



INSTRUMENTS

OWNER'S MANUAL

HANDHELD METERS

Models HO-200, HQ-300, HQ-400, HQ-500, HQ-600, HU-200,
HU-300

Rev: 20-Oct-2026



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TABLE OF CONTENTS

Owner’s Manual 1

 Certificates of Compliance 3

 Introduction..... 5

 Specifications..... 6

 Deployment and Installation..... 7

 Operation and Measurement..... 9

 Sensor-Specific Navigations..... 10

 Maintenance and Recalibration..... 11

 Return and Warranty Policy 12

CERTIFICATE OF COMPLIANCE

EU Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Apogee Instruments, Inc.
721 W 1800 N
Logan, Utah 84321
USA

for the following product(s):

Models: MQ-500
Type: Quantum Meter

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Hazardous Substances (RoHS 2) Directive
2015/863/EU	Amending Annex II to Directive 2011/65/EU (RoHS 3)

Standards referenced during compliance assessment:

EN 61326-1:2013	Electrical equipment for measurement, control, and laboratory use – EMC requirements
EN 63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Please be advised that based on the information available to us from our raw material suppliers, the products manufactured by us do not contain, as intentional additives, any of the restricted materials including lead (see note below), mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), polybrominated diphenyls (PBDE), bis (2-ethylhexyl) phthalate (DEHP), butyl benzyl phthalate (BBP), dibutyl phthalate (DBP), and diisobutyl phthalate (DIBP). However, please note that articles containing greater than 0.1 % lead concentration are RoHS 3 compliant using exemption 6c.

Further note that Apogee Instruments does not specifically run any analysis on our raw materials or end products for the presence of these substances, but we rely on the information provided to us by our material suppliers.

Signed for and on behalf of:
Apogee Instruments, August 2022



Bruce Bugbee
President
Apogee Instruments, Inc.



CERTIFICATE OF COMPLIANCE

UK Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Apogee Instruments, Inc.
721 W 1800 N
Logan, Utah 84321
USA

for the following product(s):

Models: MQ-500
Type: Quantum Meter

The object of the declaration described above is in conformity with the relevant UK Statutory Instruments and their amendments:

2016 No. 1091	The Electromagnetic Compatibility Regulations 2016
2012 No. 3032	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Standards referenced during compliance assessment:

BS EN 61326-1:2013	Electrical equipment for measurement, control, and laboratory use – EMC requirements
BS EN 63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Please be advised that based on the information available to us from our raw material suppliers, the products manufactured by us do not contain, as intentional additives, any of the restricted materials including lead (see note below), mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), polybrominated diphenyls (PBDE), bis (2-ethylhexyl) phthalate (DEHP), butyl benzyl phthalate (BBP), dibutyl phthalate (DBP), and diisobutyl phthalate (DIBP). However, please note that articles containing greater than 0.1 % lead concentration are RoHS 3 compliant using exemption 6c.

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Bruce Bugbee
President
Apogee Instruments, Inc.



INTRODUCTION

Apogee Instruments meters consist of a handheld meter portion and a dedicated sensor that is connected by cable. To see specifications and information about the specific sensor, view their manual and specification sheet. If the sensor and cable are waterproof (this information will be available on the specification sheet), that remains true for the cable and sensor. However, please note that the handheld meter itself is not waterproof.

The display utilizes e-paper technology. This allows the screen to be readable in bright sunlight, which is helpful for use in various environments. Faint ghosting or temporary image retention is normal. You may also notice the screen occasionally flashes as though the meter is refreshing; this resets the e-paper and is completely normal.

The meter features sampling, data logging, and data averaging. It also utilizes USB-C communication, allowing data logs to be exported and saved externally. The USB-C port is also used to charge the device.

