
ABB MEASUREMENT & ANALYTICS

A more measured world of water

Measurement made easy
for water and wastewater



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A more measured world of water

There are increasingly critical water and wastewater issues challenging your business, and ABB understands that. That's why we developed our water and wastewater solutions to be easily configurable and integrated, so you can concentrate on your business.

Increasingly complex challenges require smart solutions. These solutions start with better, more accurate, monitoring, measurement and control.

Let ABB help you implement a more measured world of water.



A more measured world of water

Completely optimizing your infrastructure

Municipal and industrial water and wastewater processors have a need and responsibility to source, treat, distribute and discharge water in a sustainable, cost-effective and safe way. Processors are looking for sustainable, cost-effective and safe solutions. They increasingly recognize the power and value of data in monitoring and managing infrastructure to achieve this.

Powered by ABB Ability™, ABB Measurement & Analytics' product and service offering uniquely provides and connects performance monitoring and management across your entire facility, providing the accuracy, stability and reliability your infrastructure demands.

This in turn ensures you can optimize your outcomes, whatever your need may be; increasing output, reducing operating costs, extending plant life, meeting increasing compliance or driving revenue generation.

The water cycle portfolio

ABB's complete portfolio of water and wastewater solutions are designed to help you optimize your facility's entire operations. They are intended to give you quality, sustainability and value.

Our products are easy to configure, integrate and maintain. With a global network of specialists delivering local service and support, we offer a broad range of lifecycle services for optimum product performance and customer support.

Key drivers

ABB's research and development program is a vital source of our technology leadership, and driven by the needs of our customers.

We know that customers' businesses are driven by multiple strategic and tactical issues, but believe infrastructure management and optimization is driven by the need for:

- Quality
- Sustainability
- Cost control



Expertise in Technology

More than a century of experience

To operate any process efficiently, it is essential to measure, actuate, record and control. With ABB's measurement and analytical solutions, the customer receives the best technology, reliability and service in the business. ABB's products are easy to configure, easy to integrate and easy to maintain. With a global network of specialists delivering local service and support, ABB offers a broad range of lifecycle services for optimum product performance and customer support.

Research and development is a vital source of ABB's technology leadership. It builds on the foundation of existing technologies for new applications, and continues to develop the breakthrough innovations needed to meet the challenges of the future. ABB and its heritage companies have been leaders in innovation and technology for more than 100 years.

Aztec

Bailey

BOMEM

Bush Beach Engineering
Limited

**FISCHER
& PORTER**

Hartmann & Braun

K-TEK

Kent

L G R
Los Gatos Research
A MEMBER OF THE ABB GROUP

Pressductor®

SENSYCON

Schoppe & Faeser

Spirit
A MEMBER OF THE ABB GROUP

Taylor

TBI-Bailey

TORBAR
FLOWMETERS LTD

TOTALFLOW
MEASUREMENT & CONTROL SYSTEMS



Comprehensive measurement solutions

Serving the water industries

With global water and wastewater application expertise and knowledge, ABB is the best partner throughout the entire water cycle. From abstraction to treatment, distribution and the management of the wastewater process, ABB supplies an extensive range of reliable measurement and analytical products, services and solutions meeting customers' exact requirements.

Being a single source supplier for automation technology, ABB provides what customers in the water market require.

- Solutions that best match the industry specific application requirement
- Products that functionally fit the requirements of the water market, including internationally recognized calibration facilities and material certifications
- Products that are easy to commission and install saving time and expense during a startup
- Equipment that can be diagnosed remotely, resulting in time and personnel savings
- High accuracy and reliability with a minimal investment
- Automation services emphasizing optimized product usage and care throughout the entire lifecycle



Reliable measurement and analytical products

Serving the entire water cycle

Treatment plant inlet

- Electromagnetic flow, Variable area flow, ultrasonic open channel flow, Coriolis flow
- Vortex / swirl flow, mass flow, Residual chlorine
- Ammonia, conductivity, level, pH, phosphate, redox, turbidity
- Controllers, recorders

Industrial use

- Electromagnetic flow, Flow – partially filled pipe
- Pressure
- Ammonia, dissolved oxygen, Fluoride, pH, ORP, turbidity, chlorine, conductivity
- Recorders

Residential use

- Electromagnetic flow

Pressure boosting

- Electromagnetic flow
- Pressure

Pumping station

- Electromagnetic flow
- Pressure
- Indicators, level (hydrostatic)
- Controllers, recorders
- Level

Primary sedimentation

- Electromagnetic flow, Thermal mass flow
- Temperature
- Pressure
- pH, TSS
- Level

Stormwater

- Electromagnetic flow, Flow – partially filled pipes
- Indicators
- Controllers, recorders

