

PREDICTIVE
MAINTENANCE
SYSTEMS

PROTECTING
YOUR
INVESTMENT

Accelerometers

SENSONICS

Trouble-free vibration monitoring



The PZ range
of Industrial
Accelerometers

Our Aim - To Save You Money



Condition Monitoring has been proven to significantly reduce overall operating costs in Industry especially those utilising rotating or reciprocating machinery. Nowadays vibration monitoring techniques have become so efficient at predicting problems on most types of mechanical plant that almost every Facility even those with only small sized plant can economically justify the incorporation of some kind of vibration monitoring equipment. However, if sensors are not correctly specified or installed the effectiveness of a condition monitoring program can be seriously reduced.

Trouble Free Vibration Monitoring Everytime

Sensonics PZ range of accelerometers incorporate many unique design features which provide unparalleled ease of use and Sureness of Signal to ensure that they provide effective vibration monitoring in any application.

For instance, different results can sometimes be given when accelerometers are used with portable and fixed monitoring systems. The PZ range incorporate features that allow them to be used with either type of monitoring system without any change in performance.

No other accelerometer is easier to install or simpler to use just follow Sensonics step by step guide* to installation and be sure of trouble free vibration monitoring everytime at exceptional prices.

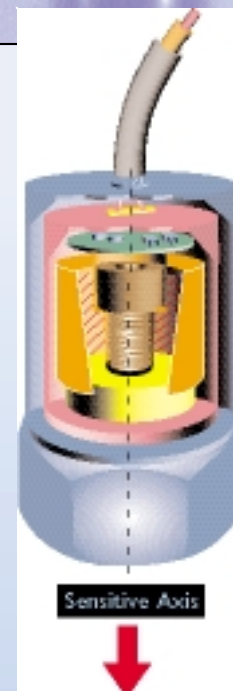
How PZ Accelerometers Work

Inside the Sealed stainless steel case is a piezo crystal disc compressed between a free mass and the the base of the unit. When the accelerometer undergoes a vibration in its sensitive axis the compressive force on the crystal varies and an electrical charge is produced across its top and bottom surfaces. This charge can be amplified, filtered and measured and is at the same frequency and is proportional to the amplitude of the vibration.

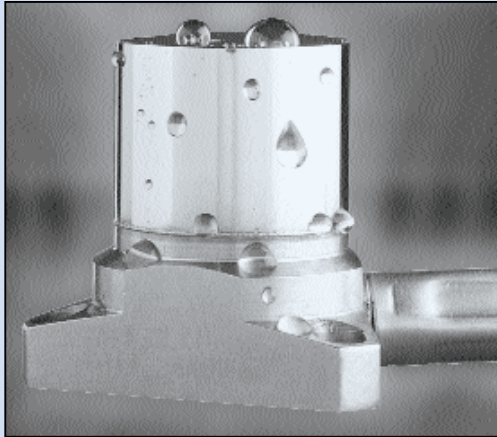
Accelerometers are available with a direct charge sensitivity or this can be amplified to provide either a voltage or current sensitivity.

If preferred an internal integrator can be fitted to provide an output proportional to velocity or internal signal conditioning can provide a direct 4-20mA analogue proportional to a choice of vibration levels.

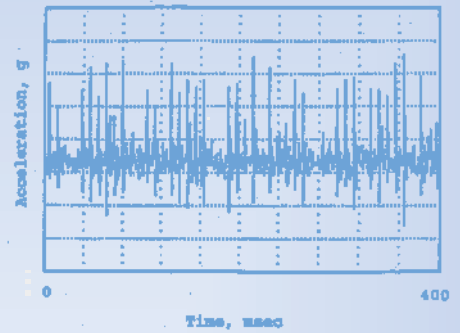
* Free installation guide available with all orders



A New Simpler Approach To Condition Monitoring



At the high end of the range is the PZ DC vibration transmitter which incorporates signal conditioning to give a direct 4-20mA output proportional to overall vibration level between 10Hz and 1KHz (as specified in ISO 2372). This single signal can be monitored on any proprietary SCADA or logging system enabling machines condition to be monitored as easily as any other parameter and at exceptionally low cost.



