Pyxis®

Precision Monitoring Solutions for Reverse Osmosis & Desalination

www.pyxis-lab.com

Reverse Osmosis (RO) Desalination

Reverse Osmosis (RO) desalination is a cutting-edge water treatment process that removes dissolved salts, minerals, and contaminants by forcing water through semi-permeable membranes under high pressure. As global water scarcity intensifies, RO has become a critical solution for transforming seawater and brackish sources into safe, usable water for municipal, industrial, and commercial applications.

However, the performance and longevity of RO systems are highly dependent on precise monitoring of key water quality parameters—such as pH, conductivity, TDS, chlorine, ORP, and flow rate—to prevent membrane fouling, optimize chemical dosing, and ensure regulatory compliance.

Pyxis Lab Inc. delivers advanced inline sensor technology, smart analytics, and plug-and-play monitoring systems designed specifically for the challenges of RO desalination. Our innovative solutions empower operators with real-time insights and reliable data to drive system efficiency, protect assets, and achieve superior water quality at every stage of the process.

pH & ORP

Critical in RO desalination to optimize chemical dosing, prevent scaling, and protect membrane integrity. Maintaining proper pH ensures ideal solubility conditions for salts, while ORP helps track the presence or removal of oxidizing agents like chlorine that can damage membranes if not properly neutralized.

Chlorine & Sulfite Monitoring for Dechlorination

Plays a vital role in protecting RO membranes from oxidative damage and ensuring effective dechlorination. While chlorine is used upstream for disinfection, residual levels must be tightly controlled and neutralized with sulfite, which itself must be monitored to avoid overdosing and unnecessary chemical consumption.

Turbidity

Essential for assessing the presence of suspended solids that can lead to membrane fouling and reduced system performance. By tracking turbidity in the feedwater, operators can evaluate pretreatment effectiveness and take corrective action before particulates compromise membrane integrity.

Conductivity

A key indicator of salinity and overall ion concentration throughout the RO desalination process. It enables operators to evaluate membrane performance, calculate salt rejection rates, and verify product water quality in real time.

PTSA Tracer Product

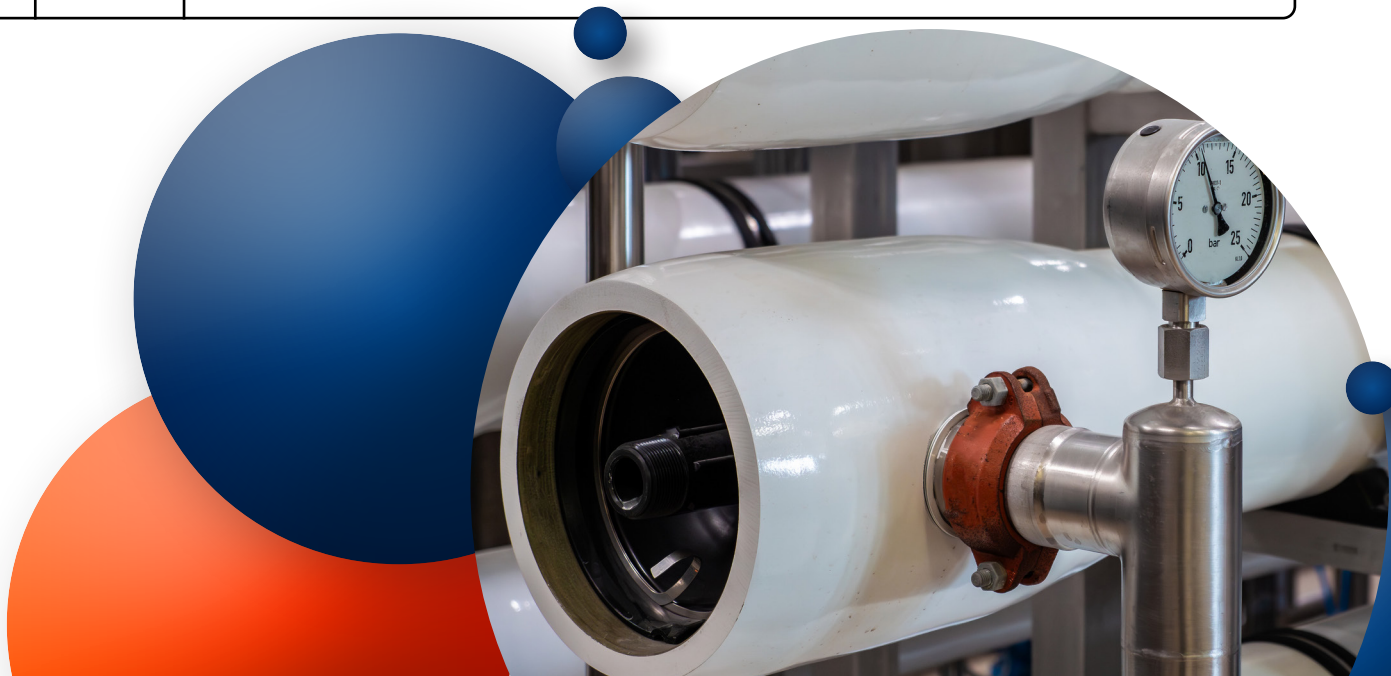
1,3,6,8-Pyrenetetrasulfonic Acid is a fluorescent tracer dye used in RO desalination to monitor and verify the accurate dosing of antiscalants and other treatment chemicals. Continuous PTSA monitoring ensures chemical feed consistency, helps prevent scaling, and supports optimized chemical usage without overdosing.

