SolaRaft-iQM™
Water Quality Monitoring
Single Float System
40SF-15V10-040 Series

General Product Specifications

Model Number	Description
40SF-15V10A040Y01	SolaRaft without telemetry
40SF-15V10M040Y01	SolaRaft with HBS Modem telemetry
40SF-15V10N040Y01	SolaRaft with Steven's Water Steelhead telemetry

'Y' Color Option - Y (yellow) or B (black) are standard colors.

For direct access to the latest copy of this manual, please scan this QR Code or refer to the *Product Manuals* section at: www.Hydro-Bioscience.com

Table of Contents

1. Safety Information

SAFETY SYMBOLS AND TERMS

Safety Symbols

The following symbols may appear on the product:

	Direct current (DC)		Caution, risk of danger
	Alternating current (AC)		Warning, risk of electric shock
	Both direct & alternating current		Risk of explosion
	Ground terminal		Recycle lithium-ion batteries
	Chassis ground		Do not incinerate
	Power on/off		Power port
	Battery/cell power connection		Battery/cell power connection
	Communication port		Solar panel port
	Repair/service		AC connection port
	Navigation light connection		MyQuattro App communication
	Conforms to European Union directives		
	Complies to the Federal Communications Commission		
RoHS	Complies with the Restriction of Hazardous Substances Directive (2002/95/EC)		
	This product complies with the WEEE Directive (2002/96/EC) marking equipment. The affixed product label indicates that you must not discard this electrical/electronic product in domestic household waste.		

Safety Terms

Terms in this manual:

 Warning/Caution: BE ALERT – YOUR SAFETY IS INVOLVED'. If you do not follow these safety instructions, personal injury, loss of life, and/or property damage may occur.

Terms on the product:

Danger: Indicates an immediate hazard which will result in death or serious injury.

Warning: Indicates a hazard which may result in death or serious injury.

Caution: Indicates a hazard which may result in minor or moderate injury.

GENERAL SAFETY REQUIREMENTS

⚠ WARNING - Read this manual thoroughly before using the SolaRaft.

User Safety and General Product Precautions

1. Locate/route all cords where they will not be tripped over or damaged by vehicles or equipment with cutting blades such as lawn mowers and hedge clippers and away from vehicle/boat traffic to prevent being driven over.
2. When deploying, follow all equipment and vehicle (such as boats, rafts, etc.) operator safety manual instructions.
3. ⚠ Installation and working in and around water always requires 2 or more individuals for safety.
4. If wildlife such as beavers, minks, nutria, otters, muskrats, turtles, etc., present a problem, additional cable protection is recommended such as a nylon or polyester braided sheath from the surface down to about 2 meters (6 feet) depth.
5. Other manuals included with this manual, such as battery, solar controller/charger, Sonic Head, and SolaRaft manuals, must be read fully. Comply with all safety precautions in those manuals. This manual contains only assembly excerpts from these other manuals. **Visit our website www.hydro-bioscience.com to locate these manuals. Alternately, find and locate the white label affixed to the inner wall of the side panel and download the manuals using the QR Codes printed on that label.**

Precautions While Working with Lithium-Ion Batteries

1. Risk of fire, explosion, and burns. Do not subject the battery to heat above 100°C (212°F) or incinerate.
2. Keep away from children and pets. NEVER put batteries in your mouth.
3. Swallowing may lead to serious injury or death. If ingested, immediately contact your physician or a poison control center.
4. Use only DPI or HBS branded and approved battery chargers.
5. Do not touch or connect the terminals of the battery to each other.
6. Do not subject the battery to a short circuit.
7. Do not place the battery near fire, in direct sunlight, or in high temperature locations.
8. Do not disassemble or modify the battery.

9. Do not crush, step on, or subject the battery to strong impact.
10. Do not smoke around or near the battery.
11. Immediately discontinue use of the battery if it emits an unusual smell, feels hot, expands, or appears abnormal in any way.
12. Inspect battery for any damage before using. Do not use battery if it has been damaged in any way.
13. Dispose of used batteries promptly according to local recycling or waste regulations.

