

MEMS Capacitive Accelerometer

ASC OS 115LN / ASC OS 125MF



- ▶ Uniaxial
- ▶ Ultra Low Noise (LN) & Medium Frequency (MF)
- ▶ High g-Range
- ▶ 4 Wire System
- ▶ Amplified Output
- ▶ Stainless Steel Housing
- ▶ Hermetic
- ▶ Made in Germany



Capacitive MEMS Technology

ASC's Offshore (OS) series capacitive accelerometers are based on capacitive sensing technology and produce an analog voltage output proportional to the input acceleration. The accelerometers can measure both static (gravity) and dynamic accelerations. ASC's OS series can be used for very low to medium frequency vibration measurements. The OS 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.

Features

- ▶ Range: $\pm 2g$ to $\pm 400g$
- ▶ DC Response
- ▶ Protection Class IP68
- ▶ Salt Water Resistance
- ▶ High Shock Resistance
- ▶ Gas Damped
- ▶ Excellent Bias and Scale Factor Stability
- ▶ Differential Mode

Options

- ▶ Customised Cable Length
- ▶ Customised Connector
- ▶ TEDS Module
- ▶ Titanium housing

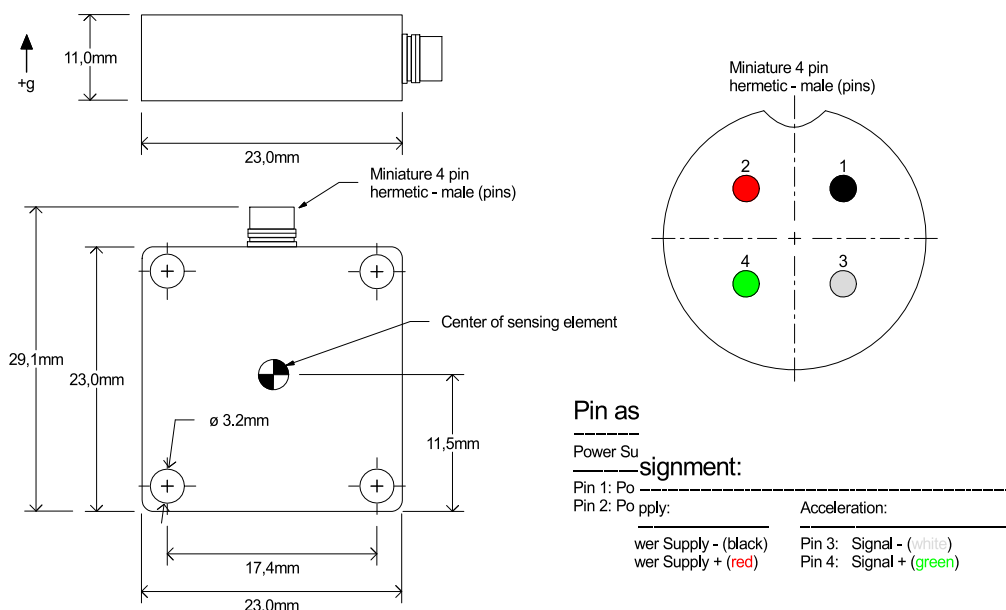
Applications

- ▶ Wind Energy
- ▶ Marine
- ▶ Structural Monitoring and Testing
- ▶ Endurance Testing
- ▶ Brake Test
- ▶ Vibration Monitoring
- ▶ Civil Engineering
- ▶ Modal Analysis
- ▶ Vehicle Testing
- ▶ Ride Quality & Comfort
- ▶ Railway Engineering

ASC's OS series capacitive accelerometers, OS 115LN and OS 125MF, are analog voltage output sensors. The sensors can be powered by a DC power supply (+5V* to +40V) where the output voltage is independent of the supply. The sensors operate in a differential configuration, which results in an improved S/N ratio due to common-mode external noise rejection.

