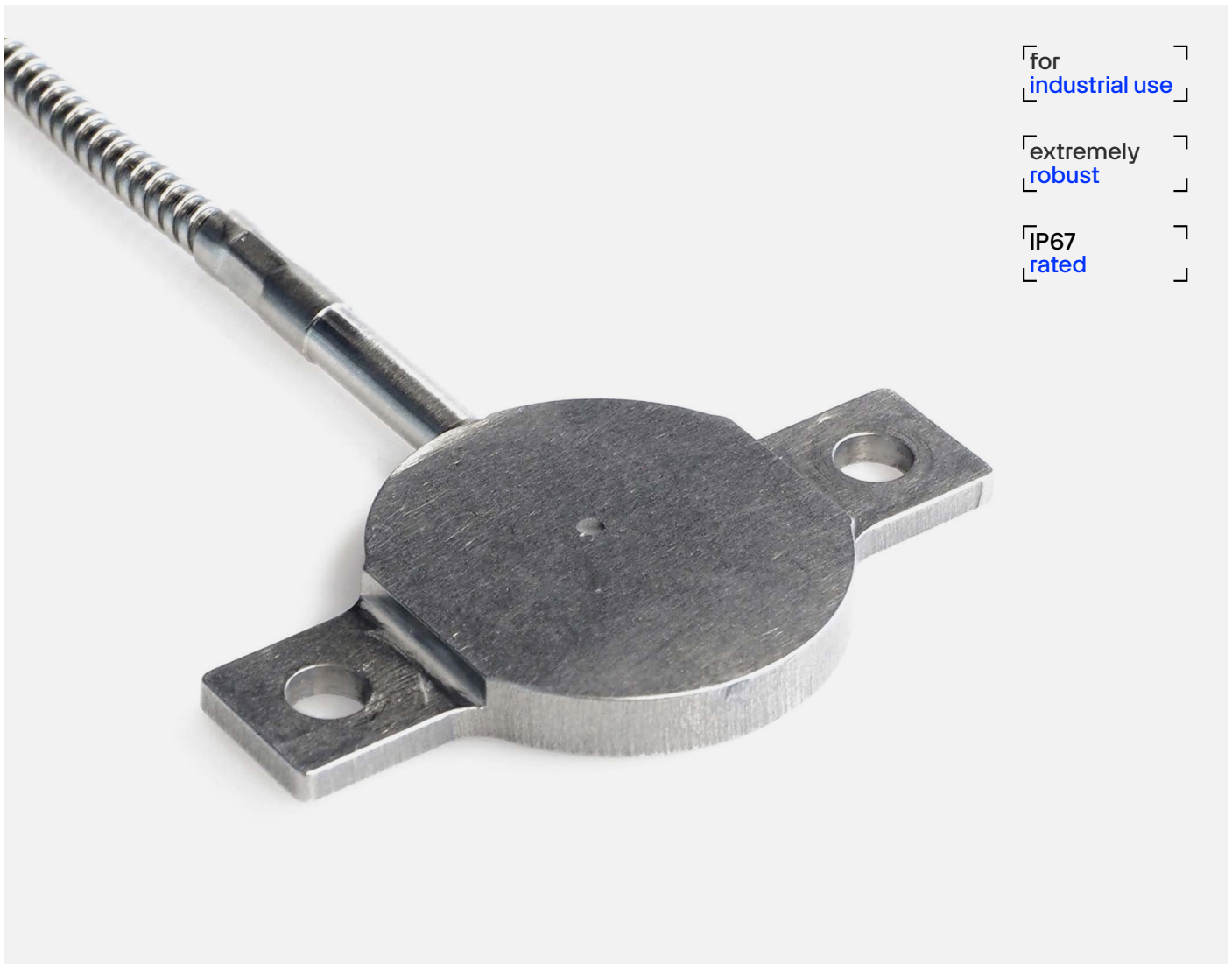
# IHF01

## Industrial heat flux sensor

IHF01 industrial heat flux sensor measures heat flux and temperature, typically in industrial high-temperature environments. IHF01 is waterproof, withstands high pressures and is extremely robust. With signal wires electrically insulated from the sensor body, it complies with industrial safety standards, such as CE and ATEX for explosive areas.

