

**Predictive
Maintenance
Systems**

VIBRATION TRANSDUCER PRODUCT CATALOGUE

SHIMADZU



**Accelerometers • Velocity Transducers
Shock Transducers • Seismometers**

**Vibration
Transducers**



Cert. No. FM26920



For all your vibration monitoring needs

Overview

Sensonics have been providing a wide range of vibration measurement instruments to industry since 1978. The quality and depth of our product range has been forged from an approach to design and development, which is application based. In addition to the industry standard instruments detailed in this catalogue, Sensonics can provide customized solutions or variations to existing products.

Within our range of vibration transducers you will find instruments to meet with the following applications.

- Motors, Pumps and Gearboxes
- Paper Machines
- Steam Turbines & Generators
- Gas Turbines & Generators
- Milling Plant
- Steel Mills
- Low speed large machines
- Ground & Foundation Vibration
- Datacollectors
- Submersible (IP 68)
- Potentially Explosive Atmosphere
- High Temperature
- Armoured
- Isolated
- Connectorised
- Low Profile
- Heavy Industrial Mounting
- Bearing Condition

The ATEX Directive

The ATEX directive 94/9/EC defines the specification requirements of equipment intended for use in potentially explosive atmospheres. Equipments supplied to meet the directive are approved by an authorized external body, the manufacturer must also maintain a quality system to meet with the standard. Sensonics produce a wide range of ATEX approved accelerometers and eddy current proximity probes for intrinsically safe applications.



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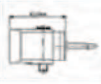


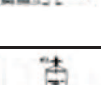




Vibration Transducer Selection

There are various applications, which determine transducer selection. The main factors to consider are as follows;

- What type of monitoring system is the device connecting to? The industry standard is an acceleration output utilising a constant current 2 or 3 wire arrangement. A velocity output may be more suitable if vibration displacement is to be monitored, a single stage of integration in the monitoring hardware can reduce the sensitivity to low frequency noise. Alternatively a direct 4-20mA set up could be required to provide a direct interface to PLC/DCS systems. A self-generating (no power supply) velocity or acceleration vibration transducer offers the advantages of simple connectivity at the expense of sensitivity and reduced cable run.
- The instrument frequency range must be selected for the application, usually determined from the machine rotational speed and the type of monitoring required. Velocity output transducers tend to have a more restricted band of operation; Sensonics PZS range of accelerometers offer very broadband acceleration performance suitable for most applications.
- The range and sensitivity are dependant on the type of measurement required, a high sensitivity device may be suitable for small range measurements, particularly in noisy environments, where pick-up on the cable runs can be a problem. Care should be taken in selecting the velocity range for direct 4 – 20 mA output devices, as these are factory set.
- Environmental factors include working temperature range, IP rating, is a waterproof system required? Is the device to be used within a potentially explosive atmosphere? If so, ensure the ATEX rating specified for the device meets with the application.
- The most economical mounting arrangement is a transducer with a single point stud mounting on to the machine – the space available may restrict the size of the transducer. More robust options should be selected where physical interference is likely, choose from 3 or 4 hole mounting, side entry options, armoured cable or flexible conduit.
- If you have any questions or wish to discuss your application in more detail, Sensonics' experienced sales and engineering team is on hand to help. Please feel free to get in touch.

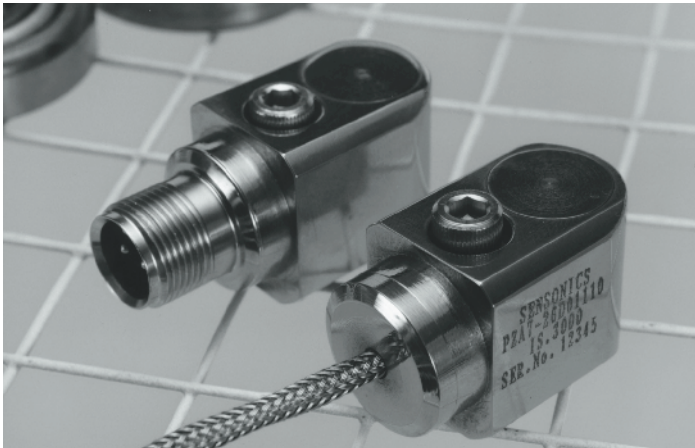
Quick Product Selection Guide

Sensor selection matrix.

Sensor Range	Measurement and Features	Accel 100 to 500mCu/g	Accel >2V/g	Velocity 4mV/mm/s	Velocity 20mV/mm/s	Velocity 50mV/mm/s	Velocity 4 – 20 mA	Charge 10 to 100pC/g	Self Generating	Impact Response	Temperature <140°C	Temperature >200°C	Temperature >400°C	ATEX Approved	Top Exit	Side Exit	Triaxial Version	Connector Version	Waterproof Option	Armoured / Conduit	Broadband <0.5Hz	ICP type drive
PZS		●									●			●	●	●	●	●	●	●	●	●
PZV				●							●			●	●	●		●	●	●		●
PZDC							●				●			●	●	●		●	●	●		
PZHT		●						●			●	●	●	●	●	●				●		●
VEL-G				●	●				●		●	●			●	●		●	●	●		
PZP								●	●		●	●			●	●		●			●	
SP			●			●										●	●				●	
PZA4								●		●					●			●		●		●

PZS Shear Mode Range of Accelerometers

ICP type vibration transducer, 100mV/g, +140°C operation and broadband performance 0.4Hz – 11KHz. ATEX approval.



The PZS series of Vibration Transducers are robust, sealed instruments suitable for operation in heavy industrial environments. The piezoelectric shear mode sensor and amplifier are contained within an inner metal enclosure, this is available in various packages offering electrical and thermal isolation from the outer stainless steel body. This arrangement prevents earth loops and eliminates electrical interference, as well as minimising thermal shocks and base strain.

Transducers are available in various packages with both MIL connector and armoured cable options. Ruggedised versions with isolated/non-isolated armoured conduit are also available. A three-axis version for triaxial measurement applications completes the range.

The PZS Product Family

Model No.	Mechanical Details	Application	Interface Options
PZS1		<ul style="list-style-type: none"> Spindle Monitoring Embedded Gearboxes 	<ul style="list-style-type: none"> Integral PVC Microdot
PZS2		<ul style="list-style-type: none"> General Purpose Datacollectors Pumps Motors 	<ul style="list-style-type: none"> Integral PVC Cable Armoured Option
PZS3		<ul style="list-style-type: none"> Heavy Industrial Large Motors Papermills Steel Mills Intrinsically Safe 	<ul style="list-style-type: none"> Integral PTFE Cable Armoured Option MIL 2-pin Conn
PZS4		<ul style="list-style-type: none"> Heavy Industrial Large Motors Gas Turbines Low Profile Intrinsically Safe 	<ul style="list-style-type: none"> Integral PTFE Cable Armoured MIL 2-pin Conn Isolated Conduit 10mV/°C Opt
PZS5		<ul style="list-style-type: none"> Heavy Industrial Large Motors Steam Turbines Low Profile Intrinsically Safe 	<ul style="list-style-type: none"> Integral PTFE Cable Armoured MIL 2-pin Conn Isolated Conduit
PZXY		<ul style="list-style-type: none"> Ground Vibration Turbine Foundations Three-axis Seismic Monitoring 	<ul style="list-style-type: none"> Integral PVC Cable MIL 6-pin Conn

PZS Shear Mode Range of Accelerometers

ICP type vibration transducer, 100mV/g, +140°C operation and broadband performance 0.4Hz – 11kHz. ATEX approval.