ASC Type OS 115LN and OS 125MF operate in a wide temperature range from -40°C to $+125^{\circ}\text{C}$ *. The sensors exhibit exceptional temperature stability, very low non-linearity and can withstand repetitive shocks as high as $6000g's^*$. The hermetically sealed OS sensors, ASC OS 115LN and OS 125MF, feature a robust and corrosion proof stainless steel housing with a welded 4-pin connector. The sensors are supplied with 1m detachable cable as a standard.

*Applicable to ASC OS 125MF



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Typical Specifications

ASC OS 115LN

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 | 6 to 40 | | | | | | | |
| 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 | 10 | 14 | 20 | 50 | 100 | 200 | 400 | 800 |
| Residual / Broadband noise (\pm 5% frequency range) | μ V | 200 | 120 | 140 | 180 | 200 | 200 | 250 | 250 |

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 | | | | | | | |
| Sealing | | Hermetic (IP68) | | | | | | | |

PHYSICAL

| | | | | | | | | | |
|------------------------|------|--|--|--|--|--|--|--|--|
| Sensing element | | MEMS Capacitive | | | | | | | |
| Case material | | Stainless Steel (Optional: Titanium) | | | | | | | |
| Connector | | 4-pin Comtronic | | | | | | | |
| Mounting | | Adhesive / screw holes | | | | | | | |
| Weight (without cable) | gram | 31 | | | | | | | |
| Cable | | 12 gram/meter; AWG 30, Polyurethane (PUR); Diameter: 3mm | | | | | | | |

Typical Specifications

ASC OS 125MF

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_{pk} | 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 | Ω | 300 | | | | | | |
| Isolation | | Case Isolated | | | | | | |
| Spectral noise | $\mu g/\sqrt{Hz}$ | 20 | 40 | 70 | 200 | 340 | 680 | 1360 |
| Residual / Broadband noise ($\pm 5\%$ frequency range) | μV | 720 | 580 | 720 | 720 | 780 | 780 | 780 |

ENVIRONMENTAL

| | | | | | | | | |
|-----------------------------|----------------|-----------------|-----|---|---|---|----|----|
| Thermal sensitivity shift | $\%/^{\circ}C$ | 0.01 | | | | | | |
| 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 | | | | | | |
| Sealing | | Hermetic (IP68) | | | | | | |

PHYSICAL

| | | | | | | | | |
|--------------------------|------|--|--|--|--|--|--|--|
| Sensing element | | MEMS Capacitive | | | | | | |
| Case material | | Stainless Steel (Optional: Titanium) | | | | | | |
| Connector (at cable end) | | 4-pin Comtronic | | | | | | |
| Mounting | | Adhesive/screw holes | | | | | | |
| Weight (without cable) | gram | 31 | | | | | | |
| Cable | | 12 gram/meter PUR; AWG 30; Diameter: 3mm | | | | | | |

ASC OS 125MF**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 15g | at 80Hz and 20g |
| Frequency Response | 1 to 200Hz | 10 to 1400Hz | 10 to 1600Hz | 10 to 1800Hz |

CALIBRATION DIN ISO 17025¹ (ORDER SEPARATELY)

| | | | | |
|--------------------|------------------|----------------|-----------------|-----------------|
| Range | 2g and 5g | 10g | 30g | 50g to 200g |
| Sensitivity | at 16Hz and 0.5g | at 80Hz and 5g | at 80Hz and 15g | at 80Hz and 20g |
| Frequency Response | 0.5 to 200Hz | 10 to 2000Hz | 10 to 2300Hz | 10 to 2500Hz |

ORDERING INFORMATION

| | | | | |
|-----|--------------|------------------------|-----------------------|--------------------|
| ASC | OS 125MF | 002 | 6 | A |
| | Model number | Range (Ex. 050 is 50g) | Cable length (meters) | Connector & Pinout |
| | | | | A: no connector |

ASC OS 115LN**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 17025¹ (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 |

ORDERING INFORMATION

| | | | | |
|-----|--------------|------------------------|-----------------------|--------------------|
| ASC | OS 115LN | 002 | 6 | A |
| | Model number | Range (Ex. 050 is 50g) | Cable length (meters) | Connector & Pinout |
| | | | | A: no connector |

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

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