SPECIFICATIONS

Specifications for the Handheld Meter Portion

Response Time	less than 1 ms
Field of View	180°
Spectral Range	389 to 692 nm $\pm$ 5 nm (wavelengths where response is greater than 50 %)
Spectral Selectivity	less than 10 % from 412 to 682 nm $\pm$ 5 nm (see Spectral Response below)
Directional (Cosine) Response	$\pm$ 5 % at 75° zenith angle (see Cosine Response below)
Azimuth Error	less than 0.5 %
Tilt Error	less than 0.5 %
Temperature Response	-0.11 $\pm$ 0.04 % C ⁻¹ (see Temperature Response below)
Uncertainty in Daily Total	less than 5 %
Detector	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 depth of 30 m
Meter Dimension	126 mm length; 70 mm width; 24 mm height
Sensor Dimensions	24 mm diameter; 37 mm height
Mass	100 g (with 5 m of lead wire)
Cable	2 m of two conductor, shielded, twisted-pair wire; additional cable available; TPR jacket

DEPLOYMENT AND INSTALLATION

PAR and UV Meters

Apogee MQ series quantum meters are designed for spot-check measurements, and calculation of daily light integral (DLI; total number of photons incident on a planar surface over the course of a day) through the built-in logging feature. To accurately measure PFFD incident on a horizontal surface, the sensor must be level. For this purpose, each MQ model comes with a different option for mounting the sensor to a horizontal plane.



The AL-110 leveling plate is recommended for use with solar sensors (AL-100 leveling plate pictured). If mounting to a cross arm, the AL-140 mounting bracket is recommended.



The AM-330 Sensor Wand accessory incorporates a mounting fixture at the end of an extendable telescopic wand (up to 36.25 inches/92 cm). It is waterproof and well-suited for saltwater use, allowing the user to place the sensor in hard-to-reach areas including aquariums. This wand is also excellent for greenhouses and growth chambers. Its ability to retract to a smaller size (11.25 inches/28.5 cm) also makes it ideal for travel use.



NOTE: The handheld meter portion of the meter is **not** waterproof, so do not submerge the meter interface in water.

Oxygen Meters

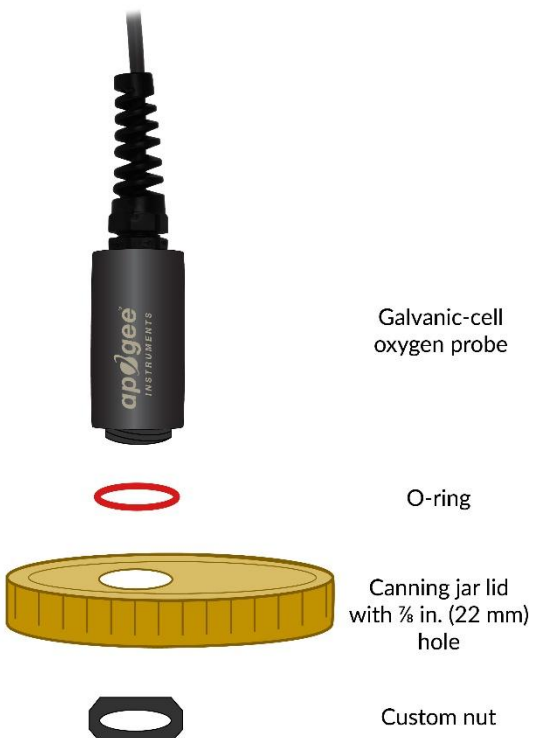
There are multiple head options for the oxygen sensor:

