iDEAS mateligentgroup

EAP Sensors


Stretch Sensor


Pressure Sensor

Better Living Through Measuring Body Movement

An EAP (electroactive polymer) Sensor is a flexible capacitor that acts as a displacement-to-capacitance transducer. The dielectric polymer exists between two stretchable or compressible electrodes. As the sensor is compressed it thins and expands within the area, increasing its capacitance. Electronics convert the change in capacitance to a digital signal that can be calibrated to a particular application.

Health Care Solutions

The soft, conformable nature of EAP Sensors makes them well-suited for medical applications such as edema detection, wound condition monitoring and measurement of body movement. The accurate, precise motion capture capabilities make the sensors ideal for:

- Orthopedics and rehabilitation
- Remote monitoring of chronic disease
- Monitoring of young and elderly
- Measurement of swelling, weight, wounds and infection

Wearable Technology

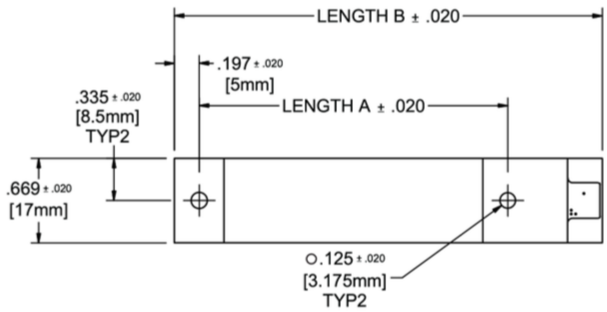
EAP Sensors' ultra-stretch, pressure capabilities, and light-weight characteristics make them a perfect fit for wearable tech. Sensors can be placed in textiles and footwear substrates to measure movement and condition change while being comfortable and non-intrusive. EAP sensors conform to many shapes and the their physical characteristics make them ideal for:

- Footwear
- Head impact monitoring
- Athletic body motion capture
- Ergonomic safety monitoring

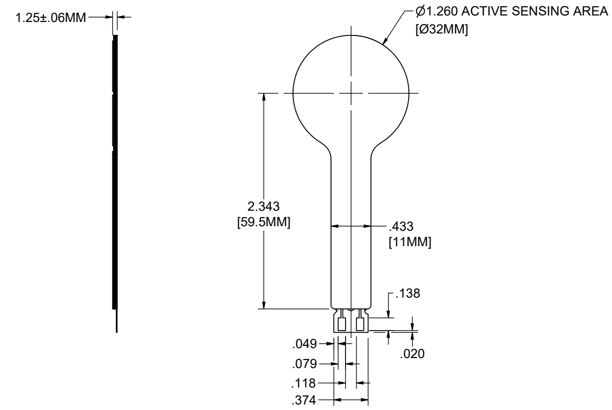
Why Electroactive Polymer Sensors?

- Stretchable/Compressible
- Flexible/Conformable/Soft
- High Resolution
- Rapid Response
- Highly Sensitive
- Economical
- Wireless Capable
- Washable
- Thin/Lightweight
- Durable/Robust
- Low Power Requirement
- Unobtrusive/Comfortable

Stretch Sensor Schematic:



Pressure Sensor Schematic:



Made of a tough silicone rubber, EAP Sensors can withstand the harshest environments from heat, cold, and shock to dust, vibration and moisture. The resolution, responsiveness and sensitivity are exceptional. The flexible sensors can take accurate measurements and readings while being stretched or compressed for millions of cycles.

Specifications - Stretch Sensors

	Description	Unit	Digital Output	Analog Output
Output Type			Serial (ASCII) Data Format	Analog Voltage 0-V Supply (5V typ)
Range	Maximum stretch	%,mm0	-100% (0-50mm)	
Sensitivity	Minimum detectable output change per mm stretch	%/mm or V/mm	2 %/mm	83.3mV/mm
Precision	Maximum error when stretching to same known value	%	0.10%	
Resolution	Smallest detectable output within noise	% (um) or V (um)	0.1% (50um)	6mV (72um)
Accuracy	Maximum difference between real stretch and sensor output	% (mm) or V (mm)	0.6% (0.3mm)	
Linearity	Maximum difference between output and ideal linear curve	%	0.60%	
Non-Linearity	Maximum input deviation / FS input X 100	%	0.60%	
Hysteresis	Maximum measured width of hysteresis curve	%	<1%	
Response Time	Maximum time to reach steady state from step input	ms	<10ms	

Specifications - Pressure Sensors - Example Application Data: Footwear

Quantitative Data	Description	Unit	Value
Range	Maximum pressure	PSI	>100
Sensitivity	Minimum detectable output change per PSI	Cnts/PSI	113
Resolution	Smallest detectable output	PSI	0.01
Response Time	Maximum time to reach steady state from step input	ms	<10

Qualitative Data	Description	Performance	Comment
Precision	Error when stretching to same known value	Good	Dependent on electronics and calibration process
Accuracy	Difference between real weight and sensor output	Good	Dependent on electronics and calibration process
Linearity	Difference between sensor output and ideal linear curve	Very Good	For this particular configuration
Hysteresis	Width of hysteresis curve	Low	For this particular configuration

For more Information: www.mateligent.de