

The water behind the brew

The instrumentation you use to test the water used for beer production is critical to maintaining the correct water profile for your beer. You need durable equipment that provides results you can trust. Thermo Scientific™ Orion™ analyzers and Thermo Scientific™ AquaSensors™ sensors are designed to provide the measurements you need to make the critical adjustments necessary to consistently obtain the desired beer quality. Choose Thermo Scientific products to help achieve your water monitoring needs today, tomorrow, and as your operation grows. We will be there every step of the way with educational materials and technical support.

Incoming Water

A successful brew starts with the incoming water and the water treatment applied. As operations expand into different locations, it can become challenging to brew the same tasting product using different incoming water sources with different chemical and taste profiles. Water monitoring and adjustment is key to producing a quality, consistent brew.

In-line Chlorine Monitoring

De-chlorinating your incoming water helps protect reverse osmosis (RO) membranes and the beer's taste. Chlorine levels should be monitored after removal treatments, like carbon filtration, UV degradation, and metabisulfite treatment. Monitoring chlorine levels after treatment can help determine the efficiency of removal and ensure equipment is maintained at highest efficiency. If source water treatment includes membrane filtration or ion exchange, removal of chlorine prior to these steps, helps prolong RO membrane and cation exchange cartridges lifetime.

The **Thermo Scientific™ Orion™ Chlorine XP™ analyzer** is capable of measuring both free and total chlorine in the range of 10ppb to 10ppm. This wide range allows the analyzer to be used for analyzing trace levels of chlorine in water post treatment or in rinse water. With the ability to add pH and temperature measurement capabilities, the Chlorine XP analyzer can provide a number of vital measurements that characterize the water all in one analyzer system. The Chlorine XP analyzer is designed to deliver high performance, reliability with low maintenance and operating costs.



In-line Ozone Monitoring

Ozone treatment is used to clean equipment and tanks. Monitoring ozone in rinse water allows you to determine when dissipation is complete. The **Thermo Scientific™ AquaSensors™ DataStick™ dissolved ozone measurement system** with a pre-calibrated ozone sensor is a simple low maintenance solution for monitoring ozone levels in incoming water.



In-line Calcium (Hardness) Monitoring

Calcium is important for many yeast, enzyme, and protein reactions, and affects the clarity, flavor, and stability of the beer. Calcium content, which determines water hardness, can be modified in water to match the water hardness at other brewery locations, brew different styles of beer, or modify the water for other uses, such as cleaning and used in boilers. Monitoring water hardness helps protect RO membranes, verify water softening treatment and indicate when the treatment system requires servicing.

The **Thermo Scientific Orion 2120XP calcium analyzer** is ideal for monitoring calcium hardness in incoming drinking water, as well as post treatment to determine the effectiveness of the water softener. Accurate and precise calcium measurements can be determined over a range of 25ppb to 500ppm. The analyzer uses a long life sensor and has no moving parts, making it easy to operate and maintain.



In-line Conductivity Monitoring

If source water treatment includes membrane filtration, such as RO, micro, ultra or nano-filtration, in-line conductivity monitoring after membrane treatment helps determine when to service or replace filtration cartridges and provides an alert for any upset condition. When boilers produce steam for heating the mash tun and kettle or for sanitizing purposes, in-line conductivity monitoring helps determine when to blowdown and/or perform maintenance.

The **Thermo Scientific AquaSensors DataStick dissolved conductivity sensor** is part of a flexible plug-and-play platform that can be connected to an analyzer or directly to a programmable logic controller (PLC). Rugged construction, high accuracy and 0-5000µS/cm measurement range* make it ideally suited for filter monitoring or boiler water measurements.



* Measurement range is 0-2000µS/cm when paired with a Thermo Scientific™ AquaPro™ multi-input analyzer.



