

RC01 RADIATION / CONVECTION (RADCON) HEAT FLUX SENSOR

The RC01 is a heat flux and temperature sensor for study of radiation, convection, and heat transfer in ovens, furnaces, baking and drying processes. The measurement result is often used as a characterisation of a "fingerprint" of oven settings, making it possible to compare or reproduce oven settings.

INTRODUCTION

RC01 consists of two heat flux sensors, the one covered by a gold reflector (only sensitive to convective transfer), the other by a black absorber (sensitive to radiative as well as convective transfer). A temperature sensor is integrated below the reflector.

The sensor can be delivered built into special heat sinks. Normally this is made of nickel; the most common type is RC01-M.

In case of RC01-M, the sensor is supplied with an external temperature sensor to determine the surrounding air temperature. By measuring the heat fluxes, sensor temperature and surrounding air temperature one is able to determine the local heat transfer coefficients.

SUGGESTED USE

- Drying kilns, baking ovens
- Continuous belt dryers

MORE INFORMATION / OPTIONS

Alternative designs: Hukseflux is specialised in heat flux sensor design, and can offer sensors with modified dimensions and specifications. RC01 can be equipped with water cooling.

RC01 GENERAL SPECIFICATIONS

Heat flux measurement:	1 black (absorber), 1 gold (reflective)
Temperature measurement:	type K thermocouple
Sensitivity:	3 $\mu\text{V}/\text{Wm}^{-2}$
Expected accuracy:	within +/- 10 %
Temperature sensor:	type K thermocouple
Response time:	0.5 s (1/e)
Temperature range:	0-250 °C
Heat flux range:	depends on sink temperature, typically 10kWm^{-2}
CE certification:	RC01 is CE certified

RC01 HEAT SINKS

RC01-M	RC01 on Nickel Heat sink with ambient air temperature sensor
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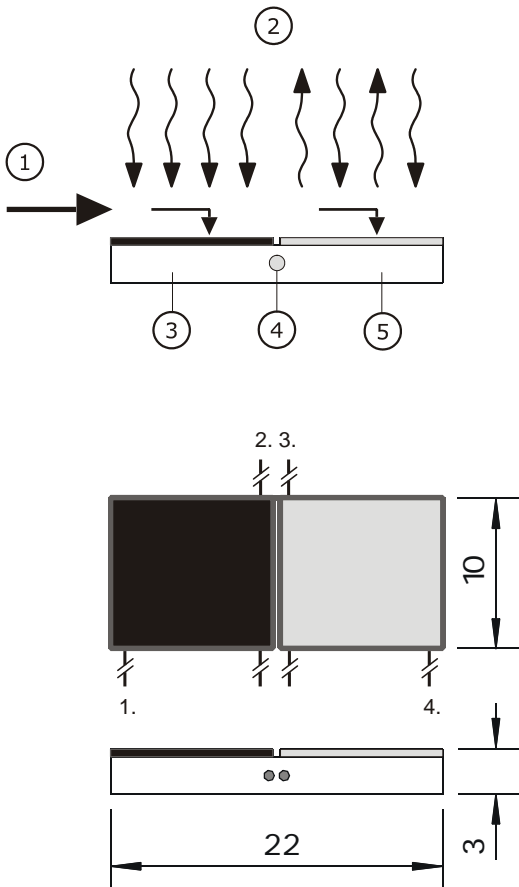


Figure 1 RC01 sensor dimensions. (22x10x3 mm)

1 convective heat

2 radiative heat

3 heat flux sensor with black absorber (emission around 0.85), which measures convective plus radiative heat.

4 temperature sensor (to measure sensor temperature)

5 heat flux sensor with gold reflector (emission depending on radiation spectrum, emission coefficient in the infra-red smaller than 0.05), which measures convective heat only.

1., 2. wiring of absorbent heat flux sensor

3., 4. wiring of reflective heat flux sensor

5., 6. wiring of type K thermocouple

The ambient air temperature sensor is not included in the picture.

Dimensions of RC01-M, including the heat sink are 65x65x13 mm.