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Underwater Sound Solutions

www.benthowave.com

# Automatic-Sensitivity-Control Hydrophone (ASCH, or Equalizing Hydrophone and Receiver): Dynamic Range 80dB for SONAR, NDT, and AE

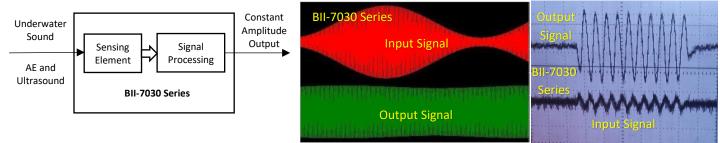
BII-7030 series hydrophones (receivers) detect the information being carried on by signal frequencies, and not by signal levels (amplitudes) and phases such as Doppler sonar for speed measurement, ASK and FSK digital communication, etc...

Automatic Sensitivity Control Hydrophone

The Automatic-Sensitivity-Control hydrophone maintains suitable (or constant) voltage amplitude at output despite the variations of the detected sound pressures by automatically reducing its sensitivity when the sound is strong and raising it when sound is weak. It has 80dB dynamic range to equalize the differences in received sound intensities emitted by different sound sources, amplitude variations in a single sound source due to fading or reduced power, as well as varying echo levels caused by sound propagation loss in SONAR and ultrasonic testing.

The built-in first order bandpass filter allows the receiver to detect the sound of the interest and reject the sounds out of its bandwidth.

### **Typical Waveforms**



Typical Applications	
Compensate Propagation Loss & Target Strength	Search of Acoustic Beacons: Tag, Pinger and Locator
Underwater Digital and Voice Communication	Passive Acoustic Monitoring (PAM System)
Doppler SONAR, Echo Sounding	Pulsing Ultrasonic Testing

#### Specification

Specification Part Number:	BII-7031						
Usable Frequency:	20 Hz to 500 kHz.						
Signal Type:	Continuous Signal (CW), Pulsed/Burst Signals, Chirp/FM, FSK, Frequency Hopping, etc						
• <i>1</i> .	Refer to BII-7000 series, BII-7010 Series, BII-7040 Series, BII-7070 Series, BII-7120 Series, BII-7190 Series, Other Hydrophones.						
Sensing Element FFVS:	Note: BII-7030 series hydrophones are upgrade models of the hydrophones listed above.						
	Custom-fit, specify when ordering.						
	1. Omnidirectional: refer to BII-7000 series.						
	2. Toroidal: refer to BII-7010 Series.						
<b>D</b>	3. Hemispherical: refer to <u>BII-7040 Series</u> .						
Directivity Pattern:	4. Conical: refer to BII-7070 Series.						
	5. Low Noise below Sea State 0: refer to <u>BII-7120 Series</u> .						
	6. Fan-shaped: refer to <u>BII-7190 Series</u> .						
	7. Other Hydrophones						
Input Dynamic Range:	80 dB						
	110 to 190 dB $\mu$ Pa. Sound Level Range $\Delta P_i$ = Input Dynamic Range = 80 dB.						
Sound Level Range ΔP <sub>i</sub> :	Note: minimum detection threshold is limited by noise levels in passband, which include electronic self-noise of the hydrophone and						
	ambient sound noises if the ambient sound noises are not the measurand. The wider passband is, the higher the noise level is.						
Overload Pressure Level:	Refer to Sound Level Range P <sub>i</sub> .						
	Customized, roughly $P_n \approx (-162 - Sensitivity of Sensing Element) at f \ge 1 kHz, in dB \muPa/VHz. RTI: Refer to Input.$						
Pressure Noise (RTI) Pn:	Equivalent pressure noise (RTI) Pn of less than 1 kHz is exponentially inversely proportional to 1/f and will be included in datasheet.						
	Most sensitive element is used in <u>BII-7120 series</u> low noise hydrophone, and is around -182 dB V/ $\mu$ Pa. Refer to the links in <b>Directivity</b>						
	Pattern for typical sensitivities and RTI Equivalent pressure noise of different sensing elements.						
