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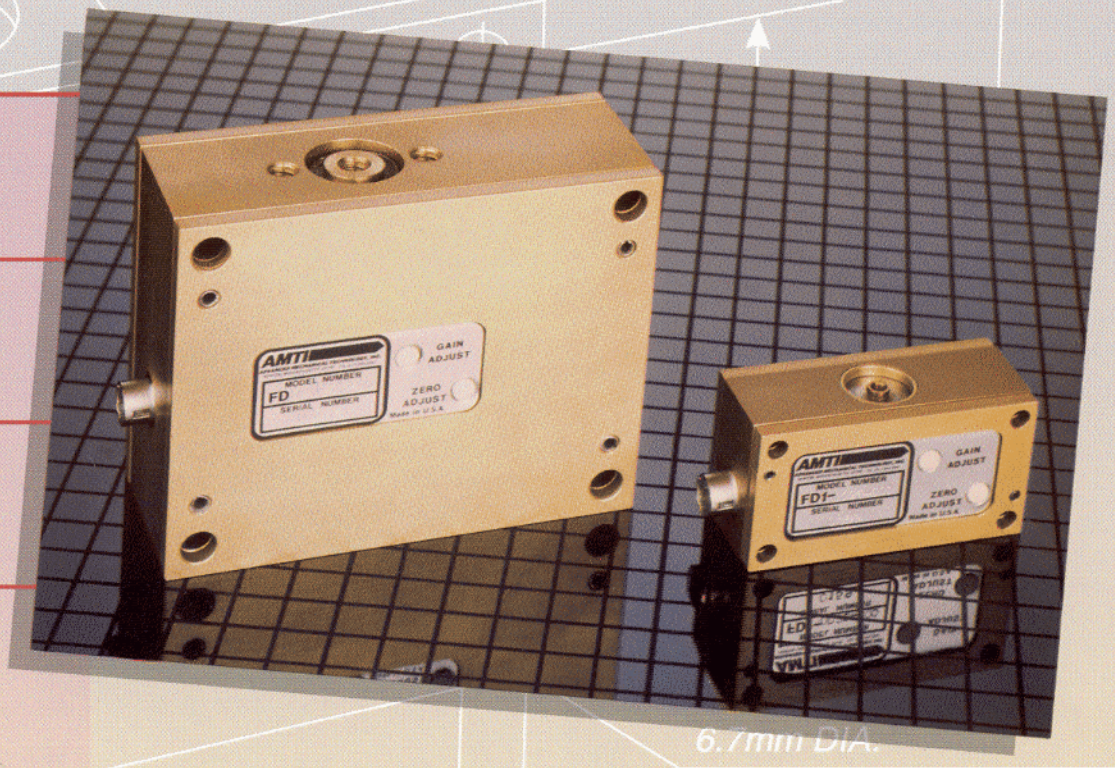
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AMTI
ADVANCED MECHANICAL TECHNOLOGY, INC.

FD-1/FD-2

High-Output Tension/Compression Load Cells

- High Overload Protection
- No Signal Conditioning Required
- High Level Outputs



AMTI's FD-I and FD-2 transducers are Tension/ Compression force sensors which provide high level outputs without the need or added cost of external signal conditioning or amplification. They are overload protectcd by more than 1000% of full load capacity. These new sensors are based upon Hall Effect devices coupled with a precision magnetic displacement system (Patents Pending).

The transducers have a rated full load displacement of 250 microns (.010 inch) and a linear displacement versus applied load relationship over the rated load range. This allows the transducers to be used as accurate devices to measure small displacements (i.e. up to 250 microns).

The mechanical design of all FD-I and FD-2 models provides integral stops, such that all models are overload protected to a minimum of ten times their full load capacity. This is a very important feature of the AMTI FD Series of sensors because the device is protected from unexpected failures caused by unintentional overloading.

The lowest-capacity unit (FD-1-0025) measures loads of 100 grams (0.22 lbs) with resolution of better than a tenth of a gram and sensitivity of 100 mV/gram. In spite of the low load capacity, this unit has an overload capability greater than 50 kg. (110 lbs).

The AMTI FD series sensors contain integral signal conditioning and provide high level outputs which eliminate the need for external amplification. The transducer requires a DC input from 10-24 volts. The force or displacement applied to the transducer is converted to a ±10 volt output signal by the internal electronics of the transducer. The output signal can be read with either a simple voltmeter or with a data acquisition board/computer or other measurement device. Each sensor is provided with easily accessible gain and balance adjustments to allow the output to be increased or reduced if necessary.

