

GENERAL DESCRIPTION

The **InSituAE™ Sensor/Coupler** is especially well suited for measuring acoustic emissions which result from slugs, splits, cracks, and broken punches which occur in tooling of forming and stamping operations. These emissions, usually occur above about 50 kHz in the surface of machine structures. Such emissions result 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 stamping and forming operations. Thanks to its rugged construction, this sensor and coupler can operate under severe environmental conditions. Different options for sensor mounting, cabling and sensor frequency range are available.

InSituAE-B2 Sensor



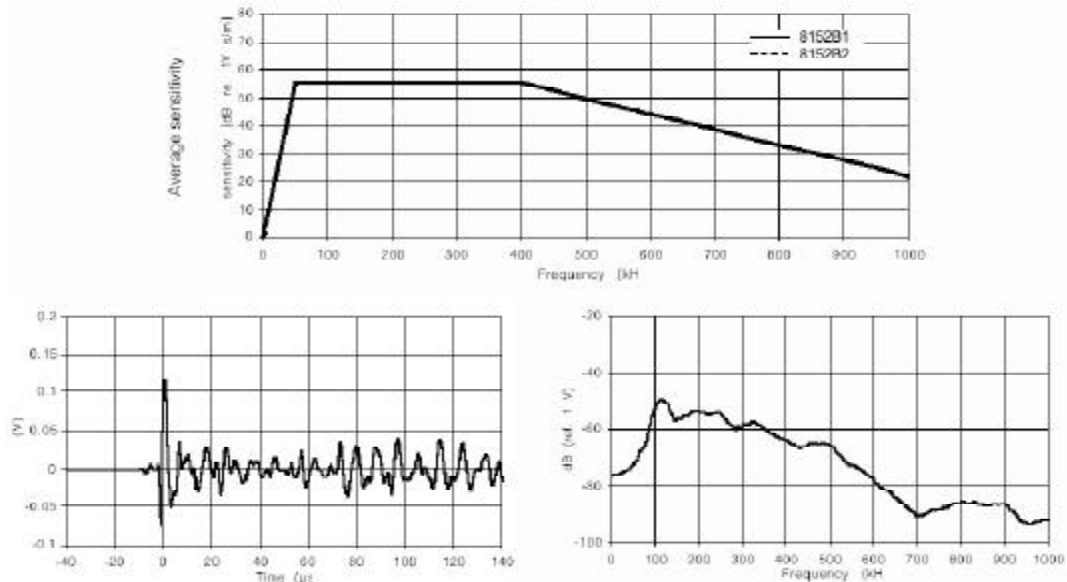
The **InSituAE1 Sensor** has a built-in impedance converter for measuring acoustic emission (AE) above about 50 kHz in machine structures. With its small size it mounts easily near the source of emission and captures the signal optimally. The sensor has a very rugged housing, welded tight (degree of protection IP 65 resp. IP 67). The small sensor may easily be mounted nearly everywhere: a M6-bolt is all that is needed.

InSituAE™ Coupler

The **InSituAE™ Coupler**, with built-in RMS converter and Limit Switch, has been specially designed for the processing of high-frequency sound emission signals from InSituAE™ Acoustic Emission Sensors. The gain can be set with a jumper (x1) either to tenfold or (x10) to hundredfold. The amplifier has two series-connected filters of the second order, designed as plug-in elements. The type of filter (high-pass or low-pass) as well as the frequency limit are freely selectable. A bandpass filter is obtained by the series connection of one high-pass and one low-pass filter. The integration time constant of the RMS converter can be freely selected. The limit switch is set with a potentiometer. The switching threshold set can be monitored at the "Limit" output using the Signature Technologies signatureACE® Process Control System. The output of the limit switch is electrically isolated by an optocoupler. The following output signals are present at the 8-pole round connector: Two analog output signals AE-Out (Filter), AE-Out (RMS) and a digital output signal (Limit Switch).