Acceleration Sensitivity:	Refer to BII-7000 series, BII-7010 Series, BII-7040 Series, BII-7070 Series, BII-7120 Series, BII-7190 Series, Other Hydrophones.						
Built-in Filters:	Bespoke First Order Band Pass filter. refer to Usable Frequency.						
Output Type:	Single Ended						
Output Level Error:	< ± 2.0 dB						
Output Level V <sub>o</sub> :	0.2 to 3.2 Vpp						
Operating Depth:	Maximum 300 m and limited by the cable length if the cable has wire leads or a non-waterproof connector.						
	1. Free Hanging (FH)						
Mounting Options:	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)						
	7. End Face Mount (O-ring Sealing) (EFMS)						
	8. Flush Mounting (FSM)						
	Please refer to online document AcousticSystem.pdf for a complete list of Mounting Options and more details.						
Cable:	Four Conductor Shielded Cable (SC)						
Cable Length:	1. Default: 10 m.						
5	2. Custom-fit Cable Length up to 305 m.						
Connector:	1. Default: Wire Leads (WL)						



# Benthowaye Instrument Inc.

SPEAD-LETACHSL      2. Male BNC (BNC) (Max. Diameter Ф14.3 mm).      3. SMA (Plug, Male Pin) (SMA), Voltage Rating: 335 Vas. Continuous. (Max. Diameter Ф9.24 mm).      4. SMC (Plug, Fenale Socket) (SMC), Voltage Rating: 335 Vas. Continuous. (SMC) (Max. Diameter Ф6.4 mm).      5. 1/8* (3.5mm) TRS Plug (TRS3) (Max. Diameter Ф10.5 mm).      6. XLR (pin) (XLR) (Max. Diameter Ф20.2 mm).      7. MIL-SD3 Style (pin) (SD15) (Max. Diameter Ф20.5 mm).      9. Underwater Mateable Connector (pin) (UMC) (Max. Diameter Ф21.5 to Ø35 mm).      10. +9VDC Battery Snap (BS)      11. Customized, buyer specifies the connector.      Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are no waterproofed.      Suggested DC Supply.      2 Mole valuer Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are no waterproofed.      Suggested DC Supply.      Current (Quiescent):    17 mA @ +24 VDC      Size:    Custom-fit.      Veriage V:    -05 Stg with 10 m cable. Actual weight depends on Mounting Parts, Cable Types and Length.      Operation Temperature:    -20 °C to +60 °C cr -4 °F to 140 °F.      Storage Temperature:    -20 °C to -60 °C cr -4 °F to 140 °F.      Storage Temperature:    -20 °C to -60 °C cr -4 °F to 140 °F.      Storage Temperature:				Underwater Sound Solutions www			w.benthowave.com					
3. SMA (Plug, Male Pin) (SMA). Voltage Rating: 335 Vans Continuous. (SMC) (Max. Diameter Φ6.4 mm).      4. SMC (Plug, Fenale Socket) (SMC). Voltage Rating: 335 Vans Continuous. (SMC) (Max. Diameter Φ6.4 mm).      5. 1/8" (3. Smm) TRS Plug (TRS35) (Max. Diameter Φ10.5 mm).      6. XR (pin) (XIR) (Max. Diameter Φ20.2 mm).      7. MIL-S015 Style (pin) (SUS) (Max. Diameter Φ3.5 mm with 3 contacts).      8. LEMO (Plug Male Pins) (LEMO) (Max. Diameter Φ3.5 mm with 3 contacts).      9. Underwater Mateable Connector (pin) (UMC) (Max. Diameter Φ2.1 S to Φ35 mm).      10. +9VDC Battery Snap (BS)      11. Customized, buyer specifies the connector.      Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are no waterproofed.      Suggested LC super visuo PVDC Battery. Snap Battery, Automobile Battery, Fixed DC Linear Power Supply. Not Included.      Suggested LC super visuo PVD visuo erasible power supply whose maximum supply voltage is higher than the rated voltage.      O NOT use switching mode DC power supply.      Current (Quieszent):    17 mA @ +24 VDC      Size Temperature:    -00° C to +60° C or 14° F to 140° F.      Storage Temperature:    -00° C to +60° C or 14° F to 140° F.      Storage Temperature:    -00° C to +60° C or 14° F to 140° F.      Storage Temperature:    -00° C to +60° C or 14° F to 140° F.      Storage Temperature:    -00° C	SE=SL-1L+A	A-NF										
