

**9** ASC 4311LN / ASC 4315LN  
MEMS Capacitive Accelerometer



**SPECIFICATIONS**

- Uniaxial
- Ultra Low Noise (LN)
- High g-Range
- 4 Wire System
- Amplified Output
- Aluminium Housing / Stainless Steel Housing
- Made in Germany

**FEATURES**

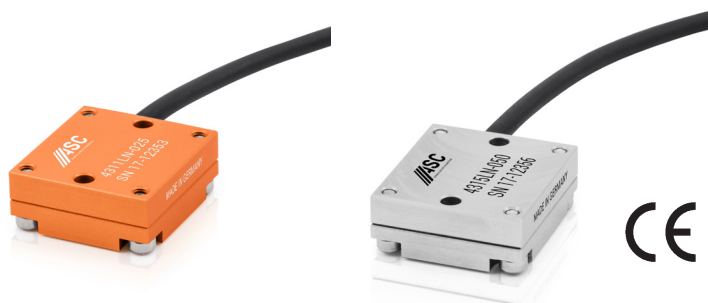
- Range:  $\pm 2g$  to  $\pm 400g$
- DC Response
- High Shock Resistance
- Gas Damped
- Excellent Bias and Scale Factor Stability
- Differential Mode

**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.

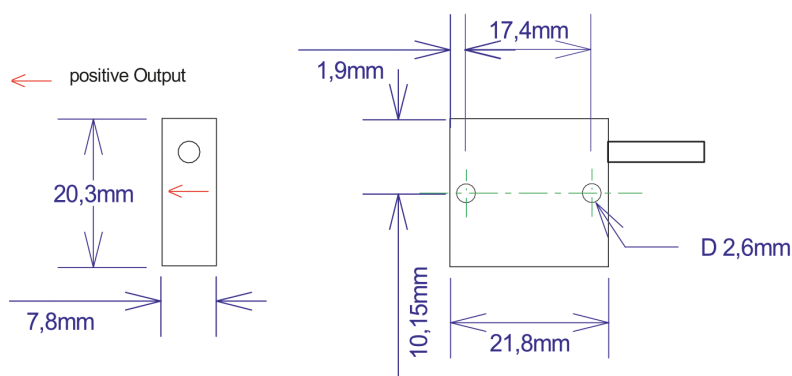
**DESCRIPTION**

The model ASC 4311LN is an uniaxial accelerometer based on capacitive technology. It is over a wide temperature range fully compensated and factory calibrated. The sensor has been developed specifically for measuring relatively small accelerations, as required in the aerospace or automotive sector, for example.

Because 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. The package is hard anodized aluminium that is rugged for automotive, industrial and military applications.

A very high flexible rugged cable provides a simple mounting. The ASC 4311LN is equipped as standard with 6m cable. It is a Low Noise version and has a better frequency response. Owing the lower noise the ASC 4311LN provides a higher resolution.

The stainless steel package of the ASC 4315LN provides a high resistance to strong environmental influences.





**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  | $\Omega$            | 100           |     |    |    |     |     |     |     |
| Isolation   |                     | Case Isolated |     |    |    |     |     |     |     |
| Spectral noise  | $\mu$ g/ $\sqrt$ Hz | 7             | 12  | 18 | 25 | 50  | 100 | 200 | 400 |
| Residual / Broadband noise<br>( $\pm$ 5% frequency range) | $\mu$ 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                          |     |      |   |   |     |    |    |

**PHYSICAL**

|                          |      |  |  |  |  |  |  |  |  |
|--------------------------|------|--|--|--|--|--|--|--|--|
| Sensing element          |      | MEMS Capacitive  |  |  |  |  |  |  |  |
| Case material            |      | Aluminium/Stainless Steel                                |  |  |  |  |  |  |  |
| Connector (at cable end) |      | Optional   |  |  |  |  |  |  |  |
| Mounting                 |      | Adhesive / screw holes                                   |  |  |  |  |  |  |  |
| Weight (without cable)   | gram | ASC 4311LN: 7 gram<br>ASC 4315LN: 19 gram                |  |  |  |  |  |  |  |
| Cable                    |      | 12 gram/meter; AWG 30, Polyurethane (PUR); Diameter: 3mm |  |  |  |  |  |  |  |



**TYPICAL SPECIFICATIONS**

**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 | 1 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**

|  |                        |                        |
|--|------------------------|------------------------|
|  | <i>Red: Supply +</i>   | <i>Green: Signal +</i> |
|  | <i>Black: Supply -</i> | <i>White: Signal -</i> |

**ORDERING INFORMATION**

|     |                    |                        |                       |                    |
|-----|--------------------|------------------------|-----------------------|--------------------|
| ASC | 4311LN (Low Noise) | 002                    | 6                     | A                  |
|     | Model number       | Range (Ex. 050 is 50g) | Cable length (meters) | Connector & Pinout |
|     |                    |                        |                       | A: no connector    |

Example: ASC 4311LN-002-6A