

# UDW3

## Underwater Sensor

### DESCRIPTION

AMTI's UDW3 is specifically designed for the precise measurement of underwater forces and moments. The sensor measures the three orthogonal force and moment components along the X, Y and Z axes., producing a total of six outputs. The characteristics of this strain gage sensor make it ideal for research and testing environments: it has high stiffness, high sensitivity, low cross talk, excellent repeatability and long term stability. It's simple to use and is available in four vertical capacities; 100, 250, 500 and 1000lbs.

### Applications

The UDW3 force / torque sensor is particularly suitable for underwater applications requiring simultaneous measurement of several forces and moments or measurement of forces that change direction or position over time. Common applications for this transducer includes research and development in tow tanks, underwater structure models, robotics and ocean engineering



### AMPLIFICATION

The UDW3 Underwater Force/ Torque sensor incorporates strain gage s mounted on a precision strain element design to measure forces and moments. As with most conventional strain gage transducers, bridge excitation and signal amplification are required. The UDW3 can be used with any strain gage amplifier, including AMTI's range of digital and analogue multi channel devices. AMTI's amplifiers are all high gain devices which provide excitation and amplification for multiple channels in one convenient package to suit different applicatons

### Calibration

Each platform is inspected and tested is AMTI's calibration facility. The calibration procedure provides a detailed sensitivity matrix and a complete test of all systems components, including the amplifier and connecting cable.

### Custom

AMTI also offers special multi-axis transducers to meet your specific requirements. Units are available that are water proof, pressure compensated, non-magnetic, non- conductive and transparent. Capacities from 1lb (4.5N) to 3 million lbs (13.3Mn) can be made.

### General Specifications

Excitation: 10V maximum.; Crosstalk: Less than 2% on all channels: Temperature Range: 0 to 125°F, (-17 to 52°C) Fx, Fy, Fz hysteresis:  $\pm 0.2\%$  Full: Scale Output: Fx, Fy, Fz non-linearity:  $\pm 0.2\%$  Full Scale Output  
Weight 4.5lbs (2kgs)

# UDW3 Underwater Sensor Specifications

UDW3 SPECIFICATIONS	100	250	500	1000
Fx, Fy Capacity, lb, (N)	50 (222.4)	125 (556)	250(1112.1)	500 (2224.1)
Fz Capacity, lb, (N)	100 (444.8)	250 (1112)	500 (2224.1)	1000 (4448.2)
Mx & My Capacity, in*lb, (Nm)	100 (11.3)	250 (28.2)	500 (56.5)	1000 (113)
Mz Capacity, in*lb, (Nm)	50 (5.6)	125 (14.1)	250 (28.2)	500 (56.5)
Fx ,& Fy Stiffness X10 <sup>5</sup> lbs/ in (X10 <sup>7</sup> N/m)	0.12 (0.21)	2.5 (0.53)	5.0 (1.06)	10 (2.12)
Fz Stiffness X10 <sup>5</sup> lbs/ in (X10 <sup>7</sup> N/m)	1.7 (2.98)	4.5 (7.88)	9.0 (15.76)	18 (31.54)
Mz Stiffness x10 <sup>4</sup> in*lb/ radian (x10 <sup>4</sup> Nm/ radian)	2.0 (0.23)	5.0 (0.57)	10 (1.13)	20 (2.26)
Fx, Fy Sensitivity μV[V*lb] (μV/[V*N])	24 (5.4)	12 (2.7)	6.0 (1.35)	3.0 (0.67)
Fz Sensitivity μV[V*lb] (μV/[V*N])	6.0 (1.35)	3.0 (0.67)	1.5 (0.34)	0.75 (0.17)
Mx, My Sensitivity μV[V*lb] (μV/[V*N])	30 (265.5)	15.5 (137.2)	8.0 (70.8)	4.0 (35.4)
Mz Sensitivity μV[V*lb] (μV/[V*N])	24 (212.4)	11 (97.4)	5.7 (50.4)	3.0 (26.6)

### Dimensions

