

General Purpose Piezoelectric Accelerometer



ASC P101A15 / ASC P101A25

- ▶ Uniaxial
- ▶ IEPE (Integrated Electronic Piezoelectric)
- ▶ Stainless Steel Housing
- ▶ Voltage Output



ASC P101A15

ASC P101A25

Features

- ▶ $\pm 50g$, $\pm 100g$, $\pm 500g$ and $\pm 1000g$ Dynamic Ranges
- ▶ Stud Mount
- ▶ Side Connector or Top Connector
- ▶ Hermetically Sealed
- ▶ High Resonance Frequency ($>50kHz$)
- ▶ Wide Bandwidth ($\pm 1dB$, $10kHz$)
- ▶ Light Weight (<10 grams)
- ▶ -55° to $+125^{\circ}C$ Operating Range
- ▶ Annular Shear Design
- ▶ TEDS

Options

- ▶ Customised Cable Length
- ▶ DAkkS Calibration

Applications

- ▶ General Purpose Vibration & Shock Monitoring
- ▶ Test & Measurement Applications
- ▶ Modal Applications
- ▶ High-Frequency Applications

Piezoelectric IEPE Technology

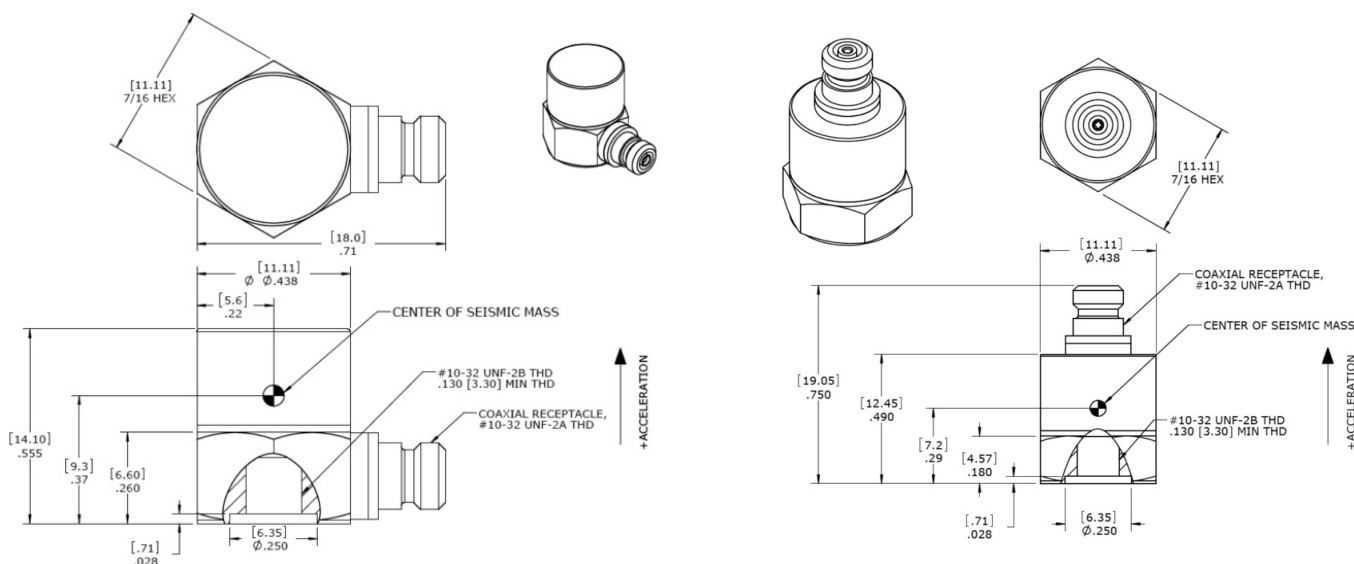
ASC's General Purpose IEPE accelerometers are made of piezoelectric ceramics and are usable over a wide frequency range from 0.3Hz to 10kHz. The accelerometers are IEPE (Integrated Electronics PiezoElectric) sensors that produce an output voltage proportional to the input acceleration. The sensors feature a built-in preamplifier and a charge to voltage converter that transforms the high-impedance charge output from the piezoelectric ceramic (Lead Zirconate Titanate, PZT) into a low-impedance voltage output that is suitable to drive long cables. ASC's IEPE sensors operate on a 2-10mA constant-current supply and use a two-wire coaxial cable for power input and signal output.

Description

ASC's General Purpose IEPE accelerometers, P101A15 and P101A25, are analog voltage output sensors. These piezoelectric vibration sensors are used typically in general purpose vibration and shock monitoring applications. The sensors are based on a piezoelectric annular shear design, which provides excellent immunity against base strain and temperature transients.

ASC Type P101A15 has a side exit connector and Type P101A25 has a top exit connector.

ASC's General Purpose accelerometers, P101A15 and P101A25, feature a rugged stainless steel housing that is corrosion proof and chemical resistant. ASC Type P101A15 and P101A25 operate over a wide temperature range from $-55^{\circ}C$ to $+125^{\circ}C$. Both sensors incorporate a welded hermetic construction and can withstand shocks up to $5000g$'s. The industry standard 10-32 coaxial connectors with side and top exit options provide flexibility in mounting. The sensors are available with built-in TEDS.



