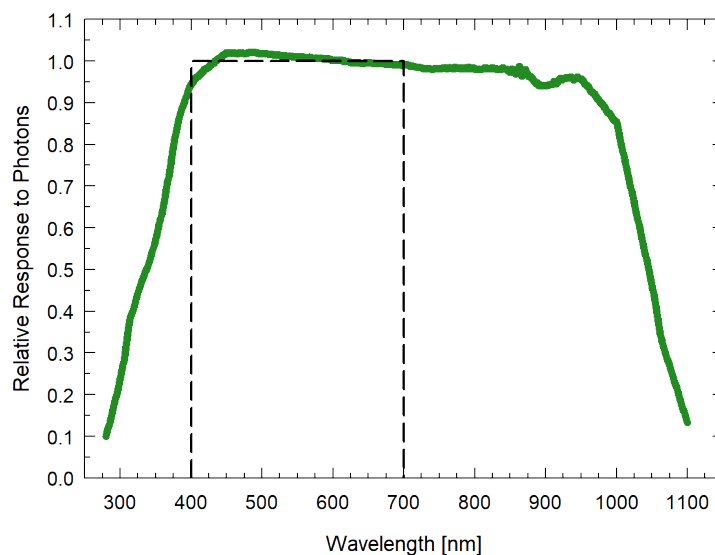




## QUANTUM LIGHT POLLUTION SENSORS

SQ-640 Series

### Spectral Response



Spectral response of six replicate Apogee SQ-600 series Quantum Light Pollution Sensors.

## Product Specifications

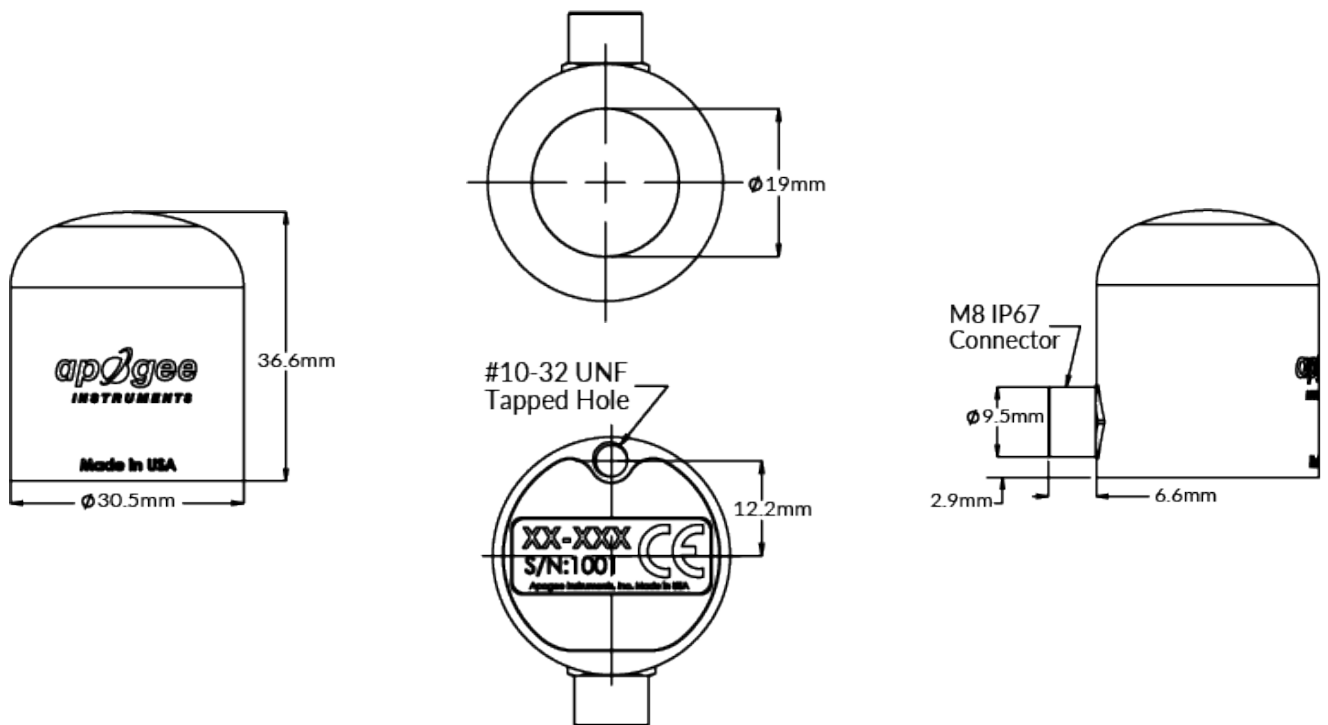
	SQ-640-SS	SQ-642-SS	SQ-644-SS	SQ-645-SS	SQ-647-SS
Power Supply	Self-powered	5 to 24 V DC	12 to 24 V DC	5.5 to 24 V DC	
Current Draw	–	12 V is 57 $\mu$ A	Maximum of 20 mA	12 V is 57 $\mu$ A	1.4 mA (quiescent), 1.8 mA (active)
Sensitivity	1 mV per $\mu$ mol m <sup>-2</sup> s <sup>-1</sup>	12.5 mV per $\mu$ mol m <sup>-2</sup> s <sup>-1</sup>	0.08 mA per $\mu$ mol m <sup>-2</sup> s <sup>-1</sup>	25 mV per $\mu$ mol m <sup>-2</sup> s <sup>-1</sup>	–
Calibration Factor	1 $\mu$ mol m <sup>-2</sup> s <sup>-1</sup> per mV	0.08 $\mu$ mol m <sup>-2</sup> s <sup>-1</sup> per mV	12.5 $\mu$ mol m <sup>-2</sup> s <sup>-1</sup> per mA	0.04 $\mu$ mol m <sup>-2</sup> s <sup>-1</sup> per mV	Custom for each sensor and stored in the firmware
Calibration Uncertainty	± 5 %				
Measurement Range	0 to 200 $\mu$ mol m <sup>-2</sup> s <sup>-1</sup>				
Measurement Repeatability	Less than 0.5 %				
Calibrated Output Range	0 to 200 mV				
Long-term Drift	Less than 2 % per year				
Non-linearity	Less than 1 % (up to 200 $\mu$ mol m <sup>-2</sup> s <sup>-1</sup> )				
Response Time	Less than 1 ms				Less than 0.6 s
Field of View	180°				
Spectral Range	340 to 1040 nm ± 5 nm (wavelengths where response is greater than 50 % of maximum)				
Directional (Cosine) Response	± 2 % at 45° zenith angle, ± 5 % at 75° zenith angle				
Temperature Response	-0.11 ± 0.04 % per C				
Operating Environment	-40 to 70 C; 0 to 100 % relative humidity; can be submerged in water up to depths of 30 m				
Dimensions	30.5 mm diameter, 37 mm height				
Mass (with 5 m of cable)	140 g				
Cable	5 m of two conductor, shielded, twisted-pair wire; TPR jacket; pigtail lead wires; stainless steel (316), M8 connector				
Warranty	4 years against defects in materials and workmanship				