Aeration and digestion

- Electromagnetic flow, Thermal mass flow
- Ammonia, dissolved oxygen, pH, phosphate, TSS
- Recorders
- Pressure
- Level

Sludge incineration

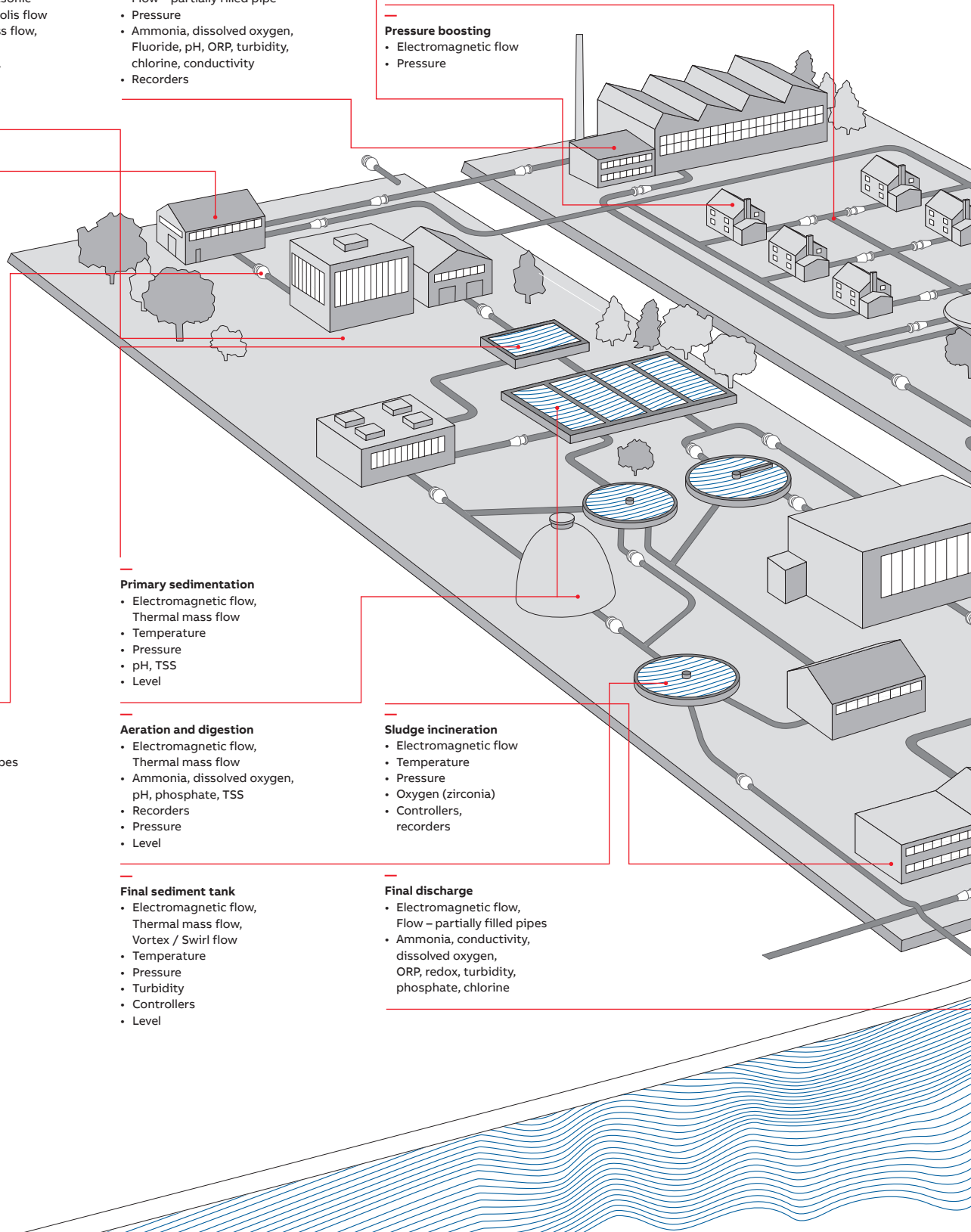
- Electromagnetic flow
- Temperature
- Pressure
- Oxygen (zirconia)
- Controllers, recorders

