THERMAL ANALYSIS INSTRUMENTS | SPECIFICATION SHEET

QRU-100

Thermal Monitoring Kit For Buildings

Overview

The QRU-100 is designed to make the thermal performance evaluation of buildings and its components easy, efficient, and accurate.

A critical requirement for modern construction, renovation, quality assurance, and energy efficiency assessment, the QRU-100 thermal monitoring kit includes separate indoor and outdoor measuring units. Indoor heat flux monitoring, together with indoor and outdoor temperature sensors, allow the QRU-100 to measure both thermal transmittance and thermal resistance, the U and R-Value of a wall or similar structure based on the standard methods defined in ISO 9869, ASTM C1046 and ASTM C1155.

The QRU-100 is delivered in a weather-proof case. Each measuring unit has a long-life battery and ultra-high resolution data-logger that can store up to 4 million data points, pre-configured and ready to use.

Features

- Pre-configured, quick set up & ready to go
- Tough carry case & Weather resistant housing
- Independent ultrahigh resolution data loggers in each unit
- Compatible with ISO 9869, ASTM C1046 & C1155 in-situ thermal measurement

Introduction

In-situ monitoring of heat flux and temperature is critical for assessing a building's thermal performance, supporting heat loss diagnosis as well as insulation quality evaluation. In turn, understanding thermal performance has, in light of climate and environmental concerns, never been more essential to the effective and efficient management of the built environment.

The QRU-100 Thermal Monitoring Kit for Buildings is designed for building inspectors, energy audit specialists, researchers, and energy advisors. It is easy to use, lightweight and comes pre-configured and ready to go; ready to deliver an accurate thermal behaviour overview of a building, its elements, and other relevant thermal systems such as hot boxes and climate chambers.

Dr. Ir. A. Rasooli
Research & Development, Heat Flux & Thermal Conductivity
EKO Instruments Europe

Operation

EuropeThe heat loss rate from an indoor space to the outdoor environment depends directly on the thermal transmittance, U-value, and thermal resistance, R-value of the components standing between the two. The two values can be measured using a heat flux sensor and two temperature sensors on either side of a building element, such as a wall or a window.

Compatible with global standards on measuring U and R-values, ISO 9869, ASTM C1046, and C1155, the QRU-100 is an accurate and flexible solution and, in contrast with other thermal monitoring products, the QRU-100 requires no cross wiring between the indoor and outdoor units. They each operate independently with their individual batteries and ultra-high-resolution data loggers.

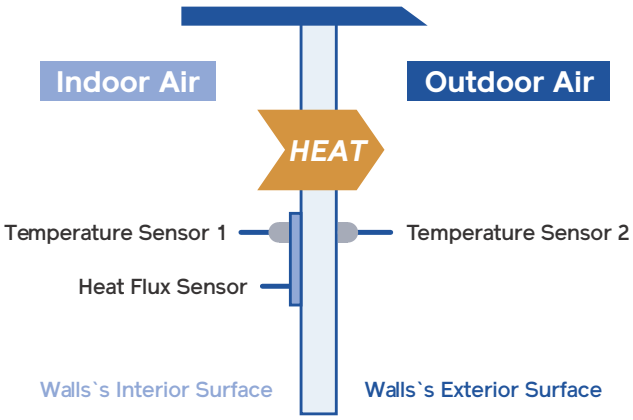


Figure 1.
Configuration for measurement of the R-value on a wall, using Indoor Unit (temperature sensor and one heat flux sensor) and the Outdoor Unit (temperature sensor).

Setting up the QRU-100 takes a matter of minutes. Simply select the area to measure, start the loggers, install the units on the wall (see. Figure 1) and leave the QRU-100 in-situ for 72-hours if you are measuring U and R-values, as instructed in the measurement standards and in the instructions manual.

Finally, download the data using the software provided. Professional users and auditors can then, following the methods detailed in ISO 9869 ASTM and C1155, analyze and calculate the result (see. Figure 2 and 3).

