

# Piezotron® Sensor

Type 8152B...

## Acoustic Emission Sensor

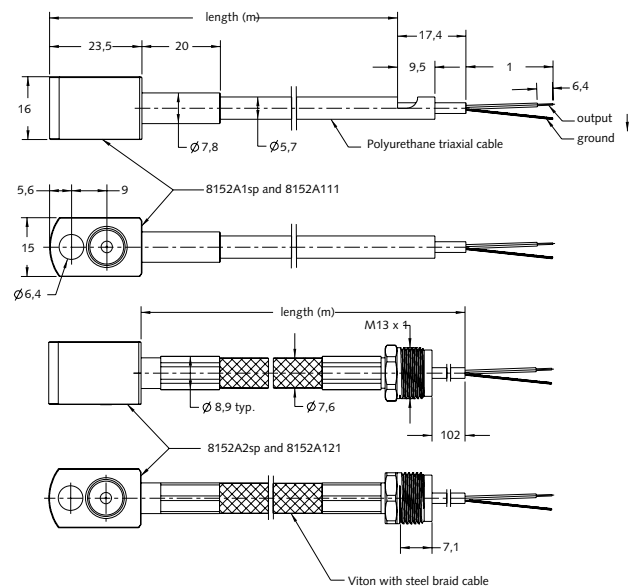
Piezotron Acoustic Emission Sensor with an integral impedance converter for measuring acoustic emission (AE) above 50 kHz in machine structures. With its small size it mounts easily near the source of emission to optimally capture the signal. The sensor has a very rugged welded housing (degree of protection IP 65 PUR or IP 67 Viton). The small sensor is easily mounted nearby everywhere; an M6 or 1/4-28 bolt is all that is needed.

- High sensitivity and wide frequency range
- Inherent highpass-characteristic
- Insensitive to electric and magnetic noise fields
- Robust, for industrial use (IP65 (PUR), IP67 (Viton))
- Ground isolated: Prevents ground loops
- Conforming to CE



### Description

The Piezotron AE Sensor consists of the sensor housing, the piezoelectric sensing element and the built-in impedance converter. The sensing element, made of piezoelectric ceramic, is mounted on a thin steel diaphragm. Its construction determines the sensitivity and frequency response of the sensor. The coupling surface of the diaphragm welded into the housing is slightly protruding to measure the AE signals. Thus a precisely defined coupling force results when mounting. This assures a constant and reproducible coupling for the AE transmission. The sensing element is acoustically isolated from the housing by design and therefore well protected against external noise. The Kistler AE sensors feature a very high sensitivity for surface (Rayleigh) and longitudinal waves over a broad frequency range. Type 8152B1... covers 50 ... 400kHz and Type 8152B2... covers 100 ... 900 kHz. A miniature impedance converter is built into the Piezotron AE Sensor, giving an output low-impedance voltage signal. The AE Piezotron Coupler Type 5125B1, is used to supply power to the sensor and for signal processing. Special highly insulating and low noise connecting cables are not required.



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**Technical Data**

Type	Unit	8152B111/121	8152B11/12sp	8152B211/221	8152B21/22sp
Sensitivity	dBref 1V/(m/s)	57	57	48	48
Frequency Range $\pm 10$ dB	kHz	50 ... 400	50 ... 400	100 ... 900	100 ... 900
Ground Isolation	M $\Omega$	>1	>1	>1	>1
Environmental:					
Shock Limit (0,5ms pulse)	gpk	2000	2000	2000	2000
Temperature Range Operating	$^{\circ}$ C	-40 ... 60	-40 ... 60	-40 ... 60	-40 ... 60
Output:					
Bias nom.	VDC	2,2	2,2	2,5	2,5
Impedance	$\Omega$	<10	<10	<10	<10
Voltage full scale	V	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$
Current	mA	2	2	4	4
Source:					
Voltage (Coupler)	VDC	5 ... 36	5 ... 36	5 ... 36	5 ... 36
Constant Current	mA	3 ... 6	3 ... 6	3 ... 6	3 ... 6
Construction:					
Sensing Element	type	ceramic	ceramic	ceramic	ceramic
Housing/Base	material	stainless steel	stainless steel	stainless steel	stainless steel
Sealing-housing/connector	type	hermetic	hermetic	hermetic	hermetic
Viton Cable Bend Radius, max.	mm	15,24	15,24	15,24	15,24
Weight (without cable)	grams	29	29	29	29
Mounting Torque	Nm	9 $\pm$ 1	9 $\pm$ 1	9 $\pm$ 1	9 $\pm$ 1

1 g = 9,80665 m/s<sup>2</sup>, 1 Inch = 25,4 mm, 1 gram = 0,03527 oz, 1 lbf-in = 0,1129 Nm

**Application**

The AE Sensor is especially well suited for measuring AE above 50 kHz in the surface of metallic components or structures. Such AE results from plastic deformation of materials, crack formation and growth, fracturing or friction. Application examples are monitoring of processes, tools and machines in metal cutting as well as forming operations. Thanks to its rugged construction and the tightly welded housing this sensor can operate under severe environmental conditions.

