# Wastewater

WATER QUALITY CAPABILITIES AND SOLUTIONS

**YSI**

a **xylem** brand

## Table of Contents

## YSI has a long, proud history of innovation.

For over 60 years, we have made instruments, sensors, software, systems, and data collection platforms for water quality monitoring and testing. Our full suite of water quality products can be incorporated into any wastewater monitoring or sampling application. They are field-tough, lab-smart, and applicable throughout your wastewater facility — from spot sampling to network monitoring.

And YSI customers are backed by our peerless reputation for quickly solving problems. Our long-standing relationships are built through dedicated, well-trained customer service and support teams. YSI employees have years of knowledge and know-how to share with you.

YSI's technology is developed using environmentally responsible business practices. We are registered to, and comply with, several certifications and directives, such as ISO 9001, ISO 14001, ISO 13485, European WEEE, MCERTS, EN46001, and RoHS.

Thank you for your interest in YSI. We stand ready to partner with you in your wastewater process.

# Media

## Application Notes

Optical DO Measurements at Wastewater Treatment Plants

IQ SensorNet Measures Turbidity and TSS in a Highly Productive Wastewater Plant

ORP Management in Wastewater as an indicator of Process Efficiency

Industrial Pretreatment Made More Efficient, Representative

Improve Wastewater Treatment Efficiency and Effluent Quality

## Follow YSI on:

Facebook
**facebook.com/myYSI**

Twitter
**twitter.com/ysiinc**

Scoop.it
**scoop.it/wastewater**

LinkedIn
**linkedin.com/company/ysi**

## Videos YouTube

View product demos, field studies, and instrument installations.

## WE KNOW D.O.™

View Dissolved Oxygen technology webinars, videos, selection guides, product spec sheets, and more at our dissolved oxygen resource page.

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On your phone or tablet, scan the QR Code to view the Pro Series spec sheets or videos.

| Pro Plus | ProODO | Pro20 | Pro30 | Pro2030 |
|---|---|---|---|---|
| Spec sheet | Spec sheet | Spec sheet | Spec sheet | Spec sheet |
| Video | Video | Video | Video | Video |

# Professional Plus

The YSI Pro Plus accommodates any combination of Pro Series sensor (parameter) and cable (parameter combination and length). This compact handheld includes simple calibrations, detailed GLP data, screen-specific Help instructions, auto-buffer recognition, mil-spec connectors, re-cal prompts, auto-stable indicators and security passwords to help make your job easier in the field or lab. Finally, a true professional instrument for the wastewater professional.

## Tougher

- Rubber, over-molded IP-67 waterproof case (even without battery cover)
- 3-year instrument warranty
- 2-year cable warranty
- Rugged cables, sensors, and military-spec connectors
- Drop-tested 1 meter at all angles
- Scratch-resistant lens; viewable with polarized glasses
- Instrument floats
- Backlit display and keypad

**Quatro Cable** (605790)
The multiparameter Quatro cable allows the measurement of temperature, conductivity, salinity, dissolved oxygen and any two ISEs - pH, ORP, ammonium, nitrate or chloride.

**Parameters**
Temperature
Conductivity/
Specific conductance
Salinity
TDS
Dissolved oxygen
(electrochemical)
pH
ORP
BOD (electrochemical)
Ammonium
Chloride
Nitrate

## Smarter

- 5,000 data sets in manual mode;
  up to 50,000 in continuous mode
  (depending on number of parameters)
- Search function filters user-defined data
- Interval or single-event logging
- 100 folder & site list data structure
- Detailed GLP data
- USB connection powers the instrument
- Auto-buffer recognition; up to 6-point cal
- Compatible with BOD Analyst Pro software

## Free Data Manager Software

- Easy-to-use software to manage all your
  data studies
- View, print, and export  graphical and
  tabular data
- View and print GLP data
- Quickly configure just one or multiple
  instruments
- Conduct real-time studies

**Cable options
for lab**

### Cable options for field

Single port cable
60510 - ISE
60520 - DO
60530 - Cond

Single port cable
with conductivity
6051030 - ISE/Cond
6052030 - DO/Cond

Dual port cable
6051010 - ISE/ISE
6051020 - ISE/DO

4-port cable
605790 - ISE/ISE/DO/
Cond

Self-stirring BOD
Lab grade ISE
605780 - BOD
605107 - pH
605108 - ORP
605109 - pH/ORP

Order instrument, cables, and sensors separately (kits also available).

