

IEPE Accelerometer

ASC P101A15 | ASC P101A25

Uniaxial

IEPE (Integrated Electronics Piezo-Electric)

Measurement Range: ± 50 to ± 1000 g

Frequency Range (± 10 %): 0.3 Hz to 10 kHz

Scale Factor: 5 mV/g to 100 mV/g

Stainless-Steel Housing (IP68)



CE

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 10 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 <1.4 mg. The sensors operate on a constant-current supply and use a simple two-wire coaxial cable for power input and signal output.

The accelerometers feature a robust stainless-steel housing with protection class IP68, different mounting options and a detachable cable with configurable length and connectors.

The uniaxial piezoelectric accelerometers ASC P101A15 (side connector) and ASC P101A25 (top connector) 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 or Top-Connector Entry
- AC Response
- High Resonance Frequency
- High Shock Resistance
- TEDS Module

Options

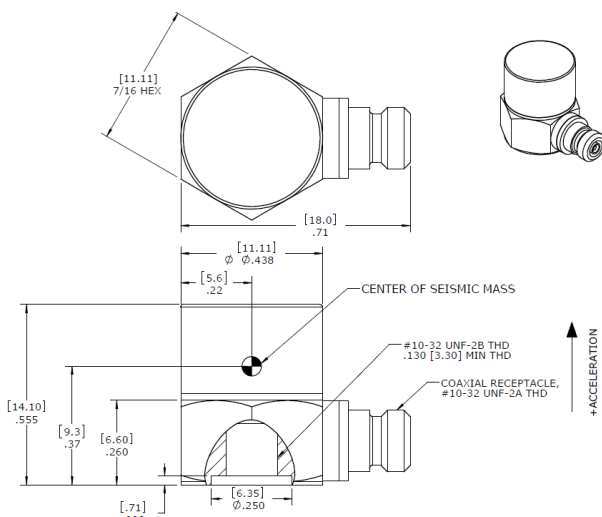
- Detachable Connector Cables
- Customized Cable Length
- Customized Connector

Applications

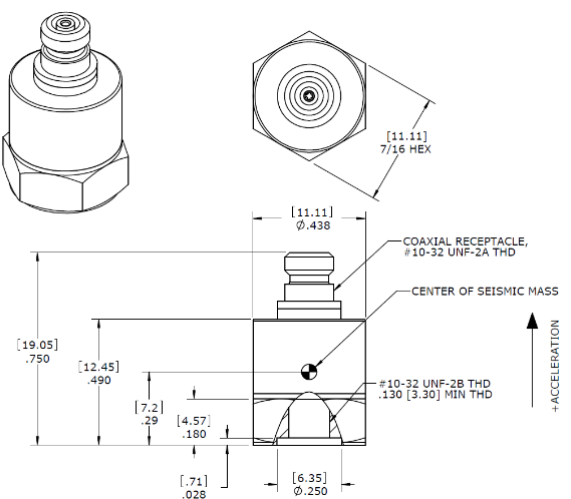
- Structural and Modal Analyses
- NVH and Operational Stability
- Railway Engineering

More applications in several markets are figured out on our web page www.asc-sensors.de

ASC P101A15 (Side-Connector)



ASC P101A25 (Top-Connector)



IEPE Accelerometer

Typical Specification

Dynamic

Measurement Range	g	±50	±100	±500	±1000
Scale Factor, Sensitivity (±10 %)	mV/g	100	50	10	5
Broadband Noise (max)	mg	0.4	0.5	0.8	1.4
Frequency Response Range (±5 %)	Hz	0.5 to 6000		0.5 to 8000	
Frequency Response Range (±1 dB)	Hz	0.3 to 10000			
Resonance Frequency	kHz	>50			
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		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	Stainless-Steel	
Connector Sensor Housing	10-32 coaxial UNF-2A	
Mounting	Adhesive Screw Studs (10-32 UNF, included)	
Mounting Thread	10-32 UNF	
Mounting Torque	Nm	2
Weight (without cable)	gram	ASC P101A15: 8.6 ASC P101A25: 7.3
Cable ASC AK-Uniax IEPE 01/xx/BNC (standard)	13 gram per meter Polyurethane (PUR) Diameter 3.0 mm 10-32 coaxial connector and BNC connector -40 °C to +150 °C Temperature Range	
Cable KPU-xxx	Low-Noise-Coaxial PTFE 10-32 coaxial connector and BNC connector -55 °C to +200 °C Temperature Range	

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Sensor Calibration

Factory Calibration (supplied with the sensor)

Part Number		#15023	#15023	#15025	#15025
Measurement Range (sensor)	g	±50	±100	±500	±1000
Applied Frequency (min)	Hz	10	10	10	10
Applied Frequency (max)	Hz	6000	6000	8000	8000
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		#12747	#12747	#12747	#12747
Measurement Range (sensor)	g	±50	±100	±500	±1000
Applied Frequency (min)	Hz	10	10	10	10
Applied Frequency (max)	Hz	10000	10000	10000	1000
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	101A15 (Side-Connector)		T (TEDS Module already integrated)	51 (±50 g)
	101A25 (Top-connector)			12 (±100 g)
				52 (±500 g)
				13 (±1000 g)

Example:

ASC P101A15-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-Uniiax IEPE 01/xx/BNC featuring 1-pin MicroCom coaxial connector at sensor side and BNC connector at DAQ as well as different lengths. Optional the cable KPU-xxx featuring different lengths, 10-32 UNF coaxial connector at sensor side and BNC connector at DAQ or customized assembled cables are available on request. Please contact us for further information.

IEPE Accelerometer

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
- When adhesives are used to mount the sensors, please select the corresponding products according to permanent or removable mounting, ambient temperature range as well as quality of the mounting surface
- 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 **CE**-compliant.

Made in Germany



analyzing



monitoring



testing



measuring