EXO

ADVANCED WATER QUALITY MONITORING PLATFORM

YSI

a **xylem** brand

Breaking the sonde barrier.

EXO represents the intersection of the Environment and Observation and a new generation of monitoring technology.

Features You'll Find Only with YSI:

SmartQC

Smart QC
Automatically checks for faults and errors to ensure successful deployments

Auto-recognition
and set-up of all sensors with background data routing

Cable-free Operation
through the use of wireless communications

Biofouling Protection
with copper-alloy components and anti-fouling wipers

Assisted Calibration
Graphical KOR software speeds the calibration process while reducing reagent consumption

Titanium Sensors
with sapphire glass and wet-mateable connectors

A smart, field-ready water monitoring platform. EXO offers a wide range of capabilities to those dedicated to monitoring natural aquatic environments such as oceans, estuaries, rivers, lakes, and ground water.

Inside the EXO platform you'll find innovations resulting in greater ruggedness, increased accuracy and improved ease-of-use in the collection and transmission of water quality data—cost-effective now and adaptable for the future.

Like you, our engineers and scientists have spent years in the field, deploying and using the products we make. That passion for producing the most advanced and reliable monitoring equipment is how we break the sonde barrier.

EXO UNIVERSITY
On-demand Sonde training
EXO-University.com

No Training? No problem.
Unprecedented customer support with our on-demand series of Sonde training videos. Visit **EXO-University.com** to learn more.

Water quality monitoring that's field-ready

EXO's welded titanium sensors and high-impact body is built for high pressure and depths to 820 feet (250 meters)

Surface Water & Ground Water Monitoring

Capturing accurate data in freshwater environments is easy with EXO.

EXO is ready to go with:

- Wireless communication to reduce the number of field cables
- Onboard diagnostics to mitigate set-up and configuration errors
- Improved power management and enhanced anti-fouling components to extend deployment times

Calibrates multiple sensors simultaneously, typically in 15 minutes; no cables required

Quick and Easy Calibration
Complete calibration in less than 15 minutes using EXO's suite of smart sensors and intuitive KOR interface software. Sondes can now be turned around and redeployed in the timespan of a typical sample interval.

Go Wireless
Set up, calibrate, and deploy your instrument without a single cable. No more trips to the field and discovering you don't have the right cables. The wireless handheld and sonde are the perfect pair.

Reduce Biofouling
There's no escaping biofouling in underwater measurements. To keep it from interfering with data, EXO uses copper-alloy parts and anti-fouling wipers to prolong deployments and improve data accuracy.

Smart Controls for Quality Data
Guided calibration and sensor feedback make EXO an extremely reliable water monitoring platform. Guided prompts and internal calibration logs not only speed up the calibration, but reduce the opportunity for errors.

Smart Probes. Smart Ports.
Never worry a bad probe will compromise your data. Active port monitoring automatically detects sensors and, if damage to a sensor occurs, can shut down that port to prevent damage to the sonde or other sensors.

Smart Sonde
Onboard monitoring systems automatically scan for configuration errors, monitor memory status, and verify sensor operation. Numerous onboard tests ensure successful deployments.

Expandable design that's network-ready

With a highly efficient power management platform, robust construction, and a chemistry-free anti-fouling system, EXO allows accurate data collection for up to 90 days between service intervals.


Estuary & Ocean Monitoring:
High-quality multisensor suite in small and durable package

In harsh conditions, EXO is a practical alternative to traditional CTDs with:

- The ability to integrate seamlessly with marine monitoring systems
- Quick and easy re-configuration and calibration
- Large suite of high-performance sensors, which eliminates individual cables and connectors

Combine traditional CTD sensing with additional sensors in a compact device which readily integrates with remote monitoring platforms
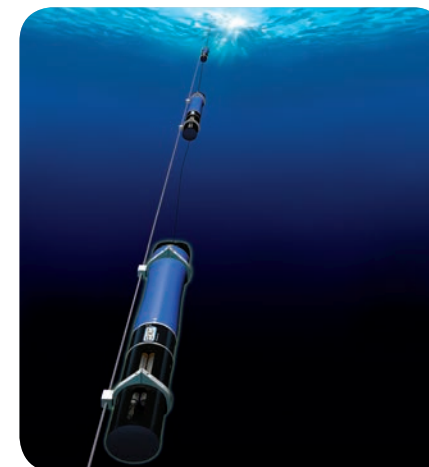
Compact and Accurate
The EXO platform offers a completely new approach—highly accurate, quick-response sensors in a small, easy-to-deploy and easy-to-maintain package. Gone are large and complicated sensor arrangements requiring complex integration.

