



Quattro-DB[®], DB-360[™], DB-Globe[™] Sonic Heads With ARCS Resonance[™] Technology



QUATTRO-DB[®]



QUATTRO-DB-360[™]



QUATTRO-DB-GLOBE[™]

General Product Specifications

Model Number	Input Power	Product Description
59-ARCS2XT00-A01B	40Vdc 15W, 20-250kHz	GEN-3 Quattro-DB, 2x 180 for 360° coverage One Built-in ForteConn [®] Connector
59-360D1CT00-A01B	40Vdc 14W, 20-250kHz	GEN-4 Quattro-DB-360, full 360° coverage One Built-in ForteConn [®] Connector
59-GLOB1CT00-A01B	40Vdc 14W, 20-250kHz	GEN-4 Quattro-DB-GLOBE, full 360° hemi- spherical coverage and ForteConn [®] Connector

EPA Co. No. 95328

Covered under one or more Patents and Patent Pending: No. 10,399,867



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please scan this QR Code or refer to the
Product Manuals section at:
www.Hydro-Bioscience.com

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















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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		
	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 that 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 battery.**

User Safety and General Product Precautions

1. Locate/route all cords where they will not be tripped over or damaged by 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) 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., are present in the water body, 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. Alternatively, download the manuals by scanning the QR code shown on the white label located on the top of the Power Supply.**

Uses

The HBS Algae Remediation Products treat bodies of water such as lakes, ponds, etc., as an aid in preventing, reducing, and, in many cases, eradicating harmful algal blooms.

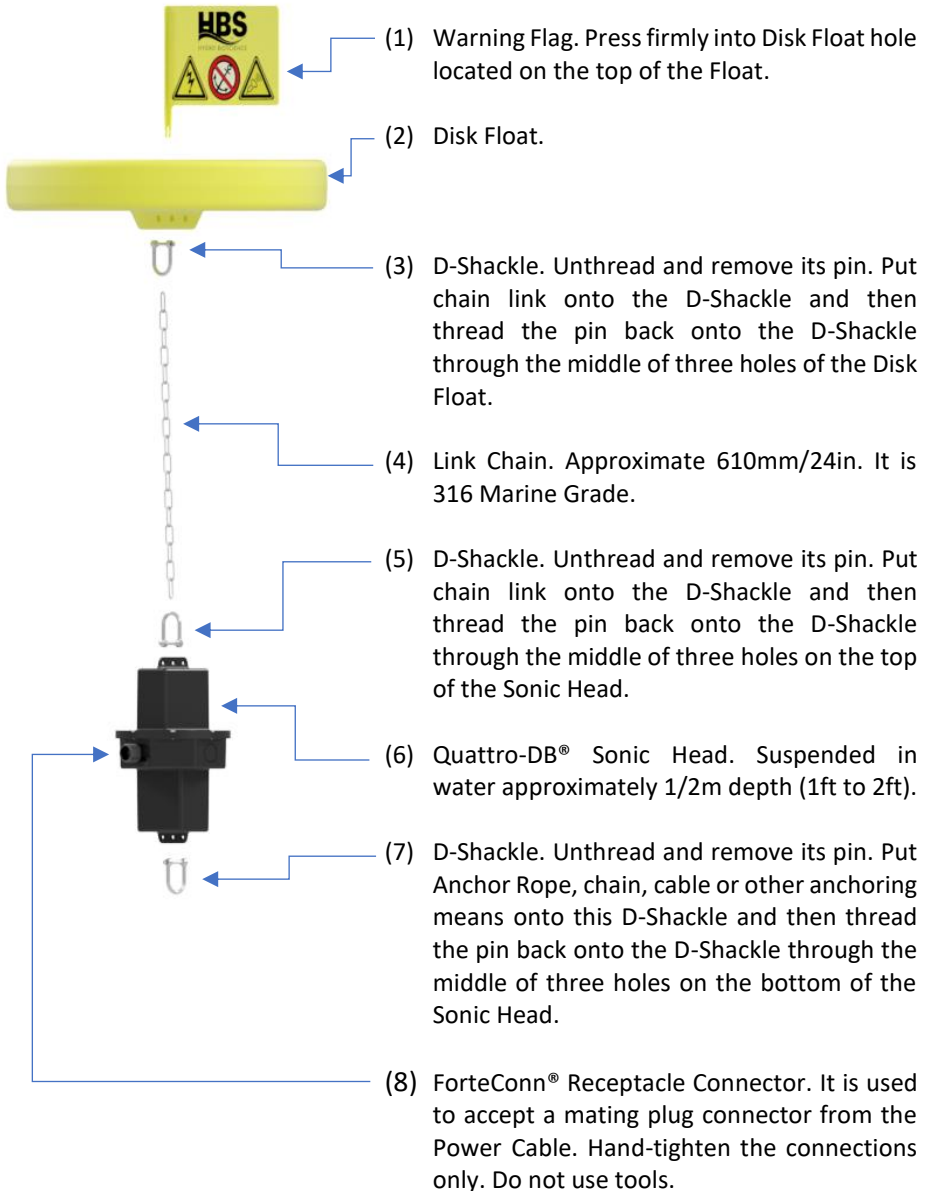
Limitations and Disclaimers

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.

