



Research Grade

Robust -
Requires little maintenance

Overview

The NR01* is a 4-component net-radiation sensor manufactured by Hukseflux that is used for scientific-grade energy balance studies. The instrument has separate measurements of solar (Short Wave or SW) and Far Infra-

Red (Long Wave or LW) radiation. Major improvements relative to comparable instruments include lower weight, reduced solar offsets in the LW signal and ease of levelling.

Benefits and Features

- › Internal resistive temperature detector (RTD) provides temperature compensation of measurements
- › Research-grade performance
- › Internal 1-W heater reduces formation of dew and melts frost
- › Separate outputs of short wave and long wave infra-red radiation for better accuracy and more thorough quality assurance
- › Robust - only requiring limited maintenance
- › Temperature sensor: PT100, users may also implement their own temperature sensor
- › Low weight
- › Ease of levelling
- › Reduced solar offsets
- › Has a built-in heater to prevent condensation
- › Calibration traceability: ITS90

Technical Description

The NR01 consists of a pyranometer and pyrgeometer pair that faces upward and a complementary pair that faces downward. The pyranometers and pyrgeometers measure short-wave and far infra-red radiation, respectively.

The NR01 includes an on-board RTD to measure the radiometer's internal temperature and a 1-W heater that minimizes the formation of dew and melts frost. To reduce current drain, a relay is typically used to turn on the heater only when the solar radiation is less than 20 W/m².

The NR01 standard cable length is 10 m. The cable can easily be installed or replaced by the user.

Campbell Scientific's CR6 and CR3000 dataloggers are ideal for measuring this radiometer. A CR1000 can also be used, but a 4WPB100 module is required to measure the internal RTD.

Please note that the NR01 is NOT compatible with our CR200-series, CR800 and CR850 dataloggers.

2-axis levelling is built into the sensor and a bubble level is fitted.

*The NR01 is manufactured by Hukseflux but cabled for use with Campbell Scientific dataloggers.

Mounting

To avoid shading or reflections and to promote spatial averaging, the NR01 should be mounted at least 1.5 m above the ground or crop canopy and away from all obstructions or reflective surfaces that might adversely affect the measurement. Campbell Scientific

recommends mounting the NR01 to a suitable mounting pole at least 8 m away from other mounting structures.

Specifications

- › Sensor: Hukseflux's SR01 ISO-class, thermopile pyranometer, IR01 pyrgeometer, PT100 RTD
- › Pyranometer Spectral Response: 305 to 2800 nm
- › Pyrgeometer Spectral Response: 4500 to 50,000 nm
- › Response Time: 18 s
- › Sensitivity Range: 10 to 40 $\mu\text{V W}^{-1} \text{m}^2$
- › Expected Output Range: -0.1 to +50 mV
- › Expected Accuracy for Daily Totals: $\pm 10\%$
- › Heater: 90 Ω , 1.6 W at 12 Vdc
- › Operating Temperature Range: -40° to 80°C
- › Dimensions: 26.3 x 11.3 x 12.1 cm (10.4 x 4.4 x 4.8 in)
- › Weight: 1.3 kg (2.9 lb) with 5 m cable; 0.9 kg (2 lb) sensor only
- › Heater Current Drain: ~140 mA
- › CE Compliance: CE compliant under the European Union's EMC Directive

Ordering Information

Research-grade Net Radiometer

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| 010504 | NR01 4-Component Net Radiation Sensor with standard 10 m cable |
| 010504-015 | NR01 4-Component Net Radiation Sensor with 15 m cable |
| 010504-025 | NR01 4-Component Net Radiation Sensor with 25 m cable |

Common Accessories

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| 4WPB100 | 100 ohm 4-Wire PRT Bridge Module for interfacing the NR01's RTD with a datalogger |
| 007924 | Radiation shield for NR01 |
| 007925 | NR01 replacement cable 15 metres |
| 010718 | CM204E Mounting Arm (120 cm) |
| 010719 | CM206E Mounting Arm (180 cm) |