Smart Probes
All EXO sensors have onboard memory and processing, allowing users to easily calibrate and configure sensors at one location and distribute to various field sites.

Measurable Sensor Performance
A new metrology system specifically for EXO offers improved accuracy of conductivity and temperature sensors to better address oceanographic challenges.

Monitor without Interruption
EXO's patented reinforced structure, welded Titanium tubes, improved power management, and stable sensor performance allow you to gather data for long periods of time and with fewer interruptions, even in the toughest conditions.

Smart Ports
Wet-mateable connectors allow for swaps in wet conditions, while the smart ports shut down any excessive current draws to prevent damage.

Self-Routing Sensors
Automatic routing enables a string of sondes to pass messages to individual probes. Anytime the configuration changes, the system automatically recognizes it. A "kick" allows any device to send alerts back up the chain.

Enhance Data Collection with these EXO Components

EXO Handheld

The EXO handheld provides an extremely durable, portable, weather-proof interface to the EXO sondes. The handheld uses a mobile version of the KOR interface software.

Additional standard features:
- GPS
- Temperature-compensated barometer
- Backlit alphanumeric keypad
- Wet-mate wireless connector
- Bluetooth communication
- Color LED screen
- 2 GB of storage
- Rechargeable battery capable

Anti-fouling Accessories

Extend deployment times and keep sensors clear of biofouling with:
- Anti-fouling wiper (EXO2)
- Copper-alloy sensor guards
- Copper mesh screen for conductivity-temperature sensor
- Copper tape

KOR Interface Software

The KOR Software offers users the capability to easily manage, visualize, and organize large amounts of field data. KOR also provides an interface to the EXO products for fast calibration, configuration, QA/QC or data collection.
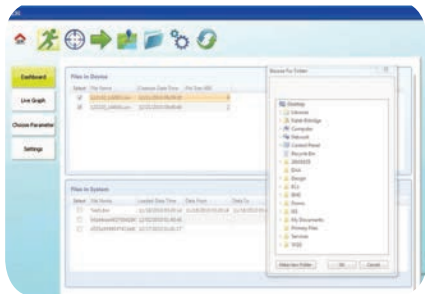
- New calibration processes for long-term monitoring
- Graphical user interface for quick data analysis
- Multiple languages

Multiple Data Output Options

Sonde output is readable by YSI handheld instruments, interface software, and data telemetry modules. In addition to the cable (standard), these communication interfaces are also available:

DCP Signal Output Adapter:
Wires into the end of the YSI field cable via flying leads and converts signal to RS-232 or SDI-12 for datalogger applications.

