



BII7000 Series Omnidirectional Spherical Hydrophone

BII's spherical hydrophones provide omnidirectional responses up to 700kHz and offer excellent acoustic characteristics of low noise and durability, which make these hydrophones ideal for a wide range of oceanography applications. Bespoke built-in preamplifiers allow the hydrophones to be used with long extension cables with no loss in sensitivity. The customized built-in filters increase Signal-to-Noise Ratio, reject unwanted noises, and avoid saturation.

Typical Applications

Sonobuoy, Dipping Hydrophone. LBL, SBL, USBL Positioning. Parabolic Antennas Underwater. Reference Hydrophone, Noise Measurement.	Detection of Ultrasonic Cavitation Noise, Thermoacoustics in Gas. Passive Acoustic Monitoring (PAM System). Array Element, Vector Hydrophone Element. Marine Bioacoustics, Phantom-power Hydrophone, Sound Recording.
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SPECIFICATION

Part Number:	BII7006	BII7006HT
Sensitivity FFVS at 1 kHz:	-214.5 dB V/ μ Pa + Sensitivity Loss over Cable. Variation: ± 2 dB.	
FFVS:	Sensitivity Loss over Extension Cable (dB) = $20 \cdot \log[C_h / (C_h + C_c)]$. Valid for hydrophone without preamplifier. C_h : Hydrophone Capacitance; C_c : Capacitance of Extension Cable. Cable is of 100 pF/meter roughly.	
Usable Frequency:	Refer to Graph of FFVS vs. Frequency . Free-field Voltage Sensitivity. In Water: 1 Hz ~ 700 kHz at ± 3 dB V/ μ Pa In Air: 1 Hz ~ 13.2 kHz at -3dB V/ μ Pa Minimum Usable Frequency depends on -3dB high pass filter $f_{-3dB} = 1 / (2\pi R_i C_h)$. R_i : Input Resistance or Impedance of Preamp. C_h : Capacitance of hydrophone at 1 kHz.	
Capacitance C_h @ 1 kHz:	1.67 nF $\pm 10\%$ without cable.	
Dissipation @ 1 kHz:	0.005	
Noise Density at $f \ll f_s$: dB μ Pa/VHz	$43.1 - 10 \cdot \log f$ 1. f in kHz; f_s : Resonance Frequency which is close to the frequency of maximum FFVS. 2. Noise densities in this datasheet are calculated values with transducer parameters being measured in water. 3. As hydrophones works with preamps or data acquisition modules, total noise density is determined by all noise sources. Generally, the total noise density is much higher than the ones stated in this datasheet.	
Directivity Pattern:	Omnidirectional, Refer to Graph of Beam Pattern .	
-3dB Beam Width:	Refer to Graph of Beam Pattern .	
Side Lobe Level:	No side lobes	
Signal Output Type:	Single Ended	
Acceleration Sensitivity:	130.0 dB μ Pa/(m/s ²).	
Underwater Projector:	Yes. Do NOT use the hydrophone as a sound projector in the air otherwise the hydrophone will be damaged.	
Resonance f_s :	420 kHz	
TVR at f_s :	145 dB μ Pa/V at 1m.	
Maximum Drive Voltage:	400 Vpp	
Maximum Pulse Length:	50 mS at Maximum Drive Voltage	
Duty Cycle in Water:	10% at Maximum Drive Voltage. 100% ≤ 30 Vpp or 10.6 Vrms.	
Operating Depth:	400 m or 4 MPa, Maximum.	50 m or 0.5 MPa, Maximum.
Mounting Options:	Limited by the cable length if the cable has wire leads or a non-waterproof connector. 1. Default: Free Hanging (FH) 2. Free-hanging with Male Underwater Connector (FHUWC) 3. Thru-hole Mounting with Single O-ring (THSO) 4. Thru-hole Mounting with Double O-ring (THDO) 5. Bolt Fastening Mounting (Plastics) (BFMP) 6. Bolt Fastening Mounting (Stainless Steel) (BFMSS) Please refer to online document AcousticSystem.pdf for a complete list of Mounting Options and more details.	
Cable Options:	1. Default: Coax RG174/U (RG174) 2. Coax RG58/U (RG58) 3. Shielded Cable with Rubber Jacket, $\Phi D=6.5$ mm (SC65).	1. Default: Coax RG178/U (RG178). 2. Shielded Cable with Twisted Pair, PTFE Jacket. $\Phi D=3.2$ mm (SC32). Not water-proof.
Cable Length:	Default: 6 m.	Default: 2 m.
Connector:	Custom-fit Cable Length. 1. Default: Wire Leads (WL). 2. Male BNC (BNC). Max. Diameter $\Phi 14.3$ mm. 3. SMA (Plug, Male Pin) (SMA). Voltage Rating: 335 V _{RMS} Continuous. Max. Diameter $\Phi 9.24$ mm. 4. SMC (Plug, Female Socket) (SMC). Voltage Rating: 335 V _{RMS} Continuous. Max. Diameter $\Phi 6.4$ mm. 5. Underwater Mateable Connector (pin) (UMC). Max. Diameter $\Phi 21.5$ to $\Phi 35$ mm. (ONLY for -10°C to +60°C or 14°F to 140°F.) Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are not waterproofed.	
Size:	$\Phi D = \Phi 8.6$ mm, Length ≥ 28.0 mm and actual length depends on Mounting Parts.	
Weight:	≥ 0.09 kg with 6m cable. Actual weight depends on Mounting Parts, Cable Types and Length.	