AO-001 Diffusion Head: For use in porous substances



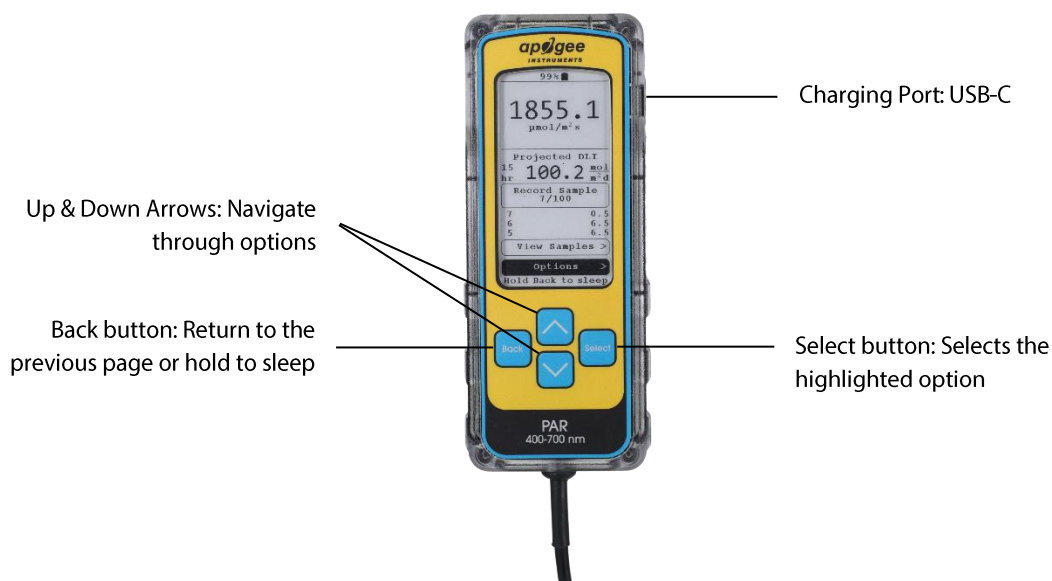
AO-002 Flow Through Head: For connection to a hose or tubing where air passes through

AO-003 Connect Nut: For sealing to a container lid such as a jar



OPERATION AND MEASUREMENT

Apogee handheld meters are designed with a user-friendly interface to make use intuitive. The USB-C port allows the meter to be used with standard USB-C cables for charging. The meter can also be connected to a computer through USB-C to store logged data and update firmware.



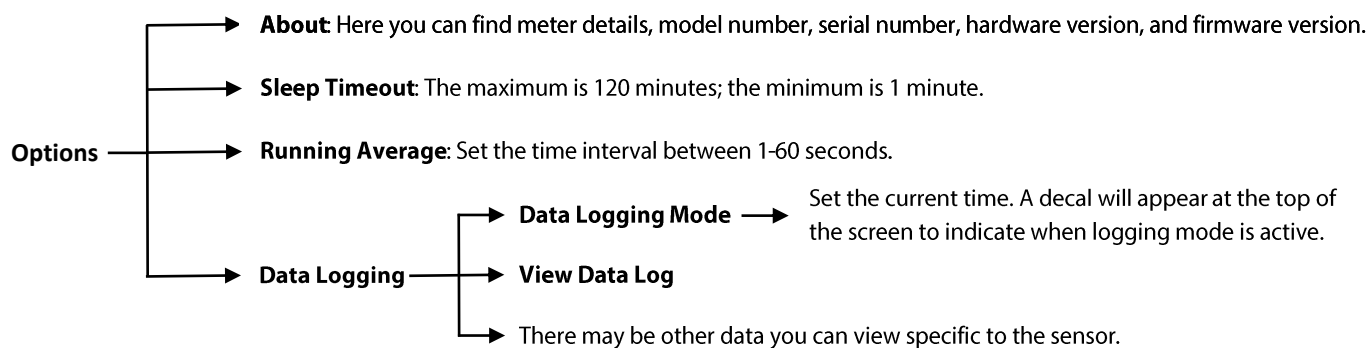
Press any of the four buttons to wake the meter. The meter automatically goes to sleep according to the timer that you set. You can also make it go to sleep by holding the “Back” button. When sleeping, you will still see the screen displaying that it is in sleep mode. This does not mean the meter is on and draining battery, since e-paper does not utilize battery once the ink display has been set.

The battery level is shown as a percentage at the top of the screen.

When scrolling through options, the active option will switch to dark, while the rest will appear light. The following tree map can be used to navigate to a desired feature on the meter.