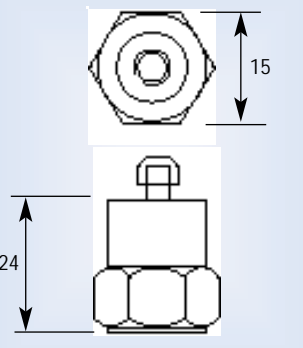
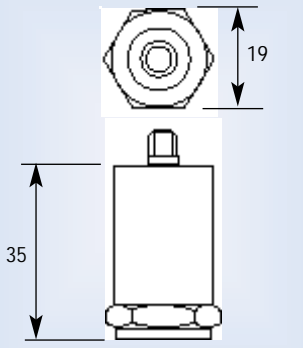
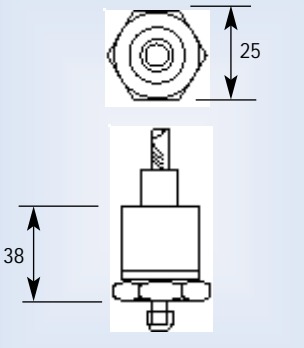
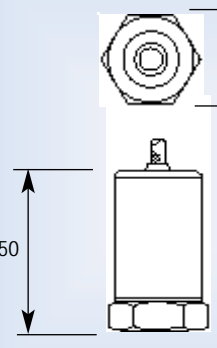


Why Use Accelerometers For Vibration Monitoring

- 1) They can be installed in minutes
- 2) They can take machines vibration readings non invasively
- 3) They require no recalibration once factory set
- 4) They have no moving parts and so are inherently very reliable
- 5) They are the lowest cost of all vibration Transducers
- 6) ICP accelerometers require only 2 cable cores

Standard Features Of The PZ Range

- All the PZ accelerometers are designed and manufactured by Sensonics under the strictest quality control procedures. Sensonics is an ISO9001 registered firm.
- All are 100% tested in house with calibration certificates provided.
- All have Sealed Stainless Steel Cases.
- All have a unique mechanical design feature to eliminate base strain (an effect that can corrupt vibration signals and is very difficult to detect).
- All can be used horizontally or vertically.



TYPE	 PZP1	 PZP2	 PZA1	 PZA2
DESCRIPTION	Lightweight, high frequency response without internal charge amplifier.	Medium sized unit without internal charge amplifier, a radiation resistant version is available	Low cost, general purpose industrial accelerometer.	General purpose industrial accelerometer with internal charge amplifier for thermal physical and electromagnetic protection
APPLICATIONS	Suitable for gearbox or other high frequency or high temperature monitoring A separate in-line charger is available	Nuclear installations and other general machine monitoring applications	Suitable for most types of machine monitoring i.e. pumps, fans and compressors etc Ideal for use with portable vibration analysis/data collectors	Suitable for monitoring electric motors, generators and all types of machinery
Output Sensitivity (10)	20 p C/g, 40p C/g (15)	100 p C/g	100 mV/g (15)	100 mV/g (15)
Frequency Response (11)	0.5Hz - 20kHz	0.5Hz - 9kHz	2.5Hz - 11kHz (Optional: 0.8Hz - 11kHz)	2.5Hz - 11kHz (Optional: 0.8Hz - 11kHz)
Dynamic Range (12)	600g	300g	75g	75g
Electrical Output Configuration	<small>See table</small>  (1)	(1)	(2)	(2) (3) (6)
Connection Method Availability (13)	<small>See table</small>  8(g)	8(g)	6(a,b), 8(f)	6, 7, 8(e, f), 9
Single or Dual Case (14)	Single	Single	Single Isolated	Dual Isolated
Intrinsically Safe version available (see data sheet)	N.A	N.A	T.B.C	EEx ia IIC T4
Weight (approx)	30 gms (1oz)	72 gms (2.5oz)	70 gms (2.5oz)	115 gms (4oz)
Operating Temperature Range	-40°C - +200°C	-40°C - +200°C	-25°C - +80°C	-30°C - +140°C
Mounting Details	Single Female Thread	Single Female Thread	Single Male Thread	Single Female Thread
Data Sheet Reference	DS 1101	DS 1102	DS 1103	DS 1104