4. SMC (Plug, Fenale Socket) (SMC), Voltage Rating: 335 Vans: Continuous. (SMC) (Max. Diameter Φ6.4 mm). 5. 1/8" (3. Smm) TRS Plug (TRS35) (Max. Diameter Φ20.2 mm). 6. XLR (pin) (XLR) (Max. Diameter Φ20.2 mm). 7. MIL-S015 Style (pin) (S015) (Max. Diameter Φ20.3 mm) th 3 contacts). 8. LEMO (Plug Male Pins) (LEMO) (Max. Diameter Φ2.5 to Φ35 mm). 10. +9VDC Battery Snap (BS) 11. Customized, buyer specifies the connector. Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are no waterproofed.      Supply Voltage Vs:    +16 to +32 VDC      49VDC Battery Snap (BS) 11. Customized, buyer specifies the connector. Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are no waterproofed.      Suggested DC Supply    +9VDC Battery Snap (BS) 11. Customized, buyer specifies the connector. Note: Underwater Mateable Convector user supply voltage is higher than the rated voltage. DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage. DO NOT use switching mode DC power supply.      Current (Quies-cml:    2 USO-fit. 49VDC Battery Snap (BC) Storage Temperature:    -0 °C to 40° C or 44° F to 140° F. 510° C to +60° C or 44° F to 140° F. 510° C to +60° C or 44° F to 140° F. 510° Stage Temperature:    -0 °C to 60° C or 44° F to 140° F. 510° Stage Temperature:    -0 °C to 40° C or 44° F to 140° F. 510° Stage Temperature:    -0 °C to 60° C or 44° F to 140° F. 510° Stage Temperature:    -0 °C to 60° C or 44° F to 140° F. 510° Stage Temperature:    -0 °C to 60° C or 44° F to 140° F. 510° Stage Temperature:    -0 °C to 60° C or 44° F to 140° F. 510° Stage Temperature:    -0 °C meta												
5. 1/8" (3.5mm) TRS Plug (TRS35) (Max. Diameter Ф10.5 mm).    6. KLR (pin) (XLR) (Max. Diameter Ф20.2 mm).      7. ML-S015 Style (pin) (SULR) (Max. Diameter Ф20.mm with 3 contacts).    9. Underwater Mateable Connector (pin) (UMC) (Max. Diameter Ф20.5 mm with 3 contacts).      9. Underwater Mateable Connector (pin) (UMC) (Max. Diameter Ф20.5 mm with 3 contacts).    9. Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are no waterproofed.      Supply Voltage Vs:    +16 to +32 VDC      +9VDC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included.      Suggested DC Surply:    DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage.      DO NOT use variable power supply.    Voltage Vs:      10. +9VDC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included.      Suggested DC Surply:    DO NOT use variable power supply.      Current (Quiescent):    17 mA @ +24 VDC      Size:    Customfit.      Veight:    2.0.55 kg with 10 m cable. Actual weight depends on Mounting Parts, Cable Types and Length.      Operation Temperature:    -10 °C to +60 °C or 14 °F to 140 °F.      AE (Acoustic Emission) Applications: These hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.												
6. XLR (pin) (XLR) (Max. Diameter Ф30 mm with 3 contacts).      7. MIL-S015 Style (pin) (S015) (Max. Diameter Ф30 mm with 3 contacts).      8. LEMO (Plug Male Pins) (LEMO) (Max. Diameter Ф30 mm with 3 contacts).      9. Underwater Mateable Connector (pin) (UMC) (Max. Diameter Ф21.5 to Ф35 mm).      10. +9VOC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply. Not Included.      Suggested DC supply    PON DO NOT use variable power supply woltage is higher than the rated voltage.      DO NOT use wariable power supply.    PON DO NOT use wariable power supply.      Current (Quiescet):    17 mA @ +24 VDC      Size:    2 0.55 kg with 10 m cable. Actual weight depends on Mounting Parts, Cable Types and Length.      Operation Temperature:    -20 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to 40 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to 40 °C or 40 °F to 140 °F.      Storage Temperature:    -20 °C to 40 °C or 40 °F to 140 °F.												
