



Aquarian Audio Products

H2c Hydrophone User's Guide

Thank you for purchasing your *Aquarian Audio Products* H2c 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 most consumer microphone preamps. It offers very good sensitivity and low noise in the human auditory range. The H2c'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 H2c

The H2c offers a very simple solution to your underwater listening needs. It incorporates a matched sensor and FET buffer amplifier 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 H2c an extremely versatile hydrophone. Examples of equipment with which the H2c can be used include: audio and video recorders, 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 H2c. 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 H2c and the appropriate patch cable.

The H2c requires bias power from the device with which it is used. You may need to switch 'plug-in power' or "phantom power" on in your recorder or mic preamp. It is very unlikely that you can harm the hydrophone or the device with which it is used by simply connecting and trying it. The standard configuration includes bare-wire termination. Connect the center conductor from the hydrophone cable to the tip and/or ring connector(s) of your microphone preamp with typical 3.5mm TRS connections. If using a professional-grade mic preamp with XLR connectors and phantom power, connect the center conductor of the hydrophone cable to pin 2 of the microphone input. The cable shield connects to signal ground, which would be the sleeve connector or pin1 respectively. If you have purchased your H2c with an output connector, it will be wired for direct connection to common mic circuits. If you are connecting to your custom amp or A/D converter, use the biasing techniques noted above. You will easily hear handling noise and close speech when connected to your preamp properly. If it does not appear to work correctly, check the documentation for the device used with the H2c and ensure that it does supply bias power. Also check for gain adjustments and increase gain if needed.

Mounting and Electrical Connection

The H2c 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

CRITICAL NOTES:

- A thread sealing compound is required! The hydrophone is completely submersible, but the cable is not water-blocked and we can not be liable for damage to other equipment 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 7/16" or 12mm open-ended wrench to firmly tighten the hydrophone into its mounting hole.
- The mounting stem of the H1c 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 H1c through it's mounting surface, it may be beneficial for you to disconnect the ground lead at the hydrophone cable.

If you have purchased your H2c with a 3.5mm TRS output plug or jack, it will be configured for 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 H2c will short the output. This will not damage the H2c but will prevent operation.

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 H2c 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 H2c is connected. The hydrophone sensor is capable of picking up sounds from below 20Hz to over 100KHz. The output impedance of the H2c 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	