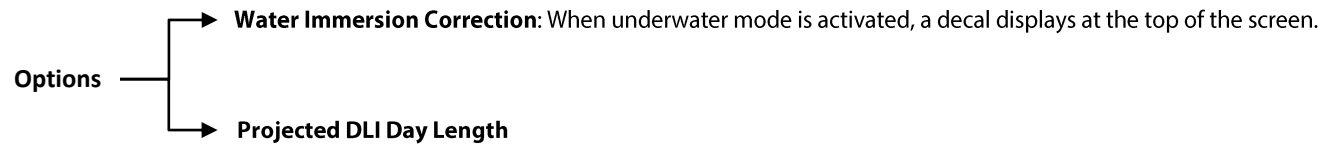
Record Sample: Captures a sample of the current data. The meter can hold 100 of these samples in its memory at a time.

View Samples

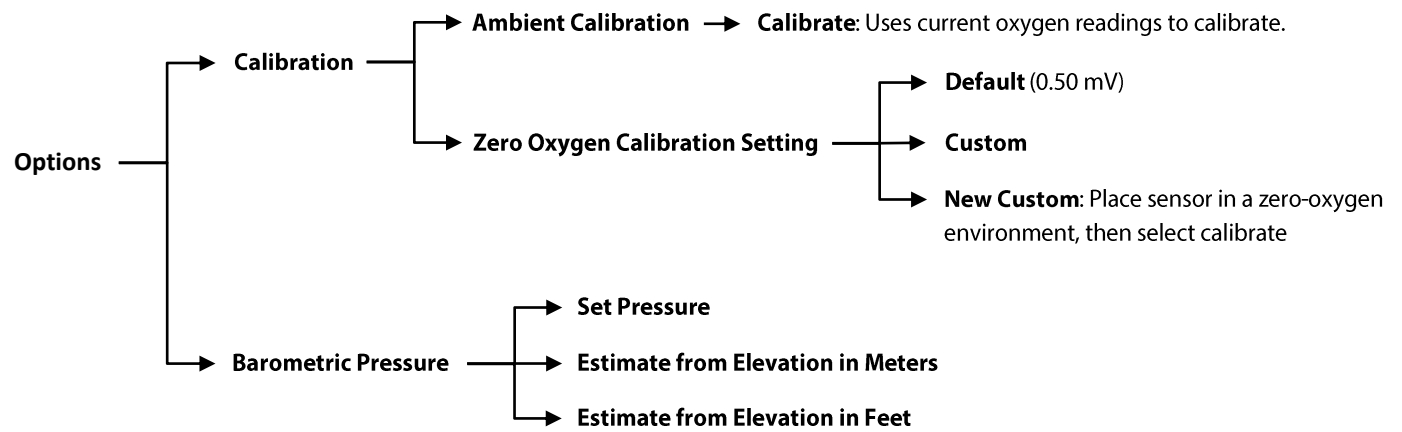


SENSOR-SPECIFIC NAVIGATIONS

PAR Meter



Oxygen Meter



Note: The UV Meter does not have additional navigation.

MAINTENANCE AND RECALIBRATION

Please refer to the manuals for the appropriate sensor to learn about its proper maintenance, cleaning instructions, and recalibration schedule.

Long-Term Storage or Logging

Leave the meter indoors in a stable environment.

Check the battery level occasionally and recharge the meter if needed. This will help preserve the battery life.

If the meter dies, it will maintain its logged data when recharged. However, any stored sample measurements will be lost. Additionally, the data logging mode will need to be restarted once the meter is turned back on.

RETURN AND WARRANTY POLICY

RETURN POLICY

Apogee Instruments will accept returns within 30 days of purchase as long as the product is in new condition (to be determined by Apogee). Returns are subject to a 10 % restocking fee.

WARRANTY POLICY

What is Covered

All products manufactured by Apogee Instruments are warranted to be free from defects in materials and craftsmanship for a period of four (4) years from the date of shipment from our factory. To be considered for warranty coverage an item must be evaluated by Apogee.