7. MIL-SO1S Style (pin) (S015) (Max. Diameter Ф30 mm with 3 contacts).    8. LEMO (Plug Male Pins) (LEMO) (Max. Diameter Ф3.5 mm with 3 contacts).    9. Underwater Mateable Connector (pin) (UMC) (Max. Diameter Ф2.1.5 to Φ35 mm).      10. +9VDC Battery Snap (BS)    11. Customized, buyer specifies the connector.    Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are no waterproofed.      Supply Voltage Vs:    +16 to +32 VDC    +9VDC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included.    Voltage Stateries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included.      Suggested DC Supply:    DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage.    DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage.      Current (Quiesert):    17 mA @ +24 VDC    Storage Temperature:    -10 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or 14 °F to 140 °F.												
8. LEMO (Plug Male Pins) (LEMO) (Max. Diameter 09.5 mm with 3 contacts).    9. Underwater Mateable Connector (pin) (UMC) (Max. Diameter 021.5 to 035 mm).      09VDC Battery Snap (BS)    11. Customized, buyer specifies the connector.    Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are no waterproced.      Supply Voltage Vs:    +16 to +32 VDC    +16 to +32 VDC      Suggested DC Supply:    DO NOT use variable power supply whose maximum supply voltage is higher than ther ated voltage.    DO NOT use variable power supply whose maximum supply voltage is higher than ther ated voltage.      Current (Quiescert):    17 mA @ +24 VDC    Excert to 120 °C +60 °C or 4 °F to 140 °F.      Size:    Custom-iter to 130 °C ro 14 °F to 140 °F.    Excert to 400 °C or 4 °F to 140 °F.      Storage Temperature:    -30 °C to +60 °C or -4 °F to 140 °F.    Excert to 130 °C ro 46 °F to 140 °F.      Storage Temperature:    -30 °C to +60 °C or -4 °F to 140 °F.    Excert to 130 °C ro 46 °F to 140 °F.      Storage Temperature:    -30 °C to +60 °C or -4 °F to 140 °F.    Storage Temperature:    -30 °C to +60 °C or -4 °F to 140 °F.      Storage Temperature:    -30 °C to +60 °C or -4 °F to 140 °F.    Storage Temperature:    -30 °C to +60 °C or -4 °F to 140 °F.      Storage Temperature:    -30 °C to +60 °C or -4 °F to 140 °F.    Storage Temperature:    NE Note Note Note Note Note N												
9. Underwater Mateable Connector (pin) (UMC) (Max. Diameter Ф21.5 to Φ35 mm).    10. #9VDC Battery Snap (BS)      10. #9VDC Battery Snap (BS)    10. #9VDC Battery Snap (BS)      11. Customized, buyer specifies the connector.    Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are no waterproofed.      Supply Voltage Vs:    +16 to +32 VDC      suggested DC supply    +9VDC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply. Not Included.      DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage.    DO NOT use variable power supply.      Current (Quiescent):    17 mA @ +24 VDC    Store growthing mode DC power supply.      Suggested DC moment:    -0.0 °C to +60 °C or 14 °F to 140 °F.    Storage Temperature:    -0.0 °C to +60 °C or -4 °F to 140 °F.      Storage Temperature:    -0.0 °C to +60 °C or -4 °F to 140 °F.    Storage Temperature:    -0.0 °C to +60 °C or -4 °F to 140 °F.      Storage Temperature:    -0.0 °C to +60 °C or -4 °F to 140 °F.    Storage Temperature:    -0.0 °C to +60 °C or -4 °F to 140 °F.      Storage Temperature:    -0.0 °C to +60 °C or -4 °F to 140 °F.    Storage Temperature:    -0.0 °C to +60 °C or -4 °F to 140 °F.      Storage Temperature:    -0.0 °C to +60 °C or -4 °F to 140 °F.    Storage Temperature:    -0.0 °C ret +60 °C or -4 °F to 140 °F.												
