

# MEMS Capacitive Accelerometer

## ASC 4221



- ▶ Uniaxial
- ▶ 4 Wire System
- ▶ Amplified Output
- ▶ Made in Germany



### Features

- ▶ Range:  $\pm 1g$  to  $\pm 200g$
- ▶ DC Response
- ▶ Gas Damped
- ▶ Excellent Bias and Scale Factor Stability
- ▶ Low Power Consumption
- ▶ Single Ended Mode

### Options

- ▶ Customised Cable Length
- ▶ Customised Connector
- ▶ TEDS Module

### Applications

- ▶ Structural Monitoring and Testing
- ▶ Endurance Testing
- ▶ Brake Test
- ▶ Vibration Monitoring
- ▶ Civil Engineering
- ▶ Modal Analysis
- ▶ Vehicle Testing
- ▶ Automotive Ride Quality & Comfort
- ▶ Railway Engineering
- ▶ Flutter Test

### Capacitive MEMS Technology

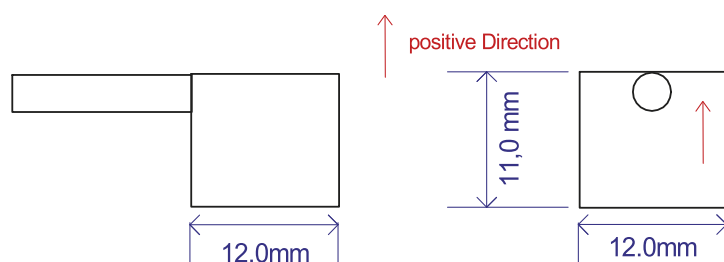
The accelerometers are based on a capacitive MEMS technology and can be used in a low frequency response up from 0Hz. Inside the sensor element, the seismic mass is connected with two conductive capacitor plates. If the seismic mass oscillates between the two capacitor plates the capacitance will change. This capacitance change is converted via an ASIC (Application Specific Integrated Circuit) into an analog signal.

### Description

The model ASC 4221 has been developed for the demanding requirements of different applications. The highly robust housing and the connecting cables are suitable for the rough application areas in automotive, train, military and so on. These ASC accelerometers benefit from the high stability of the chip technology with a low bias and an excellent scale factor temperature coefficient.

The ASC 4221 is fully compensated over a wide temperature range and are factory calibrated. As capacitive technology is used, extremely small measuring ranges are possible. The amplified output is easy to use with a data acquisition unit.

The signal is independent from the power between +8VDC to +30VDC. A very high flexible and rugged cable provides a simple mounting. The ASC 4221 is equipped with 6 meter cable as standard.



## Typical Specifications

### DYNAMIC

		Range ( $\pm$ g)							
		1	2	5	10	30	50	100	200
Sensitivity	mV/g	2000	1000	400	200	66.6	40	20	10
Frequency response: $\pm$ 5%	Hz	70	100	100	800	1000	1000	1000	1000
Amplitude non-linearity	% FSO	<1							
Transverse sensitivity	%	3							
Shock limit	$\pm$ g	5000 (0.15ms, half-sine)							
Recovery time	ms	<1							

### ELECTRICAL

Excitation voltage	V DC	8-30							
Supply current	mA	2							
Zero acceleration output	$\pm$ mV	100	30	30	30	30	30	30	30
Output Impedance	$\Omega$	200							
Isolation		Case Isolated							
Spectral noise	$\mu$ g/ $\sqrt$ Hz	9	18	45	125	375	625	1250	2500
Residual / Broadband noise ( $\pm$ 5% frequency range)	$\mu$ V	180	180	180	700	800	800	800	800

### ENVIRONMENTAL

Thermal sensitivity shift	%/ $^{\circ}$ C	0.01							
Thermal zero shift	mg/ $^{\circ}$ C	0.05	0.1	0.25	0.5	1.5	2.5	5	10
Operating temperature range	$^{\circ}$ C	-40 $^{\circ}$ C to +100 $^{\circ}$ C							
Storage temperature range	$^{\circ}$ C	-55 $^{\circ}$ C to +125 $^{\circ}$ C							
Humidity/Sealing		Epoxy sealed							

### PHYSICAL

Sensing element		MEMS Capacitive							
Case material		Aluminium							
Connector (at cable end)		Optional							
Mounting		Adhesive/screw holes							
Weight (without cable)	gram	3							
Cable		12 gram/meter; AWG 30, Polyurethane (PUR); Diameter: 3mm							

**FACTORY CALIBRATION (SUPPLIED WITH THE SENSOR)**

Range	1g	2g and 5g	10g	30g	50g to 200g
Sensitivity	at 8Hz and 0.5g	at 16Hz and 0.5g	at 80Hz and 5g	at 80Hz and 15g	at 80Hz and 20g
Frequency Response min. 5%	1 to 70Hz	1 to 100Hz	10 to 800Hz	10 to 1000Hz	10 to 1000Hz

**CALIBRATION DIN ISO 17025 (ORDER SEPARATELY)**

Range	1g	2g and 5g	10g	30g	50g to 200g
Sensitivity	at 8Hz and 0.5g	at 16Hz and 0.5g	at 80Hz and 5g	at 80Hz and 15g	at 80Hz and 200g
Frequency Response	0.5 to 100Hz	0.5 to 150Hz	10 to 1100Hz	10 to 1500Hz	10 to 2000Hz

**Cable Code/Pin Configuration***Red*    *Supply +**Black*    *Supply -**Green*    *Signal +**White*    *Signal -***ORDERING INFORMATION**

ASC	4221	002	6	A
	Model number	Range (Ex. 050 is 50g)	Cable length (meters)	Connector & Pinout
				A: no connector

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