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# ProODO®

The ProODO® is the best handheld optical dissolved oxygen instrument on the market. Its combination of versatility, field-worthy durability, and data management are second to none. The ProODO's rugged design is verified with an IP-67 waterproof rating (even without the battery cover); mil-spec connectors; and rigorous drop, cable flex, and strength tests. You'll receive extreme confidence with every purchase and help ensure your plant's operational efficiency with the ProODO's accuracy.

## Tougher

- Optical, luminescent technology eliminates membranes
- Rubber, over-molded IP-67 waterproof case (even without battery cover)
- Low maintenance - no anode or cathode
- No flow requirement and no interference from hydrogen sulfide or other gases
- 3-year instrument warranty
- 2-year cable and probe warranty
- Drop-tested 1 meter at all angles
- Rugged cables and military-spec connectors

**EPA** Approved Methodology

**ODO®** Optical DO

Optical technology eliminates stirring and interferences while reducing the need for calibration and maintenance – saving time and money.

OFFICIAL
WEFTEC
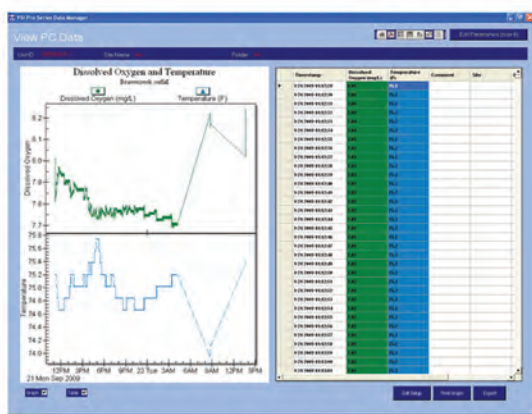**Operations
Challenge
Instrument**

**WE KNOW**™
**D.O.**

## Smarter

- 5,000 data sets in manual mode;
  up to 50,000 in continuous mode
- Expanded DO range of 0-500%; 0-50 mg/L
- Fastest response times available
- 100 folder & site list data structure
- USB connection powers the instrument
- Interval or single-event logging
- Unique, protective probe guard
- Compatible with BOD Analyst Pro software
- Extremely quiet stirrer



**Probe guard protects sensing element**



## Free Data Manager Software

- Easy-to-use software to manage all
  your data studies
- View, print, and export graphical
  and tabular data
- View and print GLP data
- Quickly configure just one or
  multiple instruments
- Conduct real-time studies

Order instrument and cables separately. DO sensor cap is included with cable order (kits also available).

# Pro20

**Parameters**
Temperature
Dissolved oxygen
(electrochemical)
BOD
(electrochemical)

The YSI Pro20 dissolved oxygen instrument fits the need for a true combined lab and field meter that's simple, easy-to-use, and rugged. Measure DO in the field with the rugged handheld and conduct lab tests with the self-stirring BOD probe within minutes.

- 3-year instrument warranty; 2-year cable
- One Touch Cal allows calibrations within 3 seconds
- 50 data set memory ensures data integrity
- Graphic, backlit display and glow-in-the-dark keypad
- Choose either Galvanic or Polarographic sensors
- Quickest response times, PE cap membranes
- Languages – English, Spanish, French, German
- Internal barometer
- Combination lab or field
- Compatible with BOD Analyst Pro software

# Pro2030

The YSI Pro2030 dissolved oxygen/conductivity instrument provides DO readings automatically compensated for changes in salinity. The internal barometer, Quick Cal feature and simple interface make getting accurate data extremely simple.