Personal Precautions While Working with Solar Panels

1. Follow all safety precautions recommended by the solar panel supplier including safe installation practices.
2. Solar panels can generate high voltages greater than 43.2Vdc.
3. Necessary precautions include:
   a. Avoid short circuits which can produce energy arcing which can cause severe burns and/or property damage.
   b. Avoid touching bare wires which can cause personal harm, and even death – DC currents can be lethal.
   c. Use a minimum of one-gauge larger conductor than the appropriate rated wire for solar panel's Short Circuit Ampacity rating.

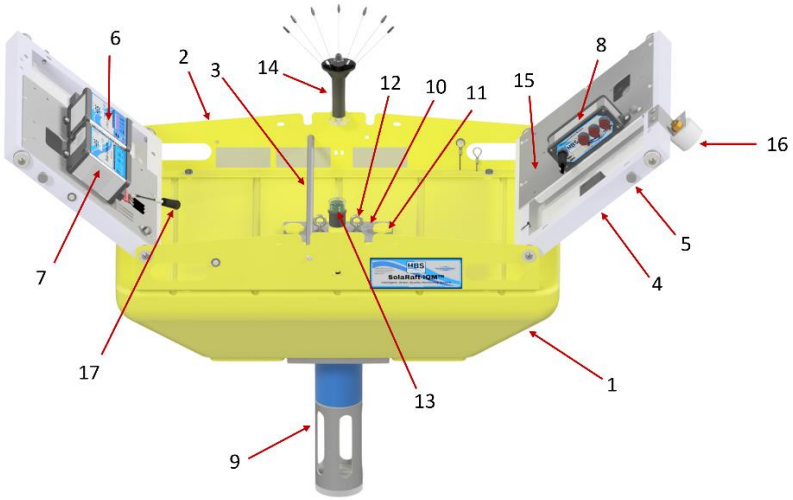
DOT Shipping Regulations

This battery ships Class 9. It cannot be carried by a passenger aircraft.

Limitations and Disclaimers

Due to environmental and manmade conditions contributing to excessive nutrient loading and many other factors, varying degrees of product efficacy should be expected and therefore, there is no guarantee regarding the total prevention or eradication of algae or algal blooms. HBS Algae Remediation products do not treat any body of water to produce potable or drinkable water. HBS Algae Remediation Products do not treat for other bacterium, pollution, viruses, toxins, micro-organisms, or other matter which may be present, and other methods of treatment may be needed to provide prevention, remediation, or elimination of such. HBS Algae Remediation Products are not a replacement for other water treatment methods, including, but not limited to, aeration, chlorination, oxidation, skimming, or other treatments meant to prevent, reduce, or eliminate other bacterium, pollution, viruses, toxins, micro-organisms, or other matter which may be present. HBS Algae Remediation Products are not to be utilized for off-label or unintended uses. Such off-label or unintended use may void the product's warranty and/or cause damage to persons or property.

PRODUCT FEATURES



1. Float: Buoyancy is approximately 54kg (120lbs).
2. Side Panels (x2): Serve as frame.
3. Lateral Stabilizing Bar: Do not suspend objects or use to support anchors, sonic head attachments, or SONDE probes.
4. Solar Panels (x2): Develops more than enough energy to power one SONDE probe (9) while charging the battery pack (6).
5. Solar Panel Lock Screws (X4): Keeps solar panels (4) locked in place to the side panels (2).
6. Lithium-Ion Battery Pack: Used to store and provide continual power to the Solar Controller (7). Battery pack is waterproof and rated at IP68. Refer to instruction manual located at www.hydro-bioscience.com.
7. Solar Controller: Takes in solar power and charges the battery pack (6), controls power to telemetry/modem module (8) (via the COMMS port), drives flashing of NAV light (13), and communicates via Bluetooth and serial communications for the MyQuattro™ app. Solar Controller is waterproof rated at IP68. Refer to instruction manual located at www.hydro-bioscience.com. A MyQuattro™ App is available free for use on Android smartphones to communicate via the Bluetooth connection.

