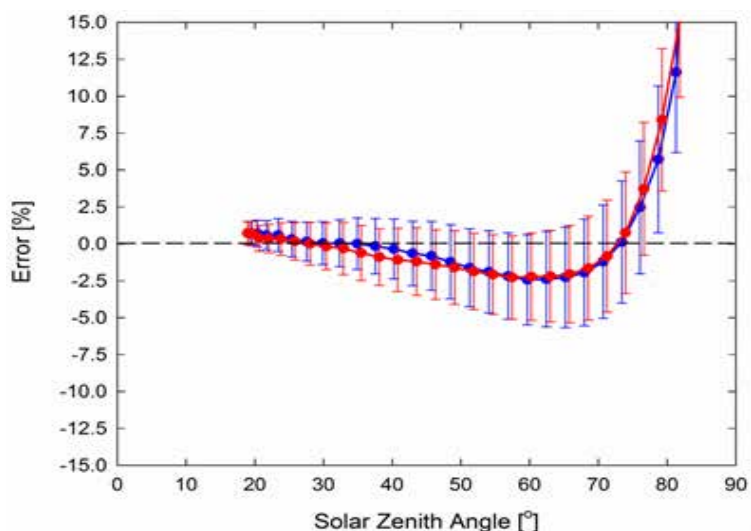
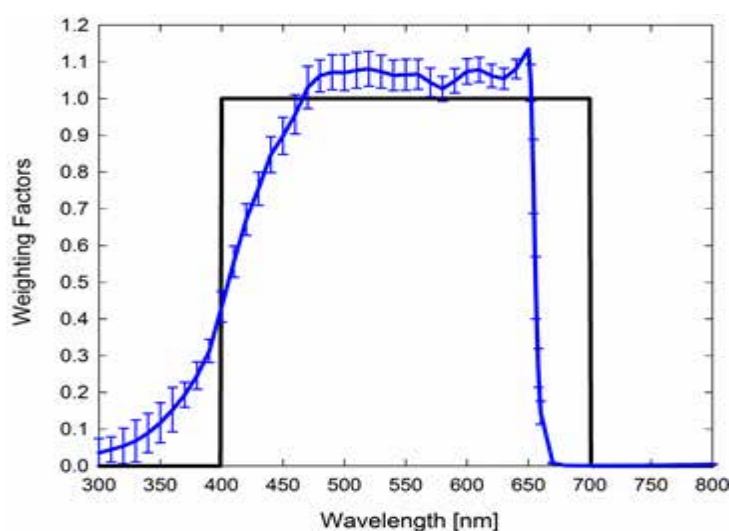