IHF01 is particularly suitable for trend-monitoring and comparative testing. The same technology can be used to manufacture heat flux sensors for different applications.

Figure 1 IHF01 industrial heat flux sensor.



## Introduction

IHF01 measures heat flux and surface temperature of industrial equipment like furnaces, boilers, fluidized beds, distillation columns and ovens. The sensors inside IHF01, a thermopile and a thermocouple, are protected by a fully sealed stainless-steel body. It is suitable for long-term use at one location as well as repeated installation when a measuring system is used at multiple locations. IHF01 measures heat flux through the object on which it is mounted, in  $W/m^2$ , as well as the temperature in  $^{\circ}C$ . The sensors in IHF01 are a thermopile and a type K thermocouple. The thermopile measures the local heat flux.

The thermocouple measures the absolute temperature of the surface on which HF01 is mounted, as well as the approximate sensor body temperature. A thermopile and a thermocouple are passive sensors; they do not require power. The part of the cabling closest to the sensor is a special high-temperature metal-sheathed cable with an interlocked spiral stainless-steel armor. The sensor as well as the high-temperature cable and armor withstand temperatures up to  $900^{\circ}C$ . The temperature range is reduced to  $650^{\circ}C$  in case the optional black coating is used. The low-temperature extension cable has a jacket of PTFE type plastic.



Figure 2 Example of an IHF01 industrial heat flux sensor mounted on a wall using tack-welded threads and spring-loaded bolts.

## Suggested use

Trend-monitoring and comparative measurement of heat flux and surface temperature in industrial installations.

## IHF01 advantages

- robust
- suitable for use at high temperatures
- IP protection class: IP67
- signal wires electrically insulated from the sensor body

## Operation

Using IHF01 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 IHF01 output, a small voltage, by the sensitivity.

The sensitivity is provided with IHF01 on its product certificate. Equipped with heavy duty cabling, and having a fully stainless steel casing so that moisture does not penetrate the sensor, IHF01 has proven to be very reliable. It survives long-term outdoor installation.

## Options

- longer cable  
(specify total cable length for both cable types in m)
- black coating
- EC type examination certificate (ATEX)  
II 2G Ex db IIC T6
- connector at IHF01 cable end
- low-temperature extension cable with 2 connectors,  
matching cable connector and chassis connector
- chassis connector with internal wiring  
(color code of wiring identical to cable color code)

## Trend-monitoring and comparative measurement

IHF01 is most suitable for relative measurements, i.e. monitoring of trends relative to a certain reference point in time or comparing heat flux at one location to the heat flux at another location. If the user wants to perform accurate absolute measurements with IHF01, as opposed to relative measurements, the user must make his own uncertainty evaluation and correction for systematic errors.