Smart Sensor Solutions

Pyxis Lab, Inc. sensors are purpose-built for the demanding conditions of RO desalination, combining industrial-grade construction with advanced optical and electrochemical technology. Designed for inline installation and real-time monitoring, our sensors offer exceptional accuracy, low maintenance, and seamless integration—making them ideal for detecting critical parameters like chlorine, sulfite, pH, conductivity, turbidity and tracer dyes throughout the desalination process.

Sensor	Part #	Measured Analyte	Measurement	Material	Install Format
ST-500RO	50669	PTSA for Reverse Osmosis	0.00–40.00ppb	CPVC	ST-001 Tee
ST-710	53001	pH	0–14	CPVC	ST-001 Tee
ST-711	53002	ORP	±1,500mV	CPVC	ST-001 Tee
ST-712	53003	pH + ORP	0–14, ±1,500mV	CPVC	ST-001 Tee
ST-722	53103	Ultra-Low Conductivity	0.02–10,000µS/cm	PEEK, Hastelloy	1” Thread
ST-724	10009	Ultra-Low Conductivity	0.02–1,000µS/cm	PEEK, Hastelloy	1” Thread
ST-725	53108	Ultra-Low Conductivity	0.02–200µS/cm	PEEK, Hastelloy	1” Thread
ST-728	53117	Ultra-Low Conductivity	0.02–10µS/cm	PEEK, Hastelloy	1” Thread
ST-730	53201	Turbidity	0–100NTU	CPVC	ST-001 Tee
LT-737	53216	Ultra-Low Turbidity	0.000–5.000NTU	304SS	FR-100 or FT-100
LT-737B (EU)	53224	Ultra-Low Turbidity	0.000–5.000NTU	304SS	FR-100 or FT-100
IK-765P-DCL	49514	F/T Chlorine + Sulfite + pH	0–5ppm + 0–100ppm	CPVC, Titanium	Panel Solution

Sensor	Part #	Monitoring Stage
ST-500RO	50669	Pretreatment and Chemical Dosing Stage or Upstream Return Loop
ST-710	53001	Pretreatment Stage and Reverse Osmosis Inlet
ST-711	53002	Pretreatment Stage and Dechlorination Verification
ST-712	53003	Pretreatment Stage
ST-722	53103	Feedwater, Posttreatment and Pre-Reverse Osmosis, CIP Loops, Reject Brine Line
ST-724	10009	Feedwater, Posttreatment and Pre-Reverse Osmosis, CIP Loops, Reject Brine Line
ST-725	53108	Feedwater, Posttreatment and Pre-Reverse Osmosis, CIP Loops, Reject Brine Line
ST-728	53117	Feedwater, Posttreatment and Pre-Reverse Osmosis, CIP Loops, Reject Brine Line
ST-730	53201	Post-Intake/Pre-Filtration and Post-Filtration/Pre-Membrane Inlet
LT-737	53216	Final Pretreatment, Just Before RO Inlet
LT-737B	53224	Final Pretreatment, Just Before RO Inlet
IK-765P-DCL	49514	Reverse Osmosis Pretreatment, After Chlorine Dosing & Before RO Inlet



ST-500RO PTSA Sensor

The ST-500RO-PTSA is a low-range fluorescent tracer sensor designed to measure PTSA from 0–40 ppb in real time, providing precise verification of antiscalant dosing in RO pretreatment systems. Its compact, CPVC construction makes it ideal for inline monitoring with minimal maintenance.

