EKO INSTRUMENTS CO., LTD.

NIST Traceable

UV-A MS-212A UV-B MS-212W

Precision UV Radiometers

Overview

Ultraviolet radiation is divided into three wavelength ranges: UV-A (315-400nm), UV-B (280-315nm) and UV-C (below 280nm). Most UV-A is not absorbed by ozone, hence it is only weakly affected by the decrease of the ozone layer. On the other hand, UV-C is completely absorbed by the ozone layer and does not reach the earth's surface. UV-B, however, is strongly affected by the change of ozone concentration. Although UV-B account for only 0.2% of total solar radiation, its spectral composition and geometrical distribution in the sky are significantly affected by the changes in atmospheric conditions. Since 99.8% of solar radiation lies in the region of the solar spectrum greater than 315 nm wavelength, the precise UV-B radiation measurement requires to exclude all radiation above 315nm. It is also essential that UV-B radiometers possess good cosine response - that is, they should be free of significant incident angle effects. Moreover, they should possess a spectral response function that minimizes spectral mismatch with changing solar ultraviolet spectral distributions.

Applications

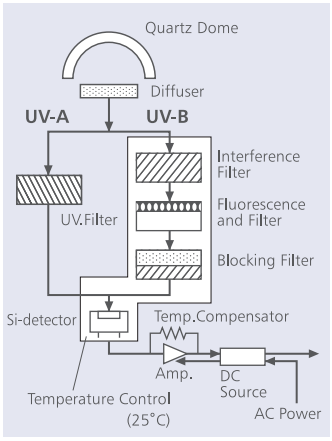
1) Meteorology, Agrometeorology :
   Monitoring total ozone, investigating the effect on plants caused by the changes of atmospheric conditions
2) Material testing :
   Material deterioration tests
3) Medical science and Biochemistry :
   Investigation to prevent sunburn and skin cancer

Measurement principle

UV-B radiometer

Solar radiation pass through quartz dome and teflon diffuser. Only UV-B pass inteface filter.

Diffused UV-B is converted into longer wavelength radiation by phosphor, which emits fluorescent light. After passing through blocking filter for undesired light elimination, the fluorescent light reach Si-detector. Built-in amplifier generates output voltage that is proportional to the strength of fluorescent light onto Si-detector.



UV-A radiometer

UV-A radiation reach Si-detector after passing through UV filter combinations, which transmit only UV-A. Other components are the same as UV-B radiometer.

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EKO-MS212AW-08-08E

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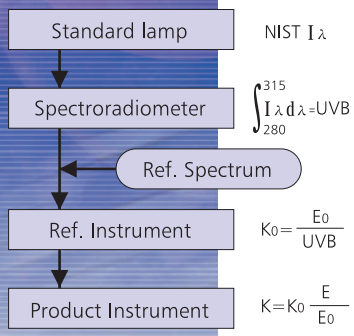
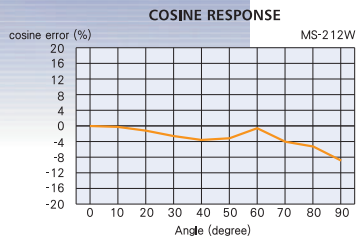
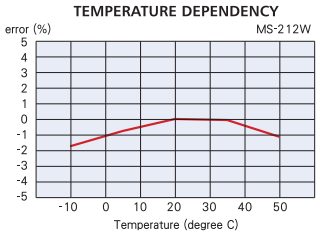


Calibration procedures

EKO precision UV radiometers are calibrated as follows;

1) EKO precision spectroradiometer is calibrated using NIST traceable standard lamp.
2) The sensitivity of EKO reference radiometer is obtained by using the calibrated spectroradiometer. It is obtained by dividing its output voltage by integrated spectral irradiance in the specified wavelength range
3) The sensitivity of product instruments are determined by intercomparison with the reference radiometer under sunlight.





Cosine response and temperature response

Cosine response and temperature response of UV radiometers are very important characteristics for solar UV radiation measurement.

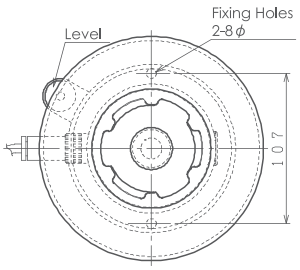
Built-in temperature compensation circuit limits the temperature-dependent error to less than 3% in 60℃ operating band.

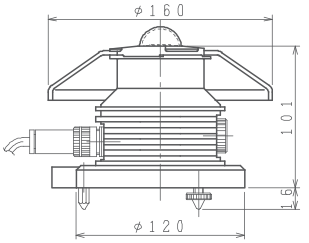
MS-212W adopted temperature control function to prevent optical filter deterioration.

Specifications

	MS-212A	MS-212W
Wavelength range	315 ~ 400nm	280 ~ 315nm
Traceability	NIST-traceable standard lamp	
Response time	1 sec. (90% response)	
Non-linearity	Less than 2%	
Cosine response	Less than 10% (at 20° solar altitude)	
Directional response	Less than 10% (at 20° altitude)	
Output (Sensitivity)	0 ~ 1V / 0 ~ 100W/m²	0 ~ 1V / 0 ~ 5W/m²
	0 ~ 10mV / 0 ~ 100W/m²	0 ~ 10mV / 0 ~ 5W/m²
Output impedance	500 ohm (V output)	
	100 ohm (mV output)	
Temperature response	±1.5% (-10~+50℃)	
Temperature control	————	25℃
Operating temperature	-10 to +50℃	
Power Consumption	AC100 to 240V , 50/60Hz, 10W	AC100 ~ 240V , 50/60Hz, 30W
Weight (Sensor)	1.0kg	1.1kg
Weight (Power supply)	0.8kg	1.3kg

Specifications could be changed without notice.





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