Custom design service is available, call us to discuss your requirements

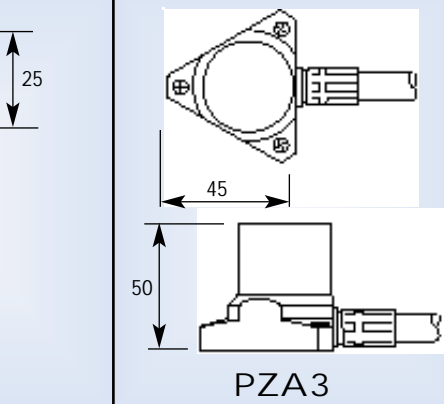
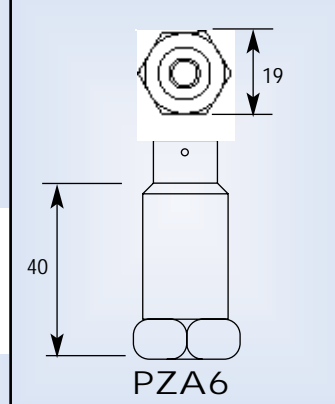
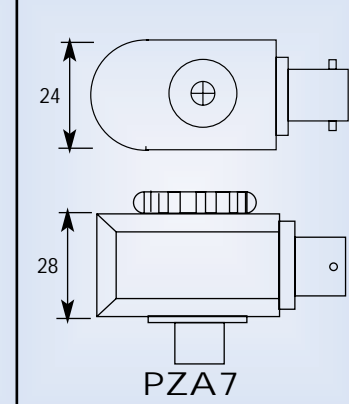
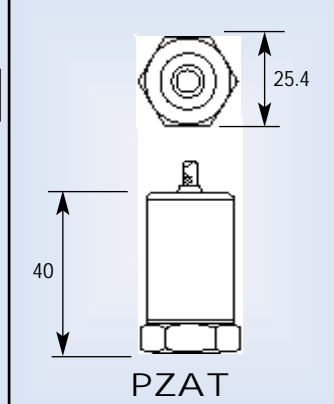
Table A ELECTRICAL CONFIGURATION OPTIONS AVAILABLE:

- 2 wire, non-isolated, direct charge output
- 2 wire loop powered device requiring constant current source, 2 - 10mA, 18 - 24 Vdc
- 3 or 4 wire device, separate 12 Vdc power supply
- 2 wire current sensitivity, constant 11 - 28 Vdc supply
- 2 wire, 4 - 20mA signal, loop powered
- 2 wire loop powered 2-10mA, 7-10v dc Bias

See relevant data sheets for connection details

Table B CONNECTION METHOD OPTIONS AVAILABLE:

- Integral cable (unit sealed to IP67)
- IP68 Submersible unit (integral cable type a. only)
- Integral connector
- Integral stainless steel braided flexible conduit and cable (type c)

					
PZA3	PZA6	PZA7	PZAT		
Industrial dual case and protection	Robust industrial accelerometer for critical applications where a high level of physical protection is required	Low cost general purpose industrial accelerometer	Low profile shear mode industrial accelerometers, with low base strain, Single point mount and side exit connections	Dual Vibration and temperature measurement channels	Low acceleration protection
Monitoring generators machines	Steam and gas turbines, gas circulators etc, where monitoring is critical	Suitable for nearly all types of machine monitoring, ideal for use with portable data collectors / analysers	Suitable for all types of machinery monitoring especially where access is tight or restricted	Suitable for general purpose machines where monitoring of vibration and surface temperature is required	Suitable for motors and
5)	100 mV/g	100mV/g (15)	100mV/g (15)	100m V/g & 1 μ A/°C	4
Hz (11kHz)	2.5Hz - 11kHz (Optional: 0.8Hz - 11kHz)	0.8Hz - 11kHz	0.8Hz - 11kHz	3.5Hz - 11kHz	2
	75g	75g	200g	75g & -30 to 125°C	200
	(2) (3)	(2) (6)	(2)	(2) + Temp output	
9	6,7,8(e,f), 9	6,7(a),8(e,f)	6,7(a),8(e,f),9	6,7,8(e,f)	
ed	Dual Isolated	Single	Dual Isolated	Single	Si
4	T.B.C	T.B.C	T.B.C	T.B.C	
z)	230 gms (8oz)	80 gms (3oz)	150 gms (5oz)	110 gms	20
°C	-30°C - +140°C	-30°C - +150°C	-30°C - +120°C	-30°C - +125°C	-2
thread	3 x M4 holes on 44mm PCD	Single Female Thread	Single Male Captive Screw	Single Female Thread	Singl
	DS 1105	DS 1128	DS 1135	DS 1142	