Frequency Response

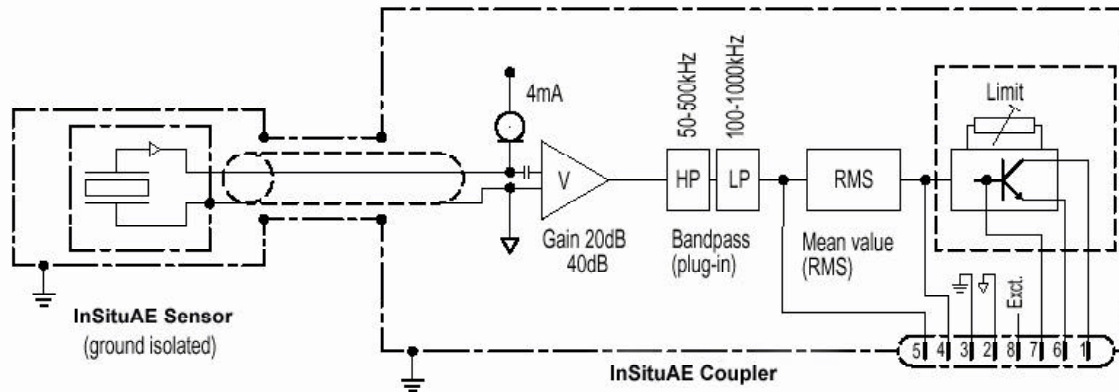


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InSituAE™ Acoustic Emissions Sensor & Coupler

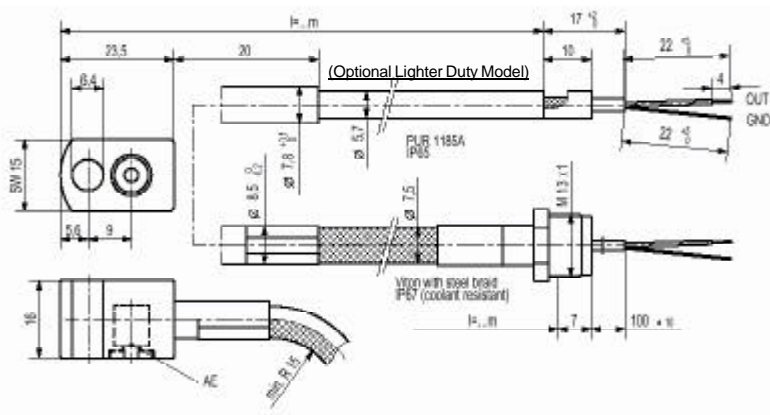
SYSTEM DIAGRAM



TECHNICAL SPECIFICATIONS

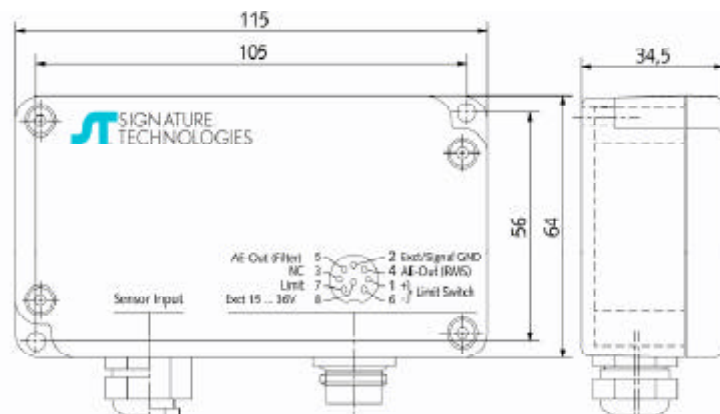
InSituAE Sensor

Frequency range (±10dB) (kHz)	50 ... 400
Sensitivity ^{Ref} 1V/(m/s) ⁵⁷ V/(m/s)	700
Operating temperature range(°C)	-40 ... 60
Mass (g)	29
Ground isolation (Mohms)	>1
Overload Shock 0,5 ms pulse(g)	2000 0,2 ms pulse
Overload vibration (g)	±1000 Supply
Constant current (mA)	3 ... 6
Voltage (coupler) (V DC)	5 ... 36
Output Voltage (full scale) (V)	±2
Output bias (V DC)	2,5
Output (mA)	2
Impedance (ohms)	10



InSituAE Coupler

Output AE-Out (RMS)	
Frequency range (±3dB)	kHz 10 ... 1000
Integration time constant	ms 1,2 (standard)
Voltage	V0 ...
Current	mA 0 ... 5
Output resistance	1 10
Zero offset	mV 510
Noise	V _{pp} typ. 10 max. 30
Tolerance Crest factor	% <2 3
<i>Limit switches</i>	
Optocoupler output cut off with alarm	
Threshold (adjustable)	%FS 0 ... 100
Optocoupler (locked)	V <30
Optocoupler (conductive)	mA <7
Fall delay time	secs 1,3
Hysteresis	mV 20
<i>Power supply</i>	
Supply voltage	VDC 15 ... 36
Current consumption	mA <70
<i>General data</i>	
Temperature range Operating	°C 0 ... 60 Min. / Max.
Housing (diecast)	Aluminum, IP 65 (DIN 40050) Plug mounted
Vibration resistance	Gs 10 (Conditions of test: 20 ... 2000 ... 20 Hz continous sweeps of 2 min, 8 times within 16 min)



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