

# Total residual oxidant in water quality monitoring and ISE technology

Biocidal treatment of wastewater and cooling water prior to discharge have become a prominent concern, due to associated hazards and aquatic toxicity when released into the environment. Total residual oxidant (TRO) measurement, specifically biocide concentration, e.g., Cl<sub>2</sub>, in effluent is a critical measurement in many industries. The Environmental Protection Agency guidelines typically require that TRO measures lower than 0.1 ppm before effluent is discharged into natural bodies of water. Effective water treatment

and monitoring are essential for the normal operation and compliance of a wide range of industries, including pharmaceutical manufacturing (RO membrane protection), power generation, food, manufacturing, refinery, and global container shipping. While many solutions are available, very few are designed to perform in line with the standard requirements and regulations across the entire spectrum of water management standards.

## The challenges



Measuring and regulating the types of total residual oxidants present in water treatment applications.

- Cl<sub>2</sub> (Chlorine)
- ClO<sub>2</sub> (Chlorine Dioxide)
- Br<sub>2</sub> (Bromine)
- NH<sub>2</sub>Cl (Monochloramine)



Potential interference from particles, color, inorganic, and organic compounds.



The Water Matrix: cooling water, sea water, and wastewater.

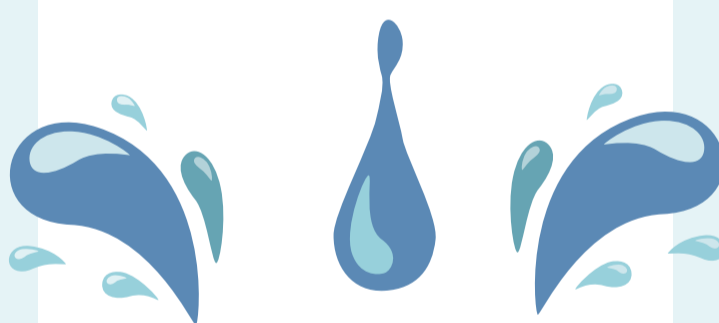
## The solution

### Aligning with water monitoring standards

In order to meet the emerging requirements for long-term operation with minimal instrument drift, the following characteristics are now essential to addressing the challenges inherent in water management and should be carefully considered in selecting the best solution.

#### Accuracy & Precision:

Real-time, accurate measurement that is not impacted by suspended solids, color or clogged membranes.



#### Operational Costs:

Stable calibration means reduced field calibration needs. Automatic on/off feature provides on-demand measurement, reducing operator intervention.

#### Total Cost of Ownership:

Self-cleaning cell design minimizes down-time and cleaning efforts.

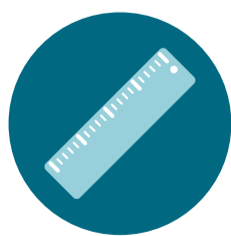
#### Maintenance Frequency:

Long sensor life with minimal to no maintenance required.

Through innovation and technology development utilizing electrochemistry, it is possible to meet stringent analysis and regulatory requirements with the Thermo Scientific™ Orion™ TRO Analyzer:



No recalibration or maintenance needs for up to 180 days compared to weekly or daily amperometric Cl<sub>2</sub> sensor



Increased measurement accuracy compared to a DPD analyzer (< 10 ppb error vs. up to 1.2 ppm error)



Lower limit of detection compared to DPD colorimetric analysis (1 ppb vs. 30 ppb or higher)



Minimal Instrument Drift: ≤ 5% over 180 days compared to the current industry standard of < 30 days

Learn more about the Orion 7070iX TRO Analyzer by visiting [www.thermofisher.com/troanalyzer](http://www.thermofisher.com/troanalyzer)

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