

# Accelerometer

## Description



OSMOS Accelerometers of high overload resistance with integrated electronics for measurement of acceleration in the frequency range to several 100 Hz

## Applications



## **OSMOS Accelerometers of high overload resistance with integrated electronics for measurement of acceleration in the frequency range 0 to several 100 Hz**

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### **Features**

- **very high overload resistance**
- **insensitive to interference by magnetic and electric fields**
- **lower cut-off frequency is zero, hence suitable for measuring static acceleration, such as gravity (inclinations) or radial acceleration (centrifugal force)**
- **linear frequency response with little or no resonant peak at upper cut-off frequency**
- **low non-linearity**
- **high signal-to-noise ratio**
- **no measurable hysteresis of signal**
- **hermetically sealed**
- **high long-term stability**
- **small temperature drift**
- **integrated sensor electronics**
- **analog DC or pulse width modulated or frequency modulated output**
- **low power consumption**
- **very short on-transition delay**
- **multiple housing options**

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### **Description**

The OSMOS sensors Acc\_04\_V are capacitive spring-mass accelerometers with integrated electronics. Resonant peaks are minimized by special gas-dynamic damping in the primary transformer.

The sensors are manufactured with either an analog DC, a pulse width modulated or a frequency modulated output. The sensor electronics require only small amounts of power and are in conjunction with the capacitive primary transformer characterized by low error and high long-term stability.

### **Application**

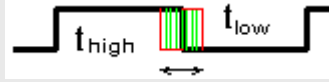
The OSMOS accelerometers Acc\_04\_V are used for applications requiring high overload tolerance, high long-term stability, small lower cut-off frequency down to measurement of static acceleration, very short on-transition delay and low power consumption. Typical applications include:

- **measurements on vehicles, machinery, buildings and plants for process control and error diagnosis**
- **seismic measurements**
- **inclination measurements**
- **safety engineering**
- **dynamic measurement of position and velocity**

## Technical Specifications

Type	OSMOS Acc_04_V
Measuring range	$\pm 0.4g$ (approx. $\pm 4m/s^2$ )
Resolution	$< 10^{-3}g$
Frequency range	0...160Hz
Linearity deviation	$< 0.5\%$
Transverse sensitivity	$< 0.5\%$
Mechanical overload resistance in direction of measurement	10 000 g (approx. 100 000 m/s <sup>2</sup> )
Nominal supply voltage (regulated)	$U_{bN} = 5$ Volt
Permissible range of supply voltage	$U_{bZ} = 3...6$ Volt
Current drawn at $U_b = 5V$	approx. 1mA
Degree of protection	IP65
Operating temperature	-40...+85°C (125°C optional)
Storage temperature	-45...+90°C (125°C optional)
Weight (in metal housing without cable)	approx. 23 grams
Standard electrical connection	3 highly flexible, color-coded wires $\varnothing 1mm$ , length approx. 18 cm (special lengths on request)
Alternative electrical connection	0,5m strong, flexible, shielded cable $\varnothing 2,1mm$ (special lengths on request) 3 flexible, color-coded wires with Teflon insulation for extended temperature range
<b>Values for analog DC output at <math>U_{bN} = 5</math> Volt</b>	
Sensitivity	approx. 110mV/g
Temperature drift of sensitivity	$< +0,06\% / K$
Temperature drift of zero point	$< 0,1mV / K$
Zero offset at $U_b=5V$	$2,5\pm 0,1$ Volt - generally: $0,5U_b\pm 4\%$
Output impedance	10 kOhm

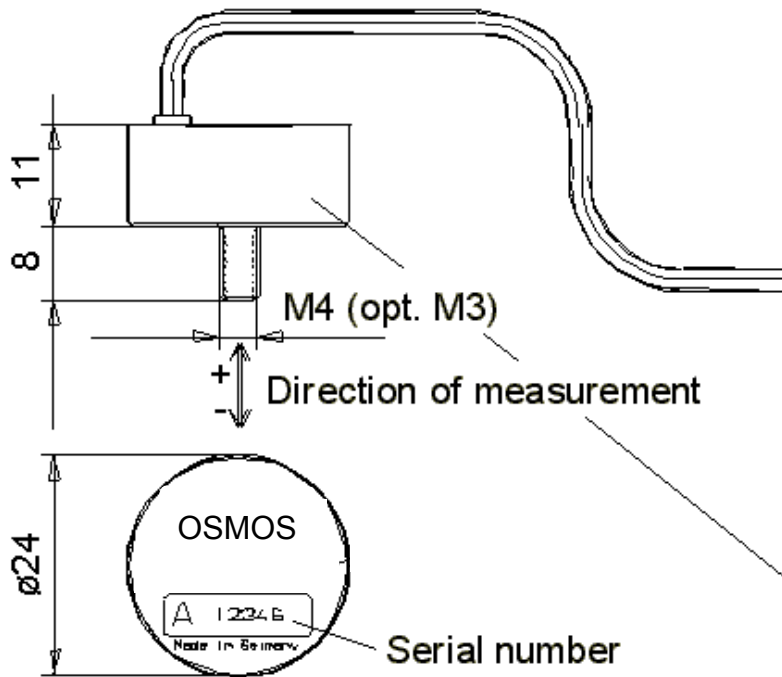
**Values for pulse width modulated output at  $U_{bN} = 5$  Volt**



Sensitivity $dt(E)/(t_{high}+t_{low})$ at middle of response curve	approx. $6,6 \cdot 10^{-3}/g$
Temperature drift of sensitivity	$< +0,06\% / K$
Temperature drift of zero point	$< \pm 5 \cdot 10^{-4} F.S./K$
Zero pulse width ratio $t_{high}/t_{low}$	$1 \pm 4\%$
Output frequency	approx. 100Hz to approx. 1MHz (optional)
<b>Values for frequency modulated output at <math>U_{bN} = 5</math> Volt</b>	
Sensitivity $df(E)/f_0$	approx. $10^{-1}/g$
Temperature drift of sensitivity	$< +0,06\% / K$
Temperature drift of zero point $df_{(Temp)}/f_0$	$< \pm 5 \cdot 10^{-3} F.S./K$ (Warning! Because of the relatively large temperature sensitivity of the zero point, these sensors are not best suited for static, long-term measurements. It is recommended to "Auto-Zero" before measuring)
Zero output frequency tolerance	$\pm 20\%$
Output frequency $f_0$	approx. 1kHz to approx. 4MHz (optional)

As standard, the housing is connected to ground (no ground connection on request).

**Dimensions (in mm) and Connections**



Cable connections:  
red:  $U_b$ :+5V (regulated)  
blue: output signal  
shield: GND, housing

Cable or 3 wires

3-wire connections:  
red:  $U_b$ :+5V (regulated)  
white or yellow:  
voltage or PWM output  
blue: GND, housing

Housing material:  
nickel-plated brass