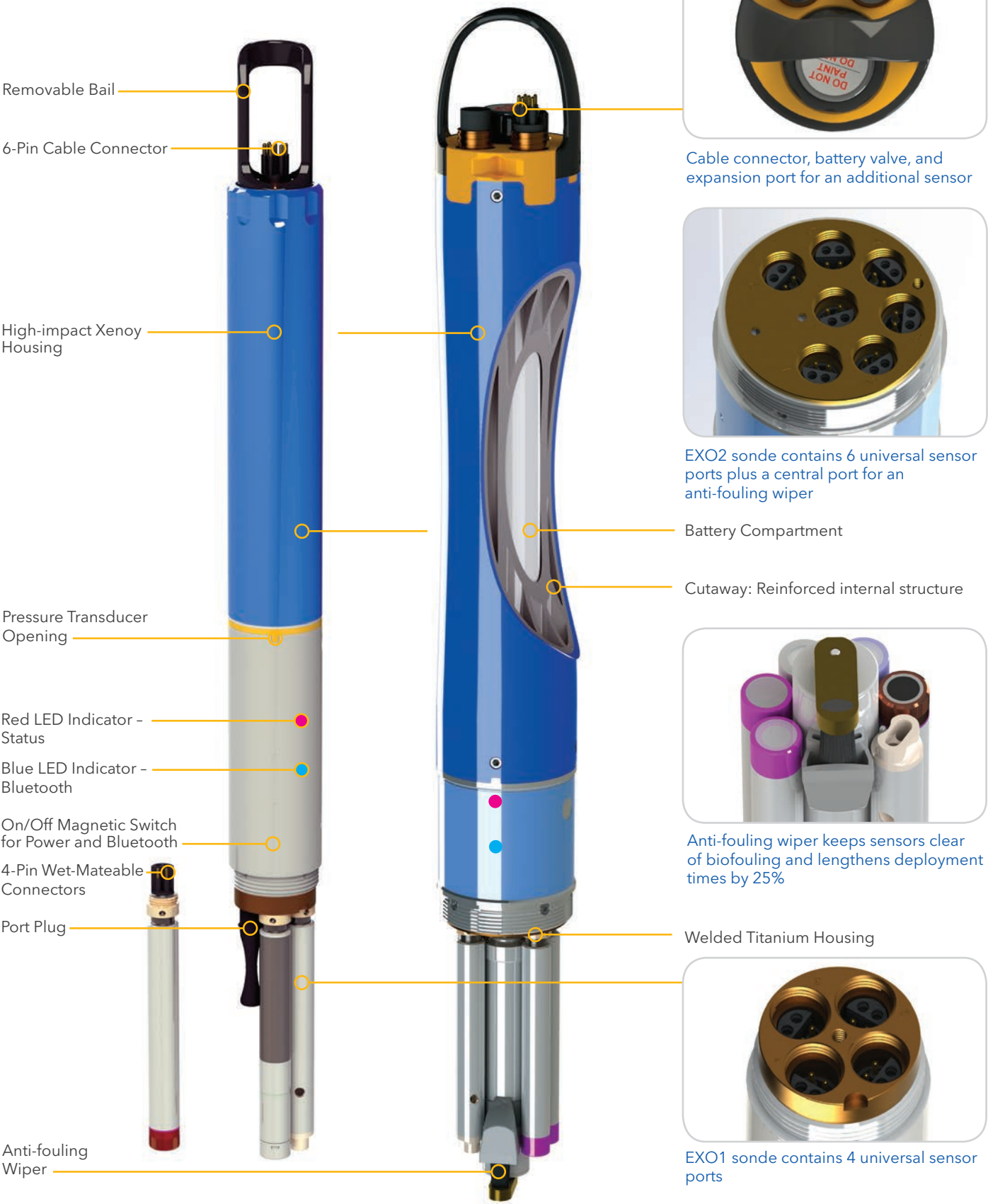**DCP Signal Output Adapter**

USB Adapter:
Allows connections between an EXO sonde and a PC.

USB Adapter

Bluetooth Wireless Technology:
Enables communication between a sonde and a user in the lab and pre-deployment in the field.

Sondes: EXO1   EXO2

Removable Bail

6-Pin Cable Connector

Cable connector, battery valve, and expansion port for an additional sensor

High-impact Xenoy Housing

EXO2 sonde contains 6 universal sensor ports plus a central port for an anti-fouling wiper

Battery Compartment

Cutaway: Reinforced internal structure

Pressure Transducer Opening

Red LED Indicator – Status

Blue LED Indicator – Bluetooth

On/Off Magnetic Switch for Power and Bluetooth

Anti-fouling wiper keeps sensors clear of biofouling and lengthens deployment times by 25%