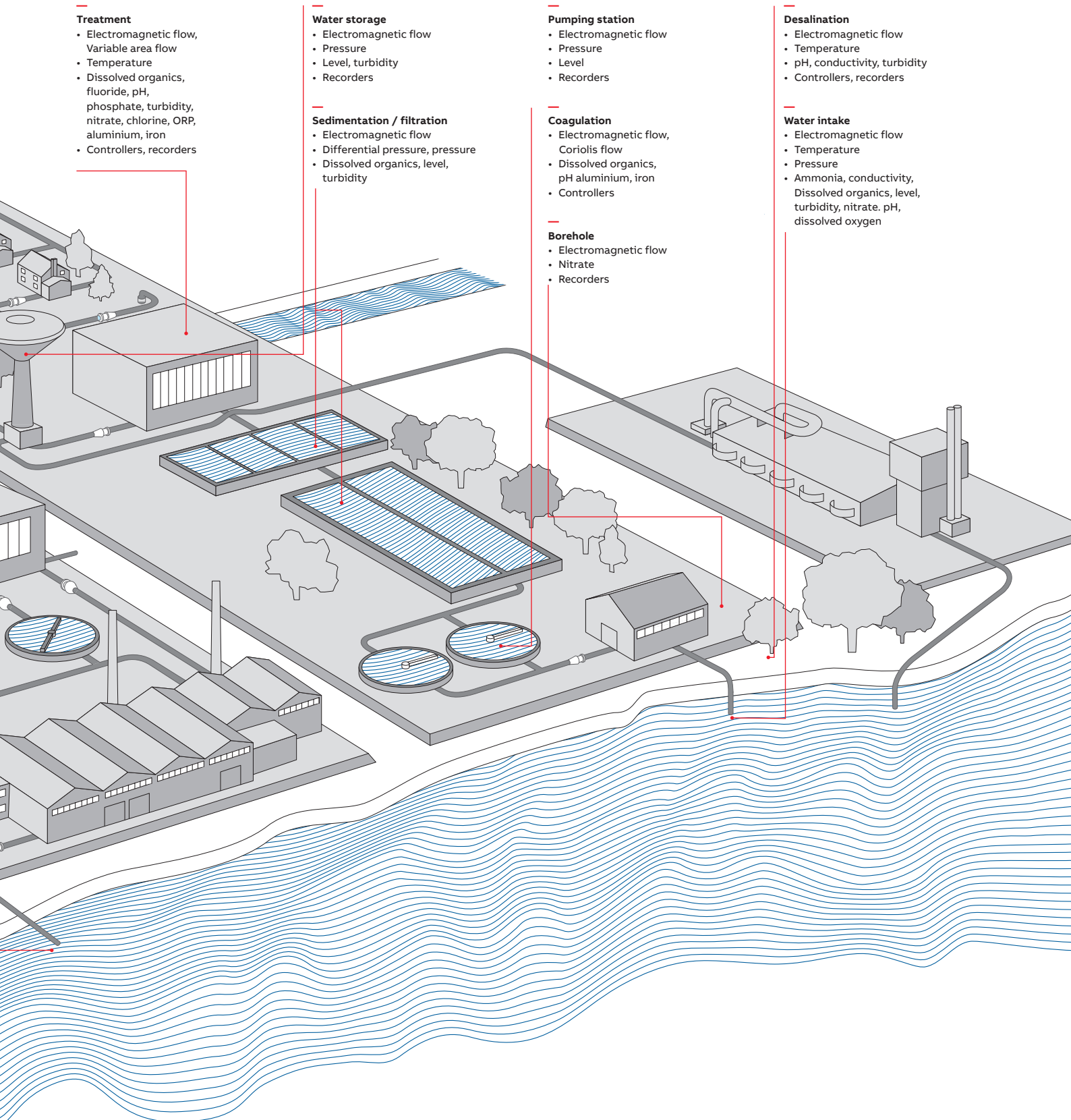
Final sediment tank

- Electromagnetic flow, Thermal mass flow, Vortex / Swirl flow
- Temperature
- Pressure
- Turbidity
- Controllers
- Level

Final discharge

- Electromagnetic flow, Flow – partially filled pipes
- Ammonia, conductivity, dissolved oxygen, ORP, redox, turbidity, phosphate, chlorine





Potable water measurement

Providing clean and pure drinking water

01 Integrated water monitoring system with the Aztec analyzer

02 AquaMaster for accurate water network reporting

03 WaterMaster unit being installed on water line

04 K10 ultrasonic transducer installed in sump service

Reliable process optimization

With regulations for water quality becoming more stringent, increasing pressure from customers to provide consistent water quality, and rising demand, the water supply industry is continually challenged to optimize water treatment processes. For example, excessive levels of soluble manganese and iron entering the distribution system cause deposition on pipe surfaces and poor aesthetic quality. These soluble species must first be chemically treated to convert to an insoluble form that can be easily filtered out in the treatment process.

Improving global water quality

ABB's Aztec series of colorimetric analyzers automatically performs reliable analysis of soluble manganese and iron allowing optimization of chemical dosing leading to operational cost savings and improved water quality. ABB's broad range of reliable online analytical instrumentation and process control expertise offer water utilities several advantages, including improvements in treated water quality, increased process efficiency, reduced use of chemicals and energy as well as reduced maintenance and personnel cost.

