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PiezoVelocity

PiezoVelocity Transducers (PVT®)

PiezoVelocity Transducers (PVT®) are solid state piezoelectric velocity measurement devices. Since many vibration analysts prefer to examine vibration signals in terms of velocity (inches per second or ips) to amplify the signal of interest. PVT's inherently decrease high frequency signals allowing better measurement of low frequency vibration. PVT sensors are essentially accelerometers with an internal integration circuit which will produce an output relative to velocity.

System Noise Advantages

PVT®s can reduce signal noise in many low frequency measurements. The integration circuit amplifies low frequency signals and attenuates high frequency signals. This increases the voltage output at low frequency and filters high frequency noise. The increase in low frequency voltage output reduces the noise contribution of the acquisition equipment. The inherent filtering reduces intermodulation (washover) distortion caused when high frequency signals overload the amplifier and may reduce "ski slope" noise in many applications.

PVT® Applications

Paper Machines

Steam seals in paper machine dryers can leak and produce very high frequency noise. This high frequency noise can overload normal accelerometers and "washover" low frequency information. The PVT® attenuation of high frequency signals ensures that quality data can still be taken in areas prone to steam leaks.

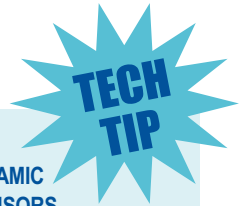
Pumps

Pumps and piping are susceptible to cavitation problems. The collapse of the cavitation pockets produces very high frequency noise that can also overload an accelerometer. PVT's allow effective measurement of normal vibration in the presence of severe cavitation.

Wilcoxon PiezoVelocity Transducers (PVT®):

Model	Style	Sensitivity	Low Freq	High Freq	Accel Range
793V	compression	100 mV/in/sec	2.5 Hz	7,000 Hz	50 in/sec peak
793V-5	shear	500 mV/in/sec	5.0 Hz	7,000 Hz	10 in/sec peak
797V	shear	100 mV/in/sec	1.6 Hz	7,000 Hz	50 in/sec peak

*Note: Frequency @ 3dB.



PVT® VS. ELECTRODYNAMIC VELOCITY SENSORS

PVT® sensors provide superior performance to older electrodynamic velocity sensors in most applications. The PVT® uses the two wire powering found in most data collectors, analyzers, and online vibration measurement systems. Because the PVT® contains no moving parts, it is more reliable than electrodynamic sensors and can be oriented in any direction. The elimination of velocity coils reduces interference from electromagnetic fields.

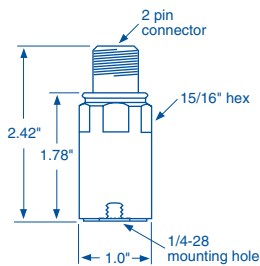
The PVT® provides much lower frequency response than electrodynamic sensors. The electrodynamic sensor contains a coil that is suspended by a spring within a magnet. The natural frequency of the coil-spring assembly is typically 8 - 14 Hz (480-840 cpm) or lower. The PVT® low frequency operation is only limited by the capability of the sensor's integrating amplifier to provide sufficient gain as the frequency decreases.



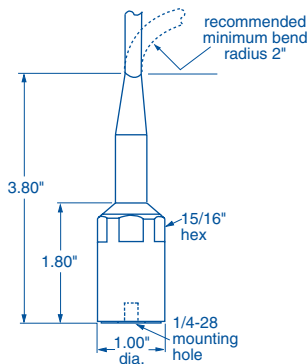
Model 793V / 793V-5 Premium, PiezoVelocity® Transducer

FEATURES:

- Intrinsic safety certified options for Model 793V
- Industrial ruggedness
- Eliminates distortion caused by high frequency signals
- Corrosion-resistant
- Internally integrated to velocity
- Ultra low-noise electronics for clear signals at very low vibration levels
- Miswiring protection



Model 793V



Model 793V5

	All Models	793V	793V-5	Units
DYNAMIC				
Sensitivity, $\pm 10\%$, 25°C	—	100	500	mV/in/sec
Velocity Range	—	50	10	in/sec peak
Amplitude Nonlinearity	1%			
Frequency Response:				
$\pm 10\%$	—	3.0 - 3,500	8.0 - 3,500	Hz
± 3 dB	—	2.5 - 7,000	5.0 - 7,000	Hz
Resonance Frequency, mounted, nom	15 kHz			
Transverse Sensitivity, max.	5 % of axial			
Temperature Response	-50°C -5%			
	+80°C +3%			
	+120°C -5%			

