

## Wastewater dechlorination compliance

The Thermo Scientific™ Orion™ 7070iX TRO Analyzer is designed to provide fast, accurate and reliable online detection of total residual oxidants (TRO) – optimized for applications that require low level detection of TRO.

### Markets

- Power
- Wastewater
- Food and Beverage

### Applications

- Cooling water discharge
- Wastewater discharge

Oxidizing biocides (e.g. chlorine) are commonly used to kill pathogens in water for disinfection in many industrial applications, such as cooling towers, drinking water and tertiary wastewater treatment. The water in these processes is often treated with chlorine, chloramine, bromine or chlorine dioxide to control microbiological fouling and pathogen levels. Strict regulatory discharge permits in many countries (e.g., United States and Canada) require that chlorine levels must be monitored online and reduced below 100 ppb or less before the water can be discharged to the environment. This introduces significant challenges to accurately measuring and controlling TRO, which is a sum of all oxidizing biocides. Process control is achieved by measuring TRO online to ensure accurate dosing to control biological growth at optimal operational cost of biocides and oxygen scavengers. More importantly, the TRO levels must be low enough for discharge to comply with the local regulatory discharge permit. Current online DPD colorimetric measurement for TRO has a few limitations, such as higher detection limit, larger error at low ppb level, drift due to discoloring reagent and poor performance in sea water and other waters with interfering ions. The new Orion 7070iX TRO Analyzer with electrode sensing technology solves these issues with significantly improved detection limit and accuracy using the existing U.S. EPA approved methods.



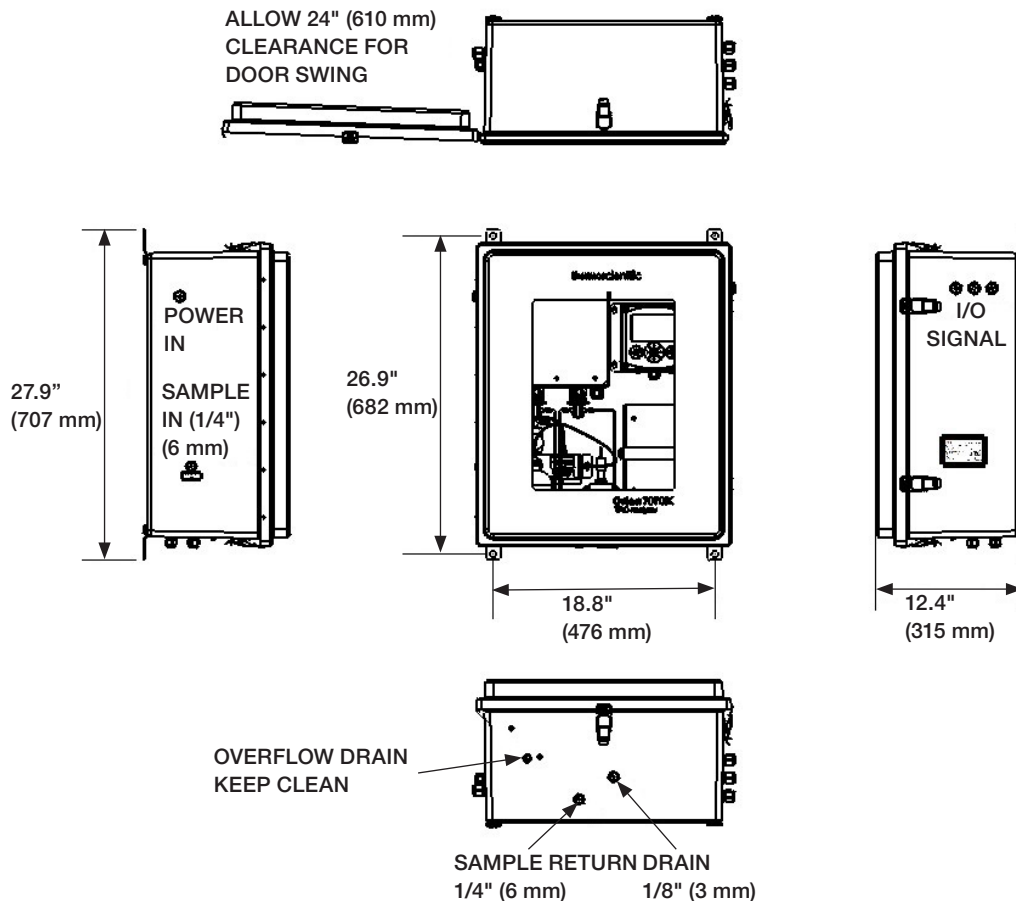
**Orion 7070iX TRO Analyzer**

### Advantages

- Optimized reagent consumption is designed to allow for 60 days between reagent consumption (may vary depending on continuous or batch mode options)
- Electrode based measurement technology that is not subject to interferences observed in the DPD method (color and turbidity)
- Utilizes a bead cleaning technology
- Designed to provide accurate and precise measurements to meet low level regulatory requirements
- Compact size – small footprint supports panel or wall mounting
- Simplified operation – intuitive menu simplifies navigation
- Low operating costs – minimal maintenance with low power consumption
- Analyzer can operate in continuous or simulated batch mode

