

Vibration sensor wiring and cabling

This technical note describes basic wiring and cabling installation techniques for accelerometers and other vibration sensors. It will allow qualified field technicians to connect vibration sensors in a variety of applications and environments. Some techniques will be general to all installations, whereas others may be specific to a particular application. If additional information is required, please consult Wilcoxon technical support.

The process of installation begins with verifying that the proper sensor was selected for the measurement point. Refer to the Wilcoxon technical note “Sensor selection guide” for assistance.

With a firm understanding of the sensor requirements, capabilities, and limitations the vibration analyst should have evaluated and determined the mounting location of the individual sensors based on the specific machine and vibration source to be monitored. Refer to Wilcoxon technical note, “Mounting considerations for vibration sensors” for assistance with proper sensor mounting.

After the sensors have been properly mounted, installation wiring can be accomplished. This technical note will address the issues involved in proper sensor wiring for permanently mounted sensors.

After wiring installation, verification of operation and troubleshooting the installation may be necessary to complete the process. Refer to the Wilcoxon technical note, “Troubleshooting accelerometer installations” for assistance. This technical note also contains a detailed explanation of sensor operation and powering.

Electrical powering requirements

Most internally amplified vibration sensors require a constant current DC power source. Generally, the power supply contains an 18 to 30 Volt source with a 2 to 10 mA constant current diode (CCD) (see Figure 1). If other powering schemes are used, consultation with the sensor manufacturer is recommended. A more thorough discussion of powering requirements follows.

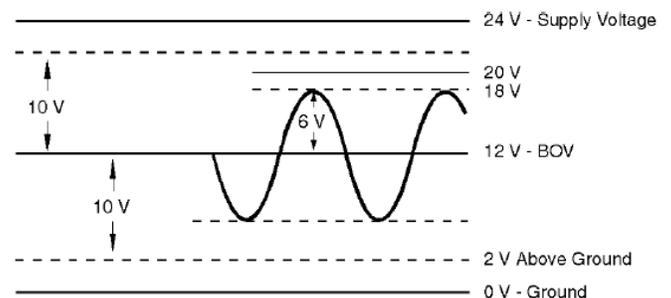


Figure 1: Amplitude range versus supply voltage

AC coupling and the DC bias voltage

The sensor output is an AC signal proportional to the vibration applied. This AC signal is superimposed on a DC bias voltage also referred to as bias output voltage (BOV) or rest voltage. The DC component of the signal can be blocked by a capacitor thereby leaving the AC output signal. Most vibration data collectors, monitors, and sensor power units contain an internal blocking capacitor for AC coupling.