Apogee MQ-210

Apogee MQ-210 Underwater Quantum Light PAR Meter User Manual

Model: MQ-210

1. Introduction

The Apogee MQ-210 Quantum Light PAR Meter is designed for precise measurement of Photosynthetic Active Radiation (PAR) in underwater environments. This device features a waterproof quantum sensor connected to a handheld meter. The MQ-210 is specifically engineered to apply an immersion effect correction factor directly through its firmware, ensuring accurate readings in aquatic settings. It is suitable for various light sources, though specific post-measurement correction factors may be required for LED light sources to achieve optimal accuracy.

Important Note: While the sensor and its cable are fully waterproof, the handheld meter unit is NOT waterproof and must be kept dry.

2. Safety Information

- Always ensure the handheld meter remains dry. Exposure to water will damage the unit and void the warranty.
- Do not attempt to open or modify the handheld meter or the sensor. This can lead to damage and inaccurate readings.
- Handle the sensor cable with care to prevent kinks or damage, which could compromise its waterproof integrity.
- Keep the device away from extreme temperatures and direct sunlight when not in use.
- Use only specified batteries (if applicable, refer to product packaging or Apogee documentation).

3. Package Contents

Upon unpacking, please verify that all the following components are present:

- Apogee MQ-210 Handheld Meter

- Waterproof Quantum Sensor (attached via cable)
- User Manual (this document)

4. Product Overview

The MQ-210 system comprises two main parts: the handheld display unit and the waterproof quantum sensor.

Figure 1: Apogee MQ-210 Underwater Quantum Light PAR Meter. This image displays the complete MQ-210 unit, featuring the handheld meter with its digital display and control buttons, connected by a cable to the compact, black waterproof quantum sensor. The sensor is designed for submersion, while the handheld unit is for dry use.

4.1 Handheld Meter

The handheld meter features a digital display for showing PAR readings in µmol m^{-2} s^{-1}. It includes control buttons for power, sampling, and mode selection. The meter processes the raw sensor data and applies the immersion effect correction factor.

4.2 Waterproof Quantum Sensor

Figure 2: Close-up view of the Apogee waterproof quantum sensor. This image highlights the robust, anodized aluminum body and the acrylic diffuser of the sensor head. The sensor contains a blue-enhanced silicon photodiode and custom optical filters, designed for accurate underwater PAR measurements.

The sensor incorporates a blue-enhanced silicon photodiode and custom optical filters housed within a rugged, anodized aluminum body with an acrylic diffuser. It is designed for full submersion in water, making it ideal for applications such as saltwater aquariums.

5. Setup

1. **Unpack the Device:** Carefully remove the handheld meter and sensor from its packaging.

2. **Inspect for Damage:** Check the handheld meter, sensor, and cable for any visible signs of damage. If damage is found, do not proceed with setup and contact support.
3. **Battery Installation (if applicable):** If the meter requires user-installed batteries (not specified, but common for handheld devices), open the battery compartment (usually on the back) and insert the correct type and number of batteries, observing polarity.
4. **Sensor Connection:** The quantum sensor is permanently attached to the handheld meter via a waterproof cable. Ensure the cable connection point to the sensor is secure and undamaged.
5. **Initial Power On:** Press the power button on the handheld meter to turn it on. The display should illuminate and show a reading.

6. Operating Instructions

6.1 Powering On/Off

- To power on the meter, press the **Power** button (usually marked with a circle and vertical line symbol).
- To power off, press and hold the **Power** button until the display turns off.

6.2 Taking Measurements

1. **Position the Sensor:** Carefully submerge the waterproof quantum sensor into the water at the desired depth and location for measurement. Ensure the sensor's acrylic diffuser is clean and unobstructed.
2. **Observe Readings:** The handheld meter's display will show the real-time PAR reading in µmol m^{-2} s^{-1}. The MQ-210 automatically applies the immersion effect correction factor in its firmware for underwater measurements.
3. **Sampling (if applicable):** If the meter has a "sample" button, pressing it may log the current reading or provide a stable reading. Refer to the on-screen indicators for specific sampling functions.
4. **Mode Selection (if applicable):** Use the "mode" button to cycle through different display modes or settings if available.

6.3 LED Light Source Considerations

While the MQ-210 is excellent for most light sources, when measuring PAR from LED light sources, post-measurement correction factors may need to be applied for the most accurate results. Consult Apogee Instruments' official documentation or website for specific correction factors pertaining to various LED types.

