MC5 SERIES
FORCE/TORQUE LOAD CELLS

DESCRIPTION

The MC5 force/torque load cell measures loads in the range between the capacities of AMTI's popular MC3 and MC8 transducers. It is available with vertical force capacities of 5,600 to 45,000N (1,250 to 10,000 lbs) and corresponding horizontal force and moment capacities (see table). These sensors are available with one to six outputs corresponding to Fx, Fy, Fz, Mx, My, and Mz. Models with custom capacities and layouts are available for special applications.

The instrument has five-inch diameter circular top and bottom plates manufactured from high strength anodized aluminum. An elastomeric O-ring seal protects the strain gages and wiring, and internal sealing of the strain gages further ensures long life and consistent, reliable performance.

AMPLIFICATION

The MC5 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 MCA series 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.

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, ocean engineering and aerospace. These sensors are also well suited for monitoring production processes.

SPECIFICATIONS

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

MC5 SERIES SPECIFICATIONS (English Units)

Model: MC5-X-	1250	2500	5000	10000	
CAPACITY[1,2]					
Fx,Fy	600	1250	2500	5000	lbs
Fz	1200	2500	5000	10000	lbs
Mx,My	1800	3700	7500	15000	in-lbs
Mz	1200	2500	5000	10000	in-lbs
TYPICAL SENSITIVITY					
Fx,Fy	4.0	2.0	1.0	0.5	μV**/V-lb
Fz	1.0	0.5	0.24	0.12	μV**/V-lb
Mx,My	2.3	1.15	0.6	0.3	μV**/V-in-lb
Mz	1.4	0.7	0.4	0.2	μV**/V-in-lb
STIFFNESS[1]					
Fx,Fy	0.12	0.25	0.5	1.0	x10⁶ lb/in
Fz	0.6	1.2	2.5	5.0	x10⁶ lb/in
Mx,My	0.75	1.5	2.9	5.5	x10⁶ in-lb/rad
Mz	0.5	1.0	2.0	4.0	x10⁶ in-lb/rad
NON-LINEARITY					
Fx,Fy,Fz	0.2	0.2	0.2	0.2	±%FSO***
HYSTERESIS					
Fx,Fy,Fz	0.2	0.2	0.2	0.2	%FSO***
LOWEST RESONANT FREQUENCY					
Mx,My	440	625	880	1250	Hz

1 Referenced to transducer origin located 2.37 inches below top surface.

2 The Fx, Fy and Fz capacities can be exceeded by a factor of 3 as long as the Mx, My and Mz capacities are not exceeded.

** μV = microvolts, *** %FSO = %Full Scale Output

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ADVANCED MECHANICAL TECHNOLOGY, INC.

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MC5 SERIES SPECIFICATIONS (Metric Units)

Model: MC5-X-	1250	2500	5000	10000	
CAPACITY[1,2]					
Fx,Fy	2670	5340	10680	21360	N
Fz	5340	10680	21360	42720	N
Mx,My	203	418	848	1695	N-m
Mz	136	283	565	1130	N-m
TYPICAL SENSITIVITY					
Fx,Fy	.91	.45	.23	.11	µV** / V-N
Fz	.23	.11	.05	.03	
Mx,My	20.3	10.18	5.31	2.65	µV** / V-N-m
Mz	12.4	6.2	3.54	1.77	
STIFFNESS[1]					
Fx,Fy	2.1	4.4	8.8	17.5	$x10^7$ N/m
Fz	10.5	21.0	43.8	87.6	$x10^7$
Mx,My	.09	.17	.33	.62	$x10^6$ N-m/rad
Mz	.06	.11	.23	.45	$x10^6$
NON-LINEARITY					
Fx,Fy,Fz	0.20	0.20	0.20	0.20	±%FSO***
HYSTERESIS					
Fx,Fy,Fz	0.20	0.20	0.20	0.20	%FSO***
LOWEST RESONANT FREQUENCY					
Mx,My	440	625	880	1250	Hz

1 Referenced to transducer origin located 6 cm below top surface

2 The Fx, Fy and Fz capacities can be exceeded by a factor of 3 as long as the Mx, My and Mz capacities are not exceeded.

** µV = microvolts, *** %FSO = %Full Scale Output

GENERAL SPECIFICATIONS

Safety Factor: Minimum 50% above capacity

Crosstalk: Less than 2% on all channels. The normalizing factor for force to moment crosstalk calculations is 40:1 (N to N-m), or 1:1 (lb to in-lb). For example, a 1 N-m moment is equivalent to a 40 N force and produces less than 0.8 N output on a force channel due to crosstalk

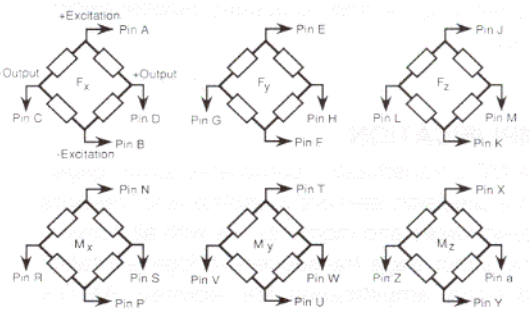
Excitation: 10V or less

Temperature Range: -17 to 52°C (0 to 125°F)

Sensitivity Change With Temperature: 0.01%/°C (0.02%/°F)

Weight: 3 Kg (7 lb) total, 1.4 Kg (3 lb) top

WIRING



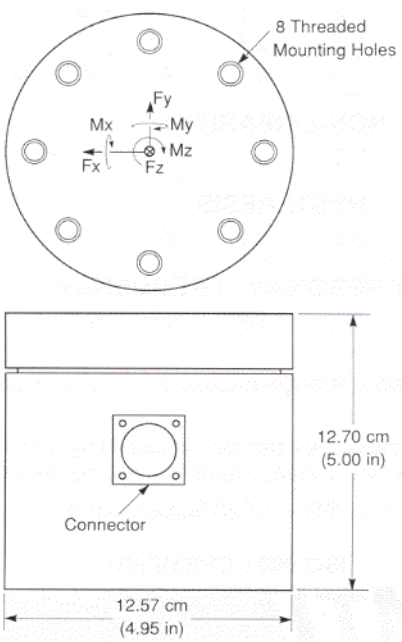
Connector Type: Burndy BTO2E16-26P or equivalent

MC5 — X — XXXX

Series

No. of Channels

Capacity



MOUNTING INFORMATION

Eight 5/16"-18 threaded inserts equally spaced on 10.16 cm (4 in) diameter bolt circles on the top and bottom surfaces.
Metric inserts and other sizes available on request.

AGT Absolute Gauge Technologies™

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