• Proven, super-stable conductivity electrode
• 3-year instrument warranty; 2-year cable
• Quick Cal allows calibrations within seconds
• 50 data set memory ensures data integrity
• Graphic, backlit display and glow-in-the-dark keypad
• Choose either Galvanic or  Polarographic sensors
• Quickest response times, PE cap membranes

**ysi.com/pro2030**

# Pro30

The YSI Pro30 conductivity instrument fits the need for an accurate, easy-to-use conductivity, specific conductance, salinity instrument.

• 3-year instrument warranty; 2-year cable and sensor
• 50 data set memory ensures data integrity
• Graphic, backlit display and glow-in-the-dark keypad
• Proven, super-stable conductivity cell built into the cable
• Quick Cal recalls previous cal values
• Languages – English, Spanish,  French, German

**ysi.com/pro30**

# IQ SensorNet 2020 XT

Improve operational efficiency with continuous data. With an easily scalable solution, the 2020 XT allows for the connection of up to 20 sensors. Add sensors at any time and at any location or change them out with ease. This completely modular plug-and-play system allows you to monitor and control the water quality in your wastewater facility continuously and accurately.

## Only YSI can offer:

- 3-year warranty
- Ultrasonic cleaning on some sensors
- System-wide lightning protection
- Modular expansion from 1 to 20 sensors
- Easily stack modules without extra wiring
- One cable for power and communications
- Factory-calibrated optical DO cap with a 2-year warranty
- USB interface (can be used for security)
- System redundancy for backup control
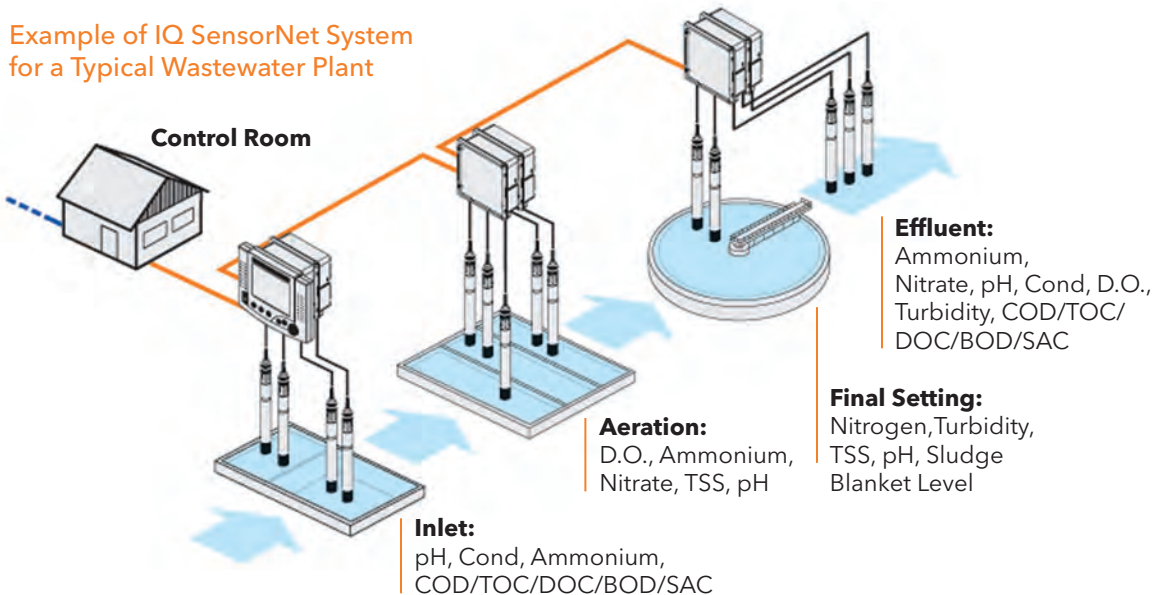
## The System 2020 XT

- Up to 20 digital sensors
- Easy, intuitive system expansion
- Centralized power supply along entire network
- Numerous relays and analog outputs may be selected
- Communications via modem, Bluetooth, radio transmission, PROFIBUS, MODBUS, RS-232
- LED status update
- Integrates into existing systems
- Change or move parameters at any time with ease

The YSI IQ SensorNet 2020 XT is a modular water quality monitoring system for a complete sensor network, ideal for many installation needs. The modular system can accept additional sensors easily at any time. This is a powerful system to continuously measure water quality parameters anywhere in a facility for process control.