Wastewater

Brewing and cleaning processes often generate large quantities of wastewater which must be treated before disposal in order to comply with local pretreatment requirements and avoid higher wastewater fees. Treatment may include removal of large solids, pH equalization, sedimentation, digestion, and final release of the wastewater. Extra discharge fees can be incurred depending on total suspended solids (TSS) and biological oxygen demand (BOD) limits. Outgoing wastewater pre-treatment is necessary for not only sustainability, but also to minimize disposal costs.

Suspended Solids Monitoring

Removal of solids is necessary at several stages of the brewery wastewater treatment process. The first stage in a wastewater treatment usually involves removal of larger solids, such as grains, hops, yeast, glass, and bottle caps. Later in the process, finer solids are removed by sedimentation or a filtration process. Solids are also removed during digestion by way of clarification or membrane filtration. Monitoring suspended solids after large solid removal, sedimentation, clarification, and filtration and at the point of discharge into the municipal sewer system helps you control and optimize the treatment process to avoid downtime, and minimize wastewater disposal costs.

The **Thermo Scientific AquaSensors DataStick suspended solids sensor** has rugged construction and fouling correction optics together with a 0-20,000mg/L measurement range, make it ideally suited for suspended solids monitoring in wastewater treatment.



pH Monitoring

After removal of large solids, a pH equalization tank is typically used to equalize flow and allow for pH adjustment to optimize sedimentation, digestion and other downstream treatment processes. If fine solids are removed by sedimentation, the pH must be optimized for the coagulation and flocculation. The microbes in aerobic, anaerobic, and/or membrane bioreactor (MBR) digestion processes are sensitive to pH and temperature. Large breweries can face tighter pH controls on their discharge to the municipal sewer system. Monitoring pH at the pH equalization tank, the sedimentation step, the digester, and/or at the discharge stream allows the brewery to control and optimize the treatment process and minimize wastewater disposal costs.

The **Thermo Scientific AquaPro multi-input analyzer** and **Thermo Scientific™ Orion™ pHR Process ROSS™ electrode** are designed for the challenging pH measurements in wastewater applications. The rugged design, reliability and stability of the ROSS reference technology used in this sensor make it ideally suited to deliver fast and accurate pH measurements. The AquaPro analyzer's large display provides a clear indication of the measurements even from a distance, while displaying up to four measurement inputs.



Dissolved Oxygen Monitoring

Brewery wastewater typically contains high levels of nutrients and total suspended solids (TSS) which need to be removed. When high volumes of wastewater are generated, nutrients and TSS will need to be removed before discharge to a local sewer system. Digestion will consume most of the nutrients and a sludge removal process will reduce solids. When aerobic treatment (traditional or MBR) is the digestion of choice, monitoring and controlling the dissolved oxygen levels during digestion will protect and feed the microbes, while controlling the electricity costs incurred by the blowers used to aerate the biomass.

The **Thermo Scientific™ AquaSensors™ RDO Pro-X optical dissolved oxygen sensor** is ideally suited for wastewater treatment, with its robust construction, optical sensor technology, no cross sensitivity, conditioning or need for membranes, it offers a measurement range of 0-20ppm of dissolved oxygen.



Ordering Information

Description	Cat. No.
Thermo Scientific Orion Chlorine XP analyzer	CXP71
Thermo Scientific AquaSensors DataStick dissolved ozone measurement system	AQZ1C0
Thermo Scientific Orion 2120XP calcium hardness analyzer	2120XP
Thermo Scientific AquaSensors DataStick conductivity system	CC31A or CC31B, DS31-WA, CA32B1A, AP1XXXK
Thermo Scientific AquaSensors DataStick suspended solids measurement system	RT2141, AP1XXXK
Thermo Scientific AquaPro multi-input process analyzer	AP1XXXK
Thermo Scientific Orion pH/ Process ROSS electrode	SH36A9E210
Thermo Scientific AquaSensor DataStick RDO Pro-X RDO/DO measurement system	RD6A43, AP7XXXK



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