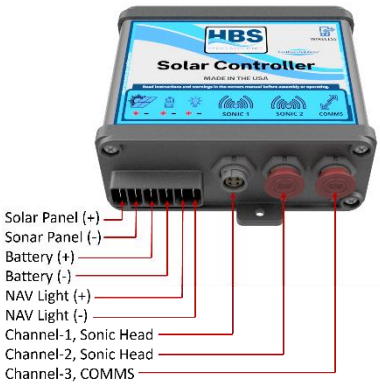
8. Telemetry/Modem Module: The modem communicates with the Solar Controller (7) via its Power/COMMS port (module channel-1). It has three additional ports (channel-2 through -4) to provide a connection to a SONDE probe (9), or other serial devices. The telemetry/modem module communicates with the cloud to provide cloud-based monitoring services and GPS position coordinates. Refer to its instruction manual located at www.hydro-bioscience.com.
9. Water Quality Monitoring SONDE Probe: Measures water quality metrics and transfers measurements to telemetry/modem module (8). Optional and purchased separately.
10. Mounting Plate: Used to mount the SONDE probe (9) to the SolaRaft.
11. Mounting Plate Thumb Screws (x2): Used to secure mounting plate (10) to float (1).
12. SONDE Probe Eyebolts (x2): Used to secure SONDE probe (9) to mounting plate (10).
13. NAV Light (navigation and warning light)
14. Bird Deflector: This wire array assembly deters birds from resting on the solar panels (4) and is mounted onto the side panel (2) bracket. Optional and purchased separately.
15. Strain Relief P-Clamp and Thumb Screw (not shown): Provides strain relief between telemetry/modem module (8) and SONDE probe (9).
16. Telemetry/Modem Antenna: Communicates with GPS and Cellular.
17. LOCKOUT Plug: When plugged into the 'COMMS' port on the Solar Controller (7), the SolaRaft is powered down for shipping.

UNPACKING AND FIRST TIME DEPLOYMENT

Refer to **PRODUCT FEATURES** figure and related call-out numbers. The call-out numbers are referenced in parenthesis.

1. Using a two-person team, remove product from its packaging and rest on a hard floor.
2. Locate and remove the four solar panel lock screws (5). Carefully swing open the two solar panels (4) fully, until the lanyards support the open solar panels. Do not allow the solar panels to drop open.

3. Locate the Solar Controller (7). During shipping, the SolaRaft is powered off by one of two methods as mandated by shipping couriers and/or country importation codes. Power the system on by the following Method One or Method Two:
   a. Method One: Two wires may not be connected to the Solar Controller – the Solar Panel (+) and Battery (+). These are identified by the printed heat shrink on the terminals. Plug these two wires into the Solar Controller tabs.
   b. Method Two: Locate Channel-3, COMMS on the Solar Controller (7). Remove the plug labeled 'LOCKOUT' (17) from the receptacle.



   The NAV Light (13) will begin to flash if the system is charged.

4. If a Telemetry/Modem Module Option was purchased, there are two options:
   a. Option One: uses a Steven's Water Steelhead. Refer to the section titled "STEVEN'S WATER TELEMETRY/MODEM" and install.
   b. Option Two: uses an HBS Telemetry/Modem Option (8). The Telemetry/Modem module is already installed.
      i. Locate the Solar Controller (7) and identify the port labeled 'COMMS'. Plug the telemetry cable into the 'COMMS' port if it is not already.
      ii. Refer to the Telemetry/Modem manual located at www.hydro-bioscience.com for a full list of operating instructions.

5. If a SONDE probe (9) was purchased, refer to the section titled "SONDE PROBE" and perform steps 1-4. Do not install the probe in the float (1) mechanically since its sensor array is delicate and should not hit the ground. After installing the probe's power cable wiring, lay the probe on its side on top of the float (1). Probe can be mechanically installed once the SolaRaft is in 3m or greater depth of water.

6. Carefully swing both solar panels (4) back into position and secure the panels with its four solar panel lock screws (5).

7. Depending on the length of time the product may have spent in a warehouse, the product may have to sit in the presence of sunlight for 24 hours to charge the battery (6) prior to moving ahead with deployment.

8. Move the SolaRaft out into the body of water to be treated along with an anchor and a length of anchor chain or anchor rope and all hardware necessary to construct the anchoring system (all items are supplied by the installer).
    a. The anchor, supplied by the installer, should typically weigh anywhere from approximately 9kgs to 23kgs (20lbs to 50lbs) but is also dependent on the environment that surrounds the body of water; for example, consideration to storms, waves, and wind may require a heavier anchor.
    b. Also refer to the section titled "ANCHOR PLACEMENT" for hints at creating the anchor system.