Discuss your requirements

* many items held in stock

CABLE TYPES

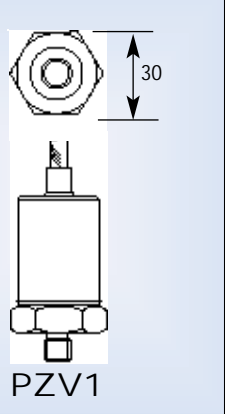
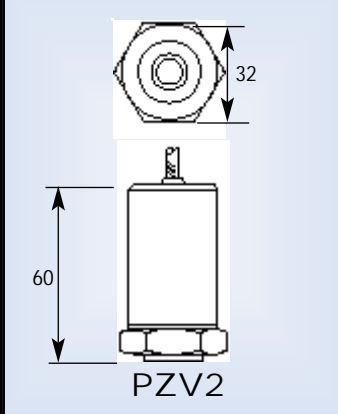
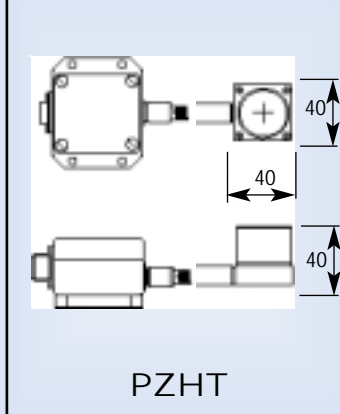
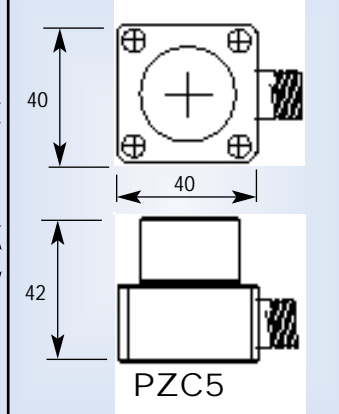
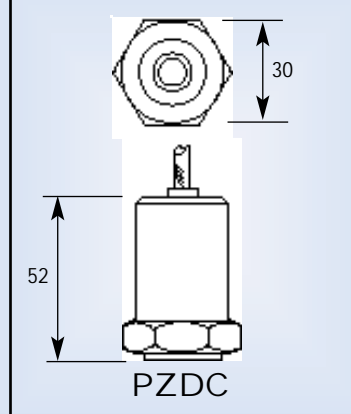
- Economy cable unarmoured (80 °C max)
- Economy cable armoured (80 °C max)
- Hi-temp cable unarmoured
- Hi-temp cable armoured

CONNECTOR TYPES

- Multipin, circular, threaded
- BNC
- Microdot coaxial

NOTES

- The output sensitivity quoted is the nominal value at 20°C and at 80Hz. Unless otherwise stated the tolerance band is $\pm 5\%$ of this value. Also see note (15) below.
- The frequency response quoted is the 3dB point unless otherwise stated
- The dynamic range is the operational range of the instrument. For the survival limits, please see the relevant data sheet for each instrument.

 <p>PZV1</p>	 <p>PZV2</p>	 <p>PZHT</p>	 <p>PZC5</p>	 <p>PZDC</p>
Low cost industrial accelerometer with output proportional to vibration velocity	General purpose industrial accelerometer with velocity output and dual case for thermal physical and electromagnetic protection	Robust, high temperature accelerometer for monitoring in hostile environments, with separate charge amplifier	Robust industrial accelerometer with current output	Loop powered vibration transmitter with 4-20mA output, proportional to overall vibration level
Suitable for pumps, fans and most other types of machine	Suitable for monitoring electric motors, generators and all types of machines	Suitable for monitoring in hostile environments	Military applications amongst others	Suitable for most types of machine and provides direct input to SCADA or DCS systems
1mV/mm/S	4mV/mm/S	100 mV/g	50 u A/g	4 - 20mA
0.5Hz - 6kHz	2.5Hz - 6kHz	8Hz - 10kHz	2.5Hz - 10kHz	10Hz - 1kHz (ISO 2372)
10g or 500mm/s	200g or 500mm/S	20g	40g	See data sheet
(2) (3)	(2) (3)	(3)	(4)	(5)
6(a,b), 8(f)	6,7,8(e,f)	8(e)	6,7,8(e),9	6,7,8(e,f)
Single Isolated	Dual Isolated	Dual Isolated	Single	Single
T.B.C	T.B.C	EEx ia IIB T4	EEx ia IIB T5	T.B.C
100 gms (7oz)	250 gms (9oz)	Transducer: 140 gms (5oz)	250 gms (9oz)	225 gms (8oz)
-50°C - +80°C	-30°C - +100°C	Transducer: -20°C - +240°C Amplifier: -20°C - +90°C	-27°C - +90°C	-30°C - +120°C
Single Male Thread	Single Female Thread	4 x M4 holes on 33mm square	4 x M4 holes on 30mm square	Single Female Thread
DS 1106	DS 1107	DS 1109	DS 1110	DS 1111

★ Free accelerometer installation guide available

13. Connection method. Where practical, we recommend the use of integral cable (or conduit) as the most robust and reliable. Integral connectors are the most convenient when removing or refitting accelerometers but they are more expensive and in some cases are susceptible to accidental damage.