7. Maintenance

7.1 Cleaning

- **Sensor:** After each use in water, rinse the sensor with fresh water to remove any salt, debris, or biological film. Gently wipe the acrylic diffuser with a soft, non-abrasive cloth. Avoid using harsh chemicals or abrasive materials that could scratch the diffuser.
- **Handheld Meter:** Clean the handheld meter with a dry, soft cloth. Do not use liquid cleaners or immerse the meter in water.

7.2 Storage

- Store the MQ-210 in a cool, dry place away from direct sunlight and extreme temperatures.

- If storing for extended periods, remove batteries from the handheld meter to prevent leakage (if applicable).
- Keep the sensor and cable free from kinks or sharp bends during storage.

8. Troubleshooting

Problem	Possible Cause	Solution
Meter does not power on.	Dead or incorrectly installed batteries.	Replace batteries with new ones, ensuring correct polarity.
Inaccurate or erratic readings.	• Dirty sensor diffuser. • Damaged sensor or cable. • Incorrect application of LED correction factor (for LED sources).	• Clean the sensor diffuser gently. • Inspect sensor and cable for damage. If damaged, contact support. • Refer to Apogee documentation for LED correction factors.
Display shows "Error" or unusual characters.	Internal malfunction or sensor issue.	Try powering off and on again. If the error persists, contact Apogee Instruments support.
Buttons are unresponsive.	Internal button malfunction or software issue.	Power cycle the device. If buttons remain unresponsive, contact Apogee Instruments support.

9. Specifications

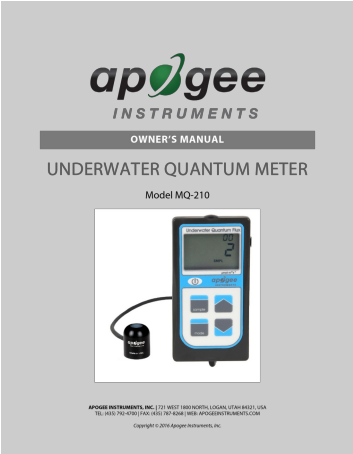
Feature	Detail
Model	MQ-210
Measurement Type	Underwater Photosynthetic Active Radiation (PAR)
Sensor Type	Blue-enhanced silicon photodiode with custom optical filters
Sensor Body Material	Rugged, anodized aluminum with acrylic diffuser
Immersion Effect Correction	Automatically applied via firmware
Handheld Meter Water Resistance	**Not waterproof**
Sensor Water Resistance	Fully waterproof
Manufacturer	Apogee Instruments

10. Warranty and Support

For detailed warranty information, technical support, or service inquiries, please contact Apogee Instruments directly. Refer to their official website for the most current contact details and warranty policies. It is recommended to register your product with Apogee Instruments to ensure you receive updates and support.

Related Documents - MQ-210

	Apogee Symphony I/O Troubleshooting: No Power On Issues A technical bulletin from Apogee Electronics providing troubleshooting steps for resolving 'no power on' issues with the Symphony I/O audio interface. Covers common symptoms and guides users through checking firmware, cables, power supply, and circuit boards.
	Apogee Clearmountain's Dance User's Guide: Delay Plugin Features and Setup Comprehensive user guide for Apogee's Clearmountain's Dance delay plugin. Learn about its analog tape emulation, ping pong delay, installation, signal routing, and troubleshooting.
	Apogee AFI-118 Subwoofer System: High-Performance 18-inch Professional Audio Subwoofer Detailed specifications and features of the Apogee AFI-118 Subwoofer System, an 18-inch (460mm) high-power subwoofer designed for professional audio applications, including live sound, clubs, and theaters. Learn about its driver, engineering data, and compatibility.
	Apogee Symphony Studio User's Guide: High-Resolution Audio Interface Comprehensive user guide for the Apogee Symphony Studio Series audio interface, covering setup, operation, software control, monitor workflows, and technical specifications for professional audio production.
	Apogee Symphony I/O MKII Price List Update A comprehensive price list for Apogee Symphony I/O MKII audio interfaces and accessories, detailing product codes, descriptions, and updated pricing effective December 21, 2020.
	Apogee Instruments MQ-510 Underwater Quantum Meter Owner's Manual Owner's Manual for the Apogee Instruments MQ-510 Underwater Quantum Meter, detailing its specifications, operation, maintenance, troubleshooting, and warranty information.