9. Once the SolaRaft is deployed in the body of water, the SONDE probe (9) can be secured into the float's (1) access hole. Refer to section titled "SONDE PROBE"

SONDE PROBE

Eureka's Manta Probe Installation

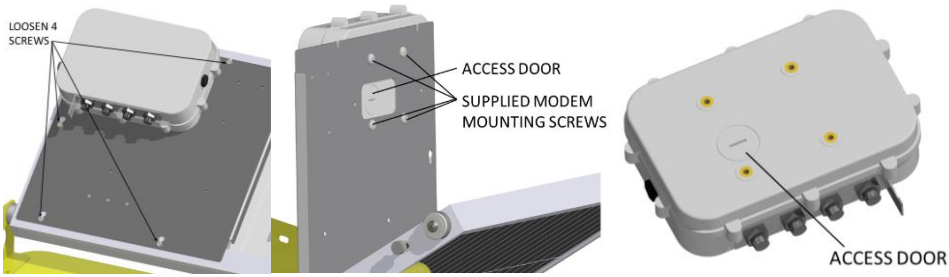
Follow Eureka SONDE probe Install and operating instructions. The following steps serve as a quick guide to installing the probe into SolaRaft. The full Manta Probe manual can be found at https://www.waterprobes.com/support-for-water-quality-monitoring.

1. Unpackage Manta Probe and locate the hardware package provided with SolaRaft.
2. Line up the mounting plate (10) holes to the top of the Manta Probe and thread the eyebolts (12) through the plate and into the probe.
3. Unscrew the protective cap on the top of the probe and connect the Underwater Cable by threading and hand tightening the cable plug.
4. Remove the Storage/Calibration Cup from the bottom of the probe and replace with the Weighted Sensor Guard.
5. Carefully lower the probe down the 114mm (4.5in) access hole of float (1). Only perform this step if SolaRaft is in the water at 3m or greater depth to prevent damage to the probe.
6. Line up the mounting plate (10) holes to the ones on the float (1) and screw in the thumb screws (11).
7. Follow the manufacturer's cleaning and calibration routine before deploying.

STEVEN'S WATER STEELHEAD MODEM

Refer to the full Steelhead manual located at https://stevenswater.com/. The following instructions are solely for the mechanical and electrical connection to the SolaRaft product.

1. Due to shipping regulations, all Bluetooth devices must be turned off. The Steelhead must first be powered on in the back of the unit.
2. If the Steelhead is already installed, then loosen the 4 screws located on the solar panel mounting plate. Tilt the mounting plate forward to locate the access door.



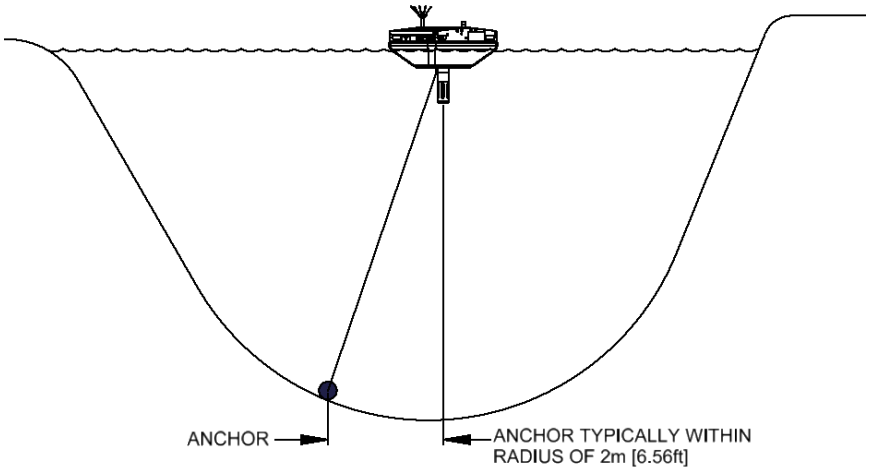
3. Locate the Power Cover Unlocking Disk provided in the hardware bag and use it to open the access door by rotating and lifting it out of the way.
4. Flip the switch in the access door to the 'ON' position.

5. Reinstall the access door. Return the mounting plate and tighten the screws.

6. Two cables plug into the bottom ports of the Steelhead. The COMMS cable from the Solar Controller (7) threads into the Power Input. The SONDE probe's cable plugs into the SDI-12 input.