Common Specifications

- Output Sensitivity: 100mV/g or 500mV/g
- Accuracy : ±5% or ±10%
- Measurement Range: ±70g
- Linearity: ±1%
- Transverse Sensitivity : <5%
- Resonant Frequency : 32 kHz
- Excitation Voltage : 18 to 28 Volts d.c. ICP type.
Other variants available, please contact factory
- Excitation Current : 2mA to 10mA
- Bias Voltage : 12 Volts d.c ±20%
- Residual Electrical noise : < 0.2mg
- Temperature Sensitivity : <8% up to max operating temperature
- Shock Limits : 2000g
- EMC : EN50081 / EN50082
- Casing Material : SS316

Model Specifications

Parameter	PZS1	PZS2	PZS3	PZS4	PZS5	PZXY
Frequency Range	0.4Hz – 11kHz	0.4Hz – 11kHz	0.4Hz – 11kHz	0.4Hz – 11kHz	0.4Hz – 8kHz	0.4Hz – 7kHz
Temperature Range	-30°C – 120°C	-30°C – 120°C	-30°C – 140°C	-30°C – 140°C	-30°C – 140°C	-30°C – 120°C
Survival Range	-55°C – 140°C	-55°C – 140°C	-55°C – 160°C	-55°C – 160°C	-55°C – 160°C	-55°C – 140°C
ATEX Certification	None	None	*EEx ia IIC T4	*EEx ia IIC T4	*EEx ia IIC T4	None
Protection EN60529	IP66	IP66	IP67/68 Waterproof Option	IP67/68 Waterproof Option	IP67/68 Waterproof Option	IP67/68
Cable Options	PVC	PVC	PTFE Armoured	2/3 wire PTFE Armoured Conduit	2/3 wire PTFE Armoured Conduit	PVC /PU
Connector Options	Microdot	None	Mil style Connector (MIL-C-5015) or M12	Mil style Connector (MIL-C-5015) or M12	Mil style Connector (MIL-C-5015) or M12	Mil style 6-pin Connector (MIL-C-5015)
Mounting Options	M3 Female	¼" UNF Female	¼" UNF, M8 Female, QF	¼" UNF, M6, M8 Bolt	3-off M4 Mounting holes	M6 Bolt
Weight	16gms	27gms	95gms	150gms	450gms	400gms

Ordering Information - Please see page 16/17 for details of cable assemblies and mounting studs

Model No.	Config	Connection	Cable Length	Accuracy	Mounting
PZS1	- 2 (2-wire)	6C (Cable unarmoured)	Specify in metres	2 (±10%)	0 (As above)
PZS2	- 3 (3-wire)	6D (Cable armoured)	e.g. 05 (5m)	1 (±5%)	1 (¼" UNF)
PZS3	- 4 (2-wire, 500mV/g)	7G (PU waterproof cable)	max 25m		2 (M6)
PZS4	-	8E (Integral MIL Conn)			3 (M8)
PZS5	-	8K (Integral M12 Conn IP68)	ATEX		4 (Quick fit)
PZXY	-	9C (Conduit - see below)	0 (Non Intrinsic) 1 (Intrinsic)		

e.g. **PZS4-2-6D-05-111** :- **PZS4** model, **2-wire**, **5m armoured cable**, **±5% accuracy**, **¼" UNF**, **Ex Version**

* Contact sales for ATEX coding and certification details

For armoured flexible conduit options

select **9C** and specify type and fitting

e.g. **9C01** (non-isolated with ¼" BSP fitting)

Conduit length is 0.5m less than cable length

Conduit

0 (non-isolated)

1 (Isolated)

Conduit Fitting

0 (None)

1 (¼" BSP)

2 (M16 Male)

3 (M20 Male)

PZV Piezoelectric Range of Velocity Transducers

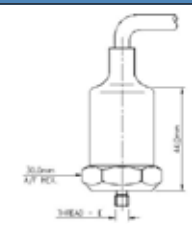

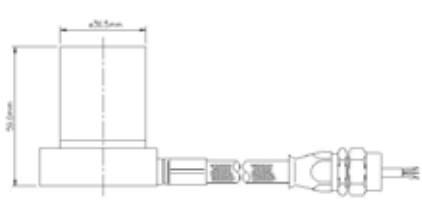



ICP type vibration transducer, 4mV/mm/s, +120°C operation and broadband velocity output performance 2.5Hz – 6KHz. ATEX approval.

The PZV series of Vibration Transducers are robust, sealed instruments suitable for operation in heavy industrial environments. The piezo-electric shear mode sensor, amplifier and integrator are contained within an inner metal enclosure, this is available in various packages offering electrical and thermal isolation from the outer stainless steel body. This arrangement prevents earth loops and eliminates electrical interference, as well as minimising thermal shocks and base strain.

Available in various packages with both MIL connector and armoured cable options. Ruggedised versions with isolated/non-isolated armoured conduit are also available. Intended for applications requiring a direct velocity output, the PZV range of devices offer superior noise performance through integration at source and permit accurate displacement vibration measurements to be determined on both portable and fixed monitoring equipment.

The PZV Product Family

Model No.	Mechanical Details	Application	Interface Options
PZV1		<ul style="list-style-type: none"> General Purpose Datacollectors Pumps Motors 	<ul style="list-style-type: none"> Integral PVC Cable
PZV2		<ul style="list-style-type: none"> Heavy Industrial Large Motors Papermills Steel Mills Intrinsically Safe 	<ul style="list-style-type: none"> Integral PTFE Cable Armoured Option MIL 2-pin Conn
PZV3		<ul style="list-style-type: none"> Heavy Industrial Large Motors Steam Turbines Low Profile Intrinsically Safe 	<ul style="list-style-type: none"> Integral PTFE Cable Armoured MIL 2-pin Conn Isolated Conduit
PZV4		<ul style="list-style-type: none"> Heavy Industrial Steam Turbines High Sensitivity Seismic Monitoring 	<ul style="list-style-type: none"> Integral PTFE Cable Armoured MIL 2-pin Conn Isolated Conduit

Note:- The PZV4 is suitable for high sensitivity applications in noisy or heavy industrial environments (50mm/s/V)

PZV Piezoelectric Range of Velocity Transducers

ICP type vibration transducer, 4mV/mm/s output, +120°C operation and broadband velocity performance 2.5Hz – 6KHz. ATEX approval.

Common Specifications

- Output Sensitivity: 4mV/mm/s or 50mV/mm/s
- Accuracy : ±5%
- Dynamic Range : >90dB
- Measurement Range: ±200g
- Transverse Sensitivity : <5%
- Amplitude Linearity : <5%
- Excitation Voltage : 18 to 28 Volts d.c. ICP type.
- Excitation Current : 3.5mA to 10mA
- Bias Voltage : 12 Volts d.c ±20%
- Residual electrical noise : 10⁻⁴ mm/s (10Hz)
- Temperature Sensitivity : <5% up to max operating temperature
- Shock Limits : 2000g
- EMC : EN50081 / EN50082
- Material : SS316

Model Specifications

Parameter	PZV1	PZV2	PZV3	PZV4
Frequency Range	2.5Hz – 6kHz	2.5Hz – 6kHz	2.5Hz – 6kHz	2.5Hz – 2kHz
Temperature Range	-30°C – 100°C	-30°C – 120°C	-30°C – 120°C	-30°C – 100°C
Survival Range	-55°C – 140°C	-55°C – 150°C	-55°C – 140°C	-55°C – 140°C
ATEX Certification	None	*EEx ia	*EEx ia	None
Protection EN60529	IP66	IP67/68 Waterproof Option	IP67/68 Waterproof Option	IP67/68 Waterproof Option
Cable Options	PVC	PTFE Armour	PTFE Armour Flexible Conduit	PTFE Armour Flexible Conduit
Connector Options	None	Mil style 2-pin Connector (MIL-C-5015)	Mil style 2-pin Connector (MIL-C-5015)	Mil style 2-pin Connector (MIL-C-5015)
Mounting Options	¼" UNF, M6-M8 Female	¼" UNF, M6-M8 Female	3-off M4 Mounting holes	M8 Female
Weight	200gms	250gms	420gms	570gms

Ordering Information - Please see page 16/17 for details of cable assemblies and mounting studs

Model No.	Config	Connection	Cable Length	Accuracy	Mounting
PZV1	- 2 (2-wire)	6C (Cable unarmoured)	Specify in metres	I (±5%)	0 (As above)
PZV2	-	6D (Cable armoured)	e.g. 05 (5m)		1 (¼" UNF)
PZV3	-	7G (PU waterproof cable)	max 25m		2 (M6)
PZV4	- 4 (2-wire, 50mV/ mm/s – PZV4 only)	8E (Integral MIL Conn) 8K (Integral M12 Conn IP68) 9C (Conduit - see below)	ATEX 0 (Non Intrinsic) I (Intrinsic)		3 (M8) 4 (QF)

e.g. **PZV3-2-6D-05-III :- PZS4 model, 2-wire, 5m armoured cable, ±5% accuracy, ¼" UNF, Ex Version**

* Contact sales for ATEX coding and certification details

For armoured flexible conduit options

select **9C** and specify type and fitting

e.g. **9C01** (non-isolated with ¼" BSP fitting)

Conduit length is 0.5m less than cable length

Conduit

0 (non-isolated)

I (Isolated)

Conduit Fitting

0 (None)

1 (¼" BSP)

2 (M16 Male)

3 (M20 Male)

VEL-G Moving Coil Range of Velocity Transducers



Self-Generating vibration transducer, 20mV/mm/s output, +200°C operation and broadband velocity performance 4.5Hz – 2KHz.