10. +9VDC Battery Snap (BS)    11. Customized, buyer specifies the connector.      Supply Voltage Vs:    +16 to +32 VDC      Supply Voltage Vs:    +16 to +32 VDC      Suggested DC Supply:    DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage. DO NOT use variable power supply.    DO NOT use variable power supply.      Current (Quiescent):    17 mA @ +24 VDC      Size:    Custom-it / ma @ +24 VDC      Storage Temperature:    -20 *C to +60 *C or : 4 * To 140 *F.      Storage Temperature:    -20 *C to +60 *C or : 4 * To 140 *F.      AE (Acoustic Emission) Applications: These hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.      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.      Wiring Information    Wiring Information      VDC    Red    Female Snap    Pin 3    Battery Snap    Battery Male Snap      Signal    White    Center Pin or Contact    Pin 2    TRS Ping and Signal Signal    N/A    XLR Pin 1 and Pin 3    TRS Ring and Signal Signal Signal Common      Signal Common    Black    Male Snap    Pin 1    Batt												
11. Customized, buyer specifies the connector. Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are not water proofed.      Supply Voltage Vs:    +16 to +32 VDC      +9VDC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included. DO NOT use switching mode DC power supply whose maximum supply voltage is higher than the rated voltage. DO NOT use switching mode DC power supply.      Current (Quiescett):    17 mA @ +24 VDC      Size:    Custom-fit.      Weight:    2 0.55 kg with 10 m cable. Actual weight depends on Mounting Parts, Cable Types and Length.      Operation Temperature:    -20 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or 14 °F to 140 °F.      AE (Acoustic Emission) Applications: These hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.      Sound Measurement in Air: The hydrophones can bused to detect sounds in air. The sensitivity in air is same to the one in water in low frequency range.      Wiring of Single to Black    Male Snap    Pin 1    Battery Female Snap    Battery Female Snap    Battery Female Snap      Signal    Vohite    Center Pin or Contact    Pin 2    XLR Pin 2    TRS Ping and Sleeve      Signal Common    Black    Male Sn												
Note: Underwater Mateable Connector is for uses underwater. Other connectors and wire leads are for dry uses and are not waterproofed.      Supply Voltage Vs:    +16 to +32 VDC      +9VDC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included.    DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage.      Do NOT use variable power supply.    DO NOT use variable power supply.    DO NOT use variable power supply.      Current (Quiescent):    17 mA @ +24 VDC    Size:    Custom-fit.      Size:    Custom-fit.    Custom-fit.    Size:    Custom-fit.      Vergention Temperature:    -10 °C to +60 °C or 14 °F to 140 °F.    Size:    -20 °C to +60 °C or 4 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or 4 °F to 140 °F.    -    -      Sound Measurement in Air: The hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.    Sound Measurement in Air: The hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.    Sound Measurement in Air: The SPUeg and 9V Battery Snap    YB Battery Female Sna												
Supply Voltage V:    +16 to +32 VDC      Suggested DC Supply:    +9VDC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included.      DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage. DO NOT use switching mode DC power supply.      Current (Quiescent):    17 mA @ +24 VDC      Size:    2 0.55 kg with 10 m cable. Actual weight depends on Mounting Parts, Cable Types and Length.      Operation Temperature:    -20 °C to +60 °C or -4 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or -4 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or -4 °F to 140 °F.      AE (Acoustic Emission) Applications: These hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.      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.      Wiring of Single    Vinte Leads    BNC Male/SMA/SMC and 9V Battery Snap    9V Battery Snap    Pin 3    Battery Female Snap    Pin 1      Signal Common    Black    Male Snap    Pin 1    Battery Female Snap    Battery Female Snap    Battery Female Snap      Signal Common    Sheld ing    Shield or YHELINE    VIA    N/				, , ,				d	سام سم			
