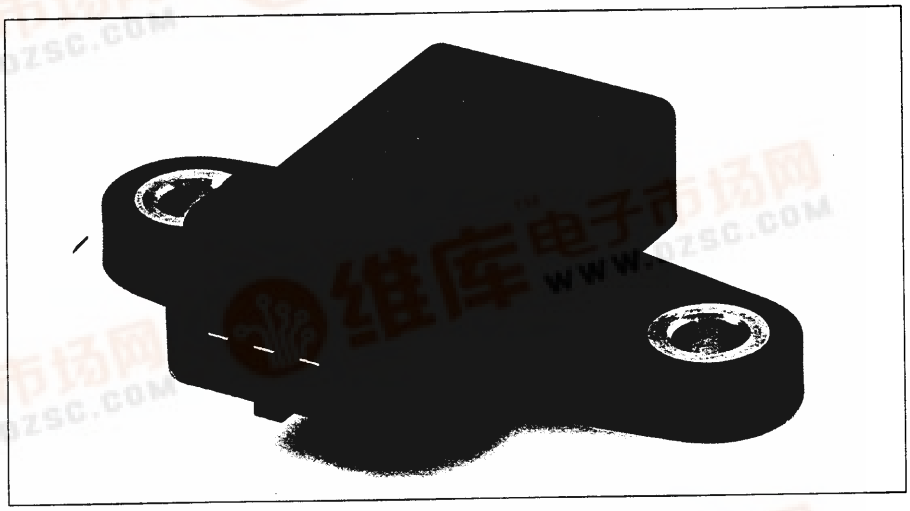
Spring-mass acceleration sensors

Measurement of acceleration up to ± 0.8 g[1])

712970

a / U

- Measurement by spring-mass system and Hall sensor
- Registration of static and low-frequency acceleration
- Optimal transient response thanks to eddy-current damping
- Temperature-insensitive output signal



Application
These acceleration sensors are used in motor vehicles as part of the antilock braking system (ABS) and traction control (ASR). In the protected interior of the vehicle, and depending on installation position, they register longitudinal or transverse acceleration (referenced to the direction of travel). Moreover, the sensors are capable of determining angles of inclination.

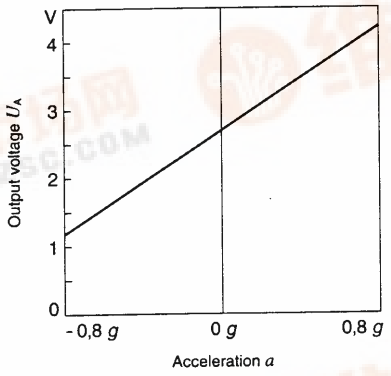
Design and function
Exposing the sensor to acceleration in measurement direction causes a spring-mass system to change its position. The measuring principle is based upon the spring-mass system whereby spring deflection is sensed by a magnetic Hall-element configuration.

Explanation of symbols

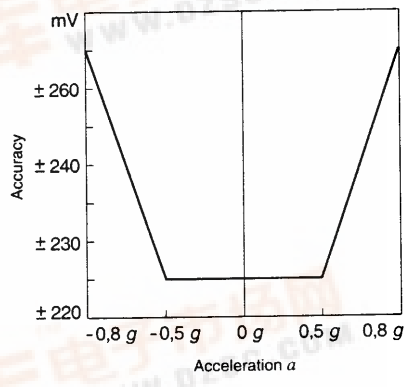
a	Acceleration
g	Acceleration due to gravity
U_A	Output voltage
U_V	Supply voltage

Installation instructions
If the installation position deviates from the horizontal by ± 1°, this results in an acceleration measuring error of 0.02 g.
The sensor is protected against polarity reversal and is drop-proof up to 0.3 m.

Characteristic curve (U_V = 5 V)
U_A = (1.875 V/g) · a + 2.7 V



Accuracy in temperature range
–40 ... +85 °C



Technical data / Range

Part number	**0 265 005 109**
Measuring range	– 0.8...+ 0.8 g[2])
Bandwidth	0...2 Hz
Deviations in temperature range – 40...+ 85 °C (referred to measuring range)	± 7.5 %
Cross-sensitivity (in y and z directions)	≤ 5 %/g
Supply voltage	5.00 V ± 0.25 V
Max. supply voltage	≤ 16 V
Input current	≤ 15 mA
Output voltage min. / max. [3])	0.96 V / 4.38 V
Load impedance	≥ 20 kΩ
Operating-temperature range	– 40...+ 85 °C
Permissible influence of external-origin magnetic induction	< 50 A · m^{-1}
Degree of protection	IP 51 as per IEC 525
Installation recommendation for mounting	Fillister-head screw ISO 4762 M 6x16-8.8 (DIN 912 M 6x16-8.8)
Tightening torque M_a	3.0 N · m ± 0.5 N · m
Max. compressive load per unit area at mounting flanges	40 N · mm^{-2}

[1]) Please inquire regarding sensors for other acceleration figures.
[2]) g = 9.81 m · s^{-2} (acceleration due to gravity).
[3]) Ratiometric to the supply voltage U_V.

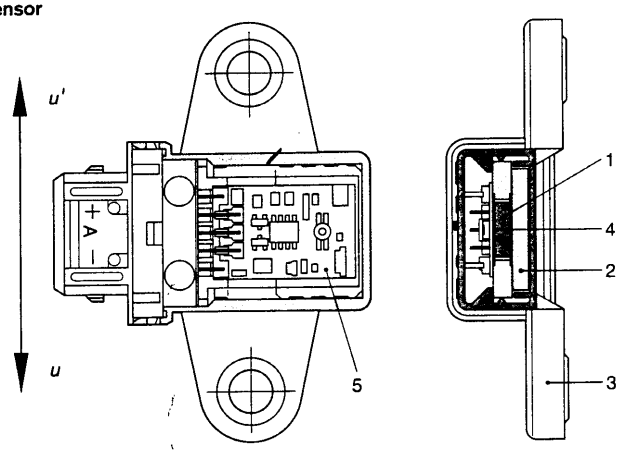
Accessories

Connector	1 237 000 039

Spring-mass acceleration sensor

1 Sensor magnet
2 Damping plate
3 Housing
4 Spring
5 Ceramic hybrid with Hall element

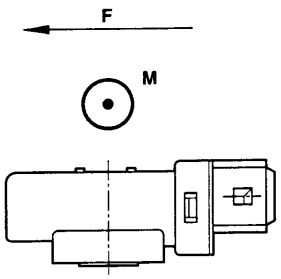
u, *u'* Movement possibility for the seismic mass, measurement direction.



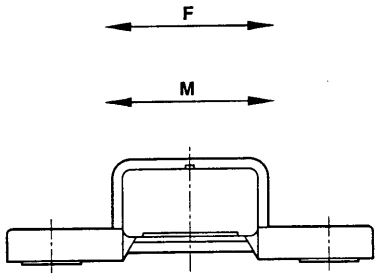
Installation position

F Travel direction, M Measurement direction.

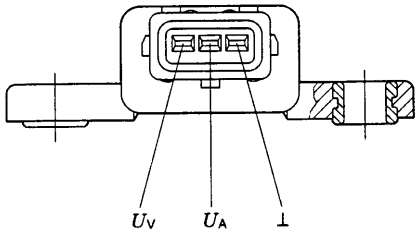
Installation position for sensing lateral acceleration in vehicle.



Installation position for sensing longitudinal acceleration in the vehicle.



Connector-pin assignment



Dimension drawings