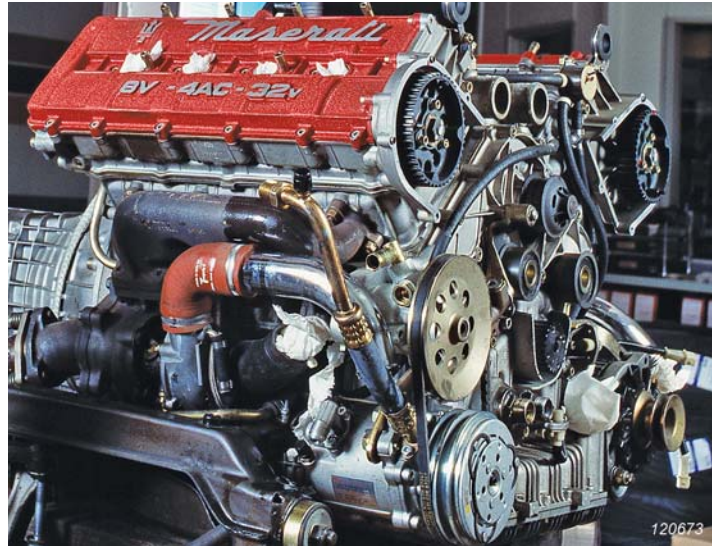


Triaxial Charge Accelerometer Type 4527-C

Triaxial Charge Accelerometer Type 4527-C is a compact triaxial charge accelerometer for high-temperature testing. Type 4527-C is a piezoelectric accelerometer housed in robust titanium with a single integrated Microtech compatible connector.

Only one cable is necessary for all three output channels. This reduces both setup time and cabling. It also reduces the size of the accelerometer and allows for installation in tight spaces, making impossible measurements possible.



Uses and Features

Uses

- Measurements on
 - Power train, engine and exhaust of vehicles
 - Auxiliary equipment of gas turbines
- Environmental stress screening
- General purpose vibration and shock measurements

Features

- One connector
- Triaxial
- Maximum operating temperature of 230 °C (446 °F)
- Small size (appr. 12 × 12 × 11 mm, excluding connector) for use in confined spaces
- Low weight (6 g) to avoid mass loading



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Description

Triaxial Charge Accelerometer Type 4527-C is designed to make triaxial measurements with charge accelerometers easy.

To reduce cabling and setup time, Type 4527-C has just one connector – a four-pin, industry-standard connector for maximum cable compatibility. The connector is hermetically sealed to keep out contamination and ensure a long operational life.

This accelerometer has a small size and light weight, making triaxial measurements in small, high-temperature locations possible – locations that previously only had space for uniaxial accelerometers.

The piezoelectric element used in Type 4527-C is PZ 23. To survive daily use and reduce the weight of the accelerometer, titanium is used for the housing.

Recommended Mounting

The design of the accelerometer is optimized to transmit vibration through the base of the unit. Mount the accelerometer on its base using adhesive or an M3 stud to achieve a flat frequency response from 1 Hz* to 10 kHz on all three measurement axes.

The design supports a wide range of mounting techniques such as:

- M3 mounting stud – to achieve the highest frequency
- Adhesive pad – to extend the life of the transducer
- Direct adhesive – to mount the accelerometer quickly

Calibration

Each accelerometer is calibrated using random excitation and 1600-line FFT transformation to provide a high-resolution (amplitude and phase) frequency response. This yields a unique characterization and secures the integrity of your vibration measurements.

The sensitivity given on the calibration chart is measured at 159.2 Hz with 95% confidence level using coverage factor $k = 2$.

The upper frequency limits given on the calibration chart are frequencies where the deviation from the reference sensitivity at 159.2 Hz is within $\pm 10\%$. The upper frequency limit is approximately 30% of the mounted resonance frequency. This assumes that the accelerometer is correctly mounted on the test structure – poor mounting can have a marked effect on the mounted resonance frequency.

The lower frequency limits and phase response are determined by the amplifier used.

Brüel & Kjær's Triaxial Charge Accelerometer Family

Type 4527-C is part of a family of triaxial charge accelerometers. To find the triaxial accelerometer that fits your needs, visit www.bksv.com.

