

PiezoStar® Shear Piezotron®

Type 8080A050...

Back-to-Back Vibration Calibration Standard

The Type 8080A050... accelerometer is a back-to-back vibration calibration standard with integrated low impedance Piezotron circuit electronics and 50 g range.

- Low base strain
- Long-term stability
- Thermal stability
- High frequency response
- Minimum sensitivity to rocking motion
- Ground isolated interface to shaker
- Conforming to **CE**

Description

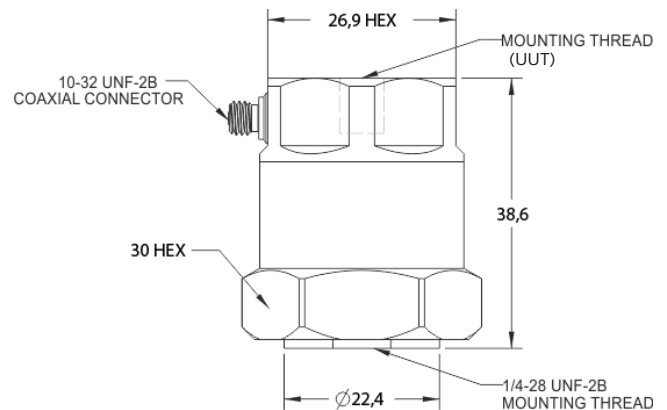
The Type 8080A050... accelerometer is Kistler's most accurate and repeatable low impedance, back-to-back, vibration calibration standard. It features low base strain, long-term and thermal stability and high frequency response. Due to its unique shear design, it offers minimum sensitivity to the shaker lateral rotation (rocking motion). A beryllium mounting base, lapped optically flat, provides optimum coupling between Type 8080A050... and the test unit. Contained within the housing is a piezoelectric system consisting of a seismic mass preloaded to a PiezoStar element and miniature hybrid electronics. This combination yields a high level, low impedance voltage output signal proportional to the accelerating stimulus.

This PiezoStar-based sensing element offers long-term stability of the sensing element, thermal stability from -65 ... 120 °C, and benefits in voltage gain/noise over quartz. Its high rigidity allows for a frequency response from 1 Hz up to 10 kHz at ±5 %. The shear design, first of its kind for back-to-back sensors, allows for a very good transient response and very low case/base strain sensitivity. The Type 8080A050... reference sensor offers a ground isolated interface to shaker with 1/4-28 threaded hole. The top threaded hole can be offered as a 1/4-28 (Type 8080A050A) or 10-32 (Type 8080A050B) versions. Typical mass loading curves are provided in page 2 of this data sheet.

Signal and DC excitation power to the unit are conducted through a single coaxial cable, such as the Type 1761B... series. The simple power signal circuitry makes it possible to easily check the circuit's integrity. Power and signal processing to the accelerometer can be provided by any one of the 5100 series coupler types.



Dimensions



| Type | Mounting Thread (UUT) |
|-----------|-----------------------|
| 8080A050A | 1/4-28 |
| 8080A050B | 10-32 |

Dimensions are shown in [mm], unless otherwise noted.

Application

The high-precision vibration standard, Type 8080A050... accelerometer is used primarily as a transfer standard for back-to-back calibration of accelerometers and is ideal for field calibrations.

8080A050_003-171e-08.14

Technical Data

| Type | Unit | 8080A050... |
|----------------------------------|------------------|--------------|
| Acceleration range | g | 50 |
| Acceleration limit | g _{pk} | 100 |
| Sensitivity ±5 % | mV/g | 100 |
| Resonant frequency mounted, nom. | kHz | >20 |
| Frequency response ±5 % | Hz | 1 ... 10 000 |
| Amplitude non-linearity | %FSO | <1 |
| Time constant | s | 1,0 |
| Threshold | g _{rms} | 0,005 |
| Transverse sensitivity max. | % | 3 |
| Long-term stability | %/yr | ±0,05 |

Environmental

| | | |
|--|-----------------|----------------|
| Base strain sensitivity @ 250 µin/in | g/µε | <0,003 |
| Mass loading error | | refer to graph |
| Shock limit (1 ms pulse) | g _{pk} | 500 |
| Temperature coeff. of sensitivity | %/°C | -0,009 |
| Operating temperature range (4 mA supply current) | °C | -65 ... 120 |

Construction

| | | |
|-----------------------------|----------|-------------------|
| Sensing element | type | PiezoStar®, Shear |
| Housing/Base | material | stainless steel |
| Sealing – housing/connector | type | hermetic |
| Connector | type | 10-32 neg. |
| Ground isolation min. | MΩ | 10 |
| Weight | grams | 175 |