2. INSTALLATION

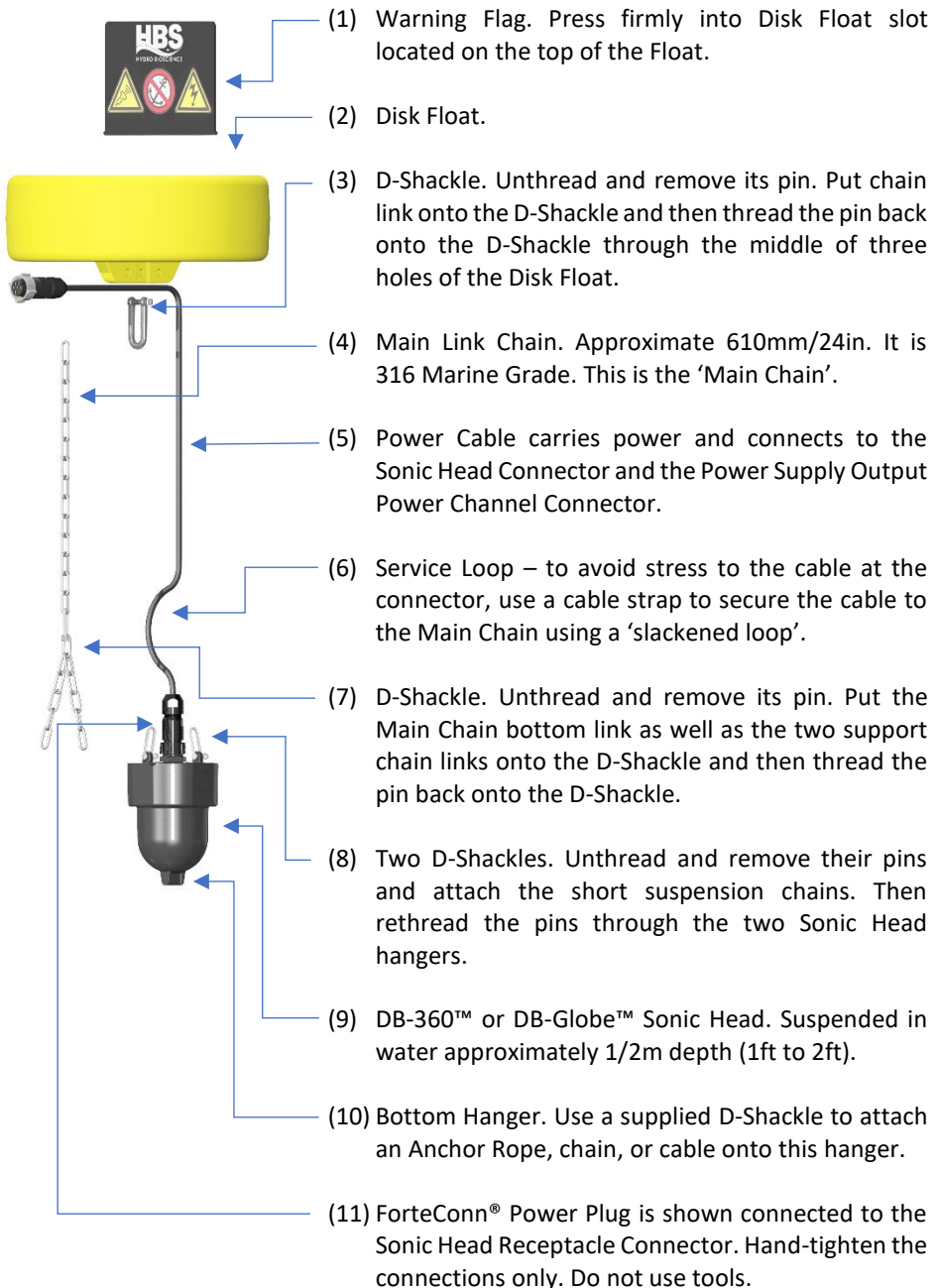
Quattro-DB®

PRODUCT FEATURES AND ASSEMBLY



Quattro-DB-360™ And DB-GLOBE™

PRODUCT FEATURES AND ASSEMBLY



Important Additional Assembly Requirements

Protecting Connector Mating Unions

1. A bag of parts kit contains extra D-Shackles, Cable Tie Straps, and a small Dielectric Grease sachet.
2. The Dielectric Grease Sachet is shown on the left. Anytime two connectors are to be mated, use a very small (sparingly) amount of grease as shown in the image below.
3. Apply 3mm or less diameter spot of dielectric grease to the power supply cable port and ForteConn® Power Plug to aid in the resilience to moisture, dirt, and grime trapped inside the union mating of the plug and receptacle.



If a cable connector is supplied that connects to a power supply, apply a very small 3mm diameter spot or less of dielectric grease to all socket contacts (as shown) – not pins to protect from corrosion, moisture, and dirt when connectors are disconnected or mated. Any dielectric grease or lubricant used must conform to NSF-61 Marine and/or Food Grade standards.

Protection of Cables from Tear and Stress

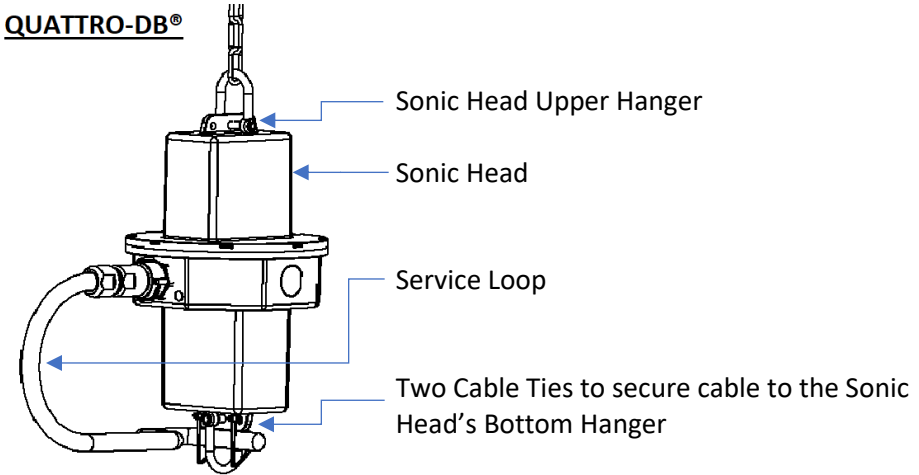


IMPORTANT – CABLE SERVICE LOOPS

Cables must never be used to pick up Sonic Heads, nor carry the weight of stress created by waves of water bobbing the Floats up and down. The cable jacket may tear at the entry points into the connectors and allow water and contamination into the waterproof connectors!

