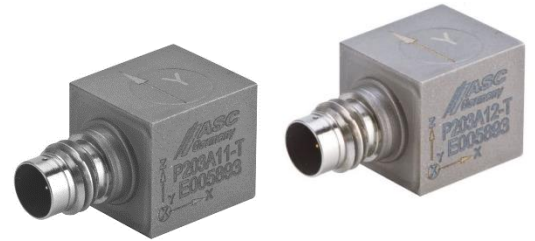


ASC P203A11 | ASC P203A12

Triaxial
IEPE (Integrated Electronics Piezo-Electric)
Measurement Range: ± 50 to ± 2000 g
Frequency Range (± 10 %): 1.0 Hz to 9 kHz
Scale Factor: 2.5 mV/g to 100 mV/g
Titanium Housing



IEPE Accelerometer

IEPE accelerometers are based on the piezoelectric effect, where an input acceleration causes a force on the seismic mass which leads to a proportional charge generation within the ceramic PZT material. The IEPE (integrated electronics piezo-electric) circuitry features the conversion of the charge to an analog voltage output signal. As opposed to capacitive accelerometers this signal has a high-pass characteristic, which enables highly dynamic measurements with a very high bandwidth of up to 9 kHz (± 10 %) even without the detection of static DC components. Further advantage of piezoelectric accelerometers is a high operating temperature range from -55 °C up to $+125$ °C.

Description

Piezoelectric accelerometers are based on PZT ceramic and feature a built-in preamplifier and a charge to voltage converter. The accelerometers providing a high full-scale output voltage of ± 5 V and low broadband noise of < 3.2 mg. The sensors operate on a constant-current supply and use a simple four-wire cable for power input and signal output.

The sensors are based on a very lightweight titanium housing while the sensor ASC P203A11 provides an additional anodized aluminum cover for case isolation. Both housings feature protection class IP68, different mounting options and a detachable cable with configurable length and connectors.

The triaxial piezoelectric accelerometers featuring a compact and lightweight design. They therefore, ideally suited for test and measurement applications such as modal and structural analyses in the automotive and aviation sectors, where a basic requirement is lightweight high-frequency accelerometers for minimizing the mass load on the test structures.

Features

- Shear Type
- Side-Connector
- Case Isolated or Grounded
- AC Response
- High Resonance Frequency
- High Shock Resistance
- TEDS Module

