

## Piezoelectric Charge Accelerometer Types 4375 and 4375-V

### Uses

- High-level, high-frequency measurements
- Vibration testing
- Measurements on lightweight structures
- Measurements in high-temperature environments

### Features

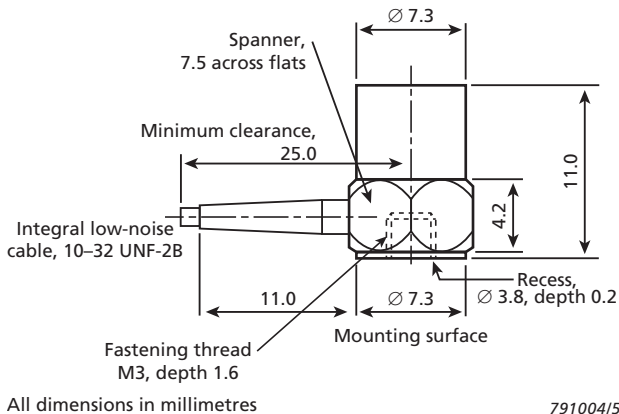
- Small size
- Low weight
- Integral cable
- Very high resonance frequency



### Description

Type 4375 is a miniature DeltaShear™ Unigain\* accelerometer with low weight and a high resonance frequency. It features an integral low-noise, 10–32 UNF cable and an M3 threaded hole for mounting. Type 4375-V† has the same specifications and stability as Type 4375, but has a relaxed sensitivity tolerance.

Fig. 1 Dimensions of Type 4375



### Characteristics

This piezoelectric accelerometer may be treated as a charge source. Its sensitivity is expressed in terms of charge per unit acceleration ( $\text{pC}/\text{ms}^{-2}$ ,  $\text{pC}/g$ ).

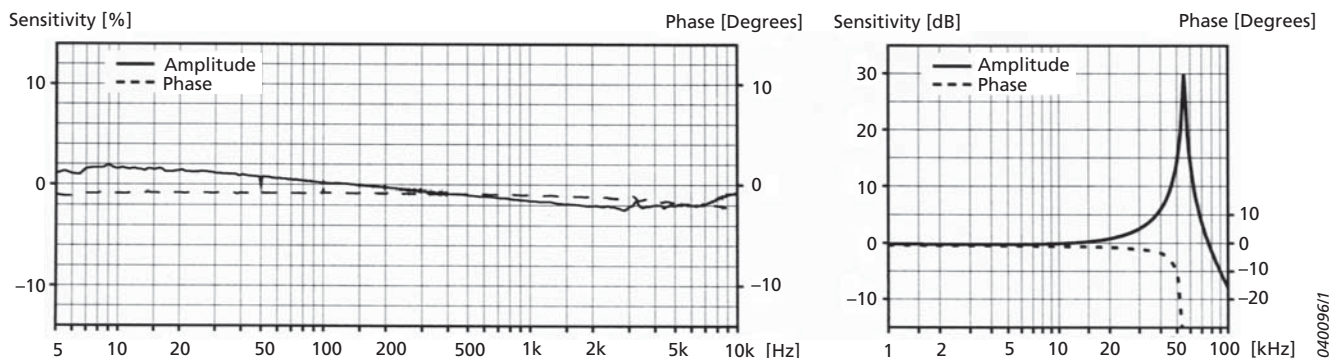
The DeltaShear design consists of three piezoelectric elements and three seismic masses arranged in a triangular configuration around a triangular centre post. They are held in place by a clamping ring that isolates the configuration from the base. The ring also prestresses the piezoelectric elements to give a high degree of linearity. This design provides a high sensitivity-to-mass ratio, a relatively high resonance frequency and high isolation from base strains and temperature transients.

The piezoelectric element in Type 4375 is a PZ 23 lead zirconate titanate element, and the housing material is titanium.

### Calibration

The sensitivity is calibrated to a convenient value such as 1, 3.16 or  $31.6 \text{ pC}/\text{ms}^{-2}$  for Unigain accelerometers. The sensitivity given in the calibration chart has been measured at 159.2 Hz with 95% confidence level, using the coverage factor  $k = 2$ .