An example of routing a power cable using a Service Loop is shown in the following image, using a Quattro-DB® Sonic Head as an example. Make a Service loop by making a radial bend and secure the cable to the two outer holes of the Sonic Head's bottom or top hanger with the cable ties that are supplied in the Parts Kit. Clip off excess cable tie straps with flush cut trimmers or scissors. **Failure to supply Service Loops may cause permanent non-warranty damage to cables or connectors.**

This figure shows a service loop in applications where the cable is allowed to fall to the bottom of the lake and then routed to a power supply on shore. For applications where the cable is routed to a SolaRaft Solar-Powered Power Supply, the cable would be routed up the chain and use the holes in the upper Hanger of the Sonic Head to secure the cable.



When laying the cable in shallow water less than 2m [\sim 6ft], and over shore ground, it may be beneficial to sheath the cable or bury it to deter wildlife from biting and severing the cable or pulling the cable.

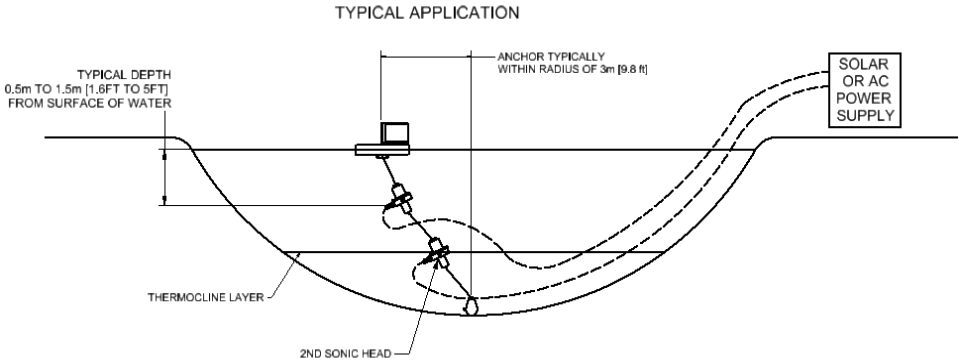


IMPORTANT: At shore, it is important to secure the cable with a Service Loop and Stress Relief to prevent damage to cable connections on power supplies typically situated on shore. Wildlife and/or water currents may pull on these cables, breaking cable connections at the power supply.