Immediate benefits include a better understanding of your process with the ability to manage the system, early detection of process failures, improved compliance with meeting regulatory targets, and cost savings through increased efficiency (reduced energy, pump/blower maintenance, labor). It's estimated 3% of all energy consumption in the U.S. goes toward WWTP operation.

The entire system can accommodate up to 20 sensors in any combination. The 2020 XT terminal is easy to move from system module to module or, by simply keeping it in one location, to view instantaneous system results.

Building a system is easy: you will need a terminal(s), module(s), cable(s), and sensor(s). Just determine which parameters you want to measure and where. After that, the IQ SensorNet takes care of the work.

Example of IQ SensorNet System for a Typical Wastewater Plant



**Control Room**

**Effluent:**
Ammonium, Nitrate, pH, Cond, D.O., Turbidity, COD/TOC/DOC/BOD/SAC

**Final Setting:**
Nitrogen, Turbidity, TSS, pH, Sludge Blanket Level

**Aeration:**
D.O., Ammonium, Nitrate, TSS, pH

**Inlet:**
pH, Cond, Ammonium, COD/TOC/DOC/BOD/SAC

# IQ SensorNet 182

The YSI IQ SensorNet 182 (up to 2 sensors, 2 analog outputs, 3 relays); 182 XT (up to 2 sensors, 4 analog outputs, 5 relays); or 182 XT-4 (up to 4 sensors, 5 analog outputs, 6 relays) is a modular system for a complete sensor network ideal for various installation needs. The modular system can accept additional sensors easily at any time. This is a powerful system to continuously measure water quality parameters anywhere in a facility for process control.

## System 182

- Connect 1-4 digital sensors for a variety of parameters
- 2-wire cable provides power and communications
- Ultrasonic cleaning on some sensors
- System-wide lightning protection
- Analog or digital outputs; relays
- 3-year warranty

# IQ SensorNet Sensors



## Sensors

| Parameters | 1 TriOxmatic® | 2 FDO® | 3 SensoLyt® | 4 TetraCon® | 5 VisoTurb® | 6 ViSolid® | 7 NitraVis® | 8 CarboVis® | 9 NiCaVis® | 10 VARiON® | 11 AmmoLyt® | 12 NitraLyt® | 13 IFL® |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temperature | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| DO (electrochemical) | ● | | | | | | | | | | | | |
| DO (optical) | | ● | | | | | | | | | | | |
| pH | | | ● | | | | | | | | | | |
| ORP | | | ● | | | | | | | | | | |
| Conductivity | | | | ● | | | | | | | | | |
| Salinity | | | | ● | | | | | | | | | |
| Turbidity | | | | | ● | | | | | | | | |
| TSS | | | | | | ● | ● | ● | ● | | | | |
| Ammonium | | | | | | | | | | ● | ● | | |
| Nitrate | | | | | | | ● | | ● | ● | | ● | |
| Potassium | | | | | | | | | | ● | ● | | |
| Chloride | | | | | | | | | | ● | ● | | |
| COD (chemical oxygen demand) | | | | | | | | ● | ● | | | | |
| TOC (total organic carbon)* | | | | | | | | ● | ● | | | | |
| BOD (biochemical oxygen demand) | | | | | | | | ● | ● | | | | |
| DOC (dissolved organic carbon share of TOC) | | | | | | | | ● | ● | | | | |
| SAC (spectral absorption coefficient) | | | | | | | | ● | ● | | | | |
| Interface (Sludge) Level Measurement** | | | | | | | | | | | | | ● |

\*   Online TOC analyzers are available with either electrochemical oxidation technology or heated persulfate oxidation technology. Please contact us for more information.

\*\*  For use with the 2020 XT and MC2 modules.

