

CTC AppNotes

A series of technical documents written by members of the CTC community

Improving Bias Stability in High Temperature Accelerometers



Figure 1. NEW AC207-1D featuring improved bias stability.

In many industrial applications certain processes require monitoring where the temperatures exceed the long term capabilities of standard accelerometers, which may work for a few weeks or months but tend to fail over the long term. Older designs of higher temperature internally amplified accelerometers utilized components that were temperature tolerant, but suffered sensor bias voltage drift over time. This phenomenon was not often a problem for route data collection in the past as the sensors were only powered

for short periods, and had little time in the powered state for the bias to drop. However, with so many manufacturing facilities turning to continuous or automatic monitoring systems, a drift in the bias voltage will frequently cause a sensor fault notification to be generated in the system and a possible work order to be generated unnecessarily. This type of unrequired action causes added expense and reduces the confidence of plant managers in maintenance programs.

Improving the bias stability

To combat this issue, CTC embarked on a research and redesign project of our high temperature IEPE accelerometers. Using newer components and improved circuit designs the engineering team at CTC was able to create a design that provides extremely stable bias voltage results at maximum operating temperature over extended periods of time, as well



Figure 2. AC208-5D side exit sensor with integral armor jacketed cable, designed for use in the dryer section of industrial paper mills.

as increasing the temperature rating from 302°F to 325°F. Testing the standard AC207-1A against the new and improved AC207-1D, CTC is able to show more than one thousand hours of continuous thermal exposure, that the new sensor maintained a bias with fluctuations of less than 1%, where the old versions showed bias variations of as much as 5% or more. (See figure 3). This improved stability will allow managers and analysts to be certain their data is consistent and reliable.

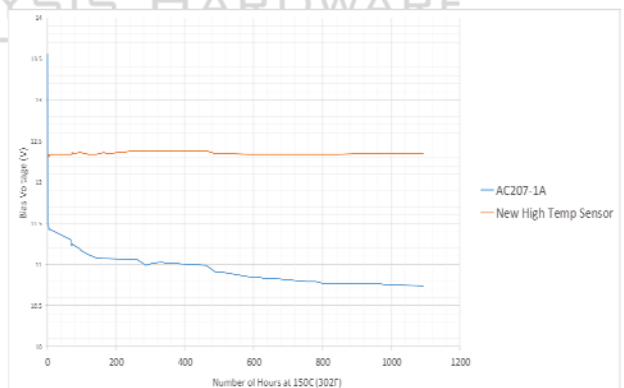


Figure 3. Bias voltage curves comparing the legacy AC207-1A design to the new and improved AC207-1D and AC208-1D .

If you have any questions feel free to contact CTC directly. Call toll free 1-800-999-5290 in the US/ Canada or +1-585-924-5900 internationally, or alternatively, email techsupport@ctconline.com.