NR01

NET RADIOMETER

The NR01 is a research grade four-component net radiometer, intended for global energy balance studies. The instrument incorporates four separate sensors for measuring total global and surface reflected short-wave (SW) solar irradiance, and the down/up-welling far infrared long-wave (LW) radiation components.

Performance advantages of the NR01 Net Radiometer over competing models include: reduced instrument weight, decreased FIR sensor/pyrgeometer window thermal offset error, and an integrated two-axis leveling assembly for improved in-field level adjustment. The NR01 is suitable for measuring all four separate radiation components of the surface energy balance via a set (two each) of short-wave pyranometers and long-wave pyrgeometers. Employing entirely passive thermopile-based sensing technology, the NR01 generates four low level DC millivolt output signals proportional to the incoming and outgoing solar short-wave and FIR long-wave radiative flux. A PT100 RTD temperature sensor is integrated into the radiometer housing for accurate calculation of the sky and surface temperatures. The NR01 also incorporates an integrated heating element which can be cycled on for dew and frost deposition prevention (for improved LW measurement accuracy under adverse climate conditions). The NR01 signal cables can be easily installed and replaced by the user. The RA01 radiometer is a single sided version of NR01 Net Radiometer. In conjunction with short-wave albedo estimates and surface temperature, the RA01 is also suitable for net radiation estimation.

APPLICATIONS

- **Agrometeorology** *(evapo-transpiration)*
- **Climatology** *(global energy balance)*
- **Highway Safety** *(road surface temperature)*
- **Material Testing** *(insullation efficiency & material degradation)*

Note: Above applications are inclusive of, but not limited to the entire NR01 application range.

NR01 SPECIFICATIONS

Gereral Performance	
Signal range (SR01 Pyranometers):	0 to 2000 W/m²
Signal range (IR01 Pyrgeometers):	± 250 W/m² *(net signal)*
Response time (95%):	18 sec.
Non-linearity (to 1000 W/m²):	± 2.5%
Non stability (drift):	< 1% per year
Operating temperature:	-40 to +80° C
Temperature dependence:	< ± 0.1 %/°C
Temperature sensor:	PT100 *(w/optional temp. sensor ports)*
Cable length:	5 meter standard *(longer lengths optional)*

SR01 Pyranometers	
ISO classification:	Second Class
Spectral range:	305 to 2800 nm
Calibration traceability:	WRR *(World Radiometric Reference)*

IR01 Pyrgeometers	
Spectral range:	4500 to 50,000 nm
Window heating offset:	< 15 W/m² *(1000 W/m² solar loading)*

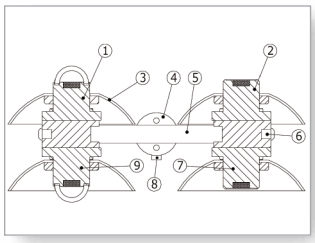

Figure 1: NR01 four-component net radiometer. SW solar radiation sensor or pyranometer (1, 9), LW Far Infra-Red radiation sensor or pyrgeometer (2, 7), radiation shield (3), leveling assembly for easy 'x' and 'y' axis adjustment (4, 5 and 8)

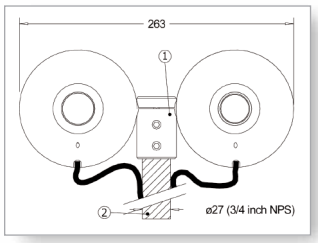

Figure 2: NR01 top view. Standard cable length is 5 m. Cable can be installed and replaced in-field by user. Easily attaches to 1" inch tube stock (2); mounting tube not included. All dimensions in mm.

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