## Engineering Specifications

1. The TRO analyzer measures Total Residual Oxidant concentrations using an EPA approved ion selective electrode method.
2. Measurement can be continuous or interval mode.
3. The range of the measurement is between 0.001 and 15 ppm.
4. The detection limit is 0.001 ppm in the range of 0.001-15 ppm.
5. Repeatability is  $< \pm 5\%$  of reading or  $\pm 10$  ppb, whichever is greater from 0.001-15 ppm.
6. Analyzer provides 2 isolated 4-20 mA outputs and 3 programmable Form C relays. Relays are rated for 1 A @ 250 VAC.
7. Analyzer has self auto cleaning function and can run without maintenance for up to six months.
8. Display is a digital color graphics LCD 4.25" (108 mm).
9. Sample delivery requirement is 40 mL/minimum.
10. Analyzer is capable of grab sample analysis.
11. Analyzer can be wall or panel mounted.
12. Analyzer fluidics cabinet is constructed to IP54. Enclosure is constructed of fiberglass with a clear poly window.
13. Power requirement is 100-240 VAC, 50/60 Hz, 40 W.
14. Analyzer has cTUVus approvals to meet UL 61010-1, CSA C22.2 No. 61010-1 certifications, FCC Class A requirement and CAN ICES-1/NMB-1.
15. Analyzer meets EC Directives 2014/30/EU and 2014/35/EU, KC, RCM, China RoHS.
16. Analyzer has sample flow sensing.



Orion 7070iX TRO Analyzer Dimensions

## Orion 7070iX TRO Analyzer Specifications

### Measurement Performance

Measuring Range	0.001-15 ppm as TRO, TRC, TC
Accuracy	Less than 5% of reading or 10 ppb, which ever is greater from 0.001-15 ppm
Resolution	0.001 ppm in all ranges
Response Time	95% within three minutes
Precision	±2% of reading or ±10 ppb, whichever is greater from 0.001-15 ppm
Limit of Detection	0.001 ppm
Method	Based on electrode 9770 ISE EPA approved standard method

### Environmental

Ambient Operating Temperature	5 to 45 °C (41 to 113 °F)
Maximum Humidity	85% at 40 °C (104 °F)

### Sample Requirements

Sample Flow	40 mL/min
Sample Pressure	5-50 psig
Sample Supply	Continuous
Sample Temperature Range	5 to 45 °C (41 to 113 °F)
Max TSS	1000 ppm
Max particle size	130 microns
Max Turbidity	500 NTUs
Chlorine	up to 20 ppm
Sample Inlet/Outlet Connections	1/4" LLDPE Tubing - length 2 ft min
Drain Tubing	1/8" LLDPE Tubing - length 2 ft min
Sample Streams	One

## Construction

Enclosure Integrity	IP54
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Enclosure Dimensions	27.9 inches x 18.8 inches x 12.4 inches (709 mm x 478 mm x 315 mm)
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Shipping Weight	20 kg (45 lbs) without reagent
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## Electrical

Power Requirements	100 - 240 VAC, 50/60 Hz, 40 watts
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## Data and Control

Current Loops	Two 4-20 mA (isolated) Maximum 900 ohm load
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Relays	Three Form C, 1 A @ 250 VAC – Programmable
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Remote Start	2 Wire Electrically Isolated Input Isolation: 500 VDC Input Signal Range: +3 VDC to +5.5 VDC (referenced to -side signal)
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## Regulatory

Safety	CE: EN/IEC61010-1, cTUVus
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EMC	CE: EN61326-1, FCC: Class A, ISED: CAN ICES-1/NMB-1, KC, RCM.
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\*Additional filtration may be required.

Certifications:



## Orion 7070iX TRO Analyzer

**Global support** - with experience that comes from supporting our customers for over 50 years throughout the world, our water quality specialists and customer support teams offer a quick, thorough and professional response to any problem encountered.

**Focus on user benefits** - we work closely with you to define your needs, and ensure you are using the analyzer in a way that improves your bottom line. For more information, visit [thermofisher.com/troanalyzer](https://thermofisher.com/troanalyzer).

### Ordering Information for the Orion 7070iX TRO Analyzer

Cat. No.	Description
7070IX	TRO Process analyzer
7070CK	Calibration kit, TRO standard 1000 ppm
7070RE	TRO reagent, 2 x 5 liters
<b>Maintenance Items</b>	
7070EK	Electrode kit for 7070iX (100020S)
7070TK	Tubing kit for 7070iX, for tube and cell cleaning
7070FLT	Filter Strainer for TRO analyzer

Find out more at [thermofisher.com/troanalyzer](https://thermofisher.com/troanalyzer)

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