The VEL-G series of Vibration Transducers are robust, sealed instruments suitable for operation in heavy industrial environments. This self-generating transducer produces a signal proportional to the velocity component of a mechanical vibration by means of relative movement between a coil and a magnet. The signal level is suitable for direct connection to most signal conditioning and data recording equipment. The main body of the transducer is fitted with a polished stainless steel case and contains a moving coil and magnet assembly. The coil is suspended within the field of the magnet by means of diaphragms, which permit virtually frictionless movement in one axis only. This measuring axis is coincident with the axis of the cylindrical body.

Application

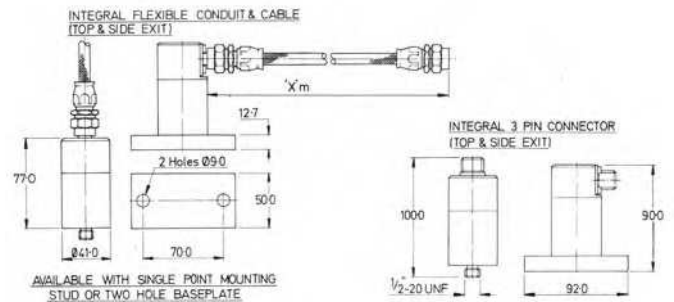
- Heavy Industrial
- Large Motors
- Steam Turbines
- Self-Generating
- High Temperature

Interface Options

- Integral PTFE Cable
- Armoured
- MIL 2-pin Conn
- Isolated Conduit
- Top or side exit

Specifications

- Output Sensitivity: 4mV/mm/s or 20mV/mm/s in to 10kOhm Load
- Accuracy : ±3%
- Linearity : ±3% at 100Hz
- Max Displacement: ±2.5mm
- Output Impedance : 200Ohm nom.
- Max Acceleration : 2000g sensitive axis; 50g non-sensitive axis
- Temperature Range: -40°C – 100°C; 200°C extended range available.
- Mass: 480 grams



Model Specifications

Dimensions (shown with primary axis vertical - 0° reference)

Freq. Range (Hz)	Angle of Calibration	Angular Range of Operation (Degrees) From Angle of Calibration	Max. Sensitivity Deviation	Option
15 - 2000	Vertical 0°	Universal (vertical 0° +/- 180°)	- 10%	1
10 - 2000	Vertical 0°	Universal (vertical 0° +/- 180°)	- 12%	2
10 - 2000	Horizontal 90°	Horizontal (90° +/- 10°)	+/- 2%	3
4.5 - 2000	Horizontal 90°	Horizontal (90° +/- 20°)	- 20%	4
4.5 - 2000	45°	45° +/- 20°	- 10%	5
4.5 - 2000	Vertical 0°	Vertical (0° +/- 20°)	- 6%	6

Output sensitivity deviation over frequency range versus mounting angle relative to angle of calibration

Ordering Information - Please see page 16/17 for details of cable assemblies and mounting studs

Model No.	Config	Connection	Exit	Cable Length	Sensitivity	Mounting
VELG	- 9	6C (Cable unarmoured)	T (top)	Specify in metres	1 4mV/mm/s	1 (1/4" UNF)
(self generating)		6D (Cable armour)	S (side)	e.g. 05 (5m)	2 20mV/mm/s	2 (1/2" UNF)
VELGT (200°C)		8E (Integral Conn 2-pin)		max 25m		3 (M8)
		8F (Integral Conn 3-pin)				4 (2 hole plate)
		9C (Conduit - see below)				

Configuration – select from table above I-6

e.g. **VELG-9-6DT-03-212** :- **VELG** model, **2-wire**, **3m armoured cable top exit**, **20mV/mm/s**, **1/4" UNF**, **Universal operation**, **10Hz to 2KHz**.

For armoured flexible conduit options

select **9C** and specify type and fitting

e.g. **9C01** (non-isolated with 1/4" BSP fitting)

Conduit length is 0.5m less than cable length

Conduit

- 0** (non-isolated)
- 1** (Isolated)

Conduit Fitting

- 0** (None)
- 1** (1/4" BSP)
- 2** (M16 Male)
- 3** (M20 Male)

PZDC 4-20mA Loop Powered Range of Velocity Transducers



4-20mA vibration transducer, up to 50mm/s range, +120°C operation and broadband velocity output performance 2.5Hz – 6KHz. ATEX approval.

The PZDC series of Vibration Transducers are compact and robust sealed instruments providing a process output of 4-20mA proportional to RMS velocity vibration. The series is designed for applications requiring direct integration in to SCADA systems (PLC/DCS) providing an extremely cost effective solution for measuring overall vibration performance.

A simple two-wire loop signal proportional to current provides the electrical interface; the velocity vibration range is factory set between 15mm/s and 50mm/s as standard. Utilising Sensonics compression mode technology the sensors offer an extremely linear performance over the full dynamic range and accuracy to within a few percent.

With ATEX approval across the PZDC range, the series is available in three packages to suit most applications including MIL connector and armoured cable options. Ruggedised with isolated/non-isolated armoured conduit and fully isolated versions are available (PZDC3) for use in harsh industrial environments where earth loops and interference are problematic.

The PZDC Product Family

Model No.	Mechanical Details	Application	Interface Options
PZDC		<ul style="list-style-type: none"> General Purpose Engines, Motors, Pumps, Fans Centrifuges PLC/DCS Intrinsically Safe 	<ul style="list-style-type: none"> Integral PTFE Cable Armoured Option MIL 2-pin Conn Waterproof PU option
PZDC2		<ul style="list-style-type: none"> General Purpose Engines, Motors, Pumps, Fans PLC/DCS Datacollectors 	<ul style="list-style-type: none"> Integral PTFE Cable Armoured Option Additional Accel (g) signal output
PZDC3		<ul style="list-style-type: none"> Heavy Industrial Motors, Pumps, Fans Low Profile PLC/DCS Intrinsically Safe 	<ul style="list-style-type: none"> Integral PTFE Cable Armoured Isolated Conduit Inner screen isolated from case

Note:- The PZDC2 provides both a 4-20mA proportional to velocity vibration for the PLC interface as well as an acceleration output (100mV/g) for more detailed analysis on portable instrumentation

PZDC 4-20mA Loop Powered Range of Velocity Transducers

4-20mA vibration transducer, up to 50mm/s range, +120°C operation and broadband velocity output performance 2.5Hz – 6KHz. ATEX approval.

Common Specifications

- Output Signal: 4 to 20mA
- Accuracy : ±5%
- Measurement Range: 0 – 15mm/s, 20mm/s, 25mm/s & 50mm/s, other ranges available
- Transverse Sensitivity : <5%
- Amplitude Linearity : ±1%
- Excitation Voltage : 16 to 32 Volts d.c.
- Electrical Isolation : 500Vrms
- Temperature Sensitivity : <5% up to max operating temperature
- Shock Limits : 2000g
- EMC : EN50081 / EN50082
- Material : SS316

Model Specifications

Parameter	PZDC	PZDC2	PZDC3
Frequency Range	2.5Hz – 6kHz	2.5Hz – 6kHz	2.5Hz – 2kHz
Temperature Range	-30°C – 120°C	-30°C – 120°C	-30°C – 120°C
Survival Range	-55°C – 140°C	-55°C – 150°C	-55°C – 140°C
ATEX Certification	*EEx ia	None	*EEx ia
Protection EN60529	IP67/68 Waterproof Option	IP67/68 Waterproof Option	IP67/68 Waterproof Option
Cable Options	PTFE Armour	PTFE Armour	PTFE Armour Flexible Conduit
Connector Options	Mil style 2-pin (MIL-C-5015) M12 IP68	None	None
Mounting Options	¼" UNF, M8 Female	¼" UNF, M8 Female	3-off M4 Mounting holes
Weight	225gms	225gms	420gms

