

# Ultra Violet Sensor | JSU-100-SS

Measure total radiation from 250 to 400 nm

## Wide Range

Sensitive from 250 to 400 nm, spanning the solar UV and range of electric lamps.

## Measurement Units

Calibration factors for photon flux density units [ $\mu\text{mol m}^{-2} \text{s}^{-1}$ ] and energy flux density [ $\text{W m}^{-2}$ ] are provided with each sensor allowing for rapid unit conversions.

## Rugged, Self-cleaning Housing

The patented domed shaped sensor head facilitates runoff of dew and rain, helping to keep the detector clean and minimizing errors caused by dust blocking the radiation path. Sensors are housed in a rugged anodized aluminum body and electronics are fully potted.

## Output Options

Analog and digital output options are available. Analog version is an un-amplified voltage output. Sensor is available attached to a hand-held meter with digital readout.

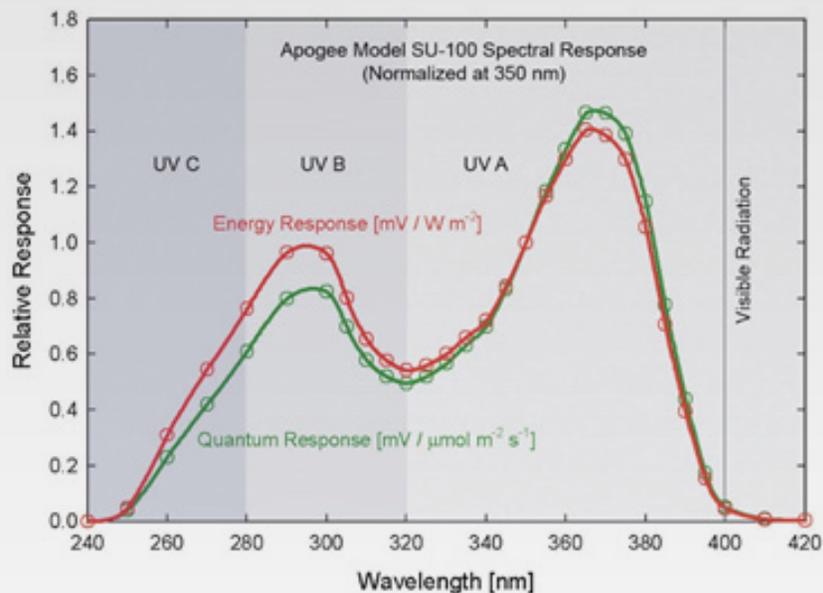
## Typical Applications

Applications include: UV radiation measurement in outdoor environments (sensor is not recommended for long-term continuous outdoor deployment), laboratory use with artificial light sources (e.g., germicidal lamps), and monitoring the filtering ability and stability of various materials.



## Spectral Response

Spectral response estimate of Apogee JSU-100 UV sensors. Spectral response measurements were made at 10 nm increments across a wavelength range of 200 to 450 nm in a monochromator with an attach electric light source. Measured spectral data were normalized at 350 nm.



In addition to naturally occurring UV radiation from the sun, there are many electric light sources that emit UV radiation (e.g., cool white fluorescent, metal halide, mercury arc, and germicidal lamps). Although the relative wavelengths of UV radiation differ among sunlight and electric lights, the error estimates shown in the table below indicate that the JSU-100 provides reasonable estimates of UV radiation coming from electric lamps (table provides spectral error estimates for UV radiation measurements from radiation sources other than clear sky solar radiation).

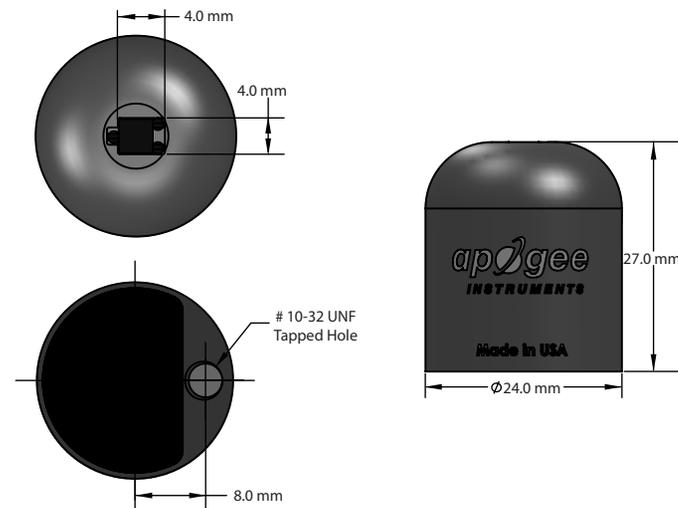
### Spectral Errors for UV Radiation Measurements with Apogee JSU-100 UV Sensor

Radiation Source (Error Calculated Relative to Sun, Clear Sky)	Error [%]
Sun (Clear Sky)	0.0
Sun (Cloudy Sky)	< 0.5
Reflected from Grass Canopy	< 0.5
Reflected from Deciduous Canopy	< 0.5
Reflected from Conifer Canopy	< 0.5
Reflected from Agricultural Soil	< 0.5
Reflected from Forest Soil	< 0.5
Reflected from Desert Soil	< 0.5
Reflected from Water	< 0.5
Reflected from Ice	< 0.5
Reflected from Snow	< 0.5
Cool White Fluorescent (T5)	9.0
Metal Halide	2.8
High Pressure Sodium	-1.7
Incandescent	-3.3
Mercury Arc	17.8

## Calibration Traceability

Apogee JSU-100 UV sensors are calibrated through side-by-side comparison to the mean of four Apogee model JSU-100 transfer standard UV sensors under high intensity discharge metal halide lamps. The transfer standard UV sensors are calibrated through side-by-side comparison to an Apogee model JPS-200 spectroradiometer under sunlight (clear sky conditions) in Logan, Utah. The PS-200 is calibrated with a LI-COR model 1800-02 Optical Radiation Calibrator using a 200 W quartz halogen lamp. The 1800-02 and quartz halogen lamp are traceable to the National Institute of Standards and Technology (NIST).

## Dimensions



### JSU-100-SS

Output (Sensitivity)	0.20 mV per $\mu\text{mol m}^{-2} \text{s}^{-1}$ ; 0.61 mV per $\text{W m}^{-2}$
Calibration Factor (Reciprocal of Output)	5.0 $\mu\text{mol m}^{-2} \text{s}^{-1}$ per mV; 1.65 $\text{W m}^{-2}$ per mV
Calibration Uncertainty	$\pm 10\%$
Measurement Repeatability	Less than 1%
Long-term Drift (Non-stability)	Less than 3% per year
Non-linearity	Less than 1% (up to 300 $\mu\text{mol m}^{-2} \text{s}^{-1}$ )
Response Time	Less than 1 ms
Field of View	180°
Spectral Range	250 nm to 400 nm
Directional (Cosine) Response	$\pm 10\%$ at 75° zenith angle
Temperature Response	Approximately 0.1% per C
Operating Environment	-40 to 70 C; 0 to 100% relative humidity
Dimensions	24 mm diameter, 28 mm height
Mass	75 g (with 5 m of lead wire)
Cable	5 m of shielded, twisted-pair wire; additional cable available in multiples of 5 m; santoprene rubber jacket (high water resistance, high UV stability, flexibility in cold conditions); pigtail lead wires
Warranty	4 years against defects in materials and workmanship