



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

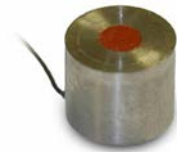


HIGH RESOLUTION ICP® PRESSURE PROBE

MODEL S112A22

100 mV/psi, 50 psi

Stainless steel, hermetic
wetted diaphragm



ACOUSTIC ICP® PRESSURE SENSOR

MODEL 103M49A/003AW

20 psi, 250 mV/psi

3 ft integral cable

316L stainless steel diaphragm



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



**ICP® UNDERWATER
ACCELEROMETER**

MODEL 337M22

100 mV/g, ±50 g pk

Frequency response from 2 Hz to
7.5k Hz

Integral waterproof cable,
hydrotested to 500 psi

Case isolated



**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 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)



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

MODEL 034W10

IP68 rated ¼-28, 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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