Typical Specifications

MODEL NUMBER: ASC P101A15 / ASC P101A25

Type: Piezoelectric IEPE General Purpose Accelerometer

| DYNAMIC | | Range (\pmg) | | | |
|--------------------------------|---------------------|-------------------------------------------------------------------------------------------------|-----|-----------|------|
| | | 50 | 100 | 500 | 1000 |
| Sensitivity ($\pm 10\%$) | mV/g | 100 | 50 | 10 | 5 |
| Full Scale Output | V | ± 5 | | | |
| Amplitude response: $\pm 5\%$ | | 0.5 to 6k | | 0.5 to 8k | |
| | $\pm 1\text{dB}$ Hz | 0.3 to 10k | | | |
| Phase response: $\pm 10^\circ$ | | 0.5 to 10k | | | |
| Non-linearity | %FSO | ± 1 | | | |
| Resonance Frequency | kHz | 50 | | | |
| Transverse sensitivity (Max.) | % | <5 | | | |
| Shock limit | \pm g | 5000 (half-sine, 300 μ s) | | | |
| Output Polarity | | Acceleration in the direction of the arrow (see outline drawing) generates a positive output | | | |

ELECTRICAL

| | | | | | |
|---------------------------------------------|--------------------------------|------------------------------------------------------------------------|-----|-----|-----|
| Excitation voltage | V DC | 18 to 30 | | | |
| Supply current | mA | 2 to 10 | | | |
| Bias Voltage | V DC | 10 \pm 2 (room temperature) ; 10 \pm 4 (in full temperature range) | | | |
| Output Impedance | Ω | <100 | | | |
| Discharge Time Constant | sec | 0.8 to 1.2 | | | |
| Startup / Settling time (to 90% of bias) | sec | 2.5 | | | |
| Isolation | | Case Grounded | | | |
| Spectral Noise | $\mu\text{g}/\sqrt{\text{Hz}}$ | 1Hz: 200; 10Hz: 80; 100Hz: 25; 1kHz: 12 | | | |
| Broadband noise (1Hz to 10kHz) | milli g | 0.4 | 0.5 | 0.8 | 1.4 |

ENVIRONMENTAL

| | | | | | |
|----------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------|--|--|--|
| Temperature coefficient of sensitivity | %/ $^\circ\text{C}$ | -55 $^\circ\text{C}$ to +80 $^\circ\text{C}$: +0.02 ; +80 $^\circ\text{C}$ to +125 $^\circ\text{C}$: -0.04 | | | |
| Thermal transient sensitivity | mg/ $^\circ\text{C}$ | 0.5 | | | |
| Operating & Storage temperature range | $^\circ\text{C}$ | -55 to +125 | | | |
| Sealing | | Hermetic | | | |

PHYSICAL

| | | | | | |
|--------------------------|------|---------------------------------------------------------|--|--|--|
| Sensing element / design | | PZT / Shear | | | |
| Case material | | Stainless Steel | | | |
| Connector | | 10-32 coaxial UNF-2A | | | |
| Mounting | | Adhesive / Stud | | | |
| Mounting thread | | 10-32 UNF 2B (10-32 to 10-32 mounting stud included) | | | |
| Mounting torque | N-m | 2 | | | |
| Weight (without cable) | gram | ASC P101A15: 8.6; ASC P101A25: 7.3 | | | |
| Cable | | 10-32 to BNC Low-noise coaxial PTFE | | | |

Note: 1g = 9.80665m/s²

FACTORY CALIBRATION (SUPPLIED WITH THE SENSOR)

| | | | | |
|--------------------|---------------------|---------------------|---------------------|-------|
| Range | 50g | 100g | 500g | 1000g |
| Sensitivity | at 160Hz and 10g | at 160Hz and 15g | at 160Hz and 25g | |
| Frequency Response | 10Hz to 6kHz | | 10Hz to 8kHz | |

CALIBRATION DIN ISO 17025 (ORDER SEPARATELY) *

| | | | | |
|--------------------|-------------------------------------------------------------------------------------------------------------|------|------|-------|
| Range | 50g | 100g | 500g | 1000g |
| Frequency Response | I: 0.5Hz to 100Hz (Long-stroke shaker calibration) II: 10Hz to 10kHz (High-frequency shaker calibration) | | | |

ORDERING INFORMATION

| | | |
|-------------------------|------|-----------|
| ASC P101A15 | | |
| or | T | XX |
| ASC P101A25 | | |
| Sensor Type | TEDS | Range |
| Side connector: P101A15 | | 51 ±50g |
| or | | 12 ±100g |
| Top connector: P101A25 | | 52 ±500g |
| | | 13 ±1000g |

Ex. ASC P101A15-T52**ACCESSORIES**

Cable Assembly for ASC Uniaxial IEPE Accelerometers

| | |
|---------------------------------------|------------------------|
| KPU | XXX |
| | Cable length in meters |
| Cable for Uniaxial IEPE Accelerometer | |
| 10-32 UNF to BNC | 003: 3m |
| -55°C to +200°C | 006: 6m |
| | 009: 9m |

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

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