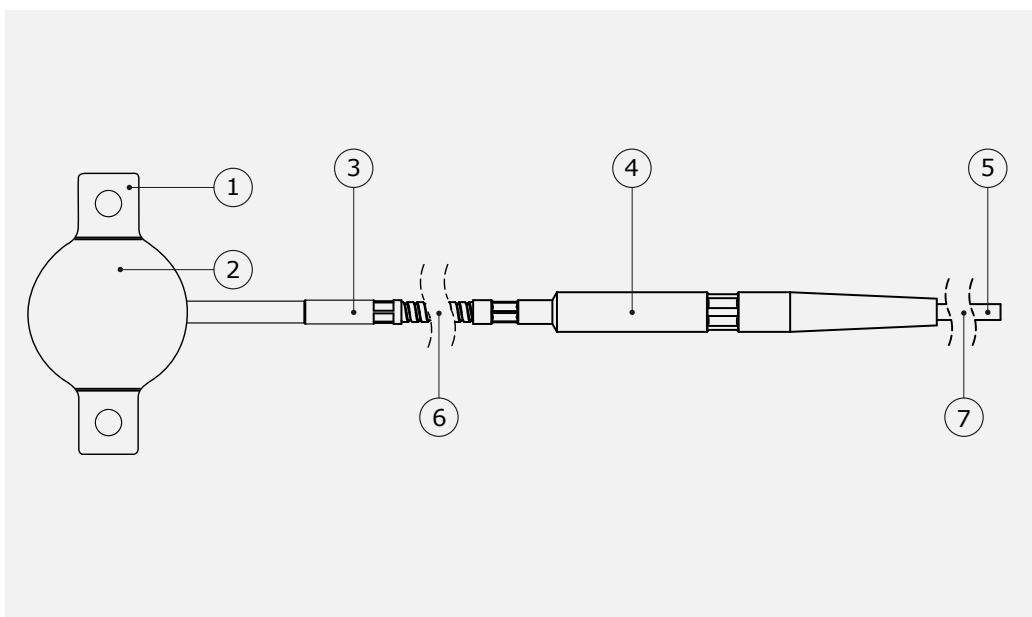


Figure 3 IHF01: the heat flux sensor consist of a stainless steel body (1) which is connected via a rigid stainless steel coupler (3) to a flexible high-temperature metal sheathed cable with interlocked spiral stainless steel armor (6). After a transition piece (4), wires are extended using a low-temperature extension cable (7). In the standard configuration, the cable ends in bare wires (5). Two mounting flanges (2) are attached to the body.

## Calibration

IHF01 calibration is traceable to international standards. The factory calibration method follows the recommended practice of ASTM C1130-17.

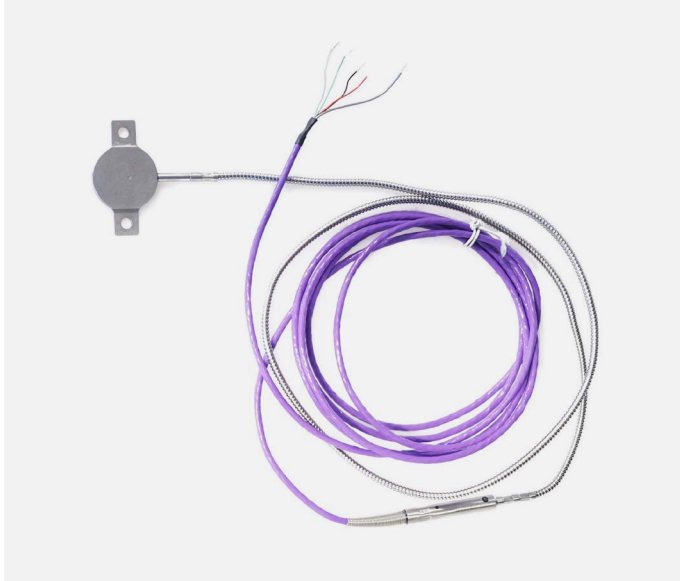


Figure 4 IHF01 as delivered in its standard configuration.



Figure 5 IHF01 with spring-loaded bolts for mounting on a well-prepared flat surface using tack-welded threads.

## See also

- model [HF05](#) for a heat flux sensor with a high sensitivity at a lower temperature range
- our complete [range of heat flux sensors](#)
- our [industrial heat flux sensors](#)

## IHF01 specifications

measurand	heat flux
measurand	temperature
heat flux sensor	thermopile
temperature sensor	thermocouple type K
sensitivity (nominal)	$9 \times 10^{-9} \text{ V}/(\text{W}/\text{m}^2)$
calibration traceability	to SI units
recommended number of sensors	2 per measurement location
measurement range	$(-1000 \text{ to } +1000) \times 10^3 \text{ W}/\text{m}^2$
rated operating temperature ranges:	
– sensor and high temperature cable	-30 to +900
– optional black coating	-30 to +650 °C
– low temperature extension cable	-30 to +240 °C
IP protection class	IP67
standard cable lengths:	
– high-temperature cable	1 m (see options)
– low-temperature extension cable	3 m (see options)
order code	IHF01 - high temperature cable length in m - low temperature extension cable length in m

## 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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