14. Single or Dual Isolated case. All PZ accelerometers have stainless steel cases. A dual case however will offer increased protection against physical interference and thermal shock. An isolated case will provide protection against electro-magnetic interference.

15. Certain PZ models are available with a slightly wider tolerance band on sensitivity at a lower price than the standard unit, ie. the output is marginally higher or lower than the stated value. These are ideal for use where changes in vibration level are being monitored.

ie. Trend monitoring

16. Armoured cable has stainless steel braid over the outer sheath for added protection.

How To Choose An Accelerometer

The following guide is intended to enable you to choose a suitable instrument for your application.

More thorough advice is available without obligation from Sensonics, please call us if we can be of assistance.

1) Sensitivity and Power Supply

What output is required? The accelerometer will be used with some kind of monitoring system, what sensitivity is required by this and what power supply can it supply? ICP devices with a Sensitivity of 100mV/g are the most frequently chosen and most modern vibration monitoring systems will support these instruments. If your monitoring system can be calibrated to suit variable inputs or if you are looking for changes in vibration level, then a wider tolerance band on sensitivity may be acceptable, see note 15 over.

2) Range

What are the vibration levels to be monitored on the machine?
Sensonics are able to offer assistance on this and International Standard ISO 2372 or the machinery manufacturer should provide relevant assistance.
Check that the accelerometer will accommodate those levels.

3) Frequency Range

This is entirely dependant on the speed and type of machine and your monitoring requirements. As with the range, the machine manufacturer and ISO 2372 should provide details, or call Sensonics who will be happy to help.

4) Environment

You need to ensure that the instrument working temperature range is suitable and consider what physical protection is appropriate for the environment, including the mounting arrangement and sealing. Are any corrosive chemicals likely to be present? Stainless steel casing will offer some protection. Do you require an Intrinsically Safe accelerometer?

5) Internal Shield

For applications where high levels of electromagnetic interference are likely, such as motor noise or where signal levels are low, an instrument with a secondary internal isolated case is recommended. This can also provide protection against thermal shock

6) Size

Check that the size of the instrument is suitable for the location, remembering that in most cases the smaller the instrument the less well protected it is and the higher it's frequency response.

7) Physical Arrangements

The most economical arrangement is a transducer with a single point stud mounting onto the machine and top entry electrical connection cable. However, a three or four point mounting arrangement and side entry cable is more robust for applications where physical interference is likely. PZ transducers are available with integral cable, flexible conduit or connector. (Military, BNC or Bayonet type). Whilst a connector offers convenience especially during installation, it is in most cases a more economical and robust solution is to use a short length of integral cable terminated in a nearby junction box with other instrument signals.

ACCESSORIES

Accessories

To help gain the most benefit from your accelerometers Sensonics manufacture a wide range of ancillary products which include:

Fixings and mounting studs

With all types and sizes of thread, which can be isolated and suitable for welding or cementing to machine castings



Connection and Switching Boxes

For easy data collection from installed transducers



In-Line Charge Amplifiers

For charge Sensitivity accelerometers



Accelerometer Simulation Units

For calibration of all monitoring systems



Vibcheck Portable Vibration Meter

With accelerometer check function



Other accessories include:

Cable, Connector and Conduit Harnesses

Bracketry - To enable effective mounting of accelerometers in difficult positions

Magnetic Bases - For temporary mounting of all transducers

FIXING METHODS

Fixing Methods For Accelerometers

The preferred method is using fixing screws or stud, this is the most dependable method and gives the best frequency response.

For Transducers that are likely to be removed often, quick release fastenings can be provided.

When machine cases cannot be prepared transducer fixings can be cemented in place.

Magnetic bases can be provided when transducers are to be mounted temporarily although some degradation of Frequency response is likely. Contact spikes can be used for "hand held" vibration measurement.