Table 1
Comparison of
Brüel & Kjær
triaxial charge
accelerometers

		4326-A	4326-A-001	4321	4527-C
Temperature	°C (°F)	175 (347)	230 (446)	250 (482)	230 (446)
Number of connectors		3			1
Weight	g	13	17	55	6
Isolated		Yes		No	No
Capacitance	pF	1000		1100	290
Frequency range*	Hz	X: 1 to 9000 Y: 1 to 8000 Z: 1 to 16000		X: 0.1 to 12000 Y: 0.1 to 12000 Z: 0.1 to 12000	X: 1 to 10000 Y: 1 to 10000 Z: 1 to 12800
Mounting		Mounting clip Adhesive M2 screws M3 stud		M4 screws	M3 stud Adhesive
Sensitivity	pC/ms ⁻²	0.316		1.0	0.316
Product Data		BP 1341		BP 2034	BP 2535

* Lower limiting frequency is determined by the amplifier used

Specifications – Triaxial Charge Accelerometer Type 4527-C

		4527-C	
General			
Weight		gram (oz)	6 (0.21)
Charge Sensitivity (at 159.2 Hz and 4 mA supply current)		$\mu\text{C}/\text{ms}^{-2}$	$0.316 \pm 15\%$
		$\mu\text{C}/g$	$3.1 \pm 15\%$
Frequency Range *	Amplitude ($\pm 10\%$) [†]	Hz	X, Y: 1 to 10000, Z: 1 to 12800
	Amplitude ($\pm 10\%$) [‡]		X, Y: 1 to 5500, Z: 1 to 12800
	Phase ($\pm 5^\circ$) [†]		X, Y: 1 to 10000, Z: 1 to 12800
	Phase ($\pm 5^\circ$) [‡]		X, Y: 1 to 5500, Z: 1 to 12800
Mounted Resonance Frequency		Hz	X, Y: 30000, Z: 42000
Transverse Sensitivity (at 30 Hz, 100 ms^{-2})		%	<5
Electrical			
Capacitance (excluding cable)		pF	290
Resistance (all conditions)		M Ω	> 10
Signal Ground			Case grounded
Measuring Axes			X, Y and Z
Environmental			
Operating Temperature Range		$^\circ\text{C}$ ($^\circ\text{F}$)	-60 to +230 (-76 to +446)
Temperature Coefficient of Sensitivity		$\%/^\circ\text{C}$	+0.15
Temperature Transient Sensitivity (3 Hz Lower Limiting Freq. (-3 dB, 6 dB/octave))		$\text{ms}^{-2}/^\circ\text{C}$	0.07
		$g/^\circ\text{F}$	0.004
Magnetic Sensitivity (50 Hz, 0.038 T)		ms^{-2}/T	15
		g/kG	0.15
Base Strain Sensitivity (at $250 \mu\epsilon$ in base plane)		$\text{ms}^{-2}/\mu\epsilon$	0.07
		$g/\mu\epsilon$	0.007
Max. Non-destructive Shock (half sine 1 ms)		kms^{-2}	50
		g (peak)	5100
Mechanical			
Case Material			Titanium ASTM Grade 5
Piezoelectric Sensing Element			PZ 23
Construction			Shear
Sealing			Hermetic
Electrical Connector			Hermetic 4-pin receptacle $\frac{1}{4}$ "-28 UNF
Mounting			
Mounting			M3 \times 2.8 mm or adhesive
Mounting Torque	Max.	Nm (lbf-in)	2.0 (17.7)
	Min	Nm (lbf-in)	0.5 (4.4)

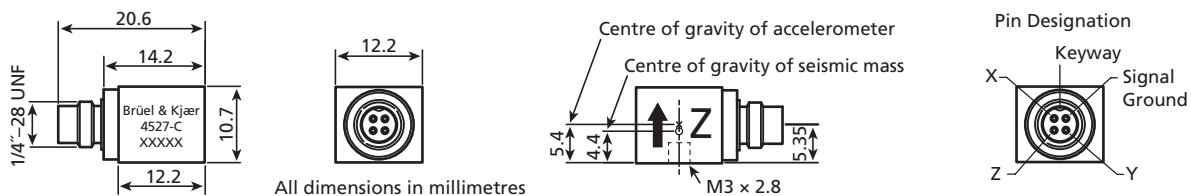
* Lower frequency limit is determined by the amplifier used

† Mounted on base

‡ Verified amplitude response during calibration with reduced useful frequency response on the x- and y-axes due to mounting on a surface other than the base

