

## MEMS Capacitive Accelerometer

# ASC 3521MF



- ▶ Uniaxial
- ▶ MF (Medium Frequency);  
DC to 2.5 kHz
- ▶ 4 Wire System
- ▶ Amplified Output
- ▶ Aluminium Housing
- ▶ Made in Germany



### Features

- ▶ Range:  $\pm 2g$  to  $\pm 200g$
- ▶ DC Response
- ▶ Gas Damped
- ▶ Excellent Bias and  
Scale Factor Stability
- ▶ Low Power Consumption
- ▶ Differential 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

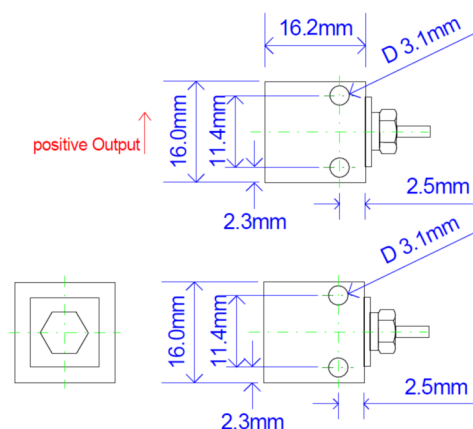
## Capacitive MEMS Technology

ASC's Medium Frequency (MF series) capacitive accelerometers are based on the capacitive sensing technology and produce an analog voltage proportional to the input acceleration. The accelerometers can measure both static (gravity) and dynamic accelerations. ASC's MF series can be used for very low to medium frequency vibration measurements from 0Hz to 2.5kHz. The MF series features a MEMS sensor element where the seismic mass is connected between two conductive capacitor plates. When subjected to an input acceleration, the seismic mass oscillates between the two capacitor plates and there is a change in the capacitance. This change in capacitance is converted via an ASIC (Application Specific Integrated Circuit) into a low impedance analog voltage output signal.

## Description

ASC's MF series capacitive accelerometer, 3521MF, is an analog voltage output sensor. The sensor can be powered by a DC power supply (+5V to +40V) where the output voltage is independent of the supply. The sensor operates in a differential configuration with  $\pm 2.7V$  full-scale output. For the full-scale acceleration range, the output swings between 0.3V and 3V. The differential configuration results in an improved S/N ratio and a better performance.

ASC Type 3521MF operates in a wide temperature range from  $-40^{\circ}C$  to  $+125^{\circ}C$ . The sensor exhibits exceptional temperature stability, very low non-linearity ( $<0.5\%$ ) and can withstand repetitive shocks as high as  $6000g$ 's. The sensor is supplied with 6m integral cable as a standard.



## Typical Specifications

### DYNAMIC

		Range ( $\pm$ g)						
		2	5	10	30	50	100	200
Sensitivity	mV/g	1350	540	270	90	54	27	13.5
Frequency response: $\pm$ 5%	Hz	700	700	1400	1600	1800	1800	1800
Amplitude non-linearity	% FSO	<0.5						
Transverse sensitivity	%	<3						
Shock limit	g <sub>pk</sub>	6000 (0.1ms, half-sine)						
Recovery time	ms	1						

### ELECTRICAL

Excitation voltage	V DC	5 to 40						
Supply current	mA	5						
Zero acceleration output	$\pm$ mV	50						
Output Impedance	$\Omega$	300						
Isolation		Case Isolated						
Spectral noise	$\mu$ g/ $\sqrt$ Hz	10	20	35	100	170	340	680
Residual / Broadband noise ( $\pm$ 5% frequency range)	$\mu$ V	360	290	360	360	390	390	390

### ENVIRONMENTAL

Temperature coefficient of sensitivity (Thermal sensitivity shift)	%/ $^{\circ}$ C	0.01						
Temperature coefficient of bias (Thermal zero shift)	mg/ $^{\circ}$ C	0.2	0.5	1	3	5	10	20
Operating temperature range	$^{\circ}$ C	-40 to +125						
Storage temperature range	$^{\circ}$ C	-55 to +125						
Humidity/Sealing		IP65						

### PHYSICAL

Sensing element		MEMS Capacitive						
Case material		Anodised Aluminium						
Connector		Optional						
Mounting		Adhesive/screw holes						
Weight (without cable)	gram	22						
Cable		13 gram/meter PUR; Li6YD11Y-T150 5*0.06mm <sup>2</sup> (AWG 30); Diameter: 2.9 $\pm$ 0.2mm						

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

Range	2g and 5g	10g	30g	50g to 200g
Sensitivity	at 16Hz and 0.5g	at 80Hz and 5g	at 80Hz and 10g	at 80Hz and 20g
Frequency Response min. 5%	1 to 100Hz	10 to 1400Hz	10 to 1600Hz	10 to 1800Hz

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

Range	2g and 5g	10g	30g	50g to 200g
Sensitivity	at 16Hz and 0.5g	at 80Hz and 5g	at 80Hz and 10g	at 80Hz and 20g
Frequency Response	0.5 to 150Hz	10 to 2000Hz	10 to 2300Hz	10 to 2500Hz

**Cable Code/Pin Configuration**

Red Supply +

Black Supply -

Green Signal +

White Signal -

**ORDERING INFORMATION**

ASC	3521MF	002	6	A
	Model number	Range (Ex. 050 is 50g)	Cable length (meters)	Connector & Pinout
				A: no connector

\* accredited by the German accreditation body (Deutsche Akkreditierungsstelle, DAkkS) to DIN EN ISO / IEC 17025

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