**Accessories Included**

- |                                | <b>Type</b>  |
|--------------------------------|--------------|
| • Mounting screw, 1/4-28 x 1in | 431-0500-001 |
| • Mounting screw, M6 x 25mm    | 431-0497-001 |

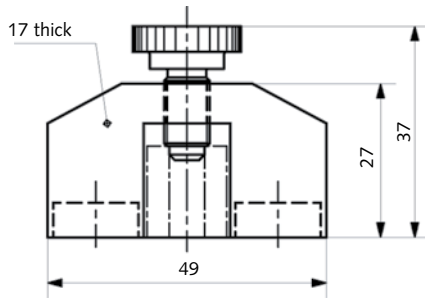
**Optional Accessories**

- |                        | <b>Type</b> |
|------------------------|-------------|
| • Magnetic clamp       | 8443B       |
| • Piezotron AE coupler | 5125B       |

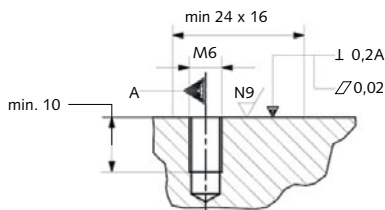
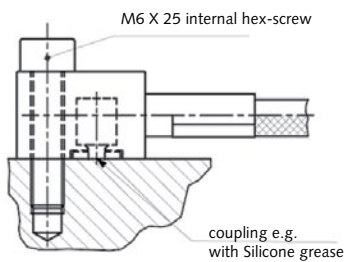
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**Mounting**

The AE Sensor is simply mounted with an M6-1/4 screw or a magnetic clamp Type 8443B onto the surface of the structure. A minimum tightening torque is sufficient for a reproducible and constant coupling. The smoother the mounting surface, the better the result. The use of a highly viscous grease (e.g. silicone grease) between the coupling surfaces is recommended.



Type 8443B Magnetic clamp

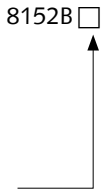


Mounting AE-Sensor

**Ordering Key**

Variants

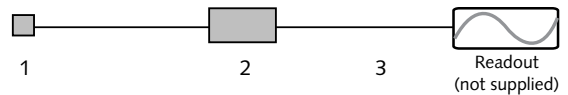
PUR, 5m (50 ... 400kHz)	111
PUR, 0,3 ... 10m (50 ... 400kHz)	11sp
PUR, 5m (100 ... 900kHz)	211
PUR, 0,3 ... 10m (100 ... 900kHz)	21sp
Viton, 2m (50 ... 400kHz)	121
Viton, 0,3 ... 3m (50 ... 400kHz)	12sp
Viton, 2m (100 ... 900kHz)	221
Viton, 0,3 ... 3m (100 ... 900kHz)	22sp



**Measuring Chain**

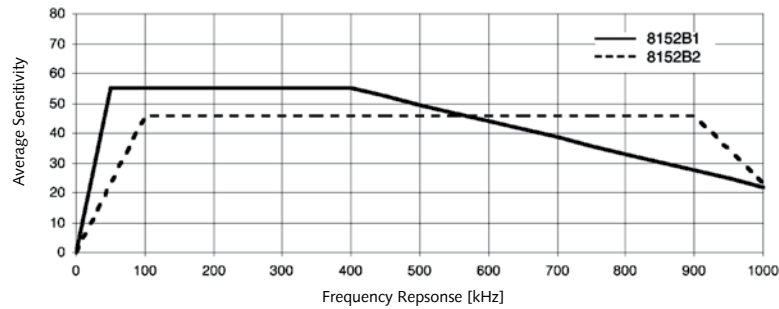
- 1 Acoustic emission sensor
- 2 Piezotron AE Coupler
- 3 Outout cable, made by customer

**Type**  
8152B...  
5125B...

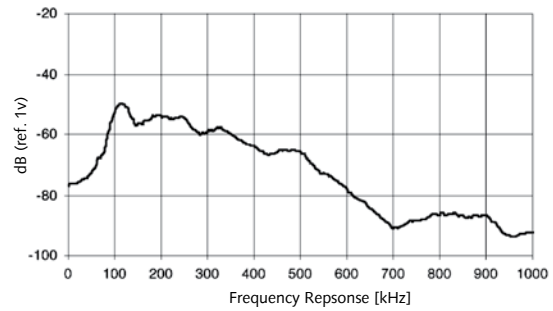
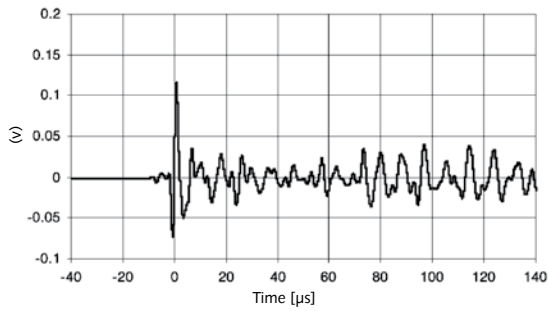


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Frequency Response



Type 8152B1



Type 8152B2