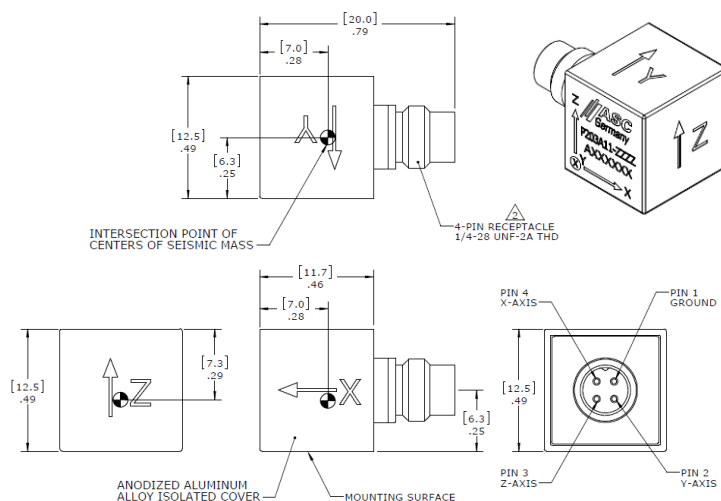
Options

- Detachable Connector Cables
- Customized Cable Length
- Customized Connector

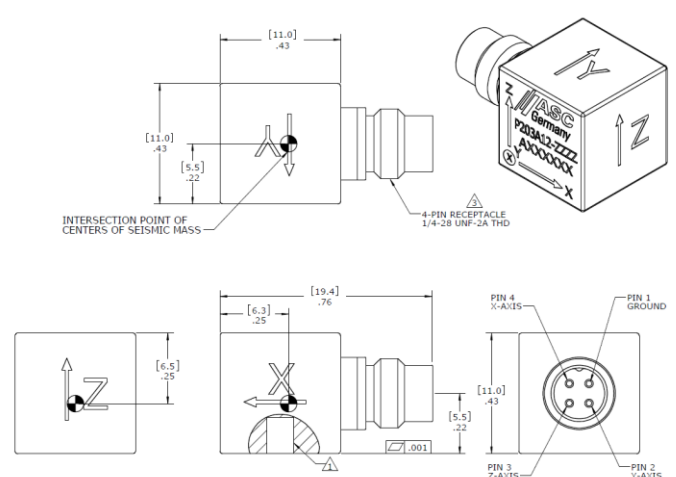
Applications

- Structural and Modal Analyses
- NVH and Operational Stability
- Railway Engineering

ASC P203A11



ASC P203A12



Typical Specification

Dynamic

| | | | | | |
|--|------|-------------|--------------|--------------|--------------|
| Measurement Range | g | ±50 | ±100 | ±500 | ±2000 |
| Scale Factor, Sensitivity (±15 %) | mV/g | 100 | 50 | 10 | 2.5 |
| Broadband Noise (max) | mg | 0.4 | 0.5 | 1.2 | 3.2 |
| Specified Frequency Response Range (±10 %) | Hz | 2.5 to 8000 | 1.5 to 8000 | 1 to 8000 | 1 to 9000 |
| Specified Frequency Response Range (±2 dB) | Hz | 1 to 10000 | 0.8 to 10000 | 0.5 to 10000 | 0.5 to 11000 |
| Resonance Frequency | kHz | >43 | | | |
| Transverse Sensitivity | % | <5 | | | |

Electrical

| | | | | | |
|-------------------------|----|--|--|--|--|
| Power Supply Voltage | V | 18 to 30 | | | |
| Constant Supply Current | mA | 2 to 10 | | | |
| Offset (bias) | V | 10 ± 2 (room temperature) 10 ± 4 (operating temperature range) | | | |
| Discharge Time Constant | s | 0.8 to 1.2 | | | |
| Output Impedance (max) | Ω | 100 | | | |
| Isolation | | ASC P203A11: Case Isolated ASC P203A12: Case Grounded | | | |

Environmental

| | | | | | |
|-----------------------------|----|-------------|--|--|--|
| Operating Temperature Range | °C | -55 to +125 | | | |
| Storage Temperature Range | °C | -55 to +125 | | | |
| Shock Limit | g | 5000 | | | |
| Protection Class | | IP68 | | | |

Physical

| | | | | | |
|--|--|--------------------------------------|--|--|--|
| Sensing Element Type | PZT Shear | | | | |
| Case Material | ASC P203A11: Titanium and Anodized Aluminum Cover ASC P203A12: Titanium | | | | |
| Connector Sensor Housing | 4-pin Microtech ¼-28" | | | | |
| Mounting | Adhesive Screw Studs | | | | |
| Mounting Thread | M2.5 x 0.45 mm | | | | |
| Mounting Torque | Nm | 2 | | | |
| Weight (without cable) | gram | ASC P203A11: 7.3 ASC P203A12: 6.0 | | | |
| Cable ASC AK-Triax IEPE 04/xx/BNC (standard) | 13 gram per meter Polyurethane (PUR) Diameter 3.0 mm 4-pin Comtronic connector and BNC connector -40 °C to +150 °C Temperature Range | | | | |
| Cable KPT-xxx | 4-pin Microtech connector and BNC connector -55 °C to +125 °C Temperature Range | | | | |

Sensor Calibration

Factory Calibration (supplied with the sensor)

| Part Number | | #15997 | #15997 | #15997 | #15998 |
|---|------------------|--------|--------|--------|--------|
| Measurement Range (sensor) | g | ±50 | ±100 | ±500 | ±2000 |
| Applied Frequency (min) | Hz | 10 | 10 | 10 | 10 |
| Applied Frequency (max) | Hz | 5000 | 5000 | 5000 | 6000 |
| Input Amplitude | m/s ² | 200 | 200 | 200 | 200 |
| Reference Frequency for Determination of Scale Factor | Hz | 80 | 80 | 80 | 80 |

