

Sensor Applications



Accelerometer Selection Considerations

Sensor Applications



Accelerometer Selection Considerations

- Frequency Range
- Minimum vibration amplitude
- Maximum vibration amplitude
- Operating temperature range
- Environment (fluids, gases, chemicals)
- Mounting method
- Physical constraints
- Intrinsic safety certifications



Frequency Range Considerations

What is the minimum and maximum frequency to be measured?

Some examples for estimating maximum frequency to be measured.

- Roller Element Bearings - 20 to 40 times the shaft RPM
- Journal Bearings - 10 to 20 times the shaft RPM
- Gear Boxes - 3.5 times the gear mesh
- Electric Motors - 3.5 times the rotor bar frequency, or 3.5 times the line current frequency
- Pumps & Fans - 3.5 times the blade pass frequency

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Minimum Vibration Amplitude

- This is rarely a consideration for industrial applications except for very low frequency measurements.
- The minimum amplitude vibration should generate a signal at least 5 times the amplifier noise present at that frequency.



Maximum Vibration Amplitude

- Maximum possible vibration must not “overload” the sensor amplifier
- The sensor sensitivity should provide sufficient voltage output without creating distortion due to amplifier overload

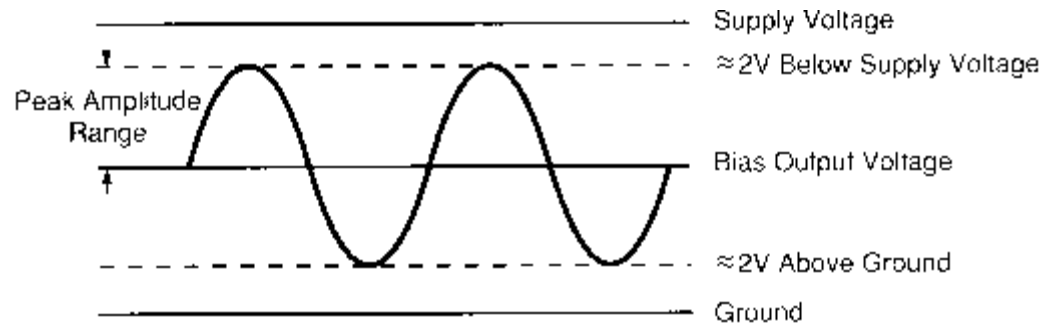


Figure 4. Range of Linear Operation

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Operating Temperature Range

- The storage temperature is the same as the specified operating temperature.
- Higher input power current adversely affects maximum operating temperature (4mA maximum is recommended for high temperature)
- Low temperatures for industrial applications rarely go below -50°C

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Environmental Considerations

- 316L Stainless steel, Viton[®], and Teflon[®] can withstand most industrial environments.
- Hermetically sealed sensors and splash proof cables, or sensors with integral cables rated to IP68 should be used in "wet" environments.

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Mounting Considerations & Physical Constraints

- How will the sensor be mounted?
stud, epoxy, quicklink, magnet
- Is there sufficient room to mount the sensor?
- Side exit or top exit connector required?