If a cable has been damaged due to breakage resulting from wildlife chewing through cables, or accidental breakage due to lawnmowers and other types of breakages, HBS offers a Cable Splice Connector kit for purchase. For information on how to connect and disconnect the cable splice connector during installation, winterization storage, or redeployment, refer to the section under [SONIC HEAD MAINTENANCE](#) titled "[Cable Splice Connector.](#)"

Anchor and Sonic Head Placement

Shown below is a typical application using one or two Sonic Heads. The Power Supply that supplies power to the Sonic Heads is mounted on shore.



Single Sonic Head

Where one Sonic Head is used, refer to the 'upper' Sonic Head in the figure:

1. A typical 2.27kg (5lb) anchor ball, available from many sources, including marinas and retail stores, is needed to keep the system in place. The anchor is first tied to a marine-grade rope, stainless-steel cable, or a chain and dropped until it rests on the lakebed. (Alternatively, cinder blocks or other heavy weights can be considered for the anchor.)
2. Adjust the anchor line so the anchor is resting on the lakebed with 2m [6.56ft] excess line above water surface, from where the anchor/system is to be placed.
3. The top end of the anchor line should then be secured to the bottom D-shackle (10).

Dual Sonic Heads

Where two Sonic Heads are used, refer to the entire figure above or the next figures. There are two alternate layouts.

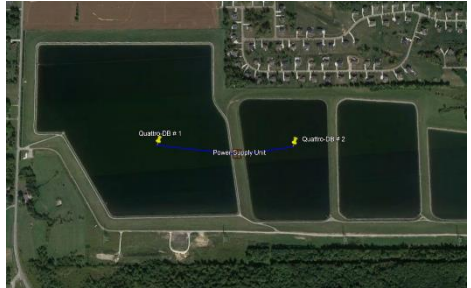
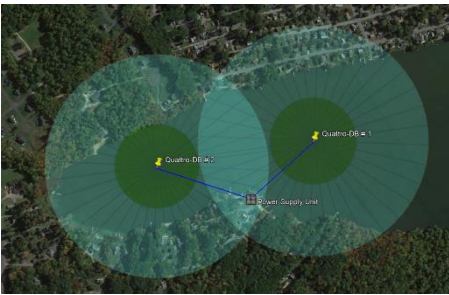
Alternate Layout One (refer to Typical Application figure above):

Consult a Limnologist to supply aid and understanding of the body of water to be treated, using this option.

For deeper lakes, a thermocline layer exists at the bottom of the lake. Algae tends to rest in this layer. By making available a second Sonic Head, positioned at this layer, it affects that algae by forcing them to transcend down into colder water, where their life cycle may be affected and shortened.

Alternate Layout Two (pictured below):

The Sonic Head technology is a line-of-sight technology much like radar. If the shape of the lake is not straight or has an obstruction (i.e. a fountain, aerator, or a point/land/island) between two bodies of water, two Sonic Heads driven from one power supply (either an HBS AC Power Supply or HBS Solar Power) should be considered. Refer to the figures below for layout placements for different applications. The figure with the circled areas represents coverage (inner circle approximately 17 acres for green algae and outer circle approximately 120 acres for blue-green algae).



3. POWER SUPPLY OPTIONS

85Vac to 264Vac 50/60Hz Universal A.C. Utility Power Supply



For operation of Sonic Heads using the AC Power Supply, please refer to the Universal Power Supply User's Manual (MNUL0057-V001) or visit the resources → manual section at <https://www.hydro-bioscience.com/>.

24Vac/Vdc Low Voltage Utility Power Supply



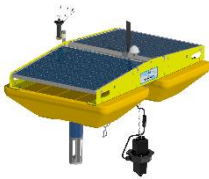
For operation of Sonic Heads using the 24V AC/DC Power Controller, please refer to the 24V AC/DC Power Supply User's Manual (MNUL0058-V001) or visit the resources → manual section at <https://www.hydro-bioscience.com/>

Solar Charger and Controller Power Supply



For operation of Sonic Heads using 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/>.