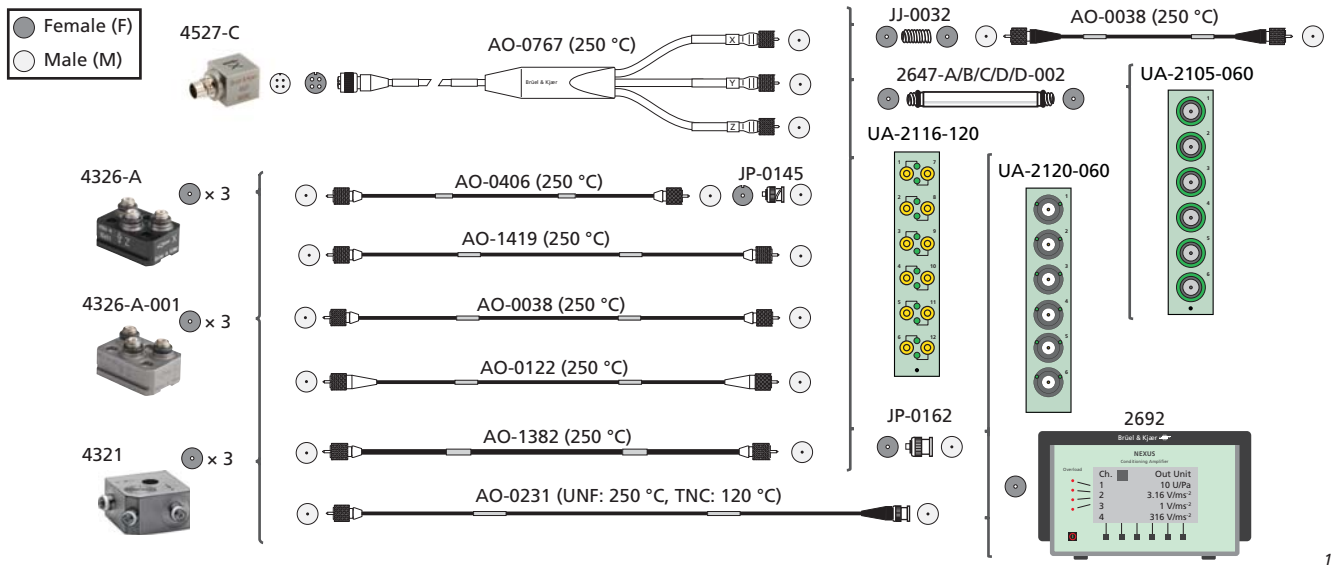
All values are typical at 25 $^\circ\text{C}$ unless measurement uncertainty is specified

Fig. 1 Dimensions of Type 4527-C



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Fig. 2 Configurations for Brüel & Kjær's family of triaxial charge accelerometers



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Ordering Information

Type 4527-C Triaxial Charge Accelerometer
Includes the following accessories:
• Carrying box
• Calibration chart
• M3 mounting stud

Optional Accessories

CABLING

- AO-0767-x-yyy* Super low-noise cable, ¼"-28 UNF circular 4-pin (F) to 3 × 10-32 UNF (M), 250 °C (482 °F)
- AO-0038-x-yyy* Super low-noise single-screened cable, 10-32 UNF connectors (M), 250 °C (482 °F)
- JJ-0032 Adaptor, 10-32 UNF (F) connectors
- JP-0145 Plug adaptor, 10-32 UNF (F) BNC (M)
- JP-0162 Plug adaptor, 10-32 UNF (F) to TNC (M)
- UA-0186 Extension connector for cables, 10-32 UNF connectors (set of 25)

MOUNTING

- QS-0007 Tube of cyanoacrylate adhesive
- QS-0090 Adhesive X-60, 2-component bonding kit
- UA-0867 Cementing stud, M3 stud with Ø 8 mm (0.3") cementing pad (set of 25)

* x = D (decimetres) or M (metres)
yyy = length in decimetres or metres
Please specify cable length when ordering

- UA-1075 Mounting magnet and 2 insulating discs, M3, Ø 10 mm, length 1.6 mm (set of 5)
- UA-1193 Insulated stud, 200 °C (set of 10)
- UA-2065 Steel stud, M3, length 5 mm (set of 10)
- WA-0224 Mechanical Filter, M3 Stud/Hole
- YJ-0216 Beeswax for Mounting

FRONT ENDS AND CONDITIONING

- Type 3053-B-120 12-ch. Input Module LAN-XI 25.6 kHz (CCLD, V) LAN-XI Front Panel, detachable, 12-ch., 12 × 10-32 UNF (F) connectors (Gain: 1 mV/pC)
- UA-2116-120 6-ch. Input Module LAN-XI 51.2 kHz (Mic, CCLD, V) LAN-XI Front Panel, detachable, 6 slots for the family of Charge to CCLD Converter Type 2647
- UA-2120-060 LAN-XI Front Panel, detachable, 6-ch., 6 × TNC (F) connectors (Gain: 1 mV/pC)
- Type 2647-A/B Charge to CCLD Converter
- Type 2692 NEXUS Conditioning Amplifier

CALIBRATION

- Type 4294 Calibration Exciter

Calibration Services

- 4527-C-CAF Accredited calibration
- 4527-C-CAI Accredited initial calibration
- 4527-C-CFF Factory standard calibration
- 4527-C-CTF Traceable calibration

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