Sensor	Measurement	Range
ST-500RO	PTSA for Reverse Osmosis	0–40ppb

ST-71X pH and/or ORP Sensors

The ST-71X Series delivers robust, flat-surface pH and/or ORP sensors engineered for reliable inline measurement in RO desalination and water treatment systems. With durable CPVC construction, replaceable reference assemblies, and resistance to fouling, these sensors provide accurate, low-maintenance monitoring in chemically dynamic environments.

Sensor	Measurement	Range
ST-710	pH	0–14
ST-711	ORP	±1,500mV
ST-712	pH + ORP	0–14, ±1,500mV

ST-72X Ultra-Low Conductivity Sensors

The ST-72X Series are high-precision, ultra-low conductivity sensors designed for real-time monitoring in high-purity water and RO permeate applications. Featuring a Hastelloy electrode, integrated temperature compensation, and a durable stainless steel body, the ST-72X sensors offer reliable performance across a wide range—from 0.02 to 10,000 µS/cm—making them ideal for tracking RO efficiency, system recovery, and product water quality.

Sensor	Measurement	Range
ST-722	Conductivity	0.02–10,000µS/cm
ST-724	Conductivity	0.02–1,000µS/cm
ST-725	Conductivity	0.02–200µS.cm
ST-728	Conductivity	0.02–10µS/cm

ST-730 Turbidity Sensor

The ST-730 is a CPVC turbidity sensor designed for inline monitoring in RO pretreatment and filtration systems. With a measurement range of 0–100 NTU, it delivers accurate, real-time detection of suspended solids, helping operators ensure effective filtration and protect RO membranes from fouling.

Sensor	Measurement	Range
ST-730	Turbidity	0–100NTU

LT-737/B Ultra-Low Turbidity Sensors

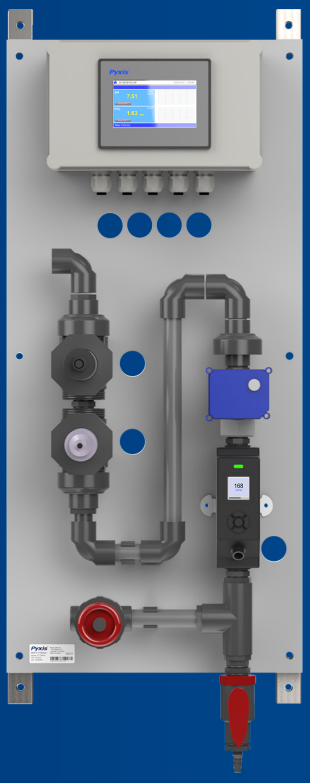
The LT-737 is a high-precision, ultra-low turbidity sensor designed for clean water and RO permeate monitoring applications. Featuring a 304 stainless steel body and advanced optical detection, it delivers reliable turbidity measurements from 0 to 5 NTU with exceptional sensitivity—ideal for detecting fine particulates and verifying post-treatment water clarity in high-purity systems.

Sensor	Measurement	Range
LT-737	Ultra-Low Turbidity	0.000–5.000NTU
LT-737B	Ultra-Low Turbidity	0.000–5.000NTU (InfraRed)

IK-765P Dechlorination Panel

The IK-765P-DCL is a compact, turnkey dechlorination monitoring panel designed specifically for RO pretreatment applications. It features integrat-ed flow control, a precision rotameter, and a pre-plumbed CPVC flow cell to ensure optimal sampling conditions. The panel the ST-765P-DCL multi-parameter sensor for real-time measurement of Free or Total Chlorine, Sulfite, pH, and ORP—delivering complete, inline visibility of oxidant removal and chemical dosing efficiency to protect RO membranes and streamline system performance. It offers an optional tee for the ST-500RO PTSA sensor for tracer chemical measurement.