Solar Powered SolaRaft Flotation Systems



For operation of Sonic Heads using Solar Flotation systems, please refer to the SolaRaft-iQDB User's Manual (MNUL0060-V001) or visit the resources → manual section at <https://www.hydro-bioscience.com/>.

Solar Powered Shore Mounted Systems



For operation of Sonic Heads using Shore Based Solar systems, please refer to the SolaRaft-iQDB User's Manual (MNUL0062-V001) or visit the resources → manual section at <https://www.hydro-bioscience.com/>.

4. WHAT TO EXPECT AFTER INSTALLATION

Blue-Green Algae (Cyanobacteria)

Most blue-green algae (cyanobacteria) will have lost their buoyancy and should be on, or settling, to the pond bottom within 3-4 days. The cells can be re-suspended via aeration, bringing them up to the light, which may prolong the time it takes for them to fully die off. Therefore, please note that a subsequent “bloom” is not uncommon, and it could take multiple cycles before a thorough algae remediation can occur.

Green Algae

Green algae (filamentous types) and colonial types require up to 3+ weeks before the damage results in them turning brown, depending on the kind (genus/species) of algae. They will normally float to the surface at this time due to the bacterial digestion process breaking them down. It takes about 7-10 days from that point before they are sufficiently digested to lose buoyancy and sink. Some users rake them out as the die-off begins or you may just let them settle to the bottom. If you do the latter, bioaugmentation can speed up the digestion process and help remove the biomass.

Diatoms

Diatoms react similarly to green algae but lose mobility quickly which hastens their dying process.

Biofilm

For biofilm control and prevention, ultrasonic frequencies mimic turbulent water which prevents the colonization of microorganisms in biofilm forms.

Affected Algae Species

Achnanidium minutissimum, Anabaena spp., Ankistrodesmus falcatus, Aphanizomenon spp., Aphanochaete spp., Botryococcus braunii, Chlamydomonas spp., Chlorella spp., Chloromonas botrys, Chroococcus spp., Closterium spp., Cocconeis placentula, Coelastrum spp., Cosmarium spp., Crucigenia spp., Cryptomonas erosa, Cryptomonas spp., Cyanobium sp., Cyclotella spp., Desmodesmus abundans, Dictyosphaerium spp., Fragilaria capucina, Fragilaria spp., Gloeocystis spp., Gomphonema parvulum, Gomphonema spp., Heteroleibleinia spp., Lagerheimia spp., Leptolyngbya spp., Lyngbya spp., Merismopedia tenuissima, Micractinium spp., Microcystis spp.*, Navicula minima, Nitzschia spp., Oedogonium spp., Oocystis pusilla, Oocystis spp., Phacus spp., Pinnularia spp., Pithophora spp.*, Plagioselmis nannoplantica, Planktothrix spp., Planorhynchium lanceolatum, Polycystis sp., Pseudanabaena spp., Raphidiopsis raciborskii*, Scenedesmus quadricauda, Sphaerocystis schroeteri, Spirogyra spp., Staurastrum spp., Stigeoclonium spp., Tabellaria spp., Tetradesmus lagerheimii, Tribonema spp., Ulnaria ulna, Ulothrix spp.

*Only partial control

(This is not a complete list of algae that is affected by HBS Ultrasonic systems)



Important Note: Certain species of plants and foliage rely on the presence of biofilm to survive and may be adversely affected. One known affected species is water hyacinth (*Pontederia crassipes*). Therefore, the sonic head devices are registered with the EPA.

Typical Area Coverage:

Blue-Green Algae:	approximately 120 acres
Green Algae:	approximately 17 acres
Biofilm/Diatoms:	approximately 3 acres

Sonic Head Maintenance

The HBS ultrasonic algae management system is designed to limit calcium carbonate crystal formation on the sound emitting surfaces, so it forms slowly. Over time, buildup will occur depending on how hard the water is where you live. Check the system for any calcium carbonate buildup after the first month of operation. If you see significant crystalline formation, use a calcium lime rust remover to wipe it away. Adjust your cleaning cycle based on how quickly the buildup returns.

Early field results show that biofilm formation on the device is likely. This has been seen on other ultrasonic devices. This is due to ultrasonic frequencies mimicking turbulent water and preventing biofilm colonization everywhere except for directly on the device (ground zero for the sound emission). For water treatment facilities, it is recommended that the sonic head gets wiped or brushed off monthly to remove any accumulated biofilm. Small accumulation of biofilm has not been shown to cause loss of output from the sonic head because ultrasound seems to easily pass through the film (since it is about 99% water), but if left uncleaned, large buildup of biofilm will cause dampening of ultrasonic frequencies and limit the effectiveness of the device.