ANCHOR PLACEMENT

TYPICAL APPLICATION



Anchoring the Water Quality Monitoring System

1. A typical 9kgs to 23kgs (20lbs to 50lbs) anchor ball, available from many sources including marinas and retail stores, is needed to keep the SolaRaft in place. Alternatively, cinder blocks or other heavy weights can be considered.
2. The anchor is first tied to a marine grade rope, stainless-steel cable, or a chain and dropped until it rests on the lakebed.
3. Cut anchor line 2m [6.56ft] above surface of the water where the SolaRaft is to be placed to allow for slack. If there is no slack, a slight increase in water level could dislodge the anchor and allow the SolaRaft to float away.
4. Attach the other end of the anchor rope or cable or chain to the D-Ring located on the bottom of the float (1).

SOLAR POWERED SYSTEMS

Solar Charger and Controller Power Supply

For operation of the Solar Controller, please refer to the Solar Charger/Controller User's Manual (MNUL0059-V001) or visit the resources → manual section at https://www.hydro-bioscience.com/.

Telemetry/Modem Module

For operation of the HBS Telemetry/Modem Module, please refer to the Modem Uplink User's Manual (MNUL0065-V001) or visit the resources → manual section at https://www.hydro-bioscience.com/.

For operation of the Steelhead Data Logger, please refer to the Steelhead User's Manual located at https://www.stevenswater.com/

Water Quality Monitoring SONDE Probe

For operation of Eureka's Manta Probe, please refer to the Manta User's Manual located at https://www.waterprobes.com/

SOLARAFT STORAGE AND RE-DEPLOYMENT

Storage

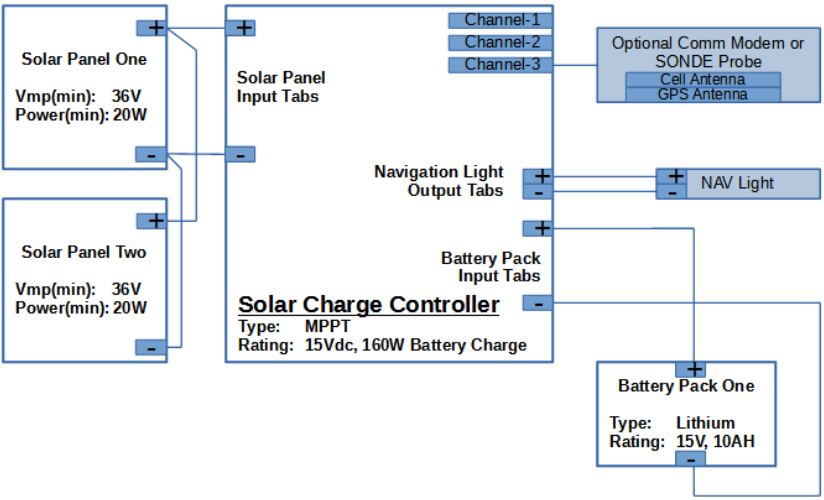
Due to seasonal cold where temperatures drop to less than 5°C (40°F) for an extended period of time, it is necessary to store the product. Also refer to the PRODUCT FEATURES figure for reference to the product numbered features.

1. Locate Anchor chain and disconnect. Make sure to secure the anchor line or remove anchor from water body to use for redeployment.
2. Pull SolaRaft system close to shore. Allow enough depth to prevent SONDE probe from hitting the lakebed.
3. Remove the four solar panel lock screws (5) and carefully swing open the solar panels (4) to gain access to components.
4. Unfasten the two mounting plate thumb screws (11) from the float (1), remove the SONDE probe (9) from the float's access hole, and rest it on the float (1). It does not need to be electrically disconnected. With probe removed from float's access hole, the solar panels (4) can be swung closed and the SolaRaft can be pulled completely onto shore or onto a dock.
5. Swing open the solar panels (4) again, once on firm ground.
6. Find the Solar Controller (7) and locate the Battery (+) terminal. Disconnect this lead by pulling it out. Fill the terminal with Dielectric Grease. Leave the terminal unconnected.
7. Unplug SONDE probe (9) from Underwater Cable, reinstall protective cap and Storage/Calibration Cup, and store in a warm, dry location.
8. Swing the solar panels (4) closed and re-install the four solar panel lock screws (5).
9. With the battery terminal unconnected, all other electrical connections, including the solar panel connection, may be left connected.
10. The SolaRaft and its battery pack (6) may now be left in storage for a year or longer.