Ordering Information - Please see page 16/17 for details of cable assemblies and mounting studs

Model No.	Config	Connection	Cable Length	Output Range	Mounting
PZDC	- 5 (2-wire)	6C (Cable unarmoured)	Specify in metres	1 0-15mm/s	0 (As above)
PZDC2	- 8 (3-wire, 4-20mA)	6D (Cable armoured)	e.g. 05 (5m)	2 0-20mm/s	1 (M8)
PZDC3	- 5 (+ 100mV/g)	7G (PU waterproof cable)	max 25m	3 0-25mm/s	2 (¼" UNF)
		8E (Integral MIL Conn)		4 0-50mm/s	
		8K (Integral M12 Conn IP68)		Atex	
		9C (Conduit - see below)		0 (Non Intrinsic)	
				1 (Intrinsic)	

e.g. **PZDC-2-6D-05-321:- PZDC model, 2-wire, 5m armoured cable, 0-50mm/s range, ¼" UNF, Ex Version.**

* Contact sales for ATEX coding and certification details

For armoured flexible conduit options

select **9C** and specify type and fitting

e.g. **9C01** (non-isolated with ¼" BSP fitting)

Conduit length is 0.5m less than cable length

Conduit

0 (non-isolated)

1 (Isolated)

Conduit Fitting

0 (None)

1 (¼" BSP)

2 (M16 Male)

3 (M20 Male)

PZP Charge Output Accelerometers



Lightweight accelerometer, 100pC/g output, +200°C operation and broadband performance 0.5Hz – 20KHz.

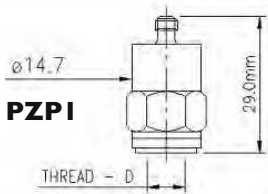
The PZP series of accelerometers are robust, sealed instruments suitable for operation in heavy industrial environments. This self-generating transducer produces a charge output proportional to acceleration and is intended for use in conjunction with an external impedance matching or charge amplifier.

The radiation resistant option has been developed for use in nuclear environments and avoids the use of materials that are unsuitable for high radiation environments. Available in either top or side exit connector variants.

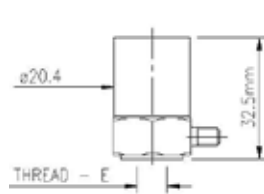
Application

- High Frequency
- Gearboxes
- Generators
- Self Generating
- High Temperature

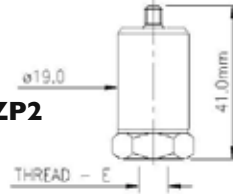
- Restricted Mounting



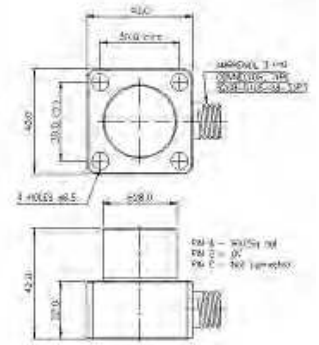
PZP1



PZP2



PZCS



Common Specifications

- Output Sensitivity: up to 100pC/g
- Accuracy : ±5% or ±10%
- Transverse Sensitivity : <4%
- Amplitude Linearity : ±1%
- Transducer Capacitance : 1000pF
- Insulation Resistance : >30GOhms
- Radiation Resistance : 1x10⁹ Rads (Gamma)
- Temperature Sensitivity : 0.08% / °C
- Shock Limits : 2000g
- Protection : IP66/67

Model Specifications

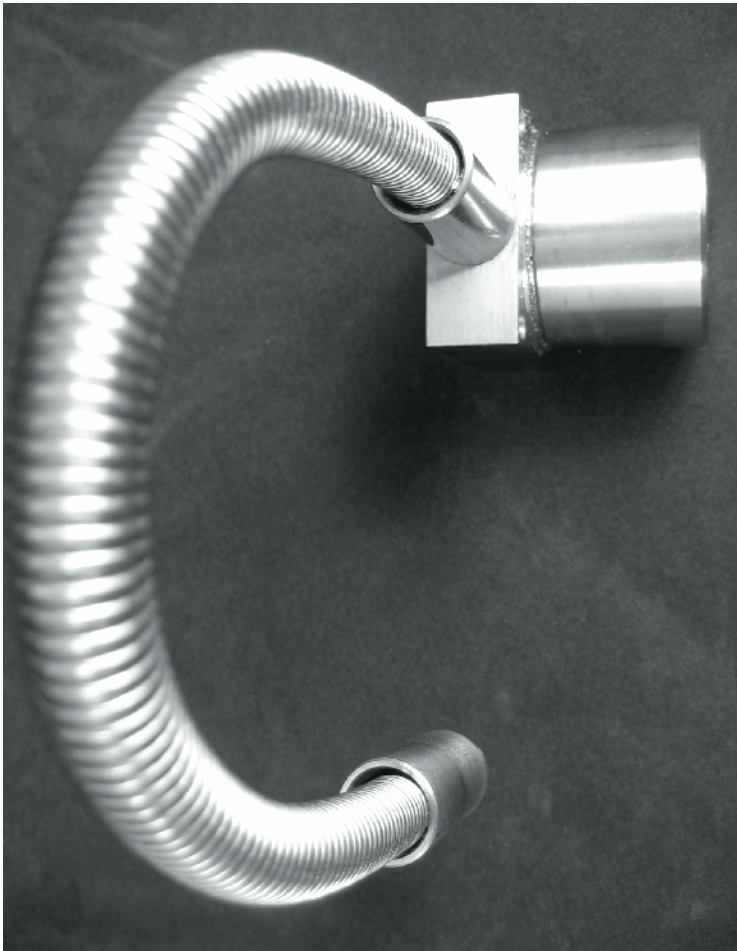
Parameter	PZP1	PZP2	PZCS
Measurement Range	±600g	±300g	±40g
Frequency Range	0.5 Hz – 20 kHz	3.0Hz – 11kHz	2.5Hz – 9kHz
Temperature Range	-40°C – 200°C	-40°C – 200°C	-30°C – 90°C
Survival Range	-40°C – 300°C	-40°C – 250°C	-55°C – 120°C
Output Sensitivity	20pC/g or 40pC/g	100 pC/g	50 uA/g (11-28VDC @ 4mA)
Connector Options	Microdot 10-32UNF	Microdot 10-32UNF	Mil style 3-pin Connector (MIL-C-5015)
Mounting Options	¼" UNF, 10-32UNF, M5 Female	¼" UNF, M5 Female	4-off M4 Mounting holes
Weight	27gms	72gms	300gms

Ordering Information - Please see page 16/17 for details of cable assemblies and mounting studs

Model No.	Config	Connection	Sensitivity	Mounting
PZP1	- 1 (2-wire charge)	8F (MIL 3-pin)	1 (20pC/g±10%)	1 (¼" UNF)
PZP2	- 1 (2-wire charge)	8GI (Microdot 2-pin top)	2 (40pC/g±10%)	2 (M5)
PZCS	- 4 (2-wire current loop)	8G2 (Microdot 2-pin side)	3 (40pC/g±5%)	3 (10-32 UNF)
			4 (50pC/g±5%)	4 (M4 mounting holes)
			5 (100pC/g±10%)	

e.g. PZP1-1-8GI-02-1:- PZP1 model, 2-wire, microdot top exit, 40pC/g±10%, ¼" UNF female mount.

PZHT High Temperature Range Accelerometers



ICP type vibration transducer, 100mV/g, up to +450°C operation, 2 and 3 wire variants, 8Hz – 10KHz. ATEX approval.

The HT series of Vibration Transducers are robust, hermetically sealed instruments suitable for operation in high temperature, heavy industrial environments, such as those found in gas turbine applications. The HT series consist of a piezoelectric sensor, hermetic integral cable and separate charge amplifier unit. This arrangement removes the electronic signal conditioning components from the high temperature environment. The configuration provides high reliability in extreme environments in conjunction with accelerometer performance usually found in much lower temperature devices.

Available in three distinct packages to suit measurement application; the 240°C PZHT range offers a cost effective 2-wire and a 3-wire ATEX approved variant. The 450°C PZEHT incorporates a test & calibration facility that can confirm correct operation of the complete sensing loop. An important consideration for high temperature applications, where the sensor is positioned in hard to reach or non-serviceable parts of the turbine.