4-Pin Wet-Mateable Connectors

Port Plug

Welded Titanium Housing

Anti-fouling Wiper

EXO1 sonde contains 4 universal sensor ports

Instrument Specifications*

EXO1 Sonde		
Ports	4 sensor ports Peripheral port: 1 power communication port	
Size	Diameter: 4.70 cm (1.85 in) Length: 64.77 cm (25.50 in)	
Weight	1.42 kg (3.15 lbs) with 4 probes, guard and batteries installed	
EXO2 Sonde		
Ports	7 sensor ports (6 ports available when central wiper used) Peripheral ports: 1 power communication port; 1 auxiliary expansion port	
Size	Diameter: 7.62 cm (3.00 in) Length: 71.10 cm (28.00 in)	
Weight	3.60 kg (7.90 lbs) with 5 probes, guard and batteries installed	
Sondes		
Operating Temperature	-5 to 50°C	
Storage Temperature	-20 to 80°C (except 0 to 60°C for pH and pH/ORP sensors)	
Depth Rating	0 to 250 m (0 to 820 ft)	
Communications	Computer Interface: Bluetooth wireless technology, RS-485, USB Output Options: USB with signal output adapter (SOA); RS-232 & SDI-12 with DCP-SOA	
Sample Rate	Up to 4 Hz	
Battery Life	90 days**	
Data Memory	512 MB total memory; >1,000,000 logged readings	
Sensors		**Calculated Parameters**
Ammonium	ORP	Salinity
Chloride	pH	Specific Conductance
Conductivity	Temperature	Total Dissolved Solids
Depth	Total Algae (Chlorophyll + BGA-PC or PE)	Total Suspended Solids
Dissolved Oxygen	Turbidity	
Fluorescent Dissolved Organic Matter (fDOM)	Vented Level	
Nitrate		
EXO Handheld		
Size	Width: 12.00 cm (4.72 in) Height: 25.00 cm (9.84 in)	
Weight	0.71 kg (1.56 lbs) without batteries	
Operating System	Windows CE 5.0	
Operating Temperature	-10 to 50°C	
Storage Temperature	-20 to 80°C	
IP Rating	IP-67	
Data Memory	2 GB total memory; >2,000,000 data sets	
Accessories		
Cables (vented and non-vented)	Flow cells	Sonde/sensor guard
Carrying case	KOR software	Calibration cup
DCP Signal Output Adapter	USB Signal Output Adapter	Anti-fouling components
Warranty		
3 months	Replaceable reagent modules for ammonium, chloride, and nitrate	
1 Year	Optical DO membranes and replaceable reagent modules for pH and pH/ORP	
2 Years	Cables; sonde bulkheads; handheld; conductivity, temperature, depth, and optical sensors; electronics base for pH, pH/ORP, ammonium, chloride, and nitrate sensors; and accessories	

* Specifications indicate typical performance and are subject to change.
Please check EXOwater.com for up-to-date information.

** Typically 90 days at 20°C at 15-minute logging interval; temperature/conductivity, pH/
ORP, DO, and turbidity sensors installed on EXO1; or temperature/conductivity, pH/ORP,
DO, total algae, and turbidity sensors installed with central wiper that rotates once per
logging interval on EXO2. Battery life is heavily dependent on sensor configuration.

EXO Bluetooth modules comply with Part 15C of FCC Rules
and have FCC, CE Mark and C-tick approval. Bluetooth-type
approvals and regulations can be country specific. Check
local laws and regulations to insure that the use of wireless
products purchased from Xylem are in full compliance.