Supply Voltage Vs:    +16 to +32 VDC      Suggested DC Supply:    +90DC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included.      Suggested DC Supply:    DO NOT use variable power supply whose maximum supply voltage is higher than the rated voltage.      DO NOT use switching mode DC power supply.      Current (Quiescent):    17 mA @ +24 VDC      Size:    Custom-fit.      Weight:    ≥ 0.55 kg with 10 m cable. Actual weight depends on Mounting Parts, Cable Types and Length.      Operation Temperature:    -10 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or -4 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or -4 °F to 140 °F.      Sound Measurement in Air: The hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.      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.      Wiring of Single Ended Output:    Wire Leads    BNC Male/SMA/SMC and 9V Battery Snap    9V Battery Snap    Stattery Female Snap      +VDC    Red    Female Snap    Pin 1    Battery Male Snap    Battery Male Snap      Common    Black    Male Snap												
H9VDC Batteries, Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included.      Suggested DC Supply:    D0 NOT use variable power supply whose maximum supply voltage is higher than the rated voltage.      D0 NOT use variable power supply.    D0 NOT use variable power supply.      Current (Quiescent):    17 mA@ +24 VDC      Size:    Custom-fit.      Weight:    ≥ 0.55 kg with 10 m cable. Actual weight depends on Mounting Parts, Cable Types and Length.      Operation Temperature:    -10 °C to +60 °C or 14 °F to 140 °F.      AE (Acoustic Emission) Applications: These hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.      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.      Wiring of Single Ended Output:    Wire Leads    BNC Male/SMA/SMC and 9V Battery Snap    VIR Plug and 9V Battery Snap      VDC    Red    Female Snap    Pin 3    Battery Female Snap    Battery Male Snap      Signal Common    Black    Male Snap    Pin 1    Battery Male Snap    Battery Male Snap      Signal Common    Blue, Green, or Yellow    N/A    XLR Pin 1 and Pin 3    TRS Ring and Sleeve      Shie	Supply Voltage	o V/c:										
Suggested DC Supply:    D0 NOT use variable power supply whose maximum supply voltage is higher than the rated voltage.      D0 NOT use variable power supply.    Current (Quiescent):    17 mA @ +24 VDC      Size:    Custom-fit.      Weight:    ≥ 0.55 kg with 10 m cable. Actual weight depends on Mounting Parts, Cable Types and Length.      Operation Temperature:    - 20°C to +60°C or 14°F to 140°F.      AE (Acoustic Emission) Applications: These hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.    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.      Wiring of Single Ended Output:    Red    Female Snap    Pin 3    Battery Snap    Battery Male Snap      Signal Common    Black    Male Snap    Pin 1    Battery Male Snap    Battery Male Snap    Battery Male Snap      Signal Common    Blue, Green, or Yellow    N/A    XLR Pin 1 and Pin 3    TRS Fing and Sleeve      Singling Mother    Shield    N/A    N/A    XLR Pin 1    Are Connector      Blue, Green, or Yellow    BNC/SMA/SMC Snield    Pin 1    Batte												
