Hukseflux
Thermal Sensors

HTR01

Heater for calibration and verification of performance of FHF-type heat flux sensors

Hukseflux, the world market leader in heat flux sensors, simplifies heat flux sensor calibration. HTR01 is a heater with 4-wire connection with a known surface area and electrical resistance. It is used for calibration and functionality checks of FHF-type heat flux sensors. Users can now easily and objectively check their sensor performance before and after use. See also model FHF02SC heat flux sensor with integrated heater.

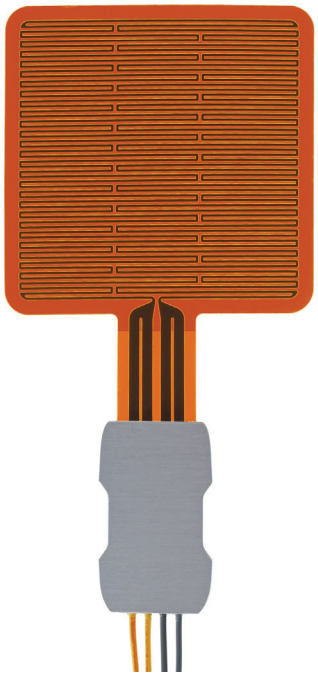

Figure 1 *HTR01 heater*

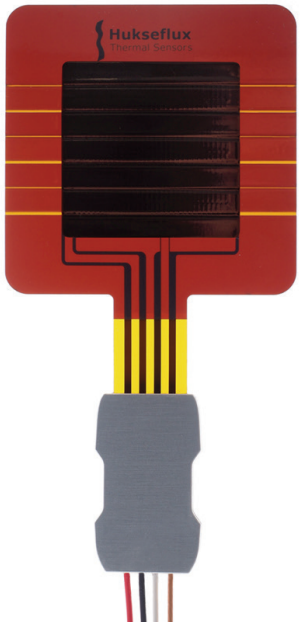

Figure 2 *FHF-type sensor, in this case model FHF02*

Introduction

Measuring heat flux, users may wish to regularly check their sensor performance. A quick check or if you like even a formal calibration is now possible with HTR01 plus some accessories that most laboratories will have in-house.
The HTR01 heater has a well characterised a traceable surface area and electrical resistance.

HTR01 is a foil heater. Either it can be used as a general-purpose heater or it can be used in combination with foil heat flux sensors such as FHF01 and FHF02 for test and calibration purposes. In a typical test setup as in figure 3, the heat losses through the insulation are typically smaller than 3 % and may be ignored. Measuring the heater power (voltage U_{heater} square divided by resistance Rh_{eater}), and dividing by the surface area A_{heater}, gives the applied heat flux. The heat flux sensor sensitivity S is the voltage output U_{sensor} divided by the applied heat flux.

$S = (U_{sensor} \cdot R_{heater} \cdot A_{heater})/U_{heater}^2$

The reproducibility of this test is much improved when using contact material between heater, sensor and heat sink.

Unique features and benefits

- makes it possible to perform a simple test
- guarantees sensor stability
- matches FHF-type heat flux sensors

Options

- longer wire length

See also

- model FHF02SC heat flux sensor with integrated heater
- model FHF02 general purpose heat flux sensor
- model FHF01 for increased flexibility
- view our complete range of heat flux sensors

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Calibration experiments

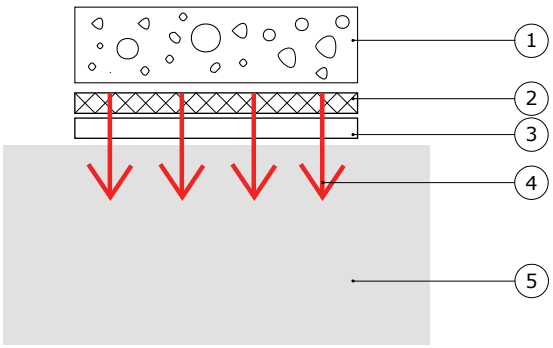

Figure 3 *Working with HTR01; a typical stack used for calibration consists of a block of metal (mass > 1 kg), for example aluminium (5), the heat flux sensor (3), the HTR01 (2) and an insulation foam (1). Under these conditions, heat losses though the insulation are negligible. Heat flux flows from hot to cold. Dimensions in x 10^{-3} m.*

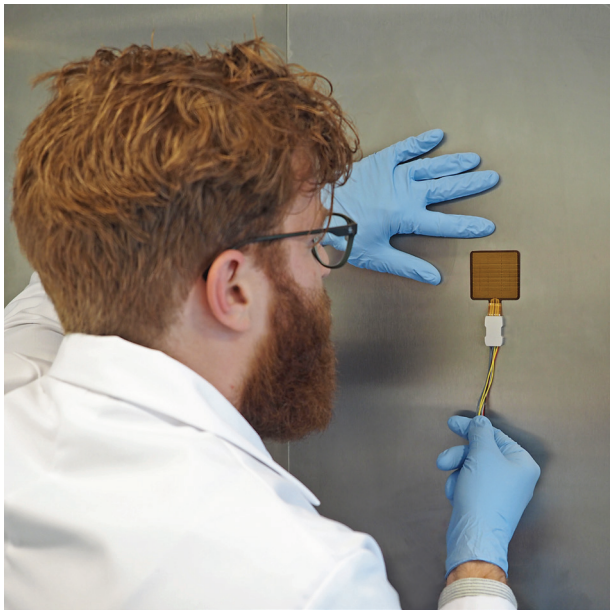

Figure 4 *Working with HTR01; application of HTR01 on an FHF-type sensor for performance verification.*

HTR01 specifications

Power supply voltage	12 VDC
Heater area	2062 x 10^{-6} m^2
Heater resistance range	100 Ω (nominal)
Heater thickness	0.1 x 10^{-3} m
Operating temperature range	-40 to +150 °C
Heater rated power supply	9 to 15 VDC
Standard wire length	2 m (2 x 2 wires)
Certificate	supplied with a certificate stating surface area in [m^2] and heater resistance in [Ω]
Requirements for testing	metal heat sink > 1 kg; power supply 12 VDC; 0.2 A; insulation material; voltage measurement; contact material such as glycerol or toothpaste
Options	longer wire length upon request

About Hukseflux

Hukseflux Thermal Sensors makes sensors and measuring systems. Our aim is to let our customers work with the best possible data. Many of our products are used in support of energy transition and efficient use of energy. We also provide services: calibration and material characterisation. Our main area of expertise is measurement of heat transfer and thermal quantities such as solar radiation, heat flux and thermal conductivity. Hukseflux is ISO 9001 certified. Hukseflux products and services are offered worldwide via our office in Delft, the Netherlands and local distributors.

Interested in this product?
E-mail us at: info@hukseflux.com