

# CNR2

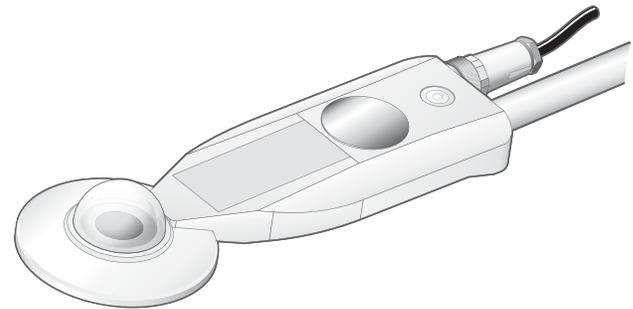
## Net Radiometer

Kipp & Zonen's CNR2 Net Radiometer measures the energy balance between incoming short-wave and long-wave infrared radiation versus surface-reflected short-wave and outgoing long-wave infrared radiation. It consists of a pyranometer and pyrgeometer pair that face upward and a complementary pair that face downward. The pyranometers and pyrgeometers measure shortwave and far infrared radiation, respectively. Field-of-view is 180 degrees for the upper pyranometer, and 150 degrees for the lower pyranometer. Both upper and lower pyrgeometers provide a 150 degree field-of-view.

The CNR2 uses drying cartridges to prevent condensation. Please note that the CNR2 is not compatible with our CR200(X)-series dataloggers.

### Mounting

To avoid shading and to promote spatial averaging, the CNR2 should be mounted at least 1.5 m above the ground and away from obstructions (see below). It can be attached to a vertical pipe or horizontal cross-arm (CM202, CM204, or CM206). To do this, first connect the radiometer to the 26127 Mounting Boom.\* The mounting boom then attaches to the pipe or cross-arm via the 26120 Net Radiation Sensor Mounting Kit. The kit includes adjustment screws for leveling the CNR2. Sensitivity is reduced when the radiometer is not level (see tilt-error in specifications).



### Ordering Information

#### Net Radiometer

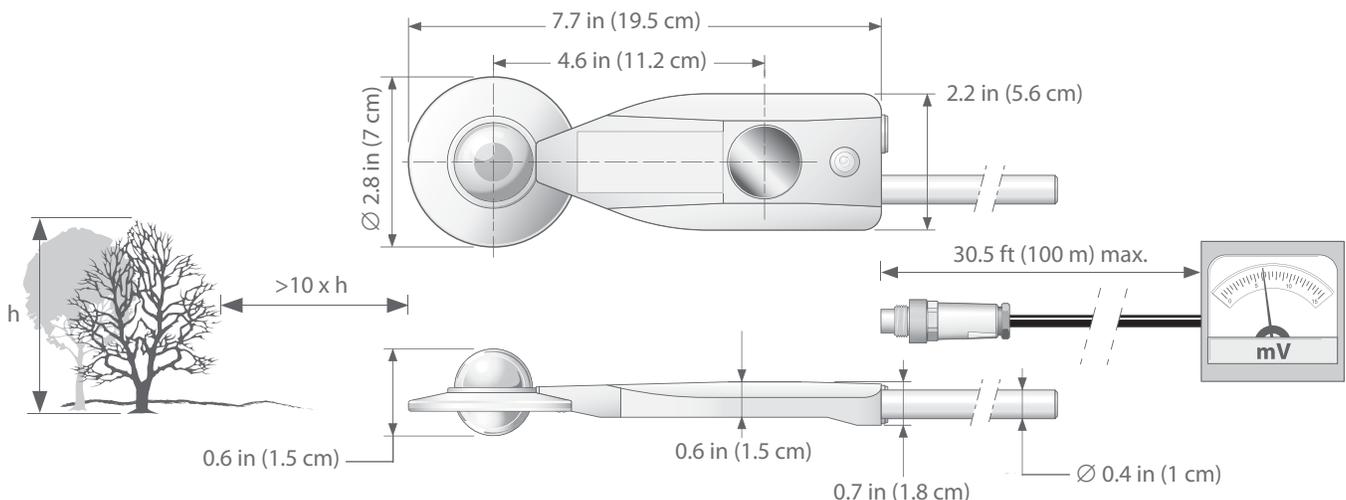
**CNR2 -L** Kipp & Zonen Net Radiometer. Shipped with a 26127 Mounting Boom, a WRR Traceable Calibration Certificate for the pyranometers, a WRR Traceable Calibration Certificate for the pyrgeometers, two drying cartridges, and a cable with a user-specified length. Enter the cable length, in feet, after the -L. Must choose a cable termination option (see below).

#### Cable Termination Options (choose one)

- PT** Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.
- PW** Cable terminates in connector for attachment to a prewired enclosure.

#### Accessories/Replacement Parts

- 26120** Net Radiation Sensor Mounting Kit.
- 20645** Replacement Drying Cartridges (limited shelf life); should be replaced every six months.



\*The 26127 Mounting Boom began shipping with the CNR2 in January 2010. If you purchased the radiometer before January 2010 or bought it directly from Kipp & Zonen, you need to purchase the 26127 Mounting Boom from Campbell Scientific in order to mount the CNR2 to a cross-arm or pole via the 26120 mounting kit.

## Specifications

### Spectral Response

Pyranometer: 310 to 2800 nm  
Pyrgeometer: 4.5 to 42  $\mu\text{m}$

**Response Time:** <10 seconds

### Temperature Dependence

**of Sensitivity:** <5% (-10° to +40°C)

**Sensitivity Range:** 10 to 20  $\mu\text{V W}^{-1} \text{m}^2$

### Output Range

Pyranometer: 0 to 50 mV  
Pyrgeometer:  $\pm 5$  mV

### Sensitivity Change

**per Year:** <1%

**Tilt Error:** <1%

**Uncertainty in Daily Total:** <10%

**Sensor Asymmetry:** <5%

**Directional Error:** <20  $\text{W m}^{-2}$  (pyranometer)

**Operating Temperature:** -40° to 80°C

### Weight

Radiometer: 8.8 oz (250 g)  
Cable: 10.6 oz (300 g) with 30 ft length

**Datalogger Requirements:** Two differential analog channels

**CE Compliance:** Conforms to the CE guideline  
89/336/EEC 73/23/EEC

