

# Acoustic Emission

Acoustic Emission (AE) are transient elastic waves during the rapid release of energy from localized sources within a material. AE waves range in frequency from a few kHz to several MHz.

The source of these emissions in metals is closely associated with the dislocation movements accompanying plastic deformation and the initiation and extension of cracks in a structure under stress. Sources of AE include melting, phase transformation, thermal stresses, cool down cracking, friction mechanisms and stress build up.

The AE sensor can be used to monitor processes such as:

- Stamping
- Deep Drawing
- Cutting Tool Breakage
- Fracture of metal or composite pressure vessels
- Fracture of stressed structures/bridges
- Detecting loose parts in an electronic assembly
- Detecting, locating and evaluating flaws in materials
- Insect activity in wood
- Steam Valve leaks
- Partial discharge in transformers

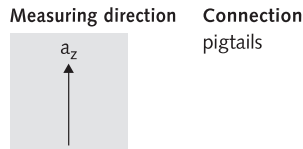
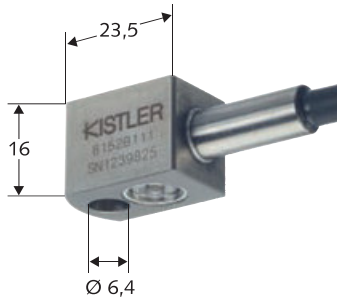
AE sensors can warn of faults when they are occurring, not just whether or not they exist like traditional non-destructive test methods, i.e. x-ray, dye penetrants, eddy current, ultrasonic transmission or microscopic inspection. Detectable AE signals are emitted before visual signs of fracture or cracking appear.



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## Voltage Output, Piezotron Acoustic Emission Sensor

### Piezotron Ceramic Shear Acoustic Emission Sensor Type 8152B...



Specifications		Type	Type
		8152B1	8152B2
Frequency range, $\pm 10$ dB	kHz	50...400	100...900
Sensitivity (nom.)	$\text{dB}_{\text{ref } 1\text{V (m/s)}}$	57	48
Overload Shock 0,5 ms pulse	g	2 000	2 000
Overload vibration	g	$\pm 1000$	$\pm 1000$
Operating temperature range	$^{\circ}\text{C}$	$-40 \dots 60$	$-40 \dots 60$
Supply: Constant current	mA	3...6	3...6
Voltage (coupler)	V DC	5...36	5...36
Output: Voltage (full scale)	V	$\pm 2$	$\pm 2$
Output bias	V DC	2,5	2,5
Mass	gram	29	29
Case material		St. Stl.	St. Stl.
Sealing	type	Hermetic	Hermetic
Ground Isolation	$\Omega$	$\geq 1$	$\geq 1$

#### Characteristics

High sensitivity and wide frequency range, inherent high-pass-characteristic, robust, suitable for industrial use (Degree of protection IP 65 resp. IP 67), ground isolated, CE compliant

#### Applications

Measurement of very high frequency phenomena particularly on machine structures. Crack formation investigations, fatigue studies and machine tool diagnostics

#### Accessories

Magnetic clamp: Type 8443B  
AE Coupler: Type 5125B...

Data sheet 8152B\_000-204