



Aquarian Audio Products

H2b Hydrophone User's Guide

Thank you for purchasing your *Aquarian Audio Products* H2b hydrophone. This hydrophone is designed to provide high-quality audio performance in a low-cost device. It is very durable and will interface directly with ECM-type consumer microphone preamps. It offers very good sensitivity and low noise in the human auditory range. The H2b's small size, hydrodynamic shape, rugged build, and solid 1/4" NPT mount make it an ideal hydrophone for many long-term installations.

Using the H2b

The H2b offers a very simple solution to your underwater listening needs. It incorporates a matched sensor and FET buffer preamplifier assembly that produces an output electrically equivalent to electret-condenser microphones. This style of microphone is the most common type used with consumer electronics, making the H2b an extremely versatile hydrophone. Examples of equipment with which the H2b can be used include: minidisc, tape and flash recorders, camcorders, computers, wireless lavalier microphone transmitters, and many telephone and two-way radio transmitters. Any device with a 3.5mm (mini) microphone jack is very likely to be compatible with the H2b. Many audio devices with 2.5mm microphone or headset jacks, or professional microphone preamplifiers with phantom-powered XLR or TRS inputs, can also be used with the H2b and the appropriate patch cable.

The H2b requires bias power from the device with which it is used. It is very unlikely that you can harm the hydrophone or the device with which it is used by simply connecting each device with a standard 3.5mm TRS (stereo mini) patch cable and trying it. If it is working, you will easily hear handling noise and close speech. If it does not appear to work correctly, check the documentation for the device used with the H2b and ensure that it does supply bias power. This is often referred to as *plug-in* or *plug-and-play* power. It may be absent or need to be switched on. If, for instance you are using a video camera that requires a battery in its normal microphone, it is likely that bias power is not available from that device. Conversely, if you can plug a microphone in that does not need its own battery, and that microphone works correctly, your H2b should work equally well. Also check for gain adjustments and increase gain if needed.

Mounting and Electrical Connection

The H2b uses a standard (ANSI) 1/4" male pipe thread for mounting. Many common types of fittings are available at your local hardware store. If you are mounting directly to a hull, tank wall, or equipment housing, drills and taps are also commonly available. Use a 7/16-inch (0.438", 11.1mm) tap drill and take care to align your tap with the hole, cutting threads only as deep as required. Note that pipe threads are tapered. It is possible to run a pipe tap too deep, making the H2b bottom out on the flats of the mount before the threads bind snugly into the mounting hole.

CRITICAL NOTES:

- A thread sealing compound is required! We will not be liable for damage caused by leaks. Liberal use of a below-waterline marine-quality sealant is recommended.
- Do not apply force to the black surfaces of the hydrophone during installation. Use a 9/16" or 14mm open-ended wrench to firmly tighten the hydrophone into its mounting hole.
- The mounting stem of the H2b is connected to signal ground. If you are mounting the hydrophone to a metal pipe or surface, ensure that the mounting surface is not connected to any voltage potential other than your preamp signal ground. Noise can be caused by having multiple ground paths between the hydrophone and preamp. If you are grounding the H2b through its mounting surface, it may be beneficial for you to disconnect the ground (sleeve terminal) at the mating plug.

The output of your H2b is configured dual mono—both the left and right stereo channels are from the same source. This configuration is quite versatile because the hydrophone will drive both channels of a stereo device and will work with all standard computer sound cards. Inserting a TS, or mono, plug into the output jack of the H2B will short the output. This will not damage the H2b but will prevent operation.

The H2b uses a 3.5mm female TRS jack for electrical connection. This jack is also referred to as 1/8" stereo, mini, or phone jack. This is a very common audio connection. Mating plugs and molded patch cables are widely available. This connection also allows the plug to rotate within the jack while threading the H2b into its mount if a blind connection is necessary. The tip and ring connections are wired "hot" while the sleeve serves as signal ground and is electrically connected to the stainless steel body of the hydrophone.

If this connection will be exposed to a damp or corrosive environment, you can extend the life and reliability of the electrical contacts by applying a silicone grease to the mating plug before insertion and/or an RTV sealant between the housings of the plug and hydrophone. Using high-quality and well-shielded connectors and patch cables will help control unwanted noise.

Specifications

The H2b is intended to be durable and low-cost. Deriving high sensitivity and low noise from lower-cost components were made a priority over maintaining strict tolerances. The following specifications are typical of a limited sample group and are not guaranteed. They are for basic comparison information only.

Specifications are dependent upon the audio device to which the H2b is connected. The hydrophone sensor is capable of picking up sounds from below 20Hz to over 100KHz. The output impedance of the H2b is set in part by the bias current supplied by your audio device. High-frequency performance is also limited by the output impedance of the hydrophone and the cable impedance—which is a function of length. Please also note that further limitations in your overall system may result from the sampling rate of digital recorders and by the input stage of your audio device's microphone preamp. Despite the uncertainties of above, you should expect to easily capture the entire human auditory range of 20Hz to 20KHz.

Sensitivity:	-180dB re: 1V/ μ Pa	(+/- 4dB 20Hz-4KHz)
Useful range:	<10 Hz to >100KHz	(not measured above 100KHz, approximate sensitivity @100KHz = -220dB re: 1V/ μ Pa)
Polar Response:	Omnidirectional	(horizontal)
Operating depth:	<80 meters	
Output impedance:	2 K Ω	(typical)
Power:	0.3 mA	(typical)

<u>Physical:</u>		(cable and output plug excluded)
Dimensions:	25mm x 58mm	
Mass:	51 grams	
Mounting Thread:	1/4"-18 NPT	
Output:	3.5mm Female TRS	

Warranty Statement

Aquarian Audio Products warrants the H2b Hydrophone from electrical failure or defects in workmanship for a period of one year following the date of purchase. Warranty claims or repairs can be made directly through *Aquarian Audio Products*. Corroded output jacks are not covered under warranty. Shipping costs to *Aquarian Audio Products* for warranty repair are the responsibility of the user. *Aquarian Audio Products* assumes a maximum return shipping cost liability of \$25.00 US funds during any warranty claim.



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