



SENSORS FOR UNDERWATER MEASUREMENT

 **PCB PIEZOTRONICS**
AN AMPHENOL COMPANY

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RAPIDLY FLUCTUATING PRESSURE, FLOW, SCREW CAVITATION, & WAVE SLAP



Piezoelectric pressure sensors are suited for dynamic pressure measurements including turbulence and cavitation. These measurements require a fast response or rise time, ruggedness, and high stiffness in order to obtain a high frequency response.

- Strict quality control inspection and standards
- Small footprint allows for mounting on models, or within limited size testing environments



HIGH FREQUENCY CVLD PRESSURE SENSOR

MODEL 113M231

- 50 psi, 100 uA/psi
- Integral waterproof cable, hydrotested to 600 psi
- Acceleration compensated
- Ground isolated



HIGH RESOLUTION ICP® PRESSURE PROBE

MODEL S112A22

- 100 mV/psi, 50 psi
- Stainless steel, hermetic wetted diaphragm



ACOUSTIC ICP® PRESSURE SENSOR

MODEL 103M49/003AW

- 200 psi, 250 mV/psi
- Integral twisted pair cable
- SS hermetic, wetted diaphragm
- RTV coated diaphragm for thermal stability



SUBMINIATURE ICP® PRESSURE SENSOR

MODEL 105C

- 100 psi, 50 mV/psi
- Integral twisted pair cable
- SS hermetic wetted diaphragm
- Solid end cap diaphragm well suited for cavitation measurement



FORCE



ICP® QUARTZ FORCE RINGS

MODEL 202M44/FCS-6

- 100 lb, 50 mV/lb
- Measures dynamic excitation or reaction forces
- Integral waterproof cable, hydrottested to 600 psi



MODALLY TUNED® IMPULSE HAMMER

MODEL 086M99

- 500 lbf, 10 mV/lbf
- Hammer mass 0.34 lbs.
- Integral waterproof cable, hydrottested to 100 psi



UNDERWATER BLAST

Piezoelectric pressure sensors measure shock waves and bubble energy associated with underwater explosion testing. Sensors structured with volumetrically sensitive, omnidirectional tourmaline crystal and ICP® microelectronics provide a high frequency, low impedance output in underwater test environments. Waterproof cables of customer requested lengths are factory installed.



TOURMALINE ICP® UNDERWATER BLAST SENSOR

SERIES 138A

- ICP® underwater blast pressure probes
- Ranges from 1000 to 50 kpsi (6894 to 344740 kPa)
- Rise time 1.5 μ sec
- Resonant frequency \geq 1 MHz
- Approximate max depth 1000 ft.



VIBRATION

Shear mode accelerometers isolate the sensing crystals from the base and housing, lowering thermal transients and signal noise resulting from base bending effects. This is a very important feature when attaching them to relatively thin walled vessel hull models during wave slap applications.



TEARDROP ICP® ACCELEROMETER WITH FLEXIBLE, INTEGRAL CABLE

MODEL 352A74

- 100 mV/g, ± 50 g range
- Frequency response 1 Hz to 8 kHz
- Hermetic housing, short term low pressure immersion



ICP® UNDERWATER ACCELEROMETER

MODEL 352M221

- 10 mV/g, ± 500 g
- 2nd order LP filter
- Frequency response from 1 Hz to 10 kHz
- Integral waterproof cable, hydrotested to 500 psi



MINIATURE RING-STYLE, CERAMIC SHEAR CVLD ACCELEROMETER

MODEL 355M87A

- 100 μ A/g, ± 50 g
- Frequency response from 7 Hz to 9 kHz
- Integral waterproof cable, hydrotested to 600 psi
- Case isolated



**MINIATURE RING-STYLE,
CERAMIC SHEAR ICP®
ACCELEROMETER**

MODEL 355M73

- 100 mV/g, ±50 g range
- Frequency response
7 Hz to 10 kHz
- Stainless steel hermetic housing
- Integral waterproof cable,
hydrotested to 600 psi
- Case isolated



**TRIAXIAL ICP®
ACCELEROMETER**

MODEL TLD339A37/NC

- 100 mV/g, ±50 g
- (±5 %) 0.3 to 4000 Hz, LP filtered
- Titanium housing,
hermetically sealed
- Low thermal coefficient with
operating temperature
-65 to +356 °F (-54 to +180 °C)



**RING-STYLE SEISMIC SHEAR
CVLD ACCELEROMETER**

MODEL 631M21

- 1000 µA/g, ±2.5 g range
- Frequency response from 1 Hz
to 4 kHz
- Integral waterproof cable,
hydrotested to 600 psi
- Case isolated



**4-CONDUCTOR, SHIELDED,
POLYURETHANE CABLE**

MODEL 078WXX

- Used with triaxial ICP®
accelerometers
- 4-conductor, shielded, flexible
polyurethane jacket
- IP68 Rated 1/4-28, 4-socket plug
to 3 BNC plugs



**TRIAXIAL, MINI,
HIGH SENSITIVITY,
ICP® ACCELEROMETER**

MODEL 354M85

- 100 µA/g, ±50 g
- (+/- 5%) 0.5 to 5000 Hz
(+/-10%) 0.4 to 6500 Hz
- Integral waterproof cable,
hydrotested to 30 psi
- Case isolated



**4-CONDUCTOR, SHIELDED,
LOW NOISE, FEP CABLE**

MODEL 034W10

- IP68 rated 1/4-28, 4-socket plug
to (3) BNC plugs
- Used with triaxial ICP®
accelerometers
- 4-conductor, twisted, shielded,
low noise, lightweight FEP jacket



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