Products not manufactured by Apogee (spectroradiometers, chlorophyll content meters, EE08-SS probes) are covered for a period of one (1) year.

What is Not Covered

The customer is responsible for all costs associated with the removal, reinstallation, and shipping of suspected warranty items to our factory.

The warranty does not cover equipment that has been damaged due to the following conditions:

1. Improper installation, use, or abuse.
2. Operation of the instrument outside of its specified operating range.
3. Natural occurrences such as lightning, fire, etc.
4. Unauthorized modification.
5. Improper or unauthorized repair.

Please note that nominal accuracy drift is normal over time. Routine recalibration of sensors/meters is considered part of proper maintenance and is not covered under warranty.

Who is Covered

This warranty covers the original purchaser of the product or other party who may own it during the warranty period.

What Apogee Will Do

At no charge Apogee will:

1. Either repair or replace (at our discretion) the item under warranty.
2. Ship the item back to the customer by the carrier of our choice.

Different or expedited shipping methods will be at the customer's expense.

How To Return An Item

1. Please do not send any products back to Apogee Instruments until you have received a Return Merchandise Authorization (RMA) number from our technical support department by submitting an online RMA form at www.apogeeinstruments.com/tech-support-recalibration-repairs/. We will use your RMA number for tracking of the service item. Call (435) 245-8012 or email techsupport@apogeeinstruments.com with questions.
2. For warranty evaluations, send all RMA sensors and meters back in the following condition: Clean the sensor's exterior and cord. Do not modify the sensors or wires, including splicing, cutting wire leads, etc. If a connector has been attached to the cable end, please include the mating connector – otherwise the sensor connector will be removed in order to complete the repair/recalibration. **Note:** *When sending back sensors for routine calibration that have Apogee's standard stainless-steel connectors, you only need to send the sensor with the 30 cm section of cable and one-half of the connector. We have mating connectors at our factory that can be used for calibrating the sensor.*
3. Please write the RMA number on the outside of the shipping container.
4. Return the item with freight pre-paid and fully insured to our factory address shown below. We are not responsible for any costs associated with the transportation of products across international borders.

Apogee Instruments, Inc.
721 West 1800 North Logan, UT
84321, USA

5. Upon receipt, Apogee Instruments will determine the cause of failure. If the product is found to be defective in terms of operation to the published specifications due to a failure of product materials or craftsmanship, Apogee Instruments will repair or replace the items free of charge. If it is determined that your product is not covered under warranty, you will be informed and given an estimated repair/replacement cost.

PRODUCTS BEYOND THE WARRANTY PERIOD

For issues with sensors beyond the warranty period, please contact Apogee at techsupport@apogeeinstruments.com to discuss repair or replacement options.

OTHER TERMS

The available remedy of defects under this warranty is for the repair or replacement of the original product, and Apogee Instruments is not responsible for any direct, indirect, incidental, or consequential damages, including but not limited to loss of income, loss of revenue, loss of profit, loss of data, loss of wages, loss of time, loss of sales, accrual of debts or expenses, injury to personal property, or injury to any person or any other type of damage or loss.

This limited warranty and any disputes arising out of or in connection with this limited warranty ("Disputes") shall be governed by the laws of the State of Utah, USA, excluding conflicts of law principles and excluding the Convention for the International Sale of Goods. The courts located in the State of Utah, USA, shall have exclusive jurisdiction over any Disputes.

This limited warranty gives you specific legal rights, and you may also have other rights, which vary from state to state and jurisdiction to jurisdiction, and which shall not be affected by this limited warranty. This warranty extends only to you and cannot be transferred or assigned. If any provision of this limited warranty is unlawful, void, or unenforceable, that provision shall be deemed severable and shall not affect any remaining provisions. In case of any inconsistency between the English and other versions of this limited warranty, the English version shall prevail.

This warranty cannot be changed, assumed, or amended by any other person or agreement

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