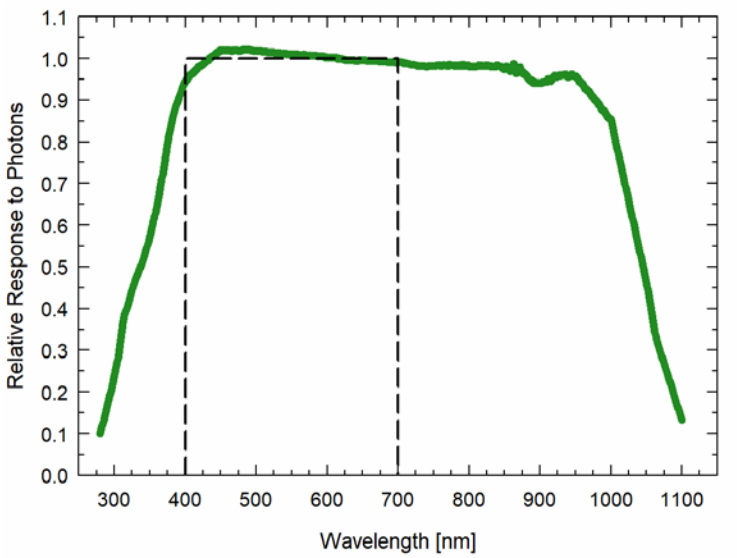
QUANTUM LIGHT POLLUTION SENSORS

SQ-640 Series

Spectral Response



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

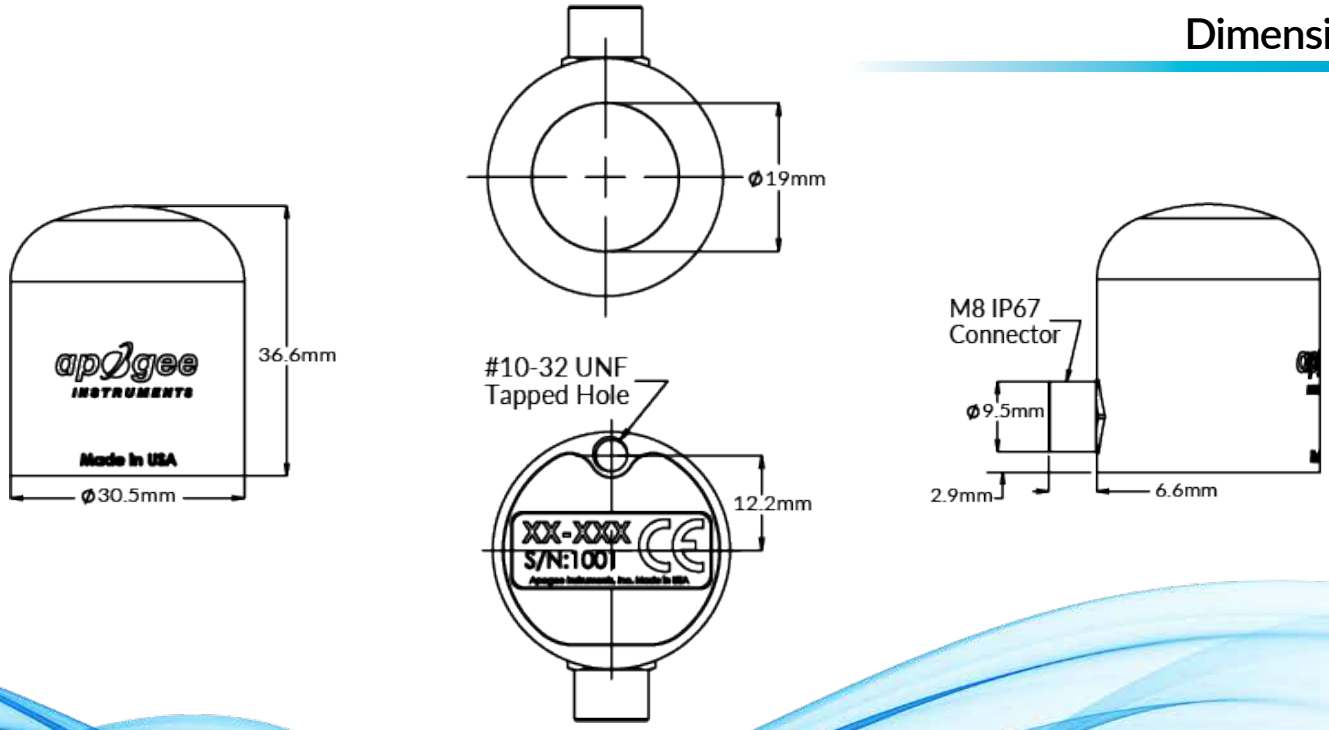
Product Specifications

	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 µA	Maximum of 20 mA	12 V is 57 µA	1.4 mA (quiescent), 1.8 mA (active)
Sensitivity	1 mV per µmol m^{-2} s^{-1}	12.5 mV per µmol m^{-2} s^{-1}	0.08 mA per µmol m^{-2} s^{-1}	25 mV per µmol m^{-2} s^{-1}	–
Calibration Factor	1 µmol m^{-2} s^{-1} per mV	0.08 µmol m^{-2} s^{-1} per mV	12.5 µmol m^{-2} s^{-1} per mA	0.04 µmol m^{-2} s^{-1} per mV	Custom for each sensor and stored in the firmware
Calibration Uncertainty	± 5 %				
Measurement Range	0 to 200 µmol m^{-2} s^{-1}				
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 400 µmol m^{-2} s^{-1})				
Response Time	Less than 1 ms				
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 hermaphrodism 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 ± 5 % at a solar zenith angle of 75°. Long-term non-stability less than 2 % per year.

HIGH QUALITY CABLE

Pigtail-lead sensors feature on 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).