Sensor Specifications*

Sensor	Range	Accuracy*	Response	Resolution
Ammonium [11] (ammonia with pH sensor)	0 to 200 mg/L [1]	±10% of reading or 2 mg/L-N, w.i.g.	-	0.01 mg/L
Barometer	375 to 825 mmHg	±1.5 mmHg from 0 to 50°C	–	0.1 mmHg
Blue-green Algae Phycocyanin (PC) (part of Total Algae sensor)	0 to 100 RFU; 0 to 100 µg/L PC	Linearity: $R^2 > 0.999$ for serial dilution of Rhodamine WT solution from 0 to 100 µg/mL PC equivalents	T63<2 sec	0.01 RFU; 0.01 µg/L PC
Blue-green Algae Phycoerythrin (PE) (part of Total Algae sensor)	0 to 100 RFU; 0 to 280 µg/L PE	Linearity: $R^2 > 0.999$ for serial dilution of Rhodamine WT solution from 0 to 280 µg/mL PE equivalents	T63<2 sec	0.01 RFU; 0.01 µg/L PE
Chloride [11]	0 to 18000 mg/L-Cl [2]	±15% of reading or 5 mg/L-Cl, w.i.g.	-	0.01 mg/L
Chlorophyll (part of Total Algae sensor)	0 to 400 µg/L Chl; 0 to 100 RFU	Linearity: $R^2 > 0.999$ for serial dilution of Rhodamine WT solution from 0 to 400 µg/L Chl equivalents	T63<2 sec	0.01 µg/L Chl; 0.01 RFU
Conductivity [3]	0 to 200 mS/cm	0 to 100: ±0.5% of reading or 0.001 mS/cm, w.i.g.; 100 to 200: ±1% of reading	T63<2 sec	0.0001 to 0.01 mS/cm (range dependent)
Depth [4] (non-vented)	0 to 10 m (0 to 33 ft)	±0.04% FS (±0.004 m or ±0.013 ft)	T63<2 sec	0.001 m (0.001 ft) (auto-ranging)
	0 to 100 m (0 to 328 ft)	±0.04% FS (±0.04 m or ±0.13 ft)		
	0 to 250 m (0 to 820 ft)	±0.04% FS (±0.10 m or ±0.33 ft)		
Vented Level	0 to 10 m (0 to 33 ft)	±0.03% FS (±0.003 m or ±0.010 ft)		
Dissolved Oxygen Optical	0 to 500% air saturation	0 to 200%: ±1% of reading or 1% saturation, w.i.g.; 200 to 500%: ±5% of reading [5]	T63<5 sec [6]	0.1% air saturation
	0 to 50 mg/L	0 to 20 mg/L: ±0.1 mg/L or 1% of reading, w.i.g.; 20 to 50 mg/L: ±5% of reading [5]		0.01 mg/L
fDOM	0 to 300 ppb Quinine Sulfate equivalents (QSE)	Linearity: $R^2 > 0.999$ for serial dilution of 300 ppb QS solution Detection Limit: 0.07 ppb QSE	T63<2 sec	0.01 ppb QSE
Nitrate [11]	0 to 200 mg/L-N [1]	±10% of reading or 2 mg/L-N, w.i.g.	–	0.01 mg/L
ORP	-999 to 999 mV	±20 mV in Redox standard solutions	T63<5 sec [7]	0.1 mV
pH	0 to 14 units	±0.1 pH units within ±10°C of calibration temp; ±0.2 pH units for entire temp range [8]	T63<3 sec [9]	0.01 units
Salinity (Calculated from Conductivity and Temperature)	0 to 70 ppt	±1.0% of reading or 0.1 ppt, w.i.g.	T63<2 sec	0.01 ppt
Specific Conductance (Calculated from Cond. and Temp.)	0 to 200 mS/cm	±0.5% of reading or .001 mS/cm, w.i.g.	–	0.001, 0.01, 0.1 mS/cm (auto-scaling)
Temperature	-5 to 50°C	-5 to 35°C: ±0.01°C [10] 35 to 50°C: ±0.05°C [10]	T63<1 sec	0.001 °C
Total Dissolved Solids (TDS) (Calculated from Conductivity and Temperature)	0 to 100,000 mg/L Cal constant range 0.30 to 1.00 (0.64 default)	Not Specified	–	variable
Total Suspended Solids (TSS) (Calculated from Turbidity and user reference samples)	0 to 1500 mg/L	Not Specified	T63<2 sec	variable
Turbidity [11]	0 to 4000 FNU	0 to 999 FNU: 0.3 FNU or ±2% of reading, w.i.g.; 1000 to 4000 FNU: ±5% of reading [12]	T63<2 sec	0 to 999 FNU: 0.01 FNU; 1000 to 4000 FNU: 0.1 FNU

All sensors have a depth rating to 250 m (820 ft), except shallow and medium depth
sensors and ISEs. EXO sensors are not backward compatible with 6-Series sondes.

* Specifications indicate typical performance and are subject to change. Please
check EXOwater.com for up-to-date information.
Accuracy specification is attained immediately following calibration under controlled
and stable environmental conditions. Performance in the natural environment may
vary from quoted specification.

[1] 0-30°C   [2] 0-40°C   w.i.g. = whichever is greater
[3] Outputs of specific conductance (conductivity corrected to 25°C) and total
dissolved solids are also provided. The values are automatically calculated from
conductivity according to algorithms found in *Standard Methods for the Examination
of Water and Wastewater* (Ed. 1989).

[4] Accuracy specifications apply to conductivity levels of 0 to 100,000 µS/cm.
[5] Relative to calibration gases
[6] When transferred from air-saturated water to stirred deaerated water
[7] When transferred from water-saturated air to Zobell solution
[8] Within the environmental pH range of pH 4 to pH 10
[9] On transfer from water-saturated air to rapidly stirred air-saturated water at
a specific conductance of 800 µS/cm at 20°C; T63<5 seconds on transfer from
water-saturated air to slowly-stirred air-saturated water.
[10] Temperature accuracy traceable to NIST standards
[11] Calibration: 1-, 2-, or 3-point, user-selectable
[12] Specification is defined in AMCO-AEPA Standards

What can Xylem do for you?

Xylem (XYL) is a leading global water technology provider, enabling customers to transport, treat, test and efficiently use water in public utility, residential and commercial building services, industrial and agricultural settings. The company does business in more than 150 countries through a number of market-leading product brands, and its 12,500 people bring broad applications expertise with a strong focus on finding local solutions to the world's most challenging water and wastewater problems. Xylem was named to the Dow Jones Sustainability World Index for advancing sustainable business practices and solutions worldwide.
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