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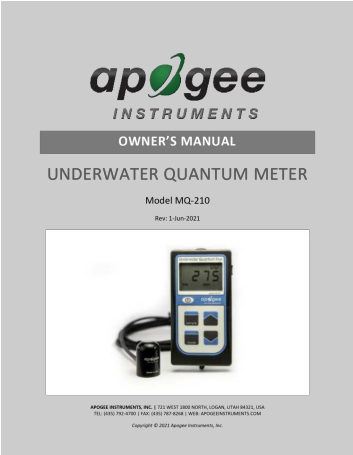

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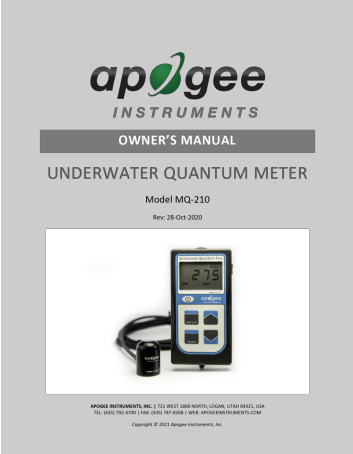

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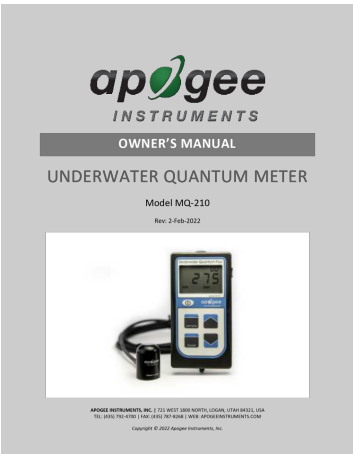

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Chris Madsen MQ 210 manual Apogee Instruments UNDERWATER QUANTUM METER 3 feb 2022 — Please be advised that based on the information available to us from our raw material suppliers products manufactured by do not contain INTRODUCTION Radiation drives photosynthesis is called photosynthetically active radiation PAR and typically defined as total across a range of 400 700 nm e lss jp apogee content |||

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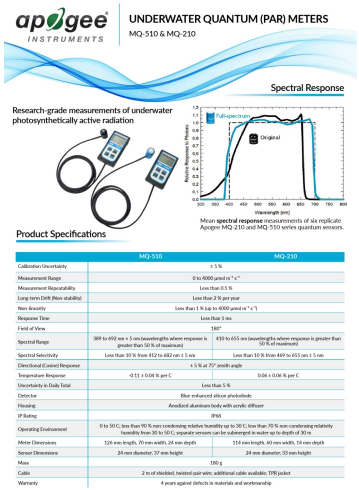

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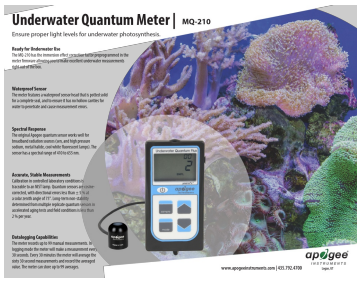

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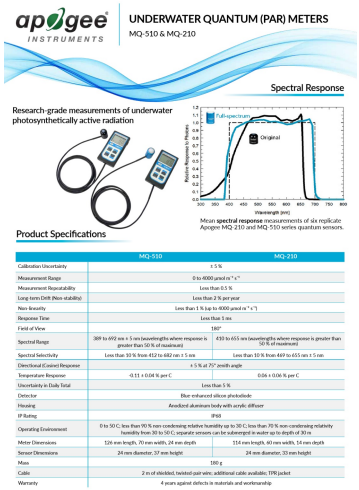

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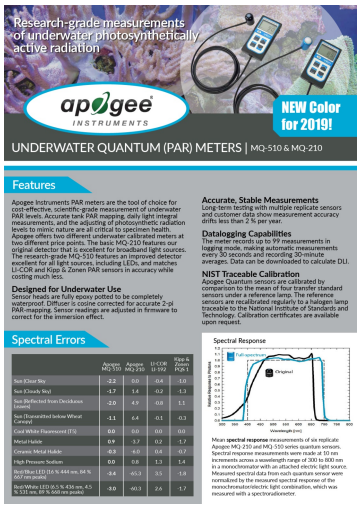

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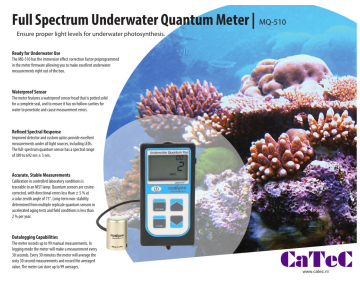

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