



M&D solutions

orp-chlorine monitoring

M&D offers a selection in monitoring for residual, total and gas-phase chlorine measurement, using ion-specific or ORP systems. www.murphyanddickey.com

Tips for Accurate ORP Monitoring

For over fifteen years, ORP measurement has been used successfully for free chlorine monitoring in wastewater treatment, cooling tower control, and water for disinfection. It is effective in high-maintenance areas where solids build-up would cause fouling of membrane-type chlorine sensors. The relationship between ORP and chlorine at various pH levels has been well-documented.

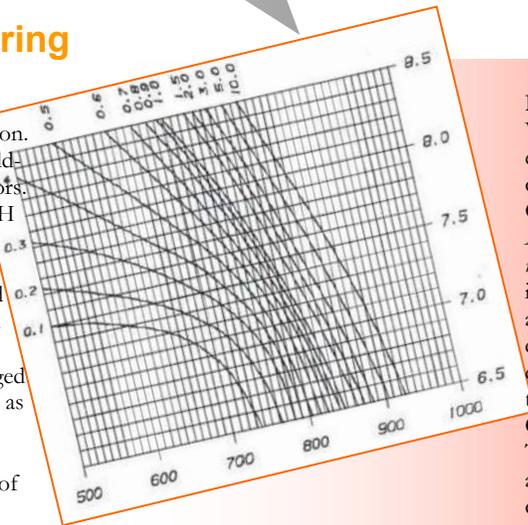
Unlike membrane-style specific-ion chlorine sensors, differential ORP sensors are more robust, lower-cost and coating-resistant. ORP electrode surfaces can be cleaned with soap-and-water or mild acid solutions. They have replaceable junctions and may be used in-line or submerged in a tank. ORP gives a more general, "millivolt" reading, as opposed to "ppm chlorine", but the results are more reliable in very low chlorine levels.

Chlorine concentration is affected by pH changes. pH of the solution needs to be controlled prior to taking a chlorine measurement. The pH should be stable and not fluctuate by more than 0.1 to 0.2 pH units.

Ferric chloride is typically used as a coagulant. If this is added upstream of the chlorine addition, a clarification process should be used.

An online pH/ORP analyzer displays pH and ORP readings that can be easily cross-referenced against a customized chlorine-ORP chart.

Call or email M&D to review your requirements today. 630-655-1080



Free Chlorine ORP/mV vs. pH

ORP/mV	pH									
	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5
0.1	100	100	100	100	100	100	100	100	100	100
0.2	200	200	200	200	200	200	200	200	200	200
0.3	300	300	300	300	300	300	300	300	300	300
0.4	400	400	400	400	400	400	400	400	400	400
0.5	500	500	500	500	500	500	500	500	500	500

Be Careful, ORP Is Non-Specific!
Variables in the process stream must be eliminated to ensure accurate chlorine correlation. Stabilized pH is key when using ORP to control chlorine feed. Here's why: *An ORP sensor measures all oxidation and reduction reactions in solution.* The assumption in ORP-chlorine monitoring is that the addition of the chlorine is the most dominant reaction in the solution. By eliminating other variables in the process then this will hold true.

Customizing Your Chlorine System Data
The pictured ORP vs. Chlorine charts are available can be used as a guide to develop a customized chart for your facility.

During the first month of measurement, a daily or twice-a-day reading of chlorine level as measured by a hand-held colorimeter or by a laboratory titration. The value is then plotted versus ORP as displayed by the analyzer. This enables development of a custom curve like those pictured here.

More questions? Contact M&D: 630-655-1080. Additional tech notes can be found at www.murphyanddickey.com.

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