

CTC AppNotes

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

Sensor Calibration Basics



Figure 1—NIST traceable Reference sensor mounted “Back to back” with sensor being calibrated in production.

In order for an analyst to properly perform their job, they need to have tools they have confidence in and understand how to use. One of the primary tools for a vibration analyst is a properly calibrated sensor. Every sensor manufactured at CTC is calibrated using a reference sensor which is

traceable to the National Institute of Standards and Testing (NIST). Sometimes questions arise as to the importance of calibration as well as the methods we use to calibrate our sensors. This edition of AppNotes will try to give a basic overview of the calibration process and options for recalibration.

Calibration Process

Once the sensor assembly is completed it is processed for calibration. Every sensor at this point is already engraved with a part number and serial number. The calibration technician selects the sensor model and enters the serial number into the computerized calibration system, and then mounts the sensor to be calibrated to a “reference sensor”, which is calibrated annually by a third party. The reference sensor is mounted to a Reference Shaker, also calibrated annually and traceable to NIST. At this point the whole assembly (See Figure 1) is shaken at several

frequencies along the sensor’s range to ensure that the output of the sensor falls within the sensor’s specified tolerances. The actual sensitivity of the sensor, as measured at 100 Hz RMS, is then printed on a calibration sticker, along with the model number, serial number, bias voltage and date/time tested (See Figure 2).

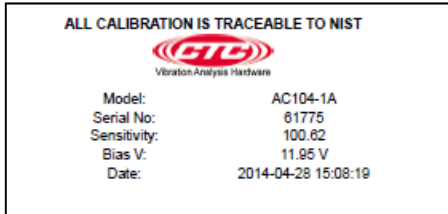


Figure 2-Typical CTC Calibration Card provided with all CTC accelerometers

Calibration Options

CTC provides every sensor with a standard CA10 single point calibration sticker enclosed with the sensor when shipped. Single point CA10 calibration sheet PDF’s are available through customer service for up to approximately one year after the original date of shipment. The model number and serial number of the sensor are required to ensure accuracy. CTC also offers an annual single point calibration for all sensors at no charge other than shipping costs.

Other Calibration Services

CTC offers more detailed calibration options for an additional charge. Multiple points are processed and plotted and graphed against frequency (See Figure 3). This information can be valuable for advanced analysts.

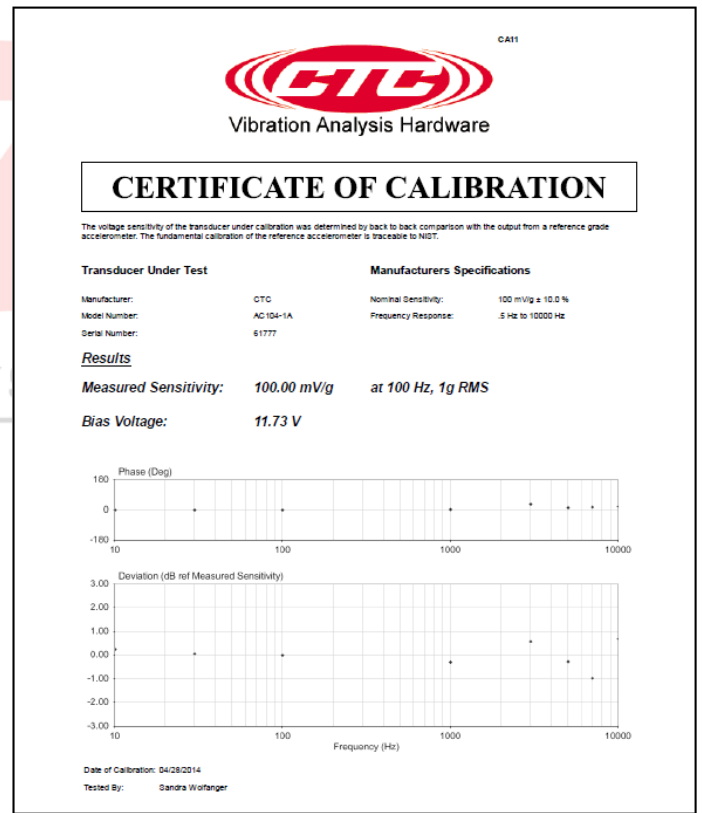


Figure 3-CA11 Calibration - Frequency Step calibration, showing calibration values for multiple points from 10 to 10,000 Hz (600 to 600,000 CPM)

If you have any questions or for further information please feel free to contact CTC directly via Email at techsupport@ctconline.com or to call 1-800-999-5290 in the US and Canada. or +1-585-924-5900 internationally.

If any CTC vibration analysis hardware product should ever fail, we will repair or replace it at no charge.