The PZHT Product Family

Model No.	Mechanical Details	Application	Interface Options
PZHT		<ul style="list-style-type: none"> Gas Turbines Aero Derivative Industrial Frames Intrinsically Safe 240°C 	<ul style="list-style-type: none"> 3 - wire Integral Armoured Flexible Conduit 100mV/g Sensitivity MIL 3-pin Conn
PZHT2		<ul style="list-style-type: none"> General Purpose Papermills Steel Mills Low Cost 240°C Bullet Charge Amplifier Design 	<ul style="list-style-type: none"> 2 – wire ICP Type Armoured Cable 100mV/g Sensitivity Free cable ends
PZEHT		<ul style="list-style-type: none"> Gas Turbines Aero Derivative Industrial Frames Intrinsically Safe 450°C 	<ul style="list-style-type: none"> Integral Hardline Cable 100mV/g Sensitivity MIL 6-pin Conn Self Test Facility

PZHT High Temperature Range Accelerometers

ICP type vibration transducer, 100mV/g, up to +450°C operation, 2 and 3 wire variants, 8Hz – 10KHz. ATEX approval.

Model Specifications

Parameter	PZHT	PZHT2	PZEHT
Frequency Range	8.0Hz – 10kHz	8.0Hz – 10kHz	5.0Hz – 3kHz
Sensitivity	100mV/g ± 5%	100mV/g ± 10%	100mV/g ± 5%
Transverse Sensitivity	<5%	<5%	<5%
Dynamic Range	20g peak	70g peak	50g peak
Amplitude Linearity	<± 1%	<± 1%	<± 1%
Shock Survival	<1000g	<1000g	<1000g
Sensor Temperature Range	-20°C – 240°C	-20°C – 240°C	-55°C – 450°C
Amplifier Temperature Range	-20°C – 90°C	-20°C – 90°C	-30°C – 120°C
Electrical Interface	12V-15Vdc 10mA nominal	ICP Type 18V - 28Vdc Current source 2-10mA	ICP Type 18V - 28Vdc Current source 2-10mA
Calibration Sensitivity	-	-	100mV/g
ATEX Certification	*EEx ia	-	*EEx ia
Protection EN60529	Hermetically Sealed	Hermetically Sealed	Hermetically Sealed
Cable Options	Std 3m Low Noise PTFE insulated s/steel flexible conduit	5m PTFE Armoured plus 10m free end on charge amplifier	Std 3m Hardline MI
Connector Options	Mil style 4-pin Connector (MIL-C-5015)	None	Mil style 6-pin Connector (MIL-C-5015)
Mounting Options	4-off 4.4mmø 33mm pitch	¼" UNF, M6 Female	4-off 7.2mmø 30.2mm pitch
Weight	950gms	Accelerometer 85gms Amplifier Module 150gms	950gms

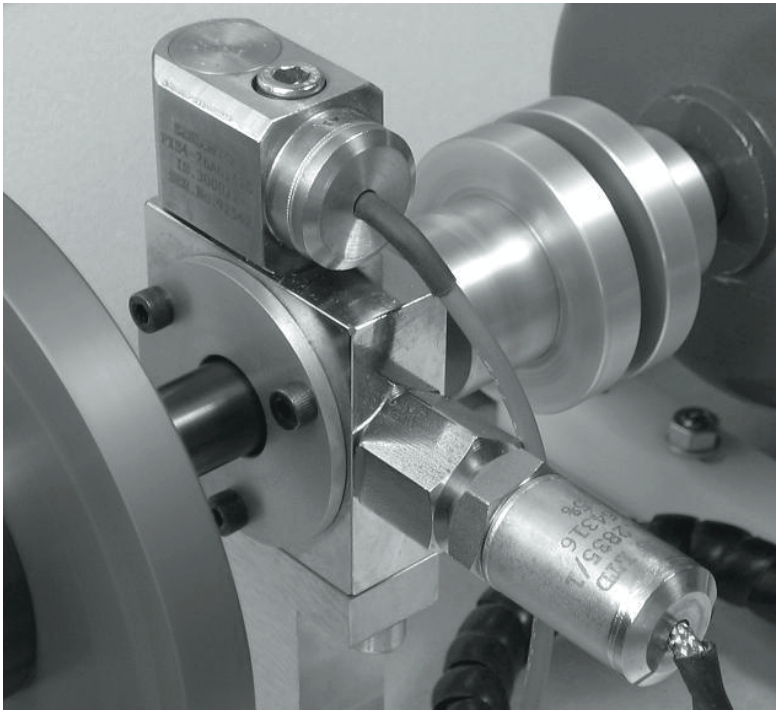
Ordering Information - Please see page 16/17 for details of cable assemblies and mounting studs

Model No.	Config	Connection	Cable Length	Accuracy	Mounting	ATEX
PZHT	- I (integral charge amp)	8E (3-wire, 4-pin MIL)	03 (3m Fixed)	1 (±5%)	0 (As above)	0 (Non intrinsic) I (Intrinsic)
PZHT2	- I (integral charge amp)	6D (Integral armoured PTFE)	05 (5m Fixed) (10m free end)	2 (±10%)	1 (¼" UNF) 2 (M6) 3 (quick release)	0 (Non intrinsic) I (Intrinsic)
PZEHT	- I (integral charge amp)	8E (2-wire 6-pin MIL)	03 (3m Fixed)	1 (±5%)	0 (As above)	0 (Non intrinsic) I (Intrinsic)

e.g. **PZHT-1-8E-03-101**:- PZHT model, 3-wire, 3m low noise armoured cable, ±5% accuracy, Ex Version

* Contact sales for ATEX coding and certification details

PZA Shock Response Accelerometer



Suitable for roller bearing monitoring, 10mV/g output, +125°C operation and resonant frequency of 33KHz.

The PZA4 shock response accelerometer is designed for the condition monitoring of machine bearings containing roller elements. The accelerometer utilises the natural resonance response of a piezoelectric circuit to oscillate at a defined frequency in response to a mechanical shock wave. As well as roller bearings, the device has applications for the detection of mechanical looseness in machinery and other non-cyclic vibration events.

The accelerometer should be used in conjunction with the appropriate signal processing unit which should perform the appropriate demodulation of the shock waveform to determine a qualitative figure directly relating to bearing condition. Sensonics can offer such solutions through both the Aegis and SpyderNet range of monitoring products, please refer to the appropriate brochure.

Application

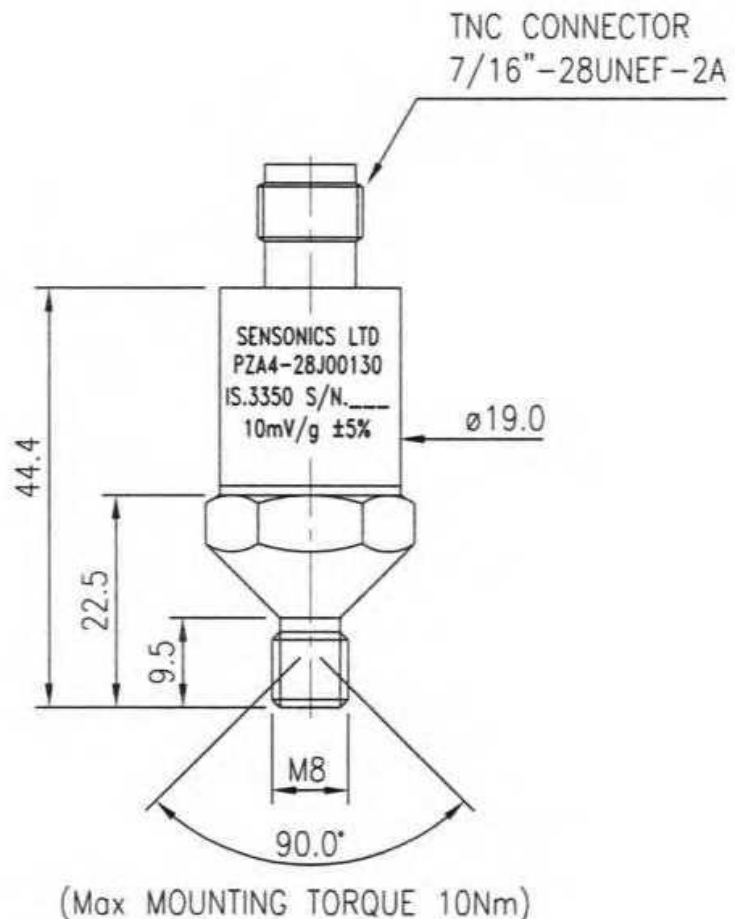
- Roller bearings
- Slow rotating plant
- Mechanical looseness
- Reciprocating compressors