# 5100/5000

**Parameters**
Temperature
Dissolved oxygen
(electrochemical)
BOD
(electrochemical)

The model 5100 dissolved oxygen instrument has a built-in barometer for instant pressure compensated calibration. Calibration is as simple as the press of a button. Other features include PC connectivity, memory, built-in OUR/SOUR software, auto-stabilization, membrane integrity check indicating membrane damage, bar code compatibility, and user-friendly interface ideal for BOD testing.
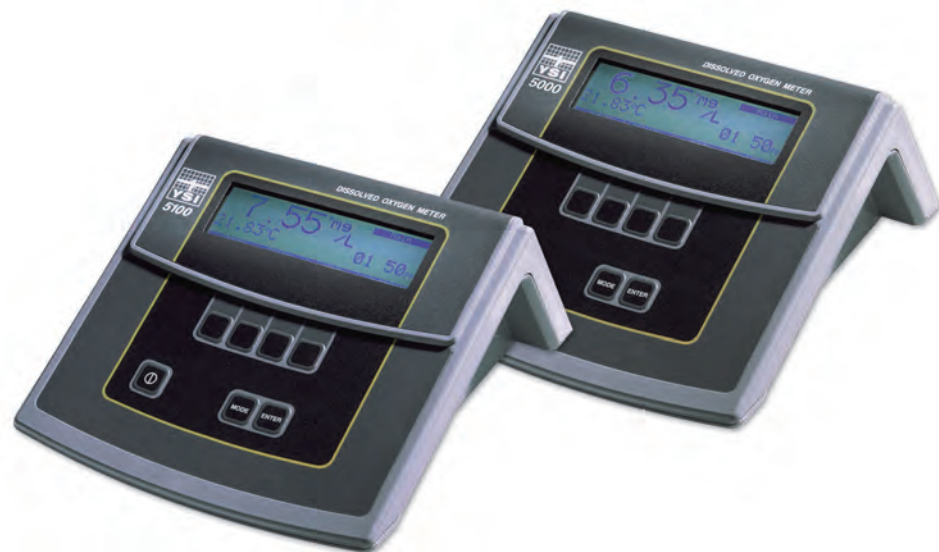


## YSI 5100 DO Meter

Receive ultimate performance and flexibility with auto-calibration and built-in OUR/ SOUR* software — valuable process control tools for indicating the biological activity of microorganisms used in treatments.

- Built-in barometer for pressure-compensated calibration
- Programmable auto-stabilization
- Integrity function indicates membrane damage
- Bar code compatibility eliminates need to maintain bench sheets by hand
- Compatible with BOD Analyst Pro software
- Auto-cal feature calibrates in seconds

## YSI 5010 Self-Stirring BOD Probe

The YSI 5010 provides continuous stirring for accurate measurement and faster response time.

International BOD probes are available. Contact YSI for more information.

## YSI 5000 DO Meter

Ease of use is highlighted by menu-driven operation; a large, liquid-crystal display; the use of auto-stabilization to determine a stable reading; and audio and tactile keypad responses for reducing errors and uncertainty. And with BOD Analyst Pro software, you can perform BOD calculations and transfer control to your computer's keypad.

\* The Specific Oxygen Uptake Rate (SOUR) is the method many wastewater treatment plants use to show compliance with U.S. EPA regulations part 503 for vector attraction in biosolids.

# pH1200

- ATC temperature sensor or manual input
- 1-, 2- or 3-point calibration with automatic buffer recognition
- Sensor efficiency-check function helps ensure data integrity
- Autolock mode holds stable readings on the display
- Accepts U.S. (7.00, 4.01, 10.01) or NIST (6.86, 4.00, 9.18) buffer sets
- Available single-junction lab grade or double-junction piercing tip or flat-glass electrodes
- Battery or AC wall power

The YSI pH1200, a lab-grade pH/mV testing meter features easy-to-use operation and a large backlit LCD. An autolock feature will hold the readings on the display once they reach stabilization. Ensure the most accurate data with the autolock feature, 1-, 2-, or 3-point calibration, automatic buffer recognition, and sensor efficiency function.

**ysi.com/pH1200**

# 3100

The instrument uses forced-current measurement technology, and other features including direct-reading digital display, adjustable temperature coefficient, reference temperature, and automatic temperature compensation.