## Overview

Many plants are affected by interruptions in dark periods even by extremely dim light. Apogee's new Quantum Light Pollution Sensor is designed to detect photons from 340-1040 nm that are below the sensitivity level of a typical quantum sensor. Detecting stray photons that disrupt the night is critical in preventing negative effects in plants such as plant hermaphroditism and stunted growth. The patented, dome-shaped aluminum head is cosine-corrected, self-cleaning, and fully-potted for a waterproof design.

## Dimensions



## Features

### TYPICAL APPLICATIONS

- Incoming PFD measurements over plant canopies in indoor greenhouses or in growth chambers, and reflected or under-canopy (transmitted) PFD measurements in the same environments
- Measuring extremely dim light that may cause interruptions in plant dark periods

### MULTIPLE OUTPUT OPTIONS

- Analog
- 4 to 20 mA
- SDI-12 output

### ACCURATE, STABLE MEASUREMENTS

Cosine-corrected with directional errors less than  $\pm 5\%$  at a solar zenith angle of  $75^\circ$ . Long-term non-stability less than 2% per year.

### HIGH QUALITY CABLE

Pigtail-lead sensors feature an IP68, marine-grade stainless-steel cable connectors attached directly to the sensor head to simplify sensor removal for maintenance and recalibration.

### CALIBRATION TRACEABILITY

Apogee Instruments SQ-600 series quantum sensors are calibrated through side-by-side comparison to the mean of four transfer standard quantum sensors under a reference lamp. The transfer standard quantum sensors are recalibrated with a quartz halogen lamp traceable to the National Institute of Standards and Technology (NIST).

