MC8

Force and Torque Sensor



DESCRIPTION

The MC8 transducers have the highest capacity of AMTI's standard line of multi-component force and torque sensors. These precision sensors feature high stiffness, high sensitivity, low crosstalk, excellent repeatability and long term stability. They exhibit the inherent ruggedness of bonded strain gage transducers and they incorporate special seals to prevent water and oil contamination.

The MC8 transducer is available with six outputs corresponding to Fx, Fy, Fz, Mx, My, and Mz. Standard vertical load capacities are 10,000, 20,000 and 30,000 pounds. Horizontal load capacities are half of the vertical rating. Models with custom capacities and layouts are available for special applications.

The instrument has eight inch square top and bottom plates manufactured from high strength 17-4 stainless steel. The center anodized aluminum shell is notched to allow 5/8" diameter bolts to pass through the 3/4-10 threaded mounting holes. This provides additional mounting possibilities. Elastomeric O-ring seals protect the strain gages and wiring, and conformal coating of the strain gages further insures long life and consistent, reliable performance.

APPLICATIONS

This instrument is particularly suitable for applications requiring simultaneous measurement of several forces and moments, or measurement of forces that change direction and position over time. Applications for this transducer include research and development in machining, robotics, and dynamics. These sensors are also well suited for monitoring production processes.

AMPLIFICATION

The MC8 transducer incorporates strain gages and a precision element to isolate and measure applied forces and moments. As with all conventional strain gage transducers, bridge excitation and signal amplification are required. AMTI's amplifiers are high gain devices which provide excitation and amplification for multiple channels in one convenient package. These amplifiers process the signals from a transducer and provide outputs suitable for an A/D converter and digital computer or other recording instrument.

CALIBRATION

Each sensor is inspected and tested in AMTI's calibration facility. The calibration procedure involves loading the transducer with ten point uniaxial loads at eight precise locations. These load sets are used by our calibration software to provide the six main senstivity terms along with calibration matrices for crosstalk compensation.

CUSTOM

AMTI also offers many other multi-axis transducers to meet your specific needs. Units smaller than 1 inch (2.54 cm) in diameter and large transducers with 200,000 pound vertical capacities are available as standard products. Many of our sensors are waterproof and custom transducers are routinely designed and manufactured. Contact AMTI for additional information.

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Contents of this publication are subject to change without notice.

AMTI
FORCE AND MOTION

AGT Absolute Gauge Technologies™

Presented by: Absolute Gauge Technologies
sales@absolutegauge.com; www.absolutegauge.com,
Toronto: 416 754 3168, Montreal: 514 695 5147, Toll Free: 1 888 754 7008

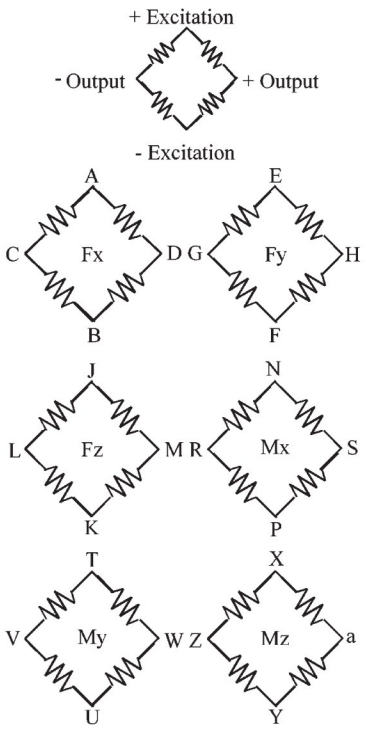
ISO 9001:2000 certified

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The following specifications are for estimating purposes. Actual precision calibrations are furnished with each instrument. The manufacturer reserves the right to alter the specifications without notice.

MC8 SERIES SPECIFICATIONS	10000	20000	30000
Fz Capacity, lb (N)	10000 (44500)	20000 (89000)	30000 (133500)
Fx, Fy Capacity, lb (N)	5000 (22250)	10000 (44500)	20000 (89000)
Mz Capacity, in-lb (Nm)	20000 (2260)	40000 (4520)	60000 (6780)
Mx, My Capacity, in-lb (Nm)	40000 (4520)	80000 (9040)	120000 (13560)
Fz Sensitivity, μV/V-lb (μV/V-N)	0.14 (0.03)	0.07 (0.02)	0.04 (0.01)
Fx, Fy Sensitivity, μV/V-lb (μV/V-N)	0.68 (0.15)	0.34 (0.07)	0.21 (0.05)
Mz Sensitivity, μV/V-in-lb (μV/V-Nm)	0.14 (1.24)	0.07 (0.62)	0.04 (0.35)
Mx, My Sensitivity, μV/V-in-lb (μV/V-Nm)	0.10 (0.89)	0.05 (0.44)	0.03 (0.27)
Fz Stiffness, x 10^6 lb/in (x 10^7 N/m)	2.5 (43.8)	5.0 (87.6)	7.5 (131.4)
Fx, Fy Stiffness, x 10^6 lb/in (x 10^7 N/m)	0.6 (10.5)	1.2 (21.0)	1.8 (31.5)
Fz Resonant Frequency, Hz	1200	1700	2000
Fx, Fy Resonant Frequency, Hz	800	1100	1300

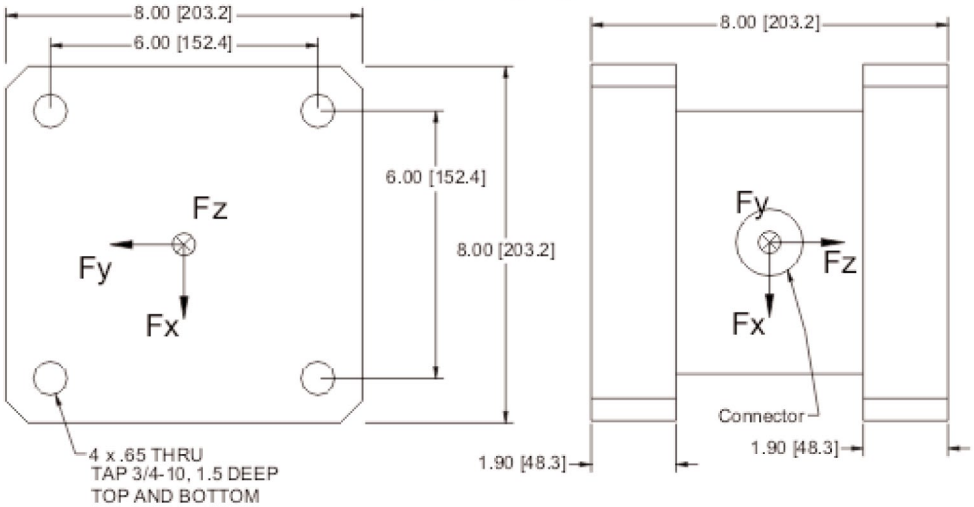


Bridge Fz = 700 ohms
Bridges Fx; Fy; Mx; My; Mz = 350 ohms

TOP VIEW

SIDE VIEW

inches [mm]



GENERAL SPECIFICATIONS

Weight: 80 lb (36 kg)
Recommended Excitation: 10V
Crosstalk: Less than 2% on all channels
Temperature Range: 0 to 125°F (-17 to 53°C)
Fx, Fy, Fz Hysteresis: ± 0.2% Full Scale Output
Fx, Fy, Fz Non-linearity: ± 0.2% Full Scale Output

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Tel: 617-926-6700 • Fax: 617-926-5045
E-mail: sales@amtimail.com • www.AMTI.biz