The YSI 3100 uses a line of NIST-traceable conductivity cells with built-in temperature sensors, assuring the most accurate measurements.

- Provides high-accuracy measurements for basic conductivity needs
- Uses forced-current technology
- Easy-to-read LCD display
- CE compliant

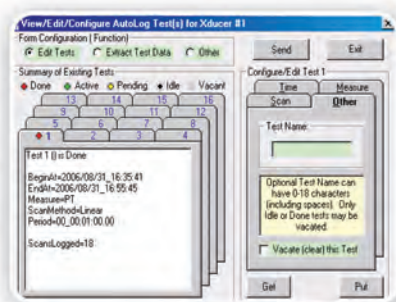**ysi.com/3100**

# Level and temperature

Level measurements provide the fundamental source of knowledge for highly dynamic water systems. Water-level stresses on these systems can affect efficiencies, operation, and maintenance. Long-term, water-level measurements provide data to evaluate, develop, design, implement, and accurately monitor the effectiveness of wastewater management decisions.

## YSI's Level Scout®

is a highly accurate, logging pressure transducer. The Level Scout combines pressure sensor technology with low power consumption. Accurate measurements, rugged housings and connectors, and easy data management make the Level Scout ideal for your next level monitoring application.

- User-replaceable batteries prevent costly down-time and potential loss of valuable data

- User-selectable reading rates allow you to get up to 15 readings per second (along with date and time stamp)

- Use one instrument for various applications with multiple data logging modes that include linear, linear averaging, event triggered, and logarithmic

- New cable with unique in-line vent filter requires zero maintenance; there is no desiccant to replace

## Data Scout Advanced

desktop software can be used to set up to 16 independent logging sequences, display tabular and graphical data, correlate barometric data, download logged data from multiple Level Scouts, acquire real-time.

**Parameters**

Temperature

Conductivity/
Specific conductance

Salinity

TDS

Dissolved oxygen
(optical or electrochemical)

pH

ORP

Turbidity

# Unattended monitoring

To comply with effluent limits and meet required standards, continuous and unattended monitoring is ideal. YSI sondes provide accurate data with integrated anti-fouling wipers to prevent fouling on the sensors. Data can be acquired remotely in order to know exactly how efficient the plant's processes are in real-time. Continuous data, longer deployment times, and less frequent visits to inspect the equipment are just some of the benefits to unattended continuous monitoring.

## 600OMS V2 Sonde

is our smallest V2 sonde, perfect for applications such as unattended optical DO monitoring. Easily connects to existing systems for unattended monitoring and control.

## 6820 V2 Sonde

is a cost-effective sampling system with up to 15-parameter reporting capability, ideal for spot-checking or monitoring with access to a power supply. Choose between 1 and 2 optical ports.



**Detection Fiber**
The sensor detects the delay in fluorescence - fluorescence lifetime

**Sensing Foil**
Dissolved oxygen in the water reacts with the dye embedded in the sensing foil

**Excitation Fiber**

The sensor calculates dissolved oxygen concentration from the fluorescence lifetime signal

**Water Permeable Protective Layer**
Water passes through the permeable protective layer

**Substrate**

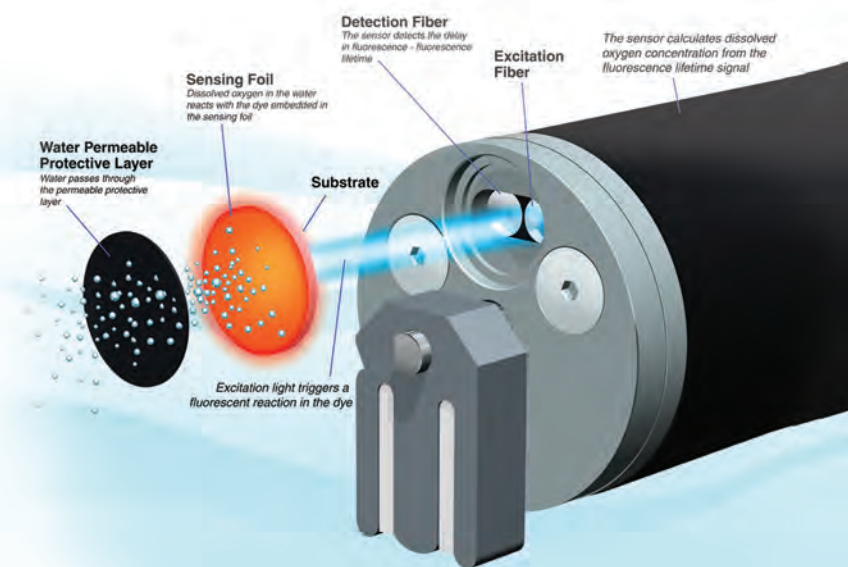Excitation light triggers a fluorescent reaction in the dye