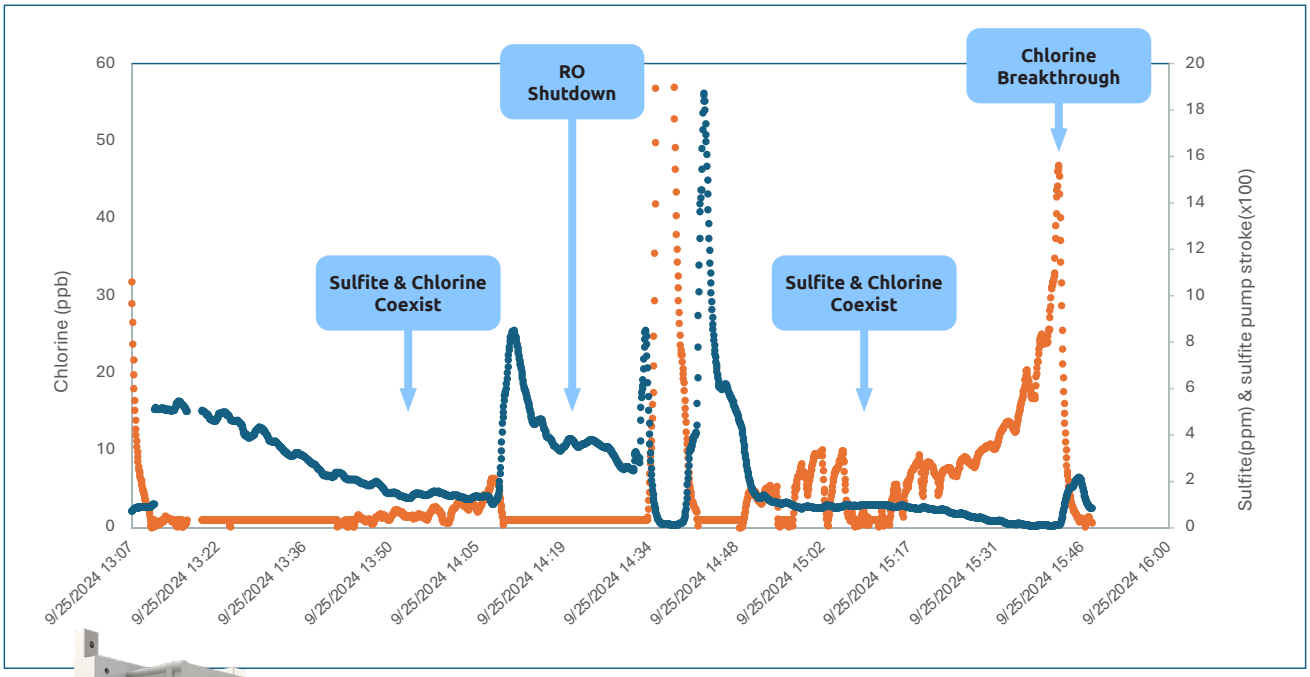
Sensors	Measurement	Range
ST-765P-DCL	F-Cl or T-Cl + Sulfite + pH	0–5ppm + 0–100ppm
ST-500RO	PTSA (OPTIONAL)	0.00–40.00ppb



IK-765P-DCL Captured Treatment Trends.

The data provided by the Pyxis Lab, Inc. IK-765P-DCL Panel demonstrates the ability to deliver high-resolution, real-time monitoring of both residual chlorine and sulfite levels during the dechlorination process.

In this chart from a customer facility, the panel captures dynamic changes in free chlorine (ppb) and sulfite dosing (ppm), showcasing its precision and responsiveness to fluctuating chemical levels. This detailed insight allows operators to quickly identify dosing imbalances, optimize chemical feed rates, and maintain compliance with regulatory discharge limits—all while protecting downstream RO membranes. The DCL Panel ensures tight process control and data-driven decision-making for critical water treatment systems.



ST-765-DCL Free Chlorine
ST-765-DCL Sulfite

Smart Sensing. Proven Performance.

Pyxis Lab, Inc. sensors are engineered to meet the demanding requirements of reverse osmosis (RO) desalination systems, delivering precise, real-time monitoring of key water quality parameters from pretreatment through permeate. With robust materials like stainless steel, Hastelloy, and CPVC, and advanced measurement technologies including fluorescence, electrochemical, and optical detection, Pyxis sensors offer exceptional durability, accuracy, and ease of integration.

Whether you need to track Free Chlorine, Sulfite, pH, ORP, Conductivity, Turbidity, or Fluorescent Tracers like PTSA, Pyxis provides a comprehensive, modular solution—designed to optimize chemical dosing, protect membrane integrity, and ensure consistent system performance.

Elevate your RO Desalination monitoring with Pyxis Lab, Inc. smart sensor technology. To learn more or request a customized solution, contact us!

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