Storage

Winterization: If your pond ices over during the winter or if temperatures drop to less than 5°C (40°F) over an extended period of time, it may become necessary to store the sonic head and float assembly to prevent ice buildup from damaging the cable or other system components.

1. Unplug the power supply and make sure the system is fully powered off.
2. Locate anchor chain and disconnect from lower D-shackle (10). Make sure to secure the anchor line or remove anchor from water body to use for redeployment.

3. Pull system to shore and out of water body.
4. Unplug cable from power supply.
5. Thoroughly dry system before storage.
6. Store system in a safe, dry location.

Redeployment

1. Prior to redeployment, clean the sonic head. Gently spray off dirt and debris using a water hose or wipe with a wet soapy cloth.
2. Reapply dielectric grease to cable connections.
3. Plug cable into power supply.
4. Reattach anchor line to D-shackle (10).
5. Redeploy.
6. Plug in power supply to AC receptacle after redeployment.

Cable Maintenance

Cable Splice Connector

Cable Splice Connector used on 'T65' models only.

This connector is an IP68 rated cable splice that can be used in field repair or upgrading to newer sonic heads. This connector may be ordered as a kit – KITM0262. Go to www.Hydro-Bioscience.com to contact the RMA department to place order.

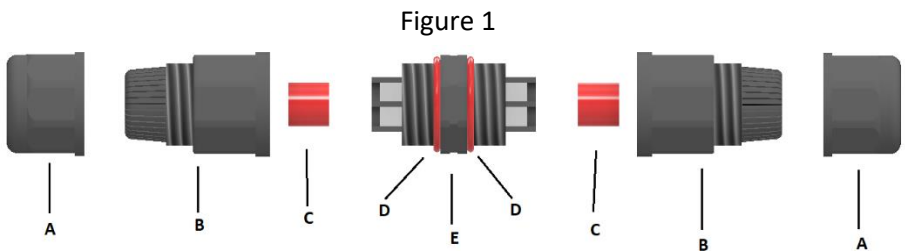
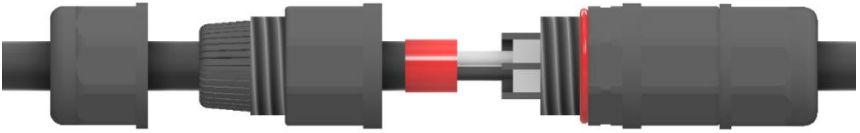


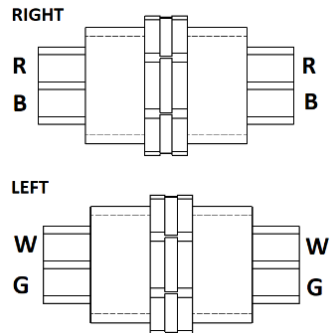
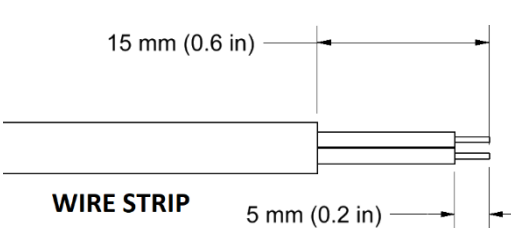
Figure-1 Parts Description

- A. Cable Sealing Cap – one for each side
- B. Connector Housing – one for each side
- C. Cable Sealing Cap Grommet – one for each side
- D. Red O-ring for sealing – one for each side
- E. Connector Splice Terminal – 4 circuit for 4 wires

Figure-2 Connecting Cables to Splice



1. Slide Cable Sealing Cap (A) and Connector Housing (B) and Cable Sealing Cap Grommet (C) onto each cable.
2. Optional adhesive-lined Heat Shrink tube. For very deep or high-integrity protection, a heat-shrink tube may be used. For most typical applications, the heat-shrink tube is not necessary. If using the heat-shrink tube, slide the cable through it before joining the cables together.
3. Prepare the ends of each cable to be joined by stripping the outer cable jacket to 0.60in (15mm) and each conductor stripped to 0.20in (5mm). Refer to the WIRE STRIP diagram in **Figure-2**.
4. To join one cable to the next, align the cable colors of each cable. Red aligns with red (R-R), black to black (B-B), green to green (G-G), and white to white (W-W). Refer to the RIGHT and LEFT (which is also the front and rear view) figure of the Connector Splice Terminal (E) shown in **Figure-2**.
5. Align the color of each conductor with each circuit of the Connector Splice Terminal (E). Use a #1 Philips screwdriver to tighten each circuit. Pull on each conductor to verify each terminal is tight in its contact circuit.
6. Thread the left side Connector Housing (B) onto the Connector Splice Terminal (E) fully until the red O-ring gasket (D) is fully covered.