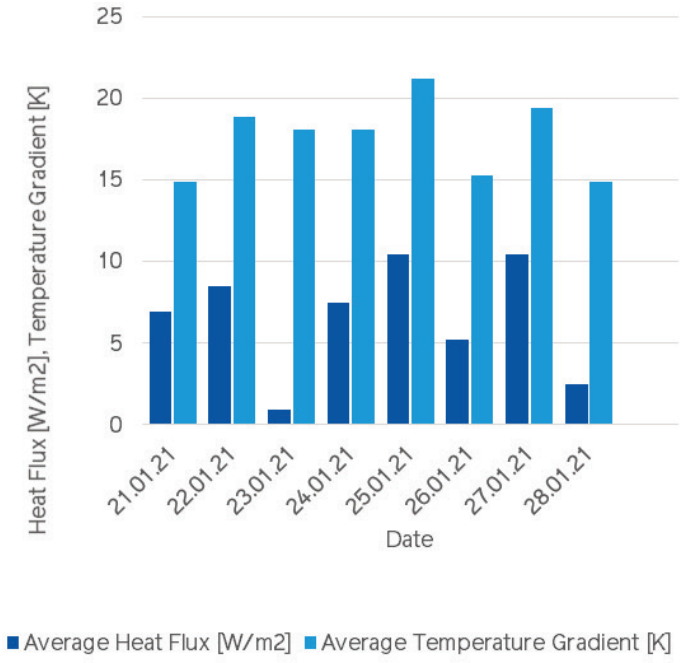
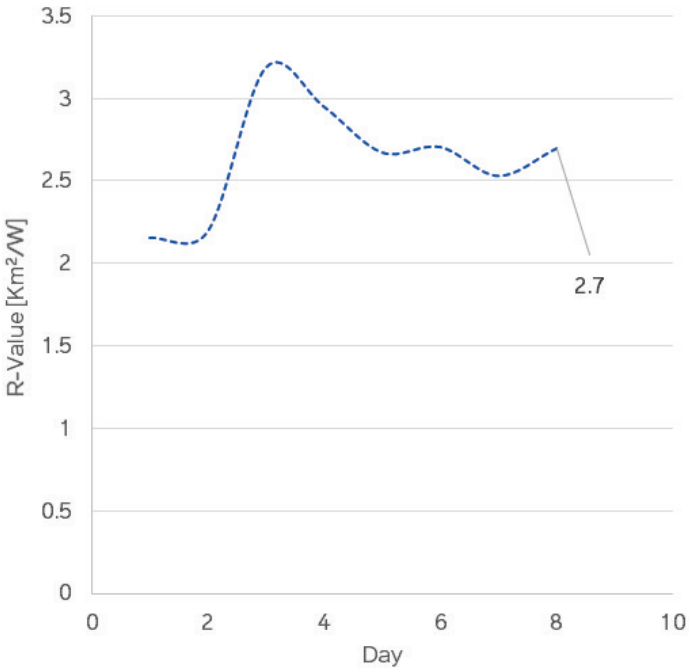


Figure 2.
Measurement results of QRU-100 on a wall, following the ISO9869 international standard.

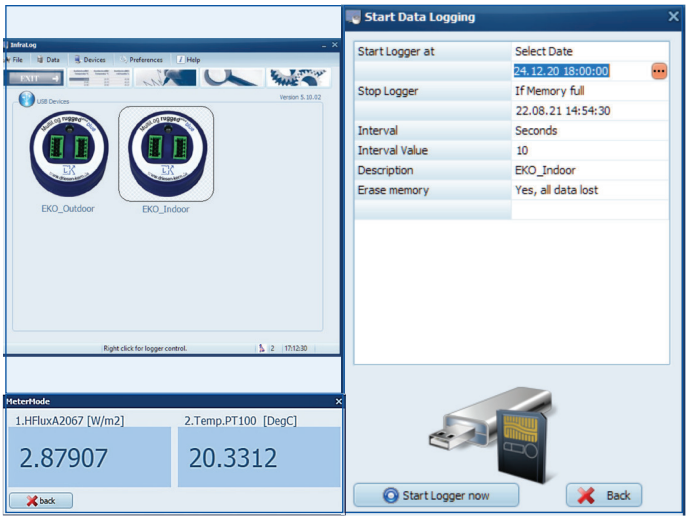


$$R = \sum_{t=0}^{t_D} \Delta T_t \Big/ \sum_{t=0}^{t_D} \dot{q}_t$$

R: Thermal Resistance [m2KW-1]
ΔT: Temperature gradient [K]
q̇: Heat Flux [Wm-2]
t: time step
t_D: Measurement Duration

Figure 3.
Determination of the R-value from the measurement data of heat flux and temperature gradient across the wall based on ISO 9869 Average method.

Software



QRU-100 data logger software is available from the EKO website. Simply download, install, and connect your QRU-100 loggers using the USB cables provided.

The software allows the user to edit the data acquisiton settings; set the startup time, the logging interval, and initiate monitoring.

Applications

The QRU-100 Thermal Monitoring Kit For Buildings is a flexible solution for calculating the U and R-Value of a wall or a similar structure.

Ideal for quality assurance after construction, heat loss and thermal comfort diagnosis, the QRU-100 can support construction companies and building managers to find energy saving opportunities, to optimise renovations, and to help determine accurate energy labels.

General Specifications

Unit dimensions (W x Lx H)	80 x 12 x 60 mm³
HFS model and type	EKO HF-01S Standard Heat Flux Sensor
HFS nominal sensitivity	55 µV/W/m²
Heat Flux range	10000 W/m²
Temperature sensor type	RTD PT-1000, 4-wire (x2)
Temperature sensor accuracy	1/10 DIN : ± 100°C : 0.1°C
Temperature range	±200°C
Software	InfraLog 5.0 - Basic
Power source	Battery: LITH12 (SL-750/S)
Cable length	3m Standard (optional)
PC connection	Mini USB Cable (Incl)
Accessories	Thermal pad (optional)

Learn More

Visit our website, contact our team, to find out more about the **QRU-100** Thermal Monitoring Kit for buildings, related products, and the full range of Class and industry-leading products from EKO.

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Made in Japan for over 90 years, EKO solar energy sensors and environmental instruments are built on a legacy of innovation, an uncompromising commitment to quality, and industry-leading accuracy.

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EKO Instruments Co. Ltd
info@eko.co.jp
+81 3 3469 6713

EKO Instruments Europe B.V.
sales-eu@eko-instruments.com
+31 0 703 050 117

EKO Instruments USA Inc.
sales-usa@eko-instruments.com
+1 408 977 7751

EKO Instruments Sales India
sales-in@eko-instruments.com
+91 986 904 7721

EKO Instruments Sales China
sales-asia@eko-instruments.com
+81 3 3469 6713

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