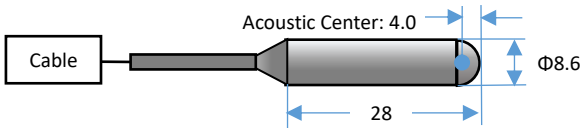
Operation Temperature:	-10°C to +60°C or 14°F to 140°F.		-10°C to 120°C, or 14°F to 248°F.	
Storage Temperature:	-20 °C to +60 °C or -4 °F to 140 °F.			
Wiring	Wire Leads	Underwater Connector	BNC/SMA/SMC	Coax with Wire Leads
Signal	White or Red	Pin 2	Center Contact	Coax Center Contact
Signal Common	Black	Pin 1	Shield	Coax Shield
Shielding	Shield	Pin 3	Shield	Coax Shield

Underwater Projector Application: for 50Ω BNC/SMA/SMC connector, it is buyer's sole responsibility to make sure that the BNC/SMA/SMC shield of the signal source is firmly grounded for operating safety before hooking up transducer/hydrophone to the signal source. Coax with BNC/SMA/SMC is not intended for hand-held use at voltages above 30Vac/60Vdc.

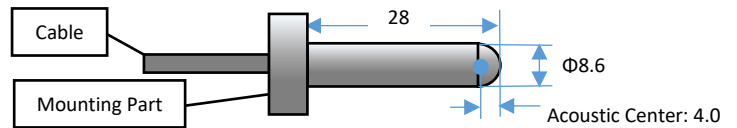
Do NOT use the hydrophone as a sound projector in the air otherwise the hydrophone will be damaged.

Sound Measurement in Air: The hydrophones can be used to detect sounds in air. The sensitivity in air is same to the one in water in low frequency range.

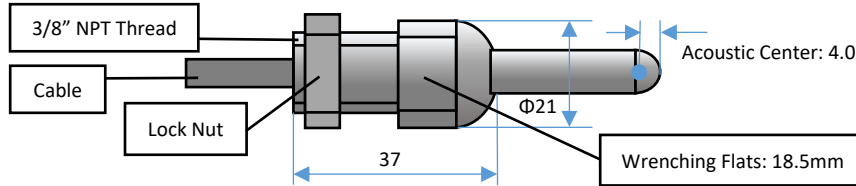
Physical Size (Dimensional Unit: mm) of Free Hanging:



Physical Size (Dimensional Unit: mm) with Mounting Part:

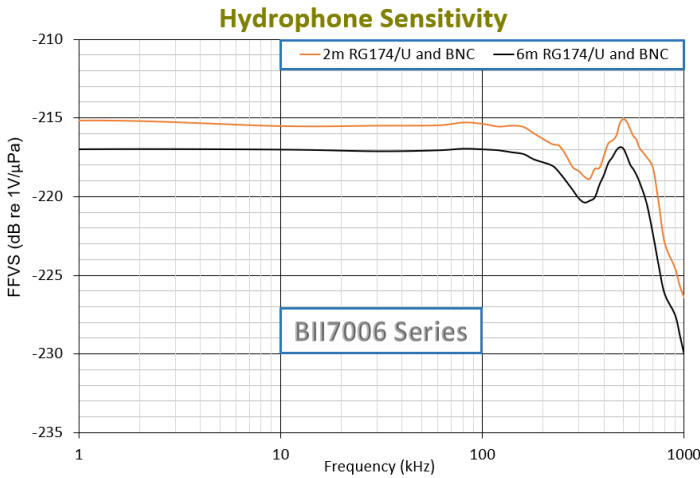


Physical Size (Dimensional Unit: mm) with BFMP Mounting Part:

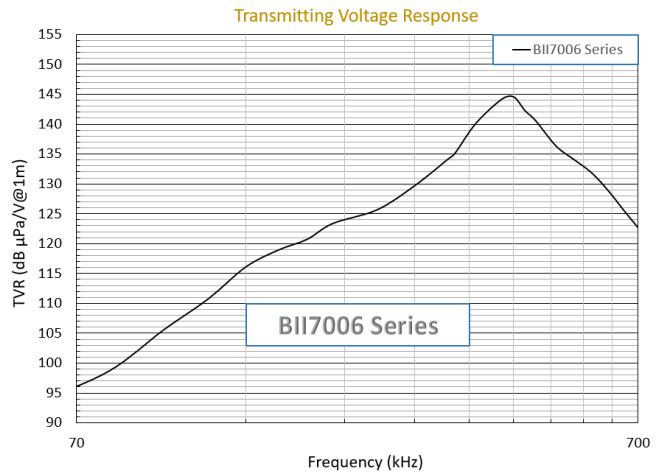


Bolt-Fastening Mount (Plastics) (BFMP)
Thread: NPT-3/8", Lock nut: included.
Maximum Depth: 300 m.
Mounting Hole: $\Phi 17.0 \pm 0.1$ mm.
Fastening Torque: ≤ 2.5 Nm.
Mounting Wall Thickness: ≤ 10 mm.

Free-field Voltage Sensitivity (FFVS):



Transmitting Voltage Response (TVR):



Beam Pattern

