APOGEE FULL-SPECTRUM QUANTUM METER | MQ-500

Features

Accurate, Stable Measurements
Long-term non-stability determined from multiple replicate quantum sensors in accelerated aging tests and field conditions is less than 2 % per year.

Unique Design
Measure photosynthetically active radiation with a research grade, full spectral response sensor. Offers a self-cleaning, cosine-corrected head that is fully-potted for a waterproof design.

Typical PPFD Measurement 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

Calibration Traceability
Apogee SQ-500 sensors are calibrated through side-by-side comparison to the mean of four transfer standard sensors under T5 cool white fluorescent lamps. The transfer standard sensors are calibrated through side-by-side comparison to the mean of at least four quantum sensors under T5 cool white fluorescent lamps traceable to the National Institute of Standards and Technology (NIST).

A research-grade PAR meter with an improved spectral response providing accurate PAR/PPFD measurements under all light sources, including LEDs.

Product Specifications

| MQ-500 |
|---------------------|---------------------|
| **Calibration Uncertainty** | ± 5 % |
| **Measurement Range** | 0 to 4000 μmol m⁻² s⁻¹ |
| **Measurement Repeatability** | Less than 0.5 % |
| **Long-term Drift (Non-stability)** | Less than 2 % per year |
| **Non-linearity** | Less than 1 % (up to 4000 μmol m⁻² s⁻¹) |
| **Response Time** | Less than 1 ms |
| **Field of View** | 180° |
| **Spectral Range** | 389 to 692 nm ± 5 nm (wavelengths where response is greater than 50 % of maximum) |
| **Spectral Selectivity** | Less than 10 % from 412 to 682 nm ±5 nm |
| **Directional (Cosine) Response** | ± 5 % at 75° zenith angle |
| **Azimuth Error** | Less than 0.5 % |
| **Tilt Error** | Less than 0.5 % |
| **Temperature Response** | -0.11 ± 0.03 % per C |
| **Uncertainty in Daily Total** | Less than 5 % |
| **Detector** | Blue-enhanced silicon photodiode |
| **Housing** | Anodized aluminum body with acrylic diffuser |
| **IP Rating** | IP68 |
| **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 30 m |
| **Cable** | 2 m of shielded, twisted-pair wire; additional cable available; TPR jacket |
| **Warranty** | 4 years against defects in materials and workmanship |
Spectral errors are theoretical errors calculated from sensor spectral responses and spectral output of radiation sources. Only spectral errors are listed in the table. Calibration, cosine, and temperature error can also contribute to measurement error.