

Application Note

pH measurements in low ionic strength samples

Problems with measuring pH of low ionic strength (such as water) solutions:

- Readings that will not stabilize
- Reading that drift

Factors that contribute to above problems:

- Samples with a low ionic strength make the electrode work very hard to find H⁺
- In order to take pH measurements current must flow through the sample (from the sensing to reference sensors). Samples with low ionic strength are not a good conduit for the current.

Solution:

- Denver Instrument glass-body probes (such as 300729.1 or 300731.1) are very quick to respond. The probe typically can be placed in the sample and a stable reading taken. However if left in the sample the readings will drift.
- Denver free-flow, sleeve junction electrode (300738.1) is also great for low ionic strength samples. It provides a constant, user-defined flow of the filling solution (3M KCl) into the sample. This increases the ionic strength of the sample that alleviates the above problems. However the addition of KCl in the solution may not be desirable as it changes the composition of the sample. Typically this discrepancy is less than the drifting results without the addition.
- Store electrodes in 3M to saturated KCl solution, which has a high ionic strength and refreshes the probe. Leave the electrode in this solution as often as possible.