YOUR TRUSTED PARTNER FOR DRINKING WATER ANALYSIS.

Online Solutions

Turbidity

Turbidity is one of the most important parameters in the drinking water treatment process. By monitoring turbidity in various parts of the treatment process, you can ensure regulatory compliance and have confidence in the quality of your water.

Turbidity is the relative clarity of a solution. Clarity is decreased by suspended solids such as clay, algae, organic matter or microorganisms. When light shines through the solution, these particles scatter and absorb the light. Turbidity is measured by the light reflected off of these particles at a 90 degree angle.

Given the wide range turbidity in the various steps of the treatment process, it is important to select the right instrument for each application.

Turbidity Range	**>10 NTU (up to 999NTU)**	**<10 NTU**
Turbidity Application	Raw influent water Clarifier effluent Filter backwash water	Filter effluent Combined filter effluent
Turbidity Solution	 *Surface Scatter 7sc*  *Solitax sc Sensor*	 *1720E sc*  *Ultraturb sc*

Online pH

pH is another important parameter to measure and control in a drinking water facility. pH directly impacts the degree of coagulation and flocculation that remove total organic carbon from raw inlet water. pH also affects the disinfecting power of chlorine and must therefore be kept in a very narrow range (7.0–7.8 pH) during and after the disinfection process; this range maximises the effectiveness of the disinfectant (which is less effective in pH >7.8) while minimising corrosion of systems caused by low pH (<7.0).

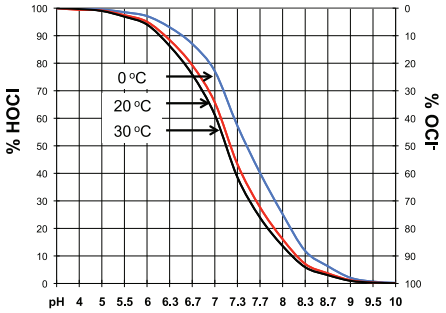
Hach's differential pH sensors use three electrodes instead of the two normally used in conventional combination pH sensors. This field-proven technique results in unsurpassed measurement accuracy, reduced potential for reference junction fouling, and elimination of sensor ground loops. The replaceable double junction salt bridge extends the operational life of the sensor, and significantly reduces maintenance requirements.

Main Benefits

- Long sensor life: 3 times longer overall sensor life than conventional combination pH sensors so replacement costs are minimised
- Accurate & stable pH readings: Reliable results with the longest time between maintenance visits so downtime is minimised

Disinfection

Disinfection with chlorine is often a preferred method to kill pathogens in drinking water. When chlorine is added to water, it forms hypochlorous acid (HOCl) which is a very strong disinfectant. This acid further dissociates to hydrogen and hypochlorite ions (H^+ and OCl^-), a significantly weaker disinfectant. The percentage of hypochlorous acid is higher in acidic environment (pH<7.5) and lower in basic environment (pH >7.5). Therefore, the same amount of chlorine added will have different disinfecting power based on the pH of the water. This balance is further affected by temperature. These variables are plotted in the Dissociation Curve pictured to the right.



Chlorine Dissociation Curve

This sensitive balance of chlorine chemistry in water can create various challenges for drinking water plants that want to make sure they have added enough chlorine to ensure water safety, but not too much to affect water taste or increase the chance of chlorine reacting with natural organic matter to form harmful disinfection byproducts.

There are two main methods for measuring chlorine levels in water, and choosing the right one for your application depends on various factors.

Chlorine measurement method	**Amperometric**		**Colorimetric**
Main benefit	Ideal for process control with fast reaction to chlorine concentration change.		High accuracy without calibration.
Best suited for	Stable pH, temperature and flow.		Any application with changing sample characteristic (pH, temperature, flow).
Chlorine analyser and main features	Sensor specificity to HOCl. No sanitary drain required.	Eliminates need for external buffer. Optional pH probe. No sanitary drain required.	Not affected by process changes and no calibration required. Low maintenance cost thanks to 30 day unattended run time.
	9184 sc 	*CL10* 	*CL17* 

Organics

Natural organic matter (humic, fulvic, tannic acids, etc.) may be present in natural water sources, and one of the main goals of the drinking water treatment process is to remove these dissolved organics. This is especially important when chlorine is used as a disinfectant, as chlorine reacts with organics to form carcinogenic disinfection by-products (THMs, HAAS, etc.) Dissolved organic material are monitored by 254 nm UV absorption.

Nitrates

Nitrates are usually found in high concentrations in ground water, especially when activities near the well can potentially contaminate the water supply. Nitrates are also found in surface water when nitrate fertilisers are leached during excessive rainfalls. High nitrate levels in water can cause methemoglobinemia or “Blue Baby” syndrome.

Sludge monitoring

Sludge thickening reduces the volume collected from the clarifier and sludge, dewatering the weight by centrifugation or filtration. Both of these processes can be optmised using online turbidimeters that measure suspended solids.


Uvas sc

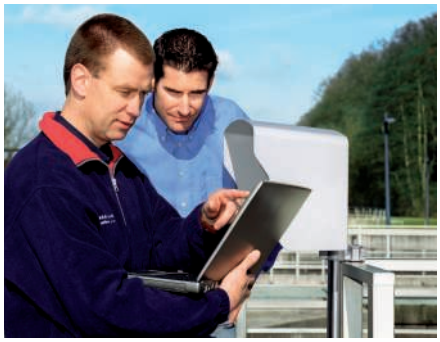

Nitratax sc


Sonatax sc

Hach online solutions for every drinking water application

Application	Turbidity	Disinfection[1]	pH	Organics	NItrates
Inlet	Surface Scatter 7 sc, Solitax sc	CL17, 9187sc[2]	pHD	Uvas sc	Nitratax sc
Clarifiers and Pre-Filtration	Surface Scatter 7sc, Ultraturb sc	CL17, 9187sc[2]	pHD		
Post-Filtration	Ultraturb sc, 1720E sc	CL17, CL10sc, 9187sc[2]		Uvas sc	
Disinfection Tanks (Contact Chambers)	Ultraturb sc, 1720E sc	CL17/CL10sc, 9184/5/7sc[3]	pHD		
Clear Well and Final Discharge (Outlet)	Ultraturb sc, 1720E sc	CL17/CL10sc, 9184/9187sc[3]	pHD		Nitratax sc

[1] Instrumentation recommended based on the application specifics, may need additional evaluation.
[2] Pre-oxidation with ClO_2 or its residual concentration.
[3] Process concentration of CL_2 , O_3 or ClO_2



Peace of mind with Hach Service

- Maximum instrument uptime
- Warranty extension options
- Predictable operating and maintenance costs
- Confidence in regulatory compliance

Contact us at hach.com to find:

- In-depth resources and application notes for drinking water analysis
- Information about our complete lab portfolio to supplement your online measurements
- Information about easily extendable system with our SC1000 controllers

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