Interface Options

- Integral PTFE
- TNC
- M8 Mounting Stud

Specification

- Output Sensitivity: 10mV/g
- Accuracy : ±5%
- Operating Voltage : 18 to 28V dc
- Operating Current : Constant current source 2-10mA
- Dynamic Range : 70g peak at 24V dc input
- Amplitude Linearity : ±1%
- Frequency Range : 2.5Hz to 11KHz
- Resonant Frequency : 33 kHz
- Temperature Range: -30°C - 125°C
- Temperature Sensitivity <5% up to 125°C
- Shock Limits : 2000g
- Protection (BS.EN60529) : IP67
- Mass: 115 gms



Ordering Information - Please see page 16/17 for details of cable assemblies and mounting studs

Model No.	Config	Connection	Cable Length	Sensitivity	Mounting
PZA4	- 2 (2-wire ICP)	6C (Cable unarmoured) 6D (Cable armoured) 8E (Integral TNC Conn)	Specify in metres e.g. 05 (5m) max 25m	1 (10mV/g)	1 (1/4" UNF) 2 (M8)

e.g. PZA4-2-6D-05-12:- PZA4 model, 2-wire, 5m armoured cable, 10mV/g, M8 conical base

SP Low Frequency Seismic Accelerometers

Short Period accelerometer, 50V/g output, high dynamic range, low frequency performance 0.1Hz – 1KHz.



The SP series of Piezoelectric Transducers are robust, portable, field proven instruments suitable for operation in any attitude without modification. The SP4 unique inertial system of matched piezoelectric elements arranged in a reciprocal configuration generates high output sensitivity and minimum noise with a capability for complete transducer verification through an input calibration facility.

Outputs proportional to ground acceleration or ground velocity are available with sensitivities up to 50V/g. The sealed stainless steel casing makes the instrument particularly suited for field operation.

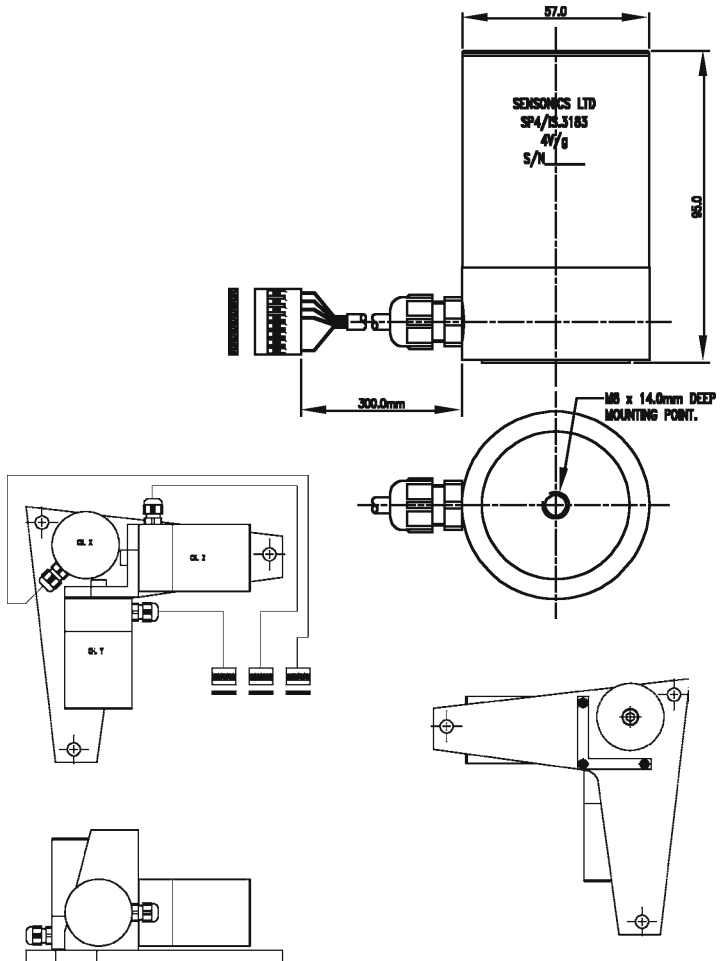
The SP4 is also available in a tri-axial configuration, consisting of three SP4s mounted in a 3-D boomerang arrangement. The tri-axial unit is also available mounted within an enclosure, providing calibration signal generation as well as alarm and switching functionality.

Application

- Slow Rotating Plant
- Construction & Foundation Monitoring
- Seismic Protection Systems
- Inaccessible Locations
- Remote Calibration Feature

Specifications

- Frequency Response: Acceleration 0.1Hz to 1000Hz (3dB)
- Sensitivity: Acceleration 2 – 50V/g
- Dynamic Range: >120dB
- Accuracy: $\pm 1\%$ at 25°C $\pm 2\%$ over operating temperature
- Linearity: 0.1%
- Maximum Output: $\pm 10V$ pk-pk
- Cross-axis Sensitivity: < 1%
- Output Impedance: Less than 10 Ω
- Signal Transmission: Two Wire Current Loop
- Power Supply: $\pm 12V$ to $\pm 15V$, 6mA typically at $\pm 15V$
- Calibration Sensitivity: 30V/g $\pm 2\%$, Maximum Drive 3Vrms
- Shock Limits: 20g peak any direction
- Operating Temperature: -30°C to +70°C
- SP4 Mass: 0.6Kg
- Tri-axial Arrangement Mass: 5.0Kg
- Standard Connection Details: 8-way MINILATCH
- Standard Cable Type: 7/0.2mm screened, PVC Insulated
 Yellow: CAL 15V, Blue: Negative Supply
 Red: Positive Supply, Green : Signal Hi
 Black : 0V, White : Not Used



Ordering Information - Please see page 16/17 for details of cable assemblies and mounting studs

Model No.	Config	Connection	Cable Length	Sensitivity	Mounting
SP4	- 6 (6-wire)	6C (PTFE)	Specify in metres	Specify in V/g	1 (M8 female)
SP4T	(Triaxial)	7G (PU)	e.g. 05 (5m) max 25m	2V/g to 50V/g	2 (Triaxial)

e.g. **SP4T-6-7G-03-202** :- **SP4T Triaxial model, 6-wires per transducer, 3m unarmoured cable with waterproof gland connection at transducer, 20V/g, Triaxial mounting assembly.**

Cable Assemblies

A range of cable assemblies to interface with Microdot and Mil style socket connectors.

Microdot 10-32UNF Plugs

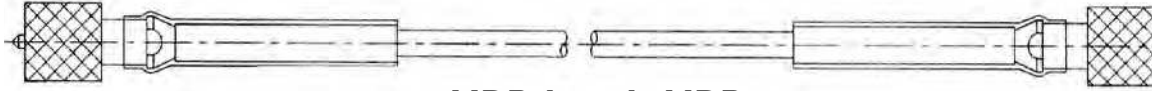
For use with the PZP range accelerometers



MDP-length-FE

e.g. MDP-05-FE 5m cable length with free end

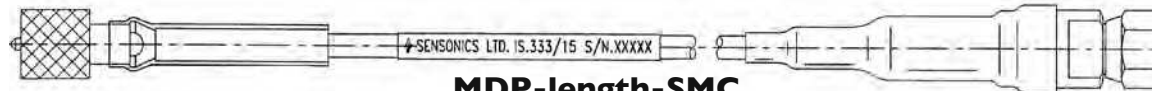
RG178 low noise coaxial cable rated to +180°C, finished with free end solder wires