7. Thread the left side Cable Sealing Cap (A) onto the Connector Housing (B) and hand-tighten until fully seated.
8. Repeat the above steps for the connector parts and cable shown on the right side.

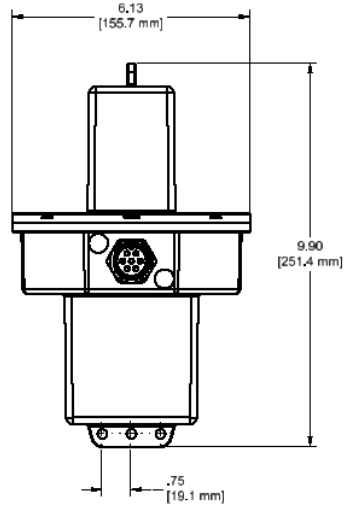
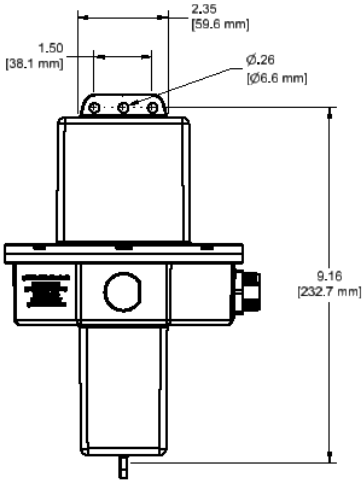
The finished assembly is shown here, without the optional adhesive-lined heat-shrink tubing that can be added over the top of the connector.