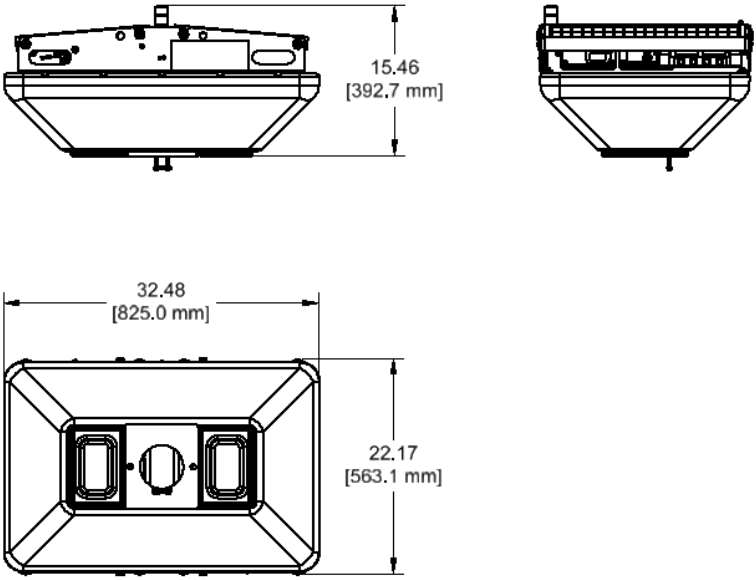
Redeployment

1. From storage and prior to redeployment, clean the SolaRaft. Gently spray off dirt and debris using a water hose.
2. Wipe the solar panels using a common household window cleaner and a soft cloth.
3. Remove the four solar panel lock screws (5) and swing open the solar panels (4).
4. Reconnect the Battery (+) terminal lead to the Solar Controller (7).
5. The NAV light (13) will begin flashing if system is charged.
6. Depending on the length of time the product may have spent in storage, the product may have to sit in the presence of sunlight for 24 hours to charge the battery prior to moving ahead with redeployment.
10. Reinstall SONDE probe (9) by following steps above in section titled "SONDE PROBE"
7. Swing closed the solar panels (4) and re-install the 4 solar panel lock screws (5).
8. Redeploy.

TYPICAL SOLARAFT CIRCUIT CONNECTION



PRODUCT DIMENSIONS



5. General Warranty

Hydro BioScience, LLC (HBS) warrants that the product will be free from defects in materials and workmanship for a period of 3 years (1 year for accessories) from the date of purchase of the product by the original purchaser from HBS. This warranty only applies to the original purchaser and is not transferable to a third party.

If the product proves defective during the warranty period, HBS either will repair the defective product without charge for parts and labor or will provide a replacement in exchange for the defective product. Parts, modules, and replacement products used by HBS for warranty work may be new or reconditioned like new performance. All replaced parts, modules and products become the property of HBS.

To obtain service under this warranty, customer must notify HBS of the defect before the expiration of the warranty period. Customer shall be responsible for packaging and shipping the defective product to the service center designated by HBS, and with a copy of customer proof of purchase. Customer must ensure that an RMA (Return Material Authorization) number has been received from HBS. This RMA number must be printed on outside of the return packaging.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. HBS shall not be obligated to furnish service under this warranty:

a) to repair damage resulting from attempts by personnel other than HBS representatives to install, repair or service the product;
b) to repair damage resulting from improper use or connection to incompatible equipment;
c) to repair any damage or malfunction caused by the use of non-HBS supplies;
d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

Please contact the nearest HBS's Sales and Service Offices for services. For better after-sales service, please visit www.hydro-bioscience.com and register the purchased product online. Warranty may also be requested on-line, along with obtaining an RMA, automatically.

Excepting the after-sales services provided in this summary or the applicable warranty statements, HBS will not offer any guarantee for maintenance declared or hinted, including but not limited to the implied guarantee for marketability and special-purpose acceptability. HBS should not take any responsibility for any indirect, special, or consequent damages.

For Customer Service, and to request an RMA or obtain Return Information, please call Hydro Bioscience, LLC at 888-500-5011.

For all returns, clearly mark the RMA # on the outside of the packaging and send to:

Hydro Bioscience, LLC
414 Century Court
Piney Flats, TN 37686
RMA Number: _____

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Eco Driven Solutions®