

MEMS Capacitive Accelerometer



ASC 5511LN / ASC 5515LN

- ▶ Triaxial
- ▶ Ultra Low Noise (LN)
- ▶ High g-Range
- ▶ 8 or 12 Wire System
- ▶ Amplified Output
- ▶ Aluminium Housing / Stainless Steel Housing
- ▶ Made in Germany

Features

- ▶ Range: $\pm 2g$ to $\pm 400g$
- ▶ DC Response
- ▶ Protection Class IP67
- ▶ High Shock Resistance
- ▶ Gas Damped
- ▶ Excellent Bias and Scale Factor Stability
- ▶ 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
- ▶ Flutter Test



Capacitive MEMS Technology

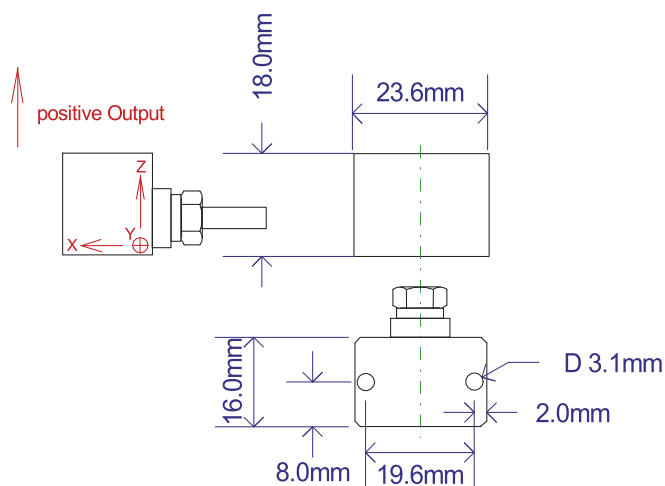
The accelerometers are based on a capacitive MEMS technology and can be used in a low frequency response up from 0Hz. Inside the sensor element, the seismic mass is connected with two conductive capacitor plates. If the seismic mass oscillates between the two capacitor plates the capacitance will change.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

Description

The models ASC 5511LN and ASC 5515LN have 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 noise level and a low bias and an excellent scale factor temperature coefficient.

The ASC 5511LN and ASC 5515LN are 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 5511LN and ASC 5515LN are equipped with 6 meter cable as standard.



Typical Specifications

DYNAMIC

| | | Range (\pm g) | | | | | | | |
|------------------------------|---------|------------------|------|------|------|------|------|------|------|
| | | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 400 |
| Sensitivity | mV/g | 2000 | 800 | 400 | 160 | 80 | 40 | 20 | 10 |
| Frequency response: \pm 5% | Hz | 100 | 100 | 300 | 500 | 650 | 650 | 1000 | 1000 |
| Amplitude non-linearity | % FSO | <1 | | | | | | | |
| Transverse sensitivity | % | 3 | | | | | | | |
| Shock limit | \pm g | 2000 | 2000 | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 |
| Recovery time | ms | <1 | | | | | | | |

ELECTRICAL

| | | | | | | | | | |
|---|---------------------|---------------|-----|----|----|-----|-----|-----|-----|
| Excitation voltage | V DC | 8-30 | | | | | | | |
| Supply current | mA | 10 | | | | | | | |
| Zero acceleration output | \pm mV | 150 | 150 | 80 | 80 | 80 | 80 | 80 | 80 |
| Output Impedance | Ω | 100 | | | | | | | |
| Isolation | | Case Isolated | | | | | | | |
| Spectral noise | μ g/ \sqrt Hz | 5 | 7 | 10 | 25 | 50 | 100 | 200 | 400 |
| Residual / Broadband noise (\pm 5% frequency range) | μ V | 100 | 60 | 70 | 90 | 100 | 100 | 125 | 125 |

ENVIRONMENTAL

| | | | | | | | | | |
|-----------------------------|------------------|---------------------------------------|-----|------|---|---|-----|----|----|
| Thermal sensitivity shift | %/ $^{\circ}$ C | 0.015 | | | | | | | |
| Thermal zero shift | mg/ $^{\circ}$ C | 0.15 | 0.4 | 0.75 | 2 | 4 | 7.5 | 15 | 30 |
| 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 (IP67) | | | | | | | |

PHYSICAL

| | | | | | | | | | |
|--------------------------|------|--|--|--|--|--|--|--|--|
| Sensing element | | MEMS Capacitive | | | | | | | |
| Case material | | Aluminium/Stainless Steel | | | | | | | |
| Connector (at cable end) | | Optional | | | | | | | |
| Mounting | | Adhesive / screw holes | | | | | | | |
| Weight (without cable) | gram | ASC 5511LN: 22 gram ASC 5515LN: 42 gram | | | | | | | |
| Cable | | 30 gram/meter; AWG 30, Polyurethane (PUR); Diameter: 4.4mm | | | | | | | |

FACTORY CALIBRATION (SUPPLIED WITH THE SENSOR)

| Range | 2g and 5g | 10g | 25g | 50g and 100g | 200g and 400g |
|--------------------|------------------|----------------|-----------------|-----------------|-----------------|
| Sensitivity | at 16Hz and 0.5g | at 80Hz and 5g | at 80Hz and 15g | at 80Hz and 20g | at 80Hz and 20g |
| Frequency Response | 10 to 100Hz | 10 to 300Hz | 10 to 500Hz | 10 to 650Hz | 10 to 1000Hz |

CALIBRATION DIN ISO 17025 (ORDER SEPARATELY)

| Range | 2g and 5g | 10g | 25g | 50g and 100g | 200g and 400g |
|--------------------|------------------|----------------|----------------|-----------------|-----------------|
| Sensitivity | at 16Hz and 0.5g | at 80Hz and 5g | at 80Hz and 5g | at 80Hz and 20g | at 80Hz and 20g |
| Frequency Response | 0.5 to 150Hz | 10 to 500Hz | 10 to 800Hz | 10 to 1600Hz | 10 to 2000Hz |

Cable Code / Pin Configuration**8-wiring-System**

Red Supply +
Black Supply -

X-Axis:
Green/Violet Signal +
White/Violet Signal -

Y-Axis:
Green/Grey Signal +
White/Grey Signal -

Z-Axis:
Green Signal +
White Signal -

12-wiring-System

X-Axis:
Red/Violet Supply +
Black/Violet Supply -
Green/Violet Signal +
White/Violet Signal -

Y-Axis
Red/Grey Supply +
Black/Grey Supply -
Green/Grey Signal +
White/Grey Signal -

Z-Axis:
Red Supply +
Black Supply -
Green Signal +
White Signal -

ORDERING INFORMATION

| ASC | 5511LN (Low Noise) | 002 | 6 | A |
|-----|--------------------|------------------------|-----------------------|--------------------|
| | Model number | Range (Ex. 050 is 50g) | Cable length (meters) | Connector & Pinout |
| | | | | A: no connector |

ASC GmbH - Advanced Sensors Calibration

Ledererstraße 10 · 85276 Pfaffenhofen · Germany · Tel. +49 (0) 8441 786 547 -0 · office@asc-sensors.de

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Instrumentation Devices Srl
Via Acquanera 29 - 22100 COMO (Italy)
ph +39 031 525 391- fax +39 031 507 984
info@instrumentation.it - www.instrumentation.it