

It's a Myth that Less Accuracy is Required For Low-Pressure Measurement

Why is it in vacuum processing that accuracy seems not to be important? Temperature is measured and controlled to a fraction of a degree. Voltage and current are measured and controlled to a fraction of a percent. We measure time for a process operation down to seconds or better. This or that physical variable is measured and controlled to the proverbial gnat's eyebrow.

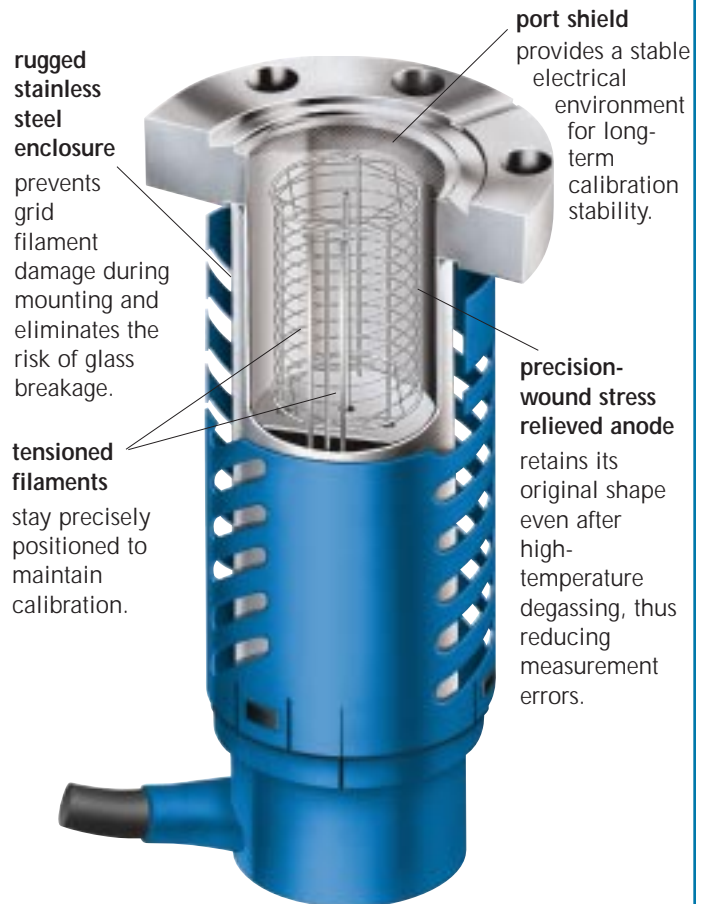
But when it comes to high vacuum measurement, accuracy seems not to matter. We speak of being in "the 6 range" or in "the low part of the 8 range." We seem to ignore the fact that the 6 range—that is the pressure difference between 1×10^{-6} and 1×10^{-5} Torr—involves a change in gas density of 10 times. We seem to think it is unimportant whether we are at 2×10^{-8} or 1×10^{-8} Torr—"Not to worry. It's okay. We're in the 8 range." Why does it matter if we pump to 2×10^{-8} rather than to 1×10^{-8} Torr?

At the higher pressure, we will have twice the density of molecules present as at the lower pressure. If this presents no problem, why then are we spending time and money pumping to a lower pressure than required? If a pressure of 2×10^{-8} Torr is satisfactory, could we use 3×10^{-8} Torr and save some pumping time? After all, nature abhors a vacuum and reducing the pressure by a factor of two or more does not come free.

As one goes to lower and lower pressure, pumping takes longer and longer, and while the chamber is being pumped, processing cannot proceed. If your IG is off by 30%, you may be pumping to 3.5×10^{-8} Torr instead of your intended 5×10^{-8} Torr. Thus, accuracy of pressure measurement becomes more and more important as a time saver in assuring appropriately clean conditions as pressure is reduced.

Any ionization gauge can be made accurate by calibration. But if the sensitivity changes with use, the calibration is no longer valid, pressure indications are inaccurate and you have not only wasted a few thousand dollars on a calibration, but you continue to waste expensive vacuum processing resources depending on inaccurate pressure indications to operate your process.

STABIL-ION® Gauges are the only ionization gauges designed to maintain a stable calibration in vacuum processing applications. □



Long-term calibration stability is assured by the unique design and careful manufacturing of STABIL-ION Gauges.

For more details about the *STABIL-ION* Gauge and how it can help you improve your results, request our *STABIL-ION* Product Information brochure containing valuable information on ionization gauges and their use.

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Advanced Vacuum Measurement Solutions

5675 Arapahoe Avenue
 Boulder, Colorado 80303-1398, USA
 Telephone (800) 776-6543 or (303) 443-7660
 FAX: (303) 443-2546
 Email: marketing@granville.com
 Web: www.granville.com