DO NOT use switching mode DC power supply.      Current (Quiescent):    17 mA @ +24 VDC      Size:    Custom-fit.      Weight:    ≥ 0.55 kg with 10 m cable. Actual weight depends on Mounting Parts, Cable Types and Length.      Operation Temperature:    -10 °C to +60 °C or 14 °F to 140 °F.      Storage Temperature:    -20 °C to +60 °C or -4 °F to 140 °F.      AE (Acoustic Emission) Applications: These hydrophones are tested and calibrated in water. It is buyer's responsibility and liability to calibrate and maintain the A sensors according to the acoustic emission national standards of buyer's country.      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.      Wiring Information    Wire Leads    BNC Male/SMA/SMC and 9V Battery Snap    Underwater Connector    XLR Plug and 9V Battery Snap    PW Battery Snap      VDC    Red    Female Snap    Pin 3    Battery Female Snap    Battery Female Snap      Signal    White    Center Pin or Contact    Pin 2    XLR Pin 1 and Pin 3    TRS Rig and Sleeve      Signal Common    Blue, Green, or Yellow    BNC/SMA/SMC Shield    Pin 4    XLR Pin 1 and Pin 3    TRS Rig and Sleeve      Shielding    Shield    N/A    N/A    XLR Pin 1 and Pin 3    TRS Rig and S	Suggested DC	Supply										
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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.      Wiring Information    Wire Leads    BNC Male/SMA/SMC and 9V Battery Snap    Underwater Connector    XLR Plug and 9V Battery Snap    TRS Plug and 9V Battery Snap      +VDC    Red    Female Snap    Pin 3    Battery Snap    Battery Female Snap    Battery Male Snap    Snap    Snap    Snap    Male Snap    M						. It is buyer stesp	Unsidinty		Jale			
Wiring Information  Wire Leads  BNC Male/SMA/SMC and 9V Battery Snap  Underwater Connector  XLR Plug and 9V Battery Snap  TRS Plug and 9V Battery Snap    +VDC  Red  Female Snap  Pin 3  Battery Female Snap  Battery Female Snap    common  Black  Male Snap  Pin 1  Battery Male Snap  Battery Male Snap    Signal  White  Center Pin or Contact  Pin 2  XLR Pin 2  TRS Tip    Signal Common  Blue, Green, or Yellow  BNC/SMA/SMC Shield  Pin 4  XLR Pin 1 and Pin 3  TRS Ring and Sleeve    Shielding  Shield  N/A  N/A  N/A  XLR Metal Shell  N/A    Hwat to Order						itivity in air is car	o to the	ono in water in low	frog	long/ rango		
Wiring of Single Ended Output:  Wire Leads  BNC Male/SMA/SMC and 9V Battery Snap  Underwater Connector  XLR Plug and 9V Battery Snap  TRS Plug and 9V Battery Snap    +VDC  Red  Female Snap  Pin 3  Battery Female Snap  Battery Female Snap    Common  Black  Male Snap  Pin 1  Battery Male Snap  Battery Male Snap    Signal  White  Center Pin or Contact  Pin 2  XLR Pin 2  TRS Tip    Signal Common  Blue, Green, or Yellow  BNC/SMA/SMC Shield  Pin 4  XLR Pin 1 and Pin 3  TRS Ring and Sleeve    Shielding  Shield  N/A  N/A  N/A  XLR Metal Shell  N/A    How to Order  -Sensing Element  -HPF/LPF  -Mounting  -Cable Length  -Connector    Bill-7031  Refer to options.  add First Order Band Pass Filter Frequencies, in Hz/kHz.  Refer to Options.  Refer to Options.  Refer to Options.  Refer to Options.				iones can be used to	detect sounds in an. The sens	itivity ill dil is sali			nequ	uency range.		
Wind of Single Ended Output:Wine Leads9V Battery SnapConnector9V Battery Snap9V Battery Snap+VDCRedFemale SnapPin 3Battery Female SnapBattery Female SnapCommonBlackMale SnapPin 1Battery Male SnapBattery Male SnapSignalWhiteCenter Pin or ContactPin 2XLR Pi 2TRS TipSignal CommonBlue, Green, or YellowBNC/SMA/SMC ShieldPin 4XLR Pi 1 and Pin 3TRS Ring and SleeveShieldingShieldShieldN/AN/AXLR Wet I ShellN/AHow to OrderConnectorBil-7031Refer to optionsHPF/LPFConptions.Refer to Options.Refer to Options3dB First Order Bard Pass Filter Frequencies, in Hz/kHz.Refer to Options.Refer to Options.	wiring inform	ation										