MDP-length-MDP

e.g. MDP-05-MDP 5m cable length with 10-32UNF plug at both ends

Available with 32UNF Plug end



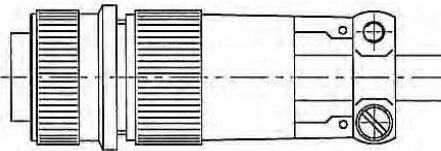
MDP-length-SMC

e.g. MDP-05-SMC 5m cable length finished with SMC plug

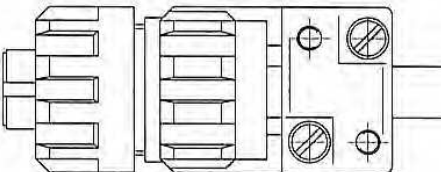
Available with SMC Plug end

MIL-5015-C Type and Waterproof Plugs

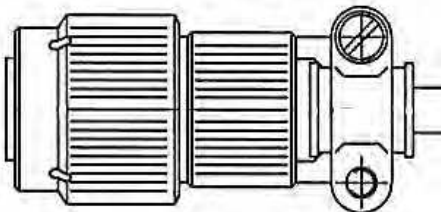
Mating Connector Option



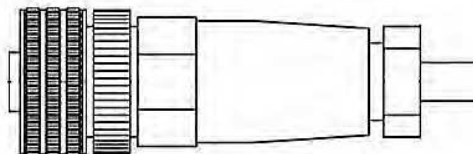
MIL-5015-C Plug 2/3 pin 120°C



MIL-5015-C Plug 2/3 pin 150°C



MIL-5015-C Plug 6 pin 120°C

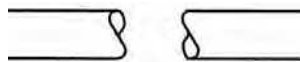


M12 5-pin Socket +150°C, IP68, suitable for waterproof applications

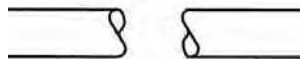
Cable Option



Armoured PTFE Multicore

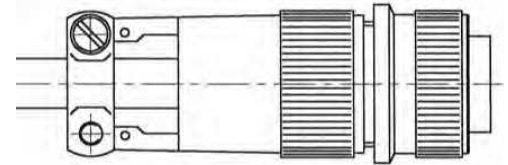


PTFE Multicore

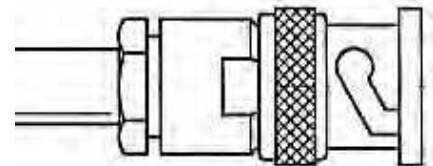


PU Multicore for use with M12

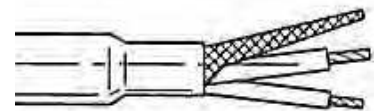
Cable End Option



MIL-5015-C Plug 2/3/6 pin 120°C



BNC Plug 120°C (2-pin MIL only)



Free End

Mating Type

MIL - 2/3/6

M12 - 5

Cable

6C (PTFE unarmoured)

6D (PTFE armoured)

7A (PU unarmoured)

Cable Length

Specify in metres

e.g. **05** (5m)

max 30m

Cable End

MIL - 2/3/6

BNC

FE

e.g. **MIL3-6D-25-FE** :- MIL-5015 type, 3 pin, 25m of armoured PTFE cable with a free end

Mounting Studs and Accessories

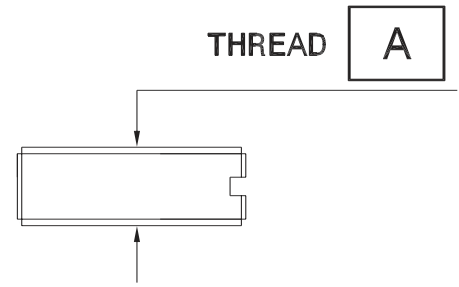
Straight Mounting Stud

MTG-S



Thread Type

- 1 = 1/4"-28UNF
- 2 = M6
- 3 = M8
- 4 = Quick release
- 5 = 10-32UNF
- 6 = M5
- 7 = M4
- 8 = M10
- 9 = 5/16"UNF



Differential Mounting Stud

MTG-D



Thread Type

- 1 = 1/4"-28UNF
- 2 = M6
- 3 = M8
- 4 = Quick release
- 5 = 10-32UNF
- 6 = M5
- 7 = M4
- 8 = M10
- 9 = 5/16"UNF

Thread Gender

- M = Male
- F = Female

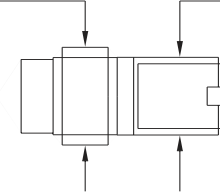
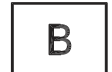
Hex Outer Profile

- H = If appropriate

TRANSDUCER
THREAD



MACHINE
THREAD



Glue Mounting Stud

MTG-G



Thread Type

- 1 = 1/4"-28UNF
- 2 = M6
- 3 = M8
- 4 = Quick release
- 5 = 10-32UNF
- 6 = M5
- 7 = M4
- 8 = M10
- 9 = 5/16"UNF

Thread Gender

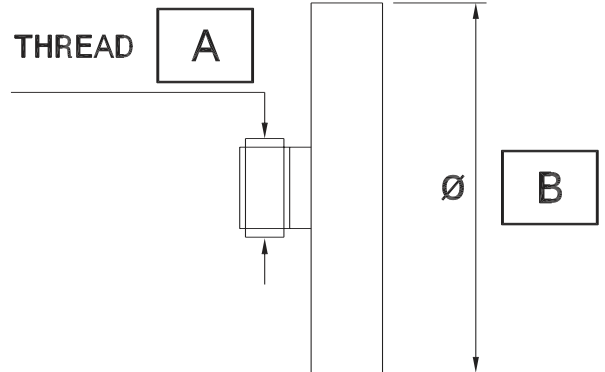
- M = Male
- F = Female

Diameter

- 1 = 25.4mm / 1.0"
- 2 = 19.05mm / 0.75"
- 3 = 30.5mm / 1.2"
- 4 = 38.0mm / 1.5"

Hex Outer Profile

- H = If appropriate



Magnetic Mounting Base

MTG-M



Thread Type

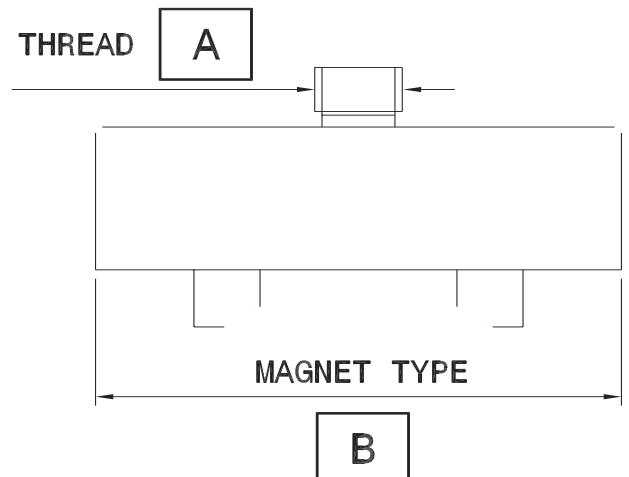
- 1 = 1/4"-28UNF
- 2 = M6
- 3 = M8
- 4 = Quick release
- 5 = 10-32UNF
- 6 = M5
- 7 = M4
- 8 = M10
- 9 = 5/16"UNF

Thread Gender

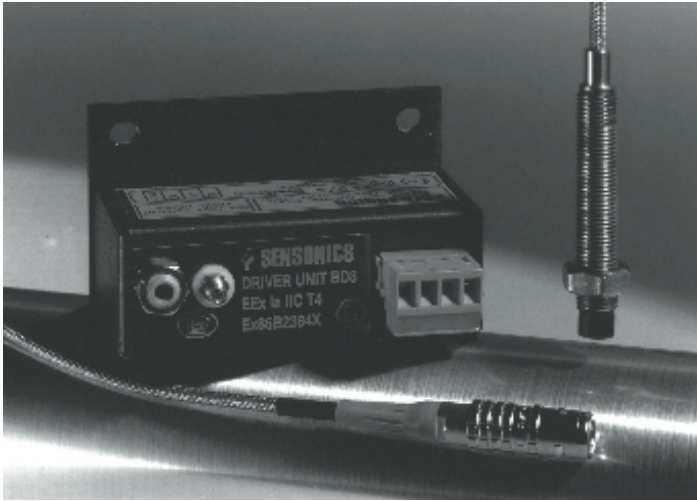
- M = Male
- F = Female

Diameter

- 1 = 25.4mm / 1.0"
- 2 = 19.05mm / 0.75"
- 3 = 30.5mm / 1.2"
- 4 = 38.0mm / 1.5"



Proximity Probe Product Range Overview

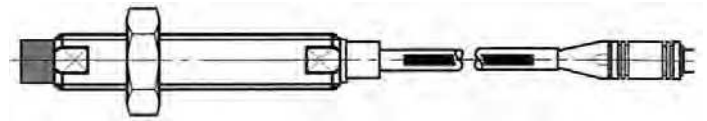


Our range of non-contact proximity probes offer both displacement and vibration measurements through eddy currents set up in the surface of the target material - shaft, collar, etc. Compliant with the API 670 standard, the systems are supplied tuned to a fixed length consisting of probe (diameter determines range), extension cable (if required) and driver. Detailed below is a summary of the product highlights.

