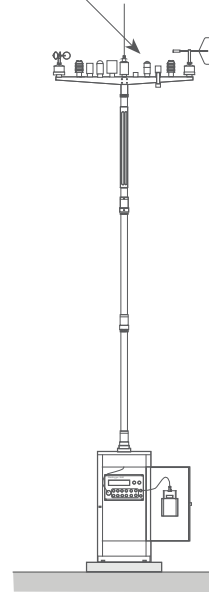




## Net Radiation Sensor 2811

*measures the difference between incoming and outgoing radiation at the Earth's surface. It is designed for use with Aanderaa Automatic Weather Station 2700.*



Net radiation is an important parameter in meteorological, climatological and agricultural studies. The 2811 sensor measures both sunlight and infrared radiation, and it is a standard sensor for the Aanderaa Automatic Weather Station 2700. It is rugged, stable and will operate under all weather conditions.

The sensor is cylindrically shaped with a teflon dome at one end, and a standard Aanderaa sensor foot with a six-pin receptacle at the other. The sensor housing is made of aluminum with a diameter of 50mm, and the overall length is 125mm.

Inside the sensor housing is the radiation detector. It has two surfaces which absorb/emit radiation, sensed by a thermistor-resistor network that form an electrical half-bridge. One surface is exposed to radiation and the other is shielded inside the sensor housing.

When operating, the radiation detector will be heated or cooled through the sensor housing and

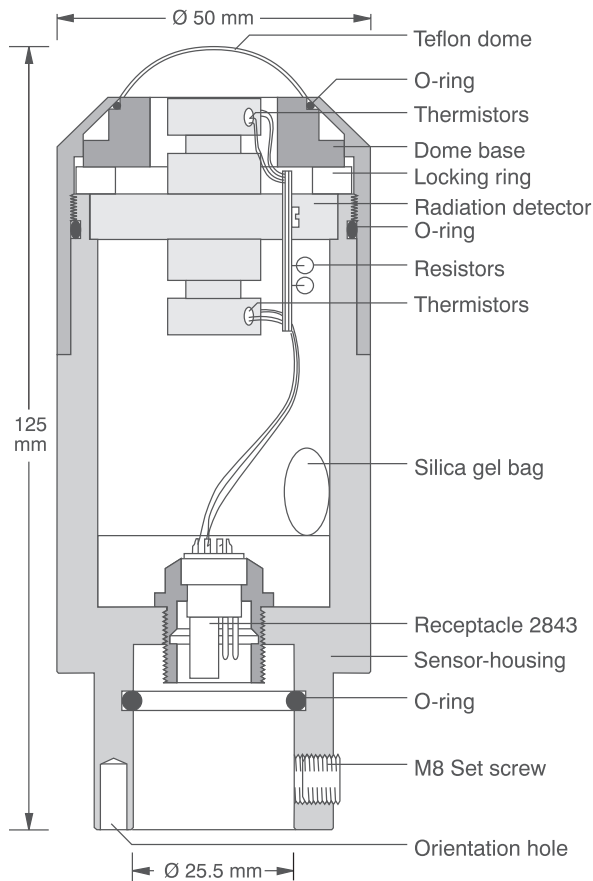
the dome. The network will sense the temperature difference between the two surfaces of the detector, giving a measure of radiation.

The teflon dome is more transparent to visible than to infrared radiation, and to compensate for this we made the radiation detector more sensitive to the infrared.

A full scale reading is caused by a temperature difference of only  $\pm 2.2^{\circ}\text{C}$  which eliminates the need for the double dome normally found on this type of sensor. The dome will protect the detector and also reduce inaccurate reading caused by wind. Due to the symmetrical design, the sensor is insensitive to changes in ambient air temperature.

The time constant for the sensor is 60 seconds, and the output signal is the Aanderaa VR-22 format. The teflon dome must be kept clean to maintain accuracy.

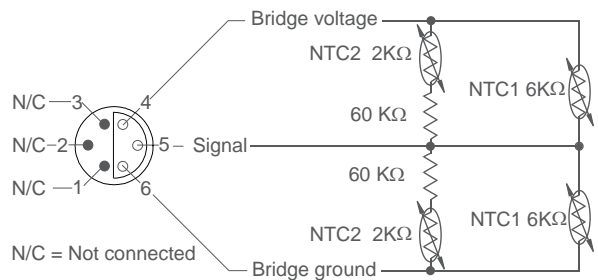
# Specifications 2811



**Wavelength:** 0.3 to 60 microns  
**Range:**  $\pm 2000 \text{ W/m}^2$   
**Accuracy:**  $\pm 1\%$  of full scale  
**Resolution:**  $4 \text{ W/m}^2$   
**Time Constant (63%):** 60 sec  
**Output Impedance:**  $2.5 \text{ k}\Omega$  at  $25^\circ\text{C}$   
**Sensor Output:** Aanderaa VR22  
**Operating Temp.:**  $-30$  to  $+50^\circ\text{C}$   
**Electrical Connection:** Six-pin Lemo receptacle mating  
 Watertight Plug 2828  
**Material and Finish:** Aluminum 6061-T6, anodized  
 10-15  $\mu$  and stainless steel  
**Dome:** Teflon  
**Weight:** 400 g  
**Warranty:** Two years against faulty materials  
 and workmanship  
 Certified  
**Approvals:**

## ELECTRONIC CIRCUIT

Receptacle, exterior view; bushing =  $\circ$ ; pin =  $\bullet$



NTC1: Thermistor Unicurve 6 k $\Omega$  at  $20^\circ\text{C}$   
 NTC 2: Thermistor Unicurve 2 k $\Omega$  at  $20^\circ\text{C}$

## CALIBRATION Serial No:

The sensor is calibrated connected to a Datalogger 3660 which gives the raw data readings N.

Radiation $\text{W/m}^2$		
Reading, N		

These readings give a set of coefficients used when converting a sensor reading to engineering units. The coefficients are:

A		C	0
B		D	0

To convert raw data to engineering units use the formula:  
 Radiation  $\text{W/m}^2 = A + BN + CN^2 + DN^3$ .

Date: .....

Sign: .....



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