### Response Graphs



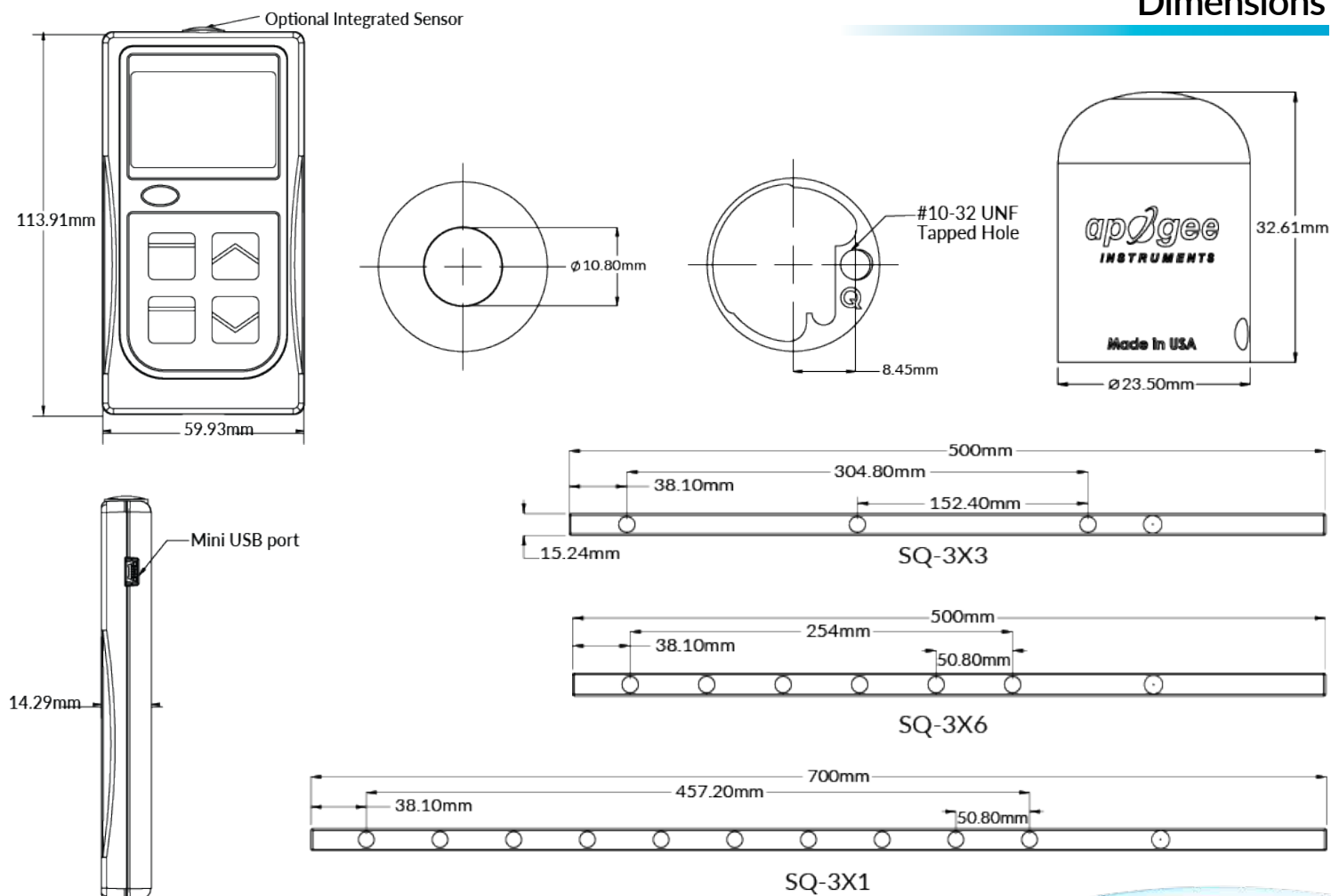
Mean cosine response of twenty-three SQ series quantum sensors. Blue points represent the AM response and red points represent the PM response.



Mean spectral response of six SQ series quantum sensors (error bars represent two standard deviations above and below mean) compared to PPFD weighting function.

## Product Specifications

	MQ-100	MQ-200	MQ-301	MQ-303/306
Calibration Uncertainty	± 5 %			
Measurement Repeatability	Less than 1 %			
Long-term Drift	Less than 2 % per year			
Non-linearity	Less than 1 % (up to 3000 $\mu\text{mol m}^{-2} \text{s}^{-1}$ )			
Response Time	Less than 1 ms			
Field of View	180°			
Spectral Range	410 to 655 nm (wavelengths where response is greater than 50 % of maximum)			
Directional (Cosine) Response	± 5 % at 75° angle			
Temperature Response	0.06 ± 0.06 % per C			
Operating Environment	0 to 50 C; less than 90 % non-condensing relative humidity up to 30 C; less than 70 % non-condensing relative humidity from 30 to 50 C; separate sensors can be submerged in water up to depths of 30 m			
Meter Dimensions	113.9 mm height, 59.9 mm width			
Sensor Dimensions	Integrated with Meter	24 mm width, 33 mm height	700 mm length, 15 mm width, 15 mm height	500 mm length, 15 mm width, 15 mm height
Mass	150 g	180 g	380 g	300 g
Cable	2 m of shielded, twisted-pair wire; additional cable available; TPR jacket (high water resistance, high UV stability, flexibility in cold conditions)			



## Features

### TYPICAL APPLICATIONS

- Incoming and reflected PPFD over and under plant canopies in greenhouses, in fields, and in growth chambers
- Aquatic environments including salt water aquariums and freshwater lakes and streams

### MULTIPLE OUTPUT OPTIONS

- Attached hand-held meter
- Separate sensor
- Line quantum meter- 3 sensors
- Line quantum meter- 6 sensors
- Line quantum meter- 10 sensors

### LINE QUANTUM SENSOR OPTIONS

Sensors are available with multiple detectors mounted along the length of a rugged anodized aluminum bar, which provide spatially averaged PPFD measurements along the length of the bar.



### 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.

### UNIQUE DESIGN

Cost-effective, original quantum sensors work well for broadband radiation sources. The patented, dome-shaped aluminum head is cosine-corrected, self-cleaning, and fully-potted for a waterproof design.

### CALIBRATION TRACEABILITY

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