- Probe tip diameter options - 5mm to 50mm
- Measurement range options - 2mm to 25mm
- Sensitivity of up to 8mV/um
- Ex intrinsic safety across the range
- System lengths 2m, 5m, 9m & 14m as standard
- Linearity better than 1%
- Maximum Operating Temperature +180°C
- High Temperature variants available

Straight and Reverse Mount Probes

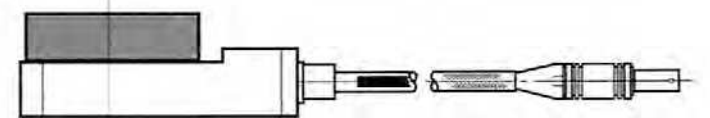
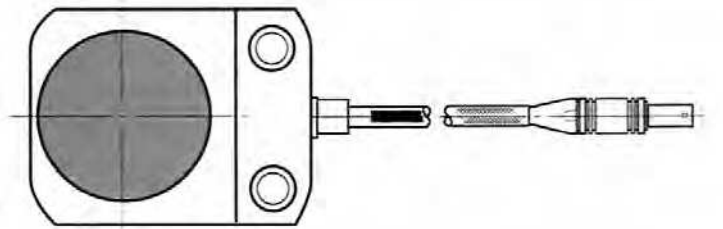
- Robust stainless steel threaded case in various lengths and threads – with integral locknut for reverse mount applications
- Peek encapsulated tip impervious to oil or water ingress
- Intrinsically safe options available
- Choice of cable lengths with or without armoring connecting directly to driver unit or extension cable
- Operating temperature range -30°C to +180°C



Probe Type	Measuring Range	Tip Diameter	Data Sheet Reference
PRS02	2.5mm	5mm	L156
PRS04	4mm	8mm	L157
PRR04	4mm	8mm	L159
PRS08	8mm	20mm	L158

Disc Probes

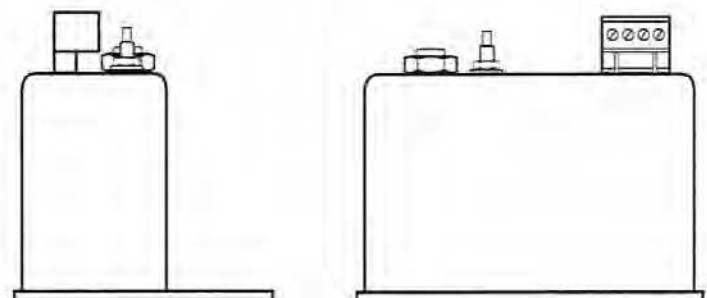
- Robust stainless steel body with 2 or 3 mounting holes
- Peek encapsulated tip impervious to oil or water ingress
- Range of standard bracketry available
- Oval tip option for limited target area application
- Choice of cable lengths with or without armoring connecting directly to driver unit or extension cable
- Operating temperature range -30°C to +180°C



Probe Type	Measuring Range	Tip Diameter	Data Sheet Reference
PRD04	4mm	8mm	L161
PRD08	8mm	20mm	L162
PRD12	12mm	25mm	L163
PRD18	18mm	40mm	L164
PRD25	25mm	50mm	L165

Driver Units

- Compact design either base plate or DIN rail mount
- Robust connector supplied for convenient connection/disconnection
- Electrically isolated case
- Four connections per box required (-24V, 0V, Signal and 0V)
- Operating temperature range -30°C to +90°C



Protecting Critical Rotating Plant






The Sensonics API 670 compliant Sentry range of equipment has been developed to provide a one-stop shop for all your measurement requirements. Designed to give maximum warning of impending machine failure without producing costly spurious alarms, the independent module microprocessor and power supply functionality provides flexibility with reliability. Voted channel arrangements can be configured to provide extremely robust solutions; for example pump and turbine overspeed protection. Sentry offers the following measurement modes;

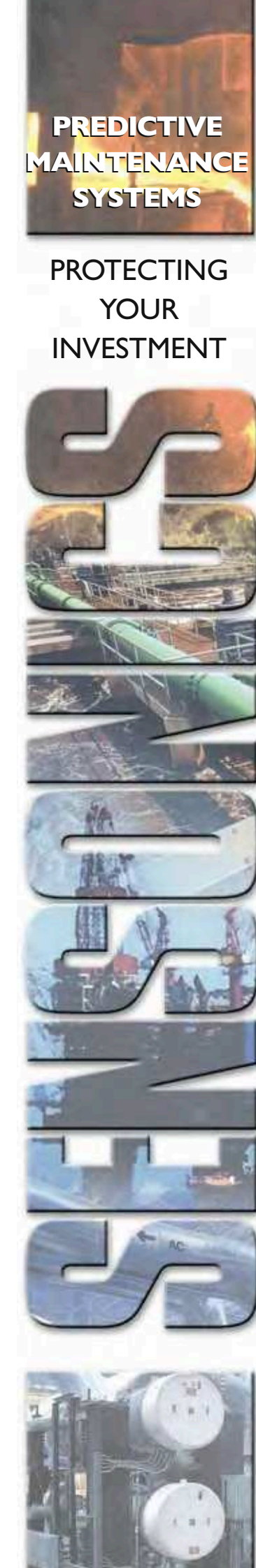
- Absolute Bearing Vibration
- Shaft Vibration / Eccentricity
- Shaft Position / Thrust
- Case Expansion (LVDT)
- Differential Expansion (Mark-Space Technique)
- Speed and Phase Marker
- Reverse Rotation
- Rod Drop
- Temperature
- Modbus TCP Communications Module



In addition to Sentry, Sensonics offer a wide range of instruments to suit most applications, as detailed in the matrix below.

Monitor selection matrix

Type	Measurement and Features	Absolute Vibration	Relative Vibration	Eccentricity	Thrust / Movement	Speed	Temperature	Differential Exp	Rod drop	LVDT	Multiple Voting	Bearing Element	RS232 / RS485	TCP / IP Ethernet	Alarm Relays	4-20mA	Din Rail Mount	Rack Mount
Sentry		●	●	●	●	●	●	●	●	●	●		●	●	●	●		●
Aegis		●	●		●	●	●			●	●	●	●	●	●	●		●
Plant Scan		●					●		2/4/8 Channel Configurations of Vibration and Temperature					●	●			
DN2600		●	●		●	●	●			●					●	●	●	
Spyder Net		●	●		8 Channel Vibration or process inputs with internal trending							●	●	●	●		●	



**PREDICTIVE
MAINTENANCE
SYSTEMS**

**PROTECTING
YOUR
INVESTMENT**

PRODUCT RANGE

- PZ Range of Industrial Accelerometers & Velocity Transducers
- SENTURION Eddy Current Probe Systems
- LVDT Displacement Transducers & Conditioning Units
- SENTRY Programmable Machine Protection System in 19" Rack Format
- AEGIS Machine Condition Monitoring System in 19" Rack Format
- DN2600 Series of Single/Dual Channel Monitoring Equipment in DIN Rail Mountable Format
- PLANTSCAN 2/4/6/8 Channel Wall Mounted Vibration Monitor
- ME960I Single Channel Wall Mounted Vibration Monitor
- VIBCHECK Hand Held Vibration Monitor
- Data Collector Accessories & Switchboxes
- Turbine Supervisory Equipment
- Seismic Protection Systems

Due to Sensonics policy of constant improvement, designs may be subject to alteration without notice.

To order or request a sample or further information

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or email on: sales@sensonics.co.uk

www.sensonics.co.uk



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www.sensonics.co.uk

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