ELECTRICAL				
Power Requirement:				
voltage source	18 - 30 VDC			
current regulating diode	2 - 10 mA			
Electrical Noise, equiv. in/sec, nominal:				
Broadband 2.5 Hz to 25 kHz	—	100	40	μ in/sec
Spectral 10 Hz	—	10	4.0	μ in/sec/ $\sqrt{\text{Hz}}$
100 Hz	—	1.0	0.4	μ in/sec/ $\sqrt{\text{Hz}}$
1000 Hz	—	0.2	0.05	μ in/sec/ $\sqrt{\text{Hz}}$
Absolute Phase Shift, nom. the greater of:	—	$\tan^{-1} 2/f$ or 2°	$\tan^{-1} 5/f$ or 2°	
Output Impedance, nominal 4mA supply, the greater of:				
.....	—	5,000/f	25,000/f	
.....	—	or 200 Ω	or 200 Ω	
Bias Output Voltage, nominal	10 VDC			
Grounding	case isolated, internally shielded			

ENVIRONMENTAL	
Temperature Range	-50 to 120°C
Vibration Limit	250 g peak
Shock Limit	2,500 g peak
Electromagnetic Sensitivity, equiv. in/sec	25 μ in/sec/gauss
Sealing	hermetic
Base Strain Sensitivity	0.0005 in/sec/ μ strain

PHYSICAL	
Weight	145 grams
Case Material	316L stainless steel
Mounting	1/4 - 28 tapped hole
Output Connector	MIL-C-5015 2-pin
Connections	signal, power
	Pin A / white
	Pin B / black
Cabling ² :	Mating Connector
	Recommended Cable
	Wilcoxon R6 (Amphenol 97-3106A-10SL-4S)
	J9T2, two conductor shielded, Tefzel jacket, 30 pF/ft.

OPTIONS: Intrinsic safety certifications for Model 793V; stainless steel flexible hose; 10 ft. sealed integral cable (793VS or 793VSG), temperature sensor (793VT), customer specified sensitivity, low frequency filtering, cable length, connector.

ACCESSORIES SUPPLIED: SF6 mounting stud, calibration data.

ACCESSORIES AVAILABLE: R6SL-J9T2-XX splash-proof cable assembly, magnetic mounting bases, SF8 cementing studs, power supplies, amplifiers, signal conditioners.



Model 797V

Premium, PiezoVelocity® Transducer



DYNAMIC

Sensitivity, ±10%, 25°C	100 mV/in/sec
Velocity Range	50 in/sec peak
Amplitude Nonlinearity	1%
Frequency Response:	
±10%	2.0 - 3,500 Hz
±3 dB	1.6 - 7,000 Hz
Resonance Frequency	18 kHz
Transverse Sensitivity, max	5% of axial
Temperature Response	-50°C -15%
	+120°C +10%

ELECTRICAL

Power Requirement:	voltage source	18 - 30 VDC
	current regulating diode	2 - 10 mA
Electrical Noise, equiv. in/sec:		
Broadband	2.5 Hz to 25 kHz	100 µin/sec
Spectral	10 Hz	10 µin/sec
	100 Hz	0.8 µin/sec
	1000 Hz	0.1 µin/sec
Output Impedance, 4mA supply, the greater of		5,000/f or 200Ω
Bias Output Voltage		10 VDC
Grounding		case isolated, internally shielded

ENVIRONMENTAL

Temperature Range	-50 to 120°C
Vibration Limit	250 g peak
Shock Limit	2,500 g peak
Electromagnetic Sensitivity, equiv. in/sec	50 µin/sec/gauss
Sealing	Hermetic
Base Strain Sensitivity	0.004 in/sec/µstrain

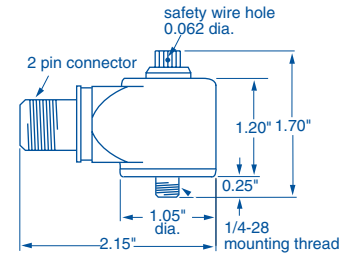
PHYSICAL

Sensing Element Design	PZT ceramic / shear
Weight	148 grams
Case Material	316L stainless steel
Mounting	1/4-28 captive socket head screw
Output Connector	2 pin, MIL-C-5015 style
Mating Connector	R6 type
Recommended Cable	J9T2A

CONNECTOR PIN	FUNCTION
SHELL	ground
A	power/ signal
B	common

FEATURES:

- Rugged design
- Internally integrated to velocity
- Eliminates distortion caused by high frequency signals
- Corrosion resistant
- ESD protection
- Miswiring protection
- Mounts in any orientation



ACCESSORIES SUPPLIED: #12105-01 captive socket head (International customers specify mounting requirements); Calibration data (level 3).

OPTIONS: Intrinsic Safety certifications.



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