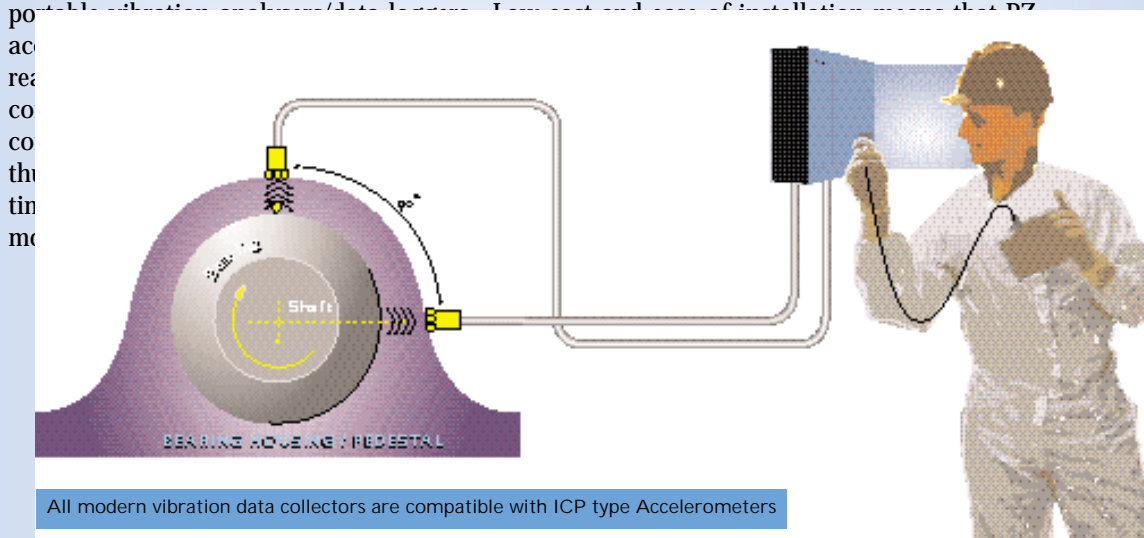
Typical uses of PZ Accelerometers (The Most Widely Used Condition Monitoring Instrument)

The PZ range of accelerometers is ideal for vibration measurement in a wide range of applications, especially in industrial environments for monitoring rotating and reciprocating machinery of all types and sizes.

This includes Steam and Gas Turbines, Motors, Fans, Pumps, Compressors and Paper Mills.



PZ Accelerometers are suitable for use with any type of monitoring system, including :-



The PZ DC accelerometers can be used directly with SCADA or other proprietary logging systems without the need for additional signal conditioning.

Where overall level protection systems are used, the reliability of the PZ range makes it suitable for even the most critical of applications.

Because of their inherent stability across the whole frequency range, PZ accelerometers are particularly suitable for providing Signals for Spectral analysis in PC based on-line Vibration Monitoring Systems (OLVMS).

Support From Sonsonics

At Sonsonics our after Sales Service philosophy is simple, we will not settle for anything less than satisfied customers and our organisation is structured to reflect this. Teams of specialist Engineers are available to assist you in Selection, installation and operation of Sonsonics monitoring products.

We are able to supply many support services including Maintenance contracts, extended warranties, product training, installation and commissioning to ensure that you get the most from your monitoring equipment.

All the PZ transducers are manufactured and 100% tested in house, we are ISO9001 accredited.

We manufacture a wide range of accelerometers other than the PZ range and offer a custom design service for special applications.



PREDICTIVE MAINTENANCE SYSTEMS

KEEPING INDUSTRY TURNING



OTHER PRODUCTS IN THE SENSONICS RANGE

- Velocity Transducers
- Eddy Current Probes
- LVDT's & RVDT's
- Signal conditioning systems
- On line vibration monitoring
- Seismic Sensors

SENSONICS CAN ALSO UNDERTAKE

- Feasibility studies
- Installation and commissioning (turnkey projects)
- System integration

To order or request a sample or further information

Call Sensonics Now on:

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or FAX us on:

+44 (0) 1442 876477

or email on:

sales@sensonics.co.uk



In a commercial environment of increasingly stringent regulations on processes, tighter budget constraints combined with increased quality controls, closer government scrutiny of operations and ever-more fierce competition from many corners of the globe, there has never been a more appropriate time for industry to adopt systems, procedures and policies that ensure the competitive advantage as well as conformity to the wide array of international standards.

Sensonics predictive maintenance technology should be a vital part of your company's strategy to enable your operations to meet the challenges of the next decade - and beyond.

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Quick Delivery - many items held in stock

Technical Assistance - always available without obligation

Free Accelerometers Buyers Guide

Extended Warranties - available on all Sensonics products

Custom Design Service - if you don't see what you want here

If you are at all unsure about any application of Accelerometers please do not hesitate to call our technical sales department, who will be delighted to offer advice without obligation.



SENSONICS



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