Calibration according DIN ISO 17025 (order separately)

| Part Number | | #16010 | #16010 | #16010 | #16011 |
|---|------------------|--------|--------|--------|--------|
| Measurement Range (sensor) | g | ±50 | ±100 | ±500 | ±2000 |
| Applied Frequency (min) | Hz | 10 | 10 | 10 | 10 |
| Applied Frequency (max) | Hz | 8000 | 8000 | 8000 | 9000 |
| Input Amplitude | m/s ² | 200 | 200 | 200 | 200 |
| Reference Frequency for Determination of Scale Factor | Hz | 80 | 80 | 80 | 80 |

Remarks:

- The conversion factor 1 g corresponds to 9.80665 m/s².
- If any other calibration procedure is required, don't hesitate to contact us. Our services include both factory calibration and calibration in accordance with DAkkS guidelines.
- Furthermore, sensors have to be calibrated regularly to ensure accurate and precise results. On request we will be glad to remind you of the next scheduled calibration of your sensors.

Ordering Information

| Series | Model | - | Features | Measurement Range |
|--------|------------------------|---|------------------------------------|-------------------|
| ASC P | 203A11 (Case Isolated) | | T (TEDS Module already integrated) | 51 (±50 g) |
| | 203A12 (Case Grounded) | | | 12 (±100 g) |
| | | | | 52 (±500 g) |
| | | | | 23 (±2000 g) |

Example:

ASC P203A11-T51

Accessories

The accelerometers are fabricated for operating with a detachable connector cable which is no part of the product and needs to be ordered separately. Standard is the IEPE plug and play accelerometer cable assembly ASC AK-Triax IEPE 04/xx/BNC featuring 4-pin MicroCom connector at sensor side and three BNC connectors at DAQ as well as different lengths. Optional the cable KPT-xxx featuring different lengths, 4-pin Microtech connector at sensor side and three BNC connectors at DAQ or customized assembled cables are available on request. Please contact us for further information.

Safety Precaution for Installing and Operating

This data sheet is a part of the product. Read the data sheet carefully before using the product and keep it available for future operation. Handling, electrical connections, mounting or any other work performed at the sensor must be carried out by authorized experts only. Appropriate safety precautions must be taken to exclude any risk of personal injury and damage to operating equipment as a result of a sensor malfunction.

Handling

The sensor is packaged in a reliable housing to protect the sensing elements and integrated electronic components from the ambient environment. However, poor handling of the product can lead to damages that may not be visible and cause electrical failure or reliability issues. Handle the component with caution:


- Avoid shocks and impacts on the housing, such as dropping the sensor on hard surface
- Never move the sensor by pulling the cable
- Make sure that the sensor is used within the specified environmental conditions
- Transport and store the sensor in its original or similar packaging
- The sensor should be mounted on a stable flat surface with all screws tightened or other mounting options
- Avoid any deformation during mounting the sensor
- Mounting tolerances may have an influence on the measured result

Electrical

ASC's inertial sensors are working with many established data acquisition systems. However, make sure that a proper DAQ is used, for the corresponding operation principle of the sensor. Furthermore, suitable precautions shall be employed during all phases of shipment, handling and operating:

- Active sensor pins are susceptible to damage due to electrostatic discharge (ESD)
- Make sure that the sensor is used within the specified electrical conditions
- Check all electrical connections prior to initial setup of the sensor
- Completely shield the sensor and connecting cable
- Do not perform any electrical modifications at the sensor
- Do not perform any adaptations on the wiring or connectors while the device under power
- Never plug or unplug the electrical connection while the sensor is under power
- When a certain pin is not used during operation, make sure that the pin is insulated

Quality

- We have a quality management system according to ISO 9001:2015.
- The Deutsche Akkreditierungsstelle GmbH (DAkkS) has awarded to our calibration laboratory the DIN EN ISO/IEC 17025:2018 accreditation for calibrations and has confirmed our competence to perform calibrations in the field of mechanical acceleration measurements. The registration number of the certificate is **D-K-18110-01-00**.
- All ASC products are -compliant.

Made in Germany



analyzing



monitoring



testing



measuring