

NINETEEN-YEAR TEST OF BAROMETER LONG-TERM STABILITY

February 12, 2008

Warren Schuchman, Quality Supervisor, Calibration Laboratory Manager

Abstract: Long-term stability measurements have been made on three Paroscientific Digiquartz® barometers. Median drift rate of the units tested was -0.006 hPa (-0.0002 inHg) per year over the Nineteen-year test period.

Three Digiquartz® pressure transducers, S/N 34264, 34266, and 37131 are used as barometers in our calibration and drift laboratories. Periodically these are checked against our primary deadweight absolute pressure standards. We now have nineteen years of measurements on these transducers. These time series of data can be used to estimate long-term drift.

Drift data for the three transducers are shown in the adjoining graphs. Least-squares fits to the data have been used to estimate drift rates. The drift rates of the three units range from -0.004 hPa per year to -0.008 hPa per year, with a median drift rate of -0.006 hPa per year (-0.0002 inHg per year).

This is a remarkable performance. The cumulative drift is so small that much of the apparent drift could be caused by real changes in delivered pressure of our primary pressure standard. The primary pressure standard used for these measurements is a CEC Model 6-201 absolute deadweight tester. Traceable accuracy is better than 0.1 hPa or 0.003 inHg at the test pressure. Short-term repeatability of the pressure standard is approximately 0.02 hPa or 0.0006 inHg, and long-term systematic effects may total another 0.02 hPa or 0.0006 inHg. Paroscientific also calibrates with a DH Instrument PG7601 absolute dead weight tester with an accuracy of 0.02 hPa (0.0006 inHg).