+VDC    Red    Female Snap    Pin 3    Battery Female Snap    Battery Female Snap      Common    Black    Male Snap    Pin 1    Battery Male Snap    Battery Male Snap      Signal    White    Center Pin or Contact    Pin 2    XLR Pin 2    TRS Tip      Signal Common    Blue, Green, or Yellow    BNC/SMA/SMC Shield    Pin 4    XLR Pin 1 and Pin 3    TRS Ring and Sleeve      Shielding    Shield    N/A    N/A    N/A    XLR Metal Shell    N/A      How to Order    -    -    -HPF/LPF    -Mounting    -Cable Length    -Connector      Bil-7031    Refer to options.    -3dB First Order Band Pass Filter Frequencies, in Hz/kHz.    Refer to Options.    Refer to Options.    Refer to Options.    Refer to Options.			tput: Wir	e Leads			•		9V Battery Snap			
Common    Black    Male Snap    Pin 1    Battery Male Snap    Battery Male Snap      Signal    White    Center Pin or Contact    Pin 2    XLR Pin 2    TRS Tip      Signal Common    Blue, Green, or Yellow    BNC/SMA/SMC Shield    Pin 4    XLR Pin 1 and Pin 3    TRS Ring and Sleeve      Shielding    Shield    N/A    N/A    N/A    XLR Metal Shell    N/A      How to Order												
Signal  White  Center Pin or Contact  Pin 2  XLR Pin 2  TRS Tip    Signal Common  Blue, Green, or Yellow  BNC/SMA/SMC Shield  Pin 4  XLR Pin 1 and Pin 3  TRS Ring and Sleeve    Shielding  Shield  N/A  N/A  XLR Metal Shell  N/A    How to Order  -  -  -  -  -Cable Length  -Connector    BlI-7031  Refer to options.  -3dB First Order Band Pass Filter Frequencies, in Hz/kHz.  Refer to Options.  in meter.  Refer to Options.  Refer to Options.	-						· · ·		· · ·			
Signal Common    Blue, Green, or Yellow    BNC/SMA/SMC Shield    Pin 4    XLR Pin 1 and Pin 3    TRS Ring and Sleeve      Shielding    Shield    N/A    N/A    XLR Metal Shell    N/A      How to Order    -    -    -    -    -    -      Hydrophone    -Sensing Element    -HPF/LPF    -Mounting    -Cable Length    -Connector      BlI-7031    Refer to options.    -3dB First Order Band Pass Filter Frequencies, in Hz/kHz.    Refer to Options.    Refer to Options.    Refer to Options.    Refer to Options.					-		· · ·					
Shielding  Shield  N/A  N/A  XLR Metal Shell  N/A    How to Order  How to Order	8											
How to Order      Hydrophone    -Sensing Element    -HPF/LPF    -Mounting    -Cable Length    -Connector      BII-7031    Refer to <u>options</u> .    -3dB First Order Band Pass Filter Frequencies, in Hz/kHz.    Refer to Options.    in meter.    Refer to Options.	•								ě.			
Hydrophone-Sensing Element-HPF/LPF-Mounting-Cable Length-ConnectorBII-7031Refer to <u>options</u> 3dB First Order Band Pass Filter Frequencies, in Hz/kHz.Refer to Options.in meter.Refer to Options.	0		Shie	d N/A N/A XLR Metal Shell				N/A				
BII-7031  Refer to options.  -3dB First Order Band Pass Filter Frequencies, in Hz/kHz.  Refer to Options.  in meter.  Refer to Options.			lomont	-HPE/I DE		Mounting		-Cable Length		Connector		
BII-7031 Refer to Options. In Meter. Refer to Options. In Meter. Refer to Options.	riyuropriorie	-Sensing E	lement			Internet		-cavie Lengtii				
	BII-7031	Refer to <u>o</u>	otions.	-		Refer to Options.		in meter.		Refer to Options.		
Example of Part Number. Description	Example of Part Number:			Description								
BII-7031-BII-7121-20Hz/100kHz-FH- BII-7031 Hydrophone with Sensing element BII-7121, Bandpass Filter: 20Hz to 100kHz, Free Hanging, 20m Shielde	BII-7031-BII-71	121-20Hz/10	0kHz-FH-	BII-7031 Hydroph	BII-7031 Hydrophone with Sensing element BII-7121, Bandpass Filter: 20Hz to 100kHz, Free Hanging, 20m Shielded							
20m-BNC&BS Cable, Connector: BNC Male for Signals, Battery Snap for +9VDC Batteries.	20m-BNC&BS Cable, Connector: BNC Male for Signals, Battery Snap for +9VDC Batteries.											

## Pressure Noise Density (RTI, referred to the input): Noise Density varies with the built-in sensing element.

### Hydrophone Noise Spectrum