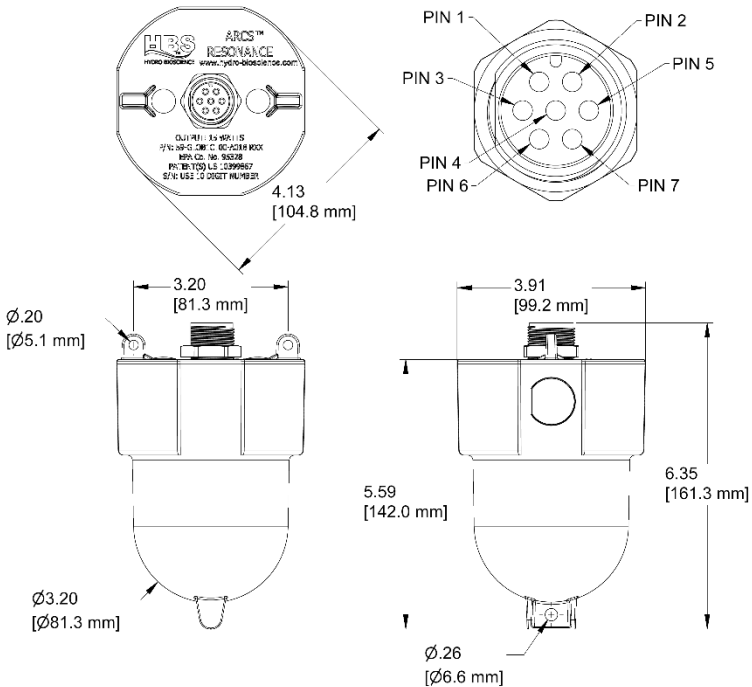
5. APPENDIX

Product Dimensions

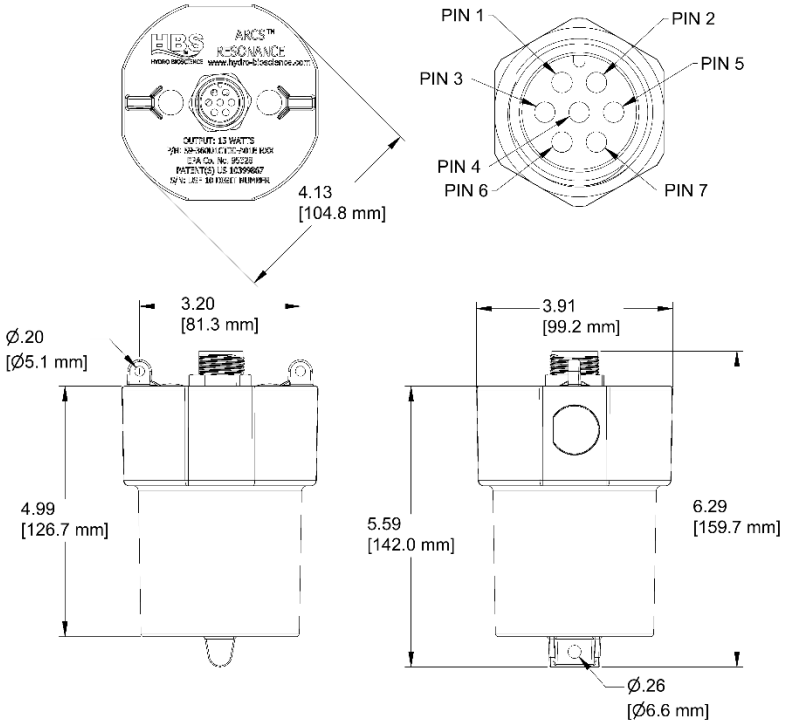
Quattro-DB®



Quattro-DB®-Globe™



Quattro-DB®-360™



Specifications

Parameter	Specification	Notes/Descriptions
Nominal Input Rating:	32Vdc to 48Vdc, 15W 26Vdc to 60Vdc, 14W	Quattro-DB® DB-360™ and DB-Globe™
Ingress Rating, Enclosure:	IP-68 minimum	
Ingress Rating, Connectors:	IP-68 minimum	
Dimension, mm, in:	156 x 251mm, 6.13 x 9.90in 81 x 155mm, 3.20 x 6.12in	Quattro-DB® DB-360™ and DB-Globe™
Weight, kg, lbs:	3.15kg, 7lbs 1.45kg, 3.2lbs	Quattro-DB® DB-360™ and DB-Globe™
Frequency Range:	20kHz to 250kHz	
Itemized Frequencies	10's of Thousands	Number of differing frequencies
Itemized Bandwidths:	Greater than 1,000 Bandwidths	Number of differing Bandwidths
Operating Temperature:	-40°C to 65°C, -40°F to 149°F	
Storage Temperature:	-40°C to 85°C, -40°F to 185°F	
Material:	Polyethylene Plastic, NSF61, REACH, Certified	Quattro-DB® DB-360™ and DB-Globe™

ForteConn® Connector Circuit Specifications

Pin Number	Signal Name	Notes
1.	RS-485 A	Communications
2.	RS-485 B	Communications/Legacy Heartbeat signal
3.	+Input	Input Positive Power, 42Vdc Typical
4.	Factory Use Only	uP Programming Purposes
5.	Cct Common	Reference Node
6.	Factory Use Only	uP Programming Purposes
7.	Factory Use Only	uP Programming Purposes

Patent And Patent Pending List Declaration

The various products described in this manual are protected by one or more of the patents and pending patent applications below. In addition to this list, other patent-pending applications are in progress.

Algae, biofilm control mimicking turbulence	US 11,299,406
Algae control by sweeping ultrasonic frequencies	PCT/US2024/049457
BMS for multicell batteries	US 9,876,367
Enhanced algae control system transducer	US 12,330,964
Full coverage algae control transducer	PCT/US2025/050747
High-density packaging system	CA 3,244,900
High-density packaging system	US 2025/0066110
Local algae control for submerged equipment	US 2024/0124332
Multi-range ultrasonic algae control	US 2025/0100904
Performance monitor for ultrasonic transducer	US 2024/0418550
Performance monitor for ultrasonic transducer	CA 3,241,638
Resonant frequency detection for algae control system	PCT/US2025/014056
(Round) Float for Water Quality Equipment	US D1,081,432
Solar Powered raft	US D1,005,933
Solar Powered Water Quality Raft	US D1,053,779
Ultrasonic algae control	CA 3,022,970
Ultrasonic algae control	CA 3,246,435
Ultrasonic algae control	EP 3,451,828 UP
Ultrasonic algae control	Greece 3,451,828
Ultrasonic algae control	India 497,341
Ultrasonic algae control	Ireland 3,451,828
Ultrasonic algae control	Korea KR 10-2454500
Ultrasonic algae control	Norway EP 3,451,828
Ultrasonic algae control	Poland PL 3,451,828
Ultrasonic algae control	Spain ES 2,947,635T3
Ultrasonic algae control	UK 3,451,828 GB
Ultrasonic algae control	US 10,399,867

6. GENERAL PRODUCT 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 will either 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 onto the 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) repair damage resulting from attempts by personnel other than HBS representatives to install, repair or service the product;
- b) repair damage resulting from improper use or connection to incompatible equipment;
- c) to repair any damage or malfunction caused by the use of a non-HBS Power Supply;
- 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 online, 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 will not take any responsibility for any indirect, special, or consequential 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 number on the outside of the package and send it to:

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