Output

| | | |
|--|-----|-----------------------------|
| Bias nom. | VDC | 11 |
| Impedance | Ω | 100 |
| Current | mA | 2 |
| Voltage full-scale | V | ±5 |
| Mounting (Shaker) | | ¼–28 UNF-2B, isolated |
| Mounting (UUT) Type 8080A050A Type 8080A050B | | ¼–28 UNF-2B 10-32 UNF-2B |

Source

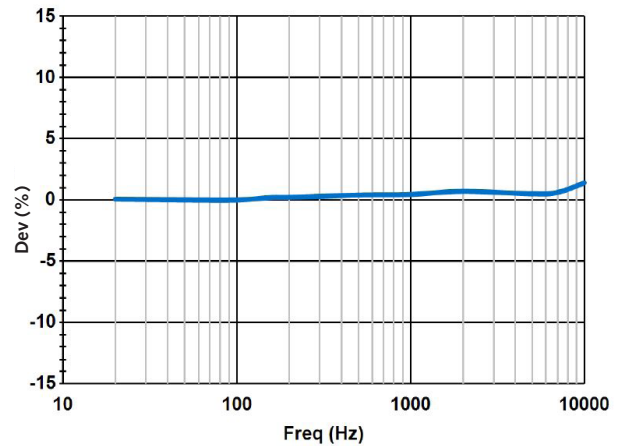
| | | |
|------------------|-----|-----------|
| Voltage | VDC | 20 ... 30 |
| Constant current | mA | 4 ... 20 |
| Impedance min. | kΩ | 100 |

Mounting Torque

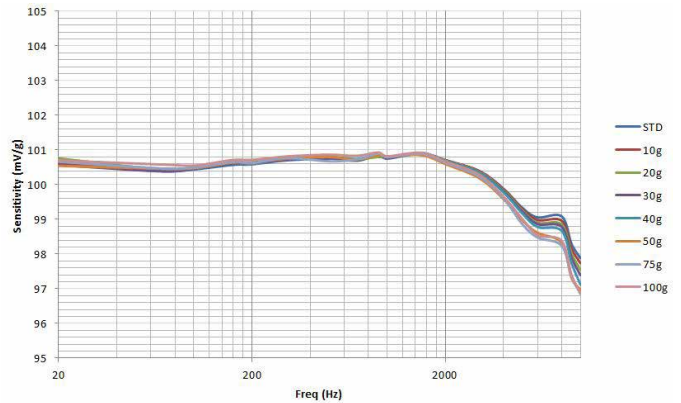
| | | |
|---------------------------------|-----|--------|
| Type 8080A050... to test sensor | N·m | 2 ±0,2 |
| Type 8080A050... to exciter | N·m | 2 ±0,2 |

1 g = 9.80665 m/s², 1 in = 25.4 mm, 1 Gram = 0.03527 oz, 1 lbf-in = 0.113 N·m

Typical Frequency Response



Mass Loading Curves

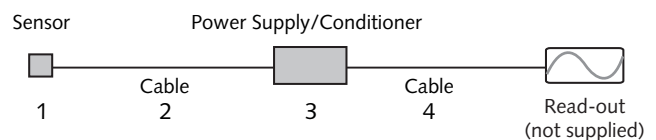


Mounting

The calibration standard is attached to the shaker by means of the supplied mounting stud. Mounting studs and a stud adapter afford extreme flexibility for back-to-back mounting between the calibration standard and the test accelerometer.

Measuring Chain

| | |
|---|---------------------|
| 1 Vibration standard quartz accelerometer | Type 8080A050... |
| 2 Sensor cable, 10-32 pos. to BNC pos. | 1761Bsp |
| 3 Series coupler | 51... |
| 4 Output cable, BNC pos. to BNC pos. | 1511sp |



Included Accessories

Included with Type 8080A050A:

- | | Type |
|---|-------------|
| • (2) Mounting studs, ¼–28 to ¼–28 thread | 8412 |
| • (1) Mounting stud, ¼–28 to M8 thread | 8421 |
| • (2) Mounting studs, ¼–28 to 10-32 thread | 8410 |
| • (1) Thread converter, 10-32 internal to ¼–28 external thread | 8414 |

Included with Type 8080A050B:

- | | |
|---|------|
| • (1) Mounting stud, ¼–28 to ¼–28 thread | 8412 |
| • (1) Mounting stud, ¼–28 to M8 thread | 8421 |
| • (2) Mounting studs, ¼–28 to 10-32 thread | 8410 |
| • (1) Mounting stud, 10-32 to 10-32 thread | 8406 |

Ordering Key**Measuring Range**±50 g 050**UUT Mounting Thread**

| | |
|-------|---|
| ¼–28 | A |
| 10-32 | B |

Type 8080A