Fig. 2 Individual frequency (left) and typical high-frequency (right) response curves for Type 4375



\* Unigain: The individual measured sensitivity is within  $\pm 2\%$  of the specified sensitivity

† V-type: The individual measured sensitivity is within  $\pm 15\%$  of the specified sensitivity

# Specifications – Charge Accelerometer Types 4375 and 4375-V

All values are typical at 25 °C (77 °F) unless measurement uncertainty is stated

Type Number		4375	4375-V
<b>General</b>			
Weight (excluding cable)	g	2.4	
	oz	0.085	
Charge Sensitivity (at 159.2 Hz)	pC/ms <sup>-2</sup>	0.316 ±2%	0.316 ±15%
	pC/g	3.10 ±2%	3.10 ±15%
Frequency Range (±10% limit)	Hz	0.1 to 16500	
Mounted Resonance Frequency	kHz	55	
Max. Transverse Sensitivity (at 30 Hz, 100 ms <sup>-2</sup> )	%	<4	
Transverse Resonance Frequency	kHz	18	
Max. Operational Continuous Sinusoidal Acceleration (peak)	kms <sup>-2</sup>	50	
	g	5000	
<b>Electrical</b>			
Residual Noise Level (measured with NEXUS Type 2692-001 in the specified frequency range)	mms <sup>-2</sup>	5.2	
	mg	0.52	
Capacitance (excluding cable)	pF	625	
Min. Leakage Resistance (at 20 °C)	GΩ	20	
<b>Environmental</b>			
Operating Temperature Range	°C	-74 to +250	
	°F	-101 to +482	
Temperature Coefficient of Sensitivity	%/°C	0.05*	
Temperature Transient Sensitivity (3 Hz Low. Lim. Freq. (-3 dB, 6 dB/octave))	ms <sup>-2</sup> /°C	5	
	g/°F	0.28	
Base Strain Sensitivity (at 250 µε in the base plane)	ms <sup>-2</sup> /µε	0.005	
	g/µε	0.0005	
Magnetic Sensitivity (50 Hz, 0.038 T)	ms <sup>-2</sup> /T	30	
	g/kG	0.3	
Max. Non-destructive Shock (± peak)	kms <sup>-2</sup>	250	
	g	25000	
<b>Mechanical</b>			
Housing Material		Titanium ASTM Grade 2	
Piezoelectric Sensing Element		PZ 23	
Construction		DeltaShear	
Sealing		Welded	
Electrical Connector		Integral cable, 10–32 UNF-2B	
Mounting		M3 × 1.6 mm threaded hole	
Mounting Torque	Max.	Nm (lbf-in)	1.0 (8.8)
	Min.		0.3 (2.7)

\* In the temperature range -25 to +125 °C (-13 to +257 °F)

## COMPLIANCE WITH STANDARDS



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# Ordering Information

## Type 4375

includes the following accessories:

- Carrying box
- Calibration chart
- AO-0038-D-012: Low-noise coaxial cable, 10–32 UNF, length 1.2 m
- Extension connector, 10–32 UNF
- Steel stud, M3 × 5 mm

## Type 4375-V

includes the following accessories:

- Carrying box
- Calibration chart
- Extension connector, 10–32 UNF
- Steel stud, M3 × 5 mm

Optional Accessories	
AO-0038-x-yyy*	Low-noise coaxial cable, 10–32 UNF connectors, 250 °C (482 °F)
AO-0122-x-yyy*	Super low-noise cable, 10–32 UNF connectors, 250 °C (482 °F)
AO-0231-x-yyy*	Super low-noise cable, 10–32 UNF to TNC, 180 °C (356 °F)
AO-1382-x-yyy*	Flexible double-screened coaxial cable, 10–32 UNF connectors, 250 °C (482 °F)
DB-0757	Cementing stud, M3, dia. 8.0 mm
JJ-0032	Adapter, 10–32 UNF connectors
JJ-0207	Plug adapter, 10–32 UNF to TNC (female)
JP-0162	Plug adapter, 10–32 UNF to TNC (male)
QA-0041	Tap for M3 thread
QA-0042	Hexagonal key for M3 studs
QS-0007	Tube of cyanoacrylate adhesive
UA-0629	Accelerometer accessory set
UA-1075	Mounting magnet and two insulating discs, M3, dia. 10 mm, length 1.6 mm (set of 5)
UA-1216	Insulated stud, double end, M3, length 5.4 mm
YJ-0216	Beeswax for mounting
YQ-2003	Set screw, stainless steel, hex socket, cup point, M3 × 5 mm
YQ-2007	Set screw, stainless steel, hex socket, cup point, M3 × 8 mm
Type 4294	Vibration Exciter
Calibration Services	
ACC-M-CAI	Accredited initial calibration
ACC-M-CAF	Accredited calibration
ACC-M-CFF	Factory standard calibration
ACC-M-CTF	Traceable calibration

\* x = D (decimetres) or M (metres)

yyy = length in decimetres or metres

Please specify cable length when ordering

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