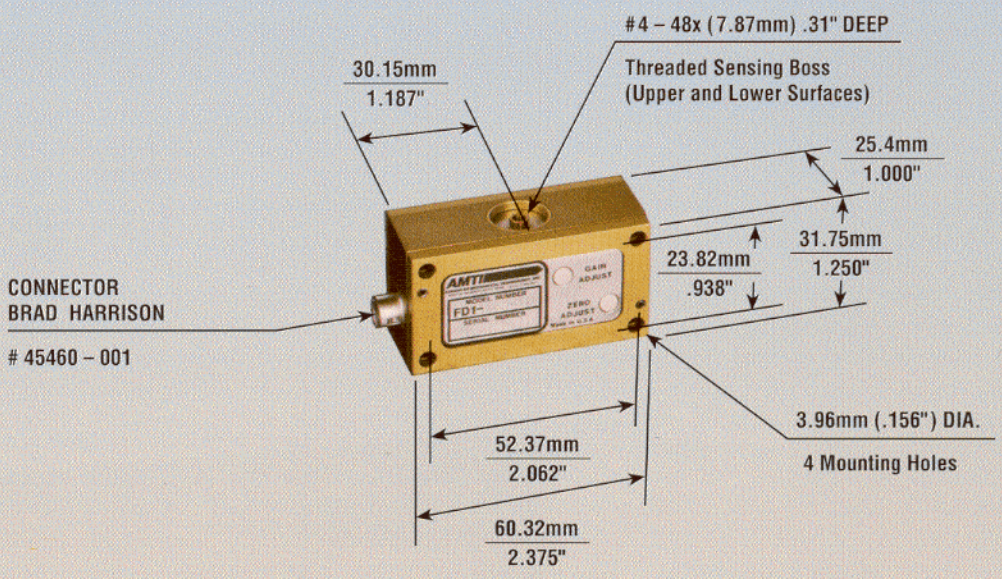
The transducer body is made of anodized high strength aluminum for corrosion resistance. Polyurethane seals are used to minimize the risk of foreign materials entering the transducer body. The transducers are equipped with a connector and a separate cable rather than integral cables. In the event of cable damage only the cable needs to be replaced.

AMTI's FD-I and FD-2 load cells are a new approach to load – monitoring or measuring applications. They are inexpensive, reliable and easy to apply.

FD-1 Load Cell

A small transducer suitable for limited space applications and small load ranges. It is well suited for the measurement of machine deflection and can therefore be used indirectly to measure very high loads.

The sensing bosses (top and bottom) are threaded to allow easy attachment of various probe points.



Model Number	Load Range Rated Capacity		Stiffness		Mechanical Resonant Frequency (stand alone) Hz
	(N)	(lb)	(N/m)	(lb/in)	
FD-1-0025	1	0.25	4.4×10^3	25	100
FD-1-0100	5	1	17.5×10^3	100	200
FD-1-0500	22	5	88×10^3	500	430
FD-1-1000	45	10	175×10^3	1000	600
FD-1-2000	90	20	350×10^3	2000	860

FD-1 load cell weight – 118 gm (0.26 lb)

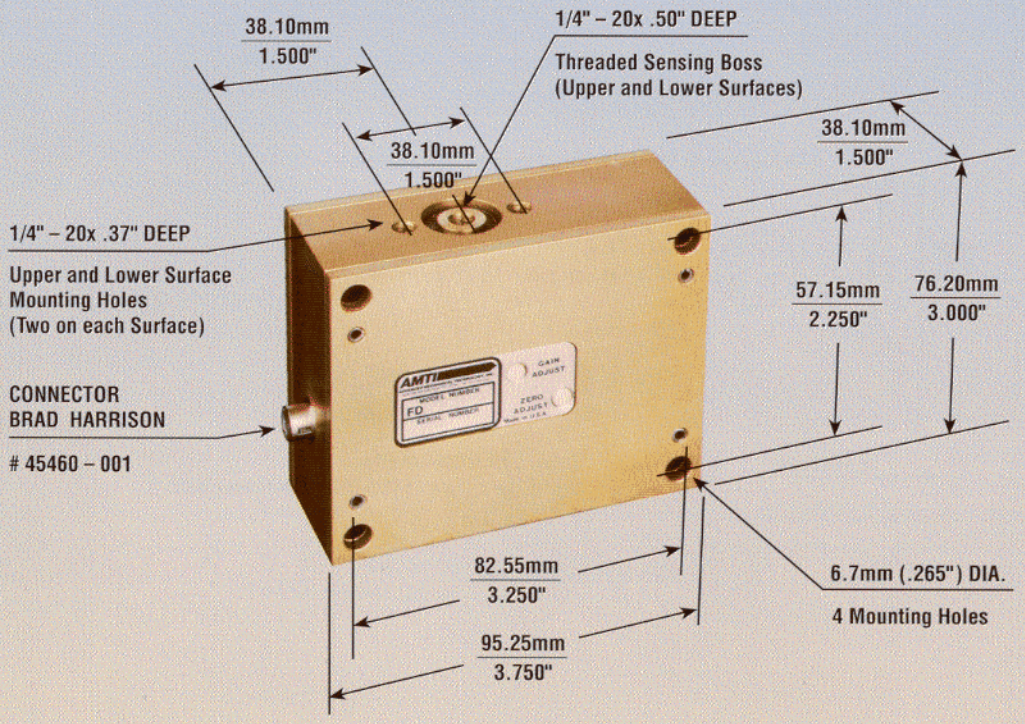
Specifications Common to All

- output voltage*: ..... ± 10 Volt
- supply voltage required: ..... +10 to +24 VDC (reverse polarity protected)
- supply current required: ..... 40 ma
- output impedance: ..... <82 ohms
- duration of output short circuit to ground: ..... indefinite
- electrical frequency response: ..... 10 KHz.
- output noise: ..... 0.1 Hz to 10 KHz <10 mV RMS
- output zero drift with temperature ..... <5 mV/°F