## Integrated Anti-fouling

Virtually maintenance-free integrated wiped fouling protection for DO, pH, ORP, turbidity, blue-green algae, and chlorophyll or rhodamine sensors.

## ROX™

(Reliable Oxygen Sensor) optical DO sensor offers superior accuracy and stability and an integrated anti-fouling wiper for long-term monitoring in extreme conditions.

# EcoSense®

OK, we get it. Sometimes your budget won't allow for a higher priced instrument with more features. So you need a basic instrument to do your job without sacrificing data quality. Our EcoSense line of products is simple, easy to use, and straight-forward. And hey, they still have some pretty good features.

## pH100A

The pH100A is an economically priced, reliable instrument for the measurement of pH and temperature. Use with the standard pH electrode or with the flat glass electrode to prevent damage in harsh wastewater applications.

## DO200A

Economical, fast dissolved oxygen measurements with screw-on cap PE membranes that require low stirring. Uses same electrochemical DO technology as other YSI models. Easy calibration routine with the ability to measure in the field or in the lab with BODs.

## EC300A

The EC300A measures conductivity, salinity, TDS, and temperature in a simple, compact handheld.

- Watertight case meets IP-67 specs
- 1-year instrument warranty
- CE compliance
- Submersible waterproof cables
- Large displays
- Quick, simple calibrations
- 50 data-set memory

**Parameters**

Temperature

Dissolved oxygen (electrochemical)

BOD (electrochemical)

pH

ORP

Conductivity/ Specific conductance

Salinity

TDS

## 9300 and 9500

The 9300 and the 9500 both feature a graphic, backlit display; on-screen instructions; a waterproof case; various diameter sample tube holder; multiple languages; 100+ test options; and direct reading concentrations.

The 9500 has additional features that include a waterproof USB that can also be used for power, 500 data-set memory, and several user-selectable options.

**ysi.com/photometers**

## pH10A

The pH10 is the perfect instrument for economical spot sampling of pH and temperature in applications such as wastewater and surface water. Quickly calibrate with up to 3-point auto-cal.

## ORP15A

The ORP15 offers accurate, low-cost measurement of ORP (absolute and relative mV) and temperature.

## EC30A

The EC30A measures conductivity, TDS, and temperature with an easy, user-replaceable electrode ensuring the instrument is always ready.

- Waterproof case meets IP-67 specs
- 1-year instrument warranty
- Replaceable electrode
- 50 data-set memory
- Hold feature locks stable readings on display
- Graphic display with on-screen instructions
- >200 hour battery life with indicator
- Last calibration GLP record

**What can Xylem do for you?**

We're 12,000 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories, and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to www.xyleminc.com

# xylem
## Let's Solve Water

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a **xylem** brand

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**ECO CALCULATIONS REPORT**

YSI, Inc. saved the following resources by U2:XG paper with 30% post-consumer recovered fiber.

| trees | energy | greenhouse gas | waste water | solid waste |
|---|---|---|---|---|
| 3 | 0.9 million BTUs | 278 lbs $CO_2$ | 1,090 gal | 69 lbs |

U2:XG is FSC-certified, contains 30% post consumer recovered fiber, and is manufactured with electricity in the form of renewable energy.
U2:XG is manufactured by Appleton Coated   www.appletoncoated.com