***Output Voltage at Rated Capacity**

Upper boss compression loading or ..... +10.0 volt
Lower boss tension loading

Upper boss tension loading or ..... –10.0 volt
Lower boss compression loading



FD-2 Load Cell

The FD-2 transducer is a medium load sensor with large overload capacity.

Force application to the sensor is made through a rugged 1/4"–20 threaded boss. There are numerous mounting options, including four through holes on the sensor face, and two threaded mounting holes on the upper and lower surfaces.

Model Number	Load Range Rated Capacity		Stiffness		Mechanical Resonant Frequency (stand alone) Hz
	(N)	(lb)	(N/m)	(lb/in)	
FD-2-0010	46	10	175 x 10^3	1000	310
FD-2-0020	89	20	350 x 10^3	2000	440
FD-2-0500	220	50	875 x 10^3	5000	620
FD-2-1000	445	100	1750 x 10^3	10000	990
FD-2-2000	890	200	3500 x 10^3	20000	1400

FD-2 load cell weight – 635 gm (1.4 lb)

FD-1 and FD-2 Load Cells

- recommended warm-up time (output setting to within 10-mV of steady state) : .....30 minutes
- The settling time is dependent upon the damped oscillations resulting from the external mass loading, transducer stiffness, and damping ratio. Contact the factory for more detailed information.
- damping ratio: .....<0.05
- full-scale cycled hysteresis: .....<0.3% F.S.O.
- non-linearity: .....0.3% F.S.O.
- temperature range: .....-20 to 85°C
- deflection at rated capacity: .....0.25 mm (0.010 inch)

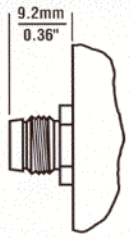
The FD1/FD2 sensors are supplied with the appropriate gain and zero balance adjustments. Factory settings can be altered by removing the small rubber plugs on the transducer name plate and turning the exposed pots.

Connector and Cable Details

Cable length – 5 meters (all transducers)

Pin	Color	Function
1	Brown	Ground**
2	White	Output
3	Blue	+VDC (Supply)
4	Black	Ground~

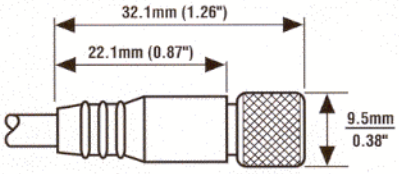
**NOTE: Pins 1 and 4 internally connected to each other.
*Daniel Woodhead Co. Northbrook, IL 60062



Connectors at Sensor: *Brad Harrison #45460-001



Pin Position
looking at Sensor Connector



Cable End Connector:
***Brad Harrison #45410-002 (with screw lock)**



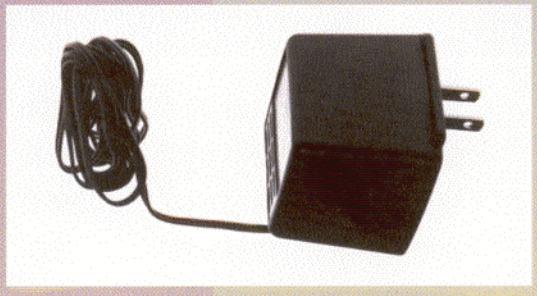
Pin position
looking at cable connector

Accessories for FD-I/FD-2

Power Supply

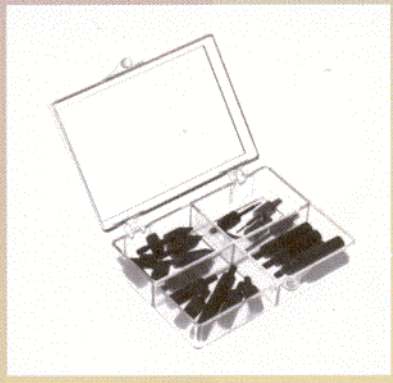
Model FDP-110
Input: 110 VAC, 60 Hz
Output: 12 VDC

Model FDP-220
220 VAC Model 50 Hz



FD-I Select-A-Point Kit

The kit contains 22 different indicator points each of which has a 4-48 thread suitable for attaching to the FD-I sensor. The points are made of steel with a black oxidized finish. Load can be applied to the load cell through these points or through any attachment with a 4-48 thread.



ISO 9001 CERTIFIED

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