- Reliable measurement
- Simple to operate and maintain
- Reliable data
- Flexible communications
- Less chemical usage

Accurate water management

Protecting the environment and conserving water resources is a global responsibility. In many regions, water shortages have led to a need to control and report the amount of water lost through distribution. Water losses of greater than 50% are not uncommon and the first step in reducing these is closer monitoring and measuring of a water system.

Fast leakage detection

ABB's AquaMaster electromagnetic flowmeter has been designed to improve the management of potable water distribution networks. Its features are targeted to the industry's specific requirements, ranging from a total water management solution for revenue (billing) applications, district metering and water distribution to leakage management and irrigation. Flowrate information can be sent via GSM/SMS or GPRS/WITS enabling operators to pinpoint difficult, small, slow leaks, virtually as they happen and providing the opportunity to rectify them quickly. The remote configuration options via GSM/SMS or GPRS/WITS make further handling very convenient.

- 3 power options: mains powered with back-up, battery powered, external renewable (solar/wind) energy with back-up
- Integrated one stop solution integrating meter, pressure measurement, logger/quad band GSM/SMS and GPRS/WITS communication
- CalMaster2 for in situ verification of flowmeter calibration
- OIML R49/MID approved

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Meeting flowmeter market requirements

Since their introduction in the late 1960s, electromagnetic flowmeters have been the preferred meter type for the water market. No moving parts, low maintenance and high reliability have increased their popularity since their introduction. However, not much has changed in the design, materials of construction or serviceability over the years. With the ever increasing demand from the market, ABB has introduced solutions to customers' requests for a meter that is easier to maintain than early generation products, can be serviced and verified in situ and has a lower whole life cost.

Flow measurement adhering to industry standards

ABB's WaterMaster is the solution for flow management in sectors as diverse as water distribution, water and wastewater treatment. Its performance adheres to the most stringent global industry standards and is certified to key international approvals. Proven in the toughest applications, the WaterMaster's rugged, robust and buriable sensors eliminate the need of expensive meter chambers. The customer takes advantage of its innovative and versatile attributes to achieve interoperability within a wide range of asset management systems.

- Superior control through advanced sensor design
- Improved performance through digital signal processing (DSP)
- VeriMaster in situ verification capabilities
- Submersible and buriable installation options
- OIML R49/MID approved
- Sizes up to DN2400, calibrated in ISO 17025 accredited rig

A sound solution for level applications

Ultrasonic level and flow measurements are found throughout the water process. In chemical treatment, for example accurate measurement of these parameters enables safe products and cost reduction. With global privatization of the water industry, highly accurate measurements and solutions will continue to be required.

Highly accurate level measurement

ABB's LST family of ultrasonic level transmitters provides non-contact level measurement and pump control for the water and wastewater industries. Used for both closed tanks and open containment ponds, they work on the principle of time of flight (of sound in air). These simple measuring devices are capable of measuring levels in both clean and harsh environments and are a very cost-effective solution for water projects.

In addition to level measurement, open channel flow can be measured in a weir or a flume arrangement, such as at the inlet of a potable water unit. The transducer is positioned above the liquid level and upstream of the engineered obstruction. With the aid of built-in linearizers, derived flow can be accurately calculated from the measured level. The LSTs can then provide flow rate and a totalized flow signal.

- Graphic LCD display with Touch Through Glass technology
- 5 configurable relays
- Configurable as open channel flowmeter
- Pump cycling and pump monitoring
- ATEX, IEC & FM Intrinsic safe and non-sparking approved

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Wastewater measurement

Enabling efficient water treatment

— 01 Remote mount
videographic recorder
SM500F monitoring
effluent flow

— 02 Dissolved oxygen
analyzer system

— 03 FSM4000 in
thickened sludge
application

— 04 Sensyflow
FMT500-IG measuring
activation air in a
waste water plant

Securing effluent monitoring

Municipal or industrial plants that have to discharge liquid waste are required to prove to the relevant authorities that the chemical content and volume discharged comply with environmental standards and do not exceed legal limits. Typically, as a minimum, instantaneous pH and flow is monitored and flow is also totalized. These variables must be recorded in a secure method, so that in the event of a downstream incident or an inspection, the original data can be easily retrieved and viewed.

Enabling security and easy retrieval of data

ABB's ScreenMaster range of paperless recorders is widely used on effluent monitoring systems, measuring and displaying the process signals and storing them in a secure tamper-proof format. Advanced features allow for remote viewing using a webserver or sending emails if an alarm condition occurs. Once recorded, the data can be transferred to remote servers where a long term data storage procedure can be implemented. Using the ABB DataManager software analysis tool, the original data can be verified as intact and can be analyzed on a PC.

- Multichannel process measurement
- Flow totalization
- Secure data storage
- Remote monitoring
- Offline data analysis

Energy savings in aeration beds

Over 70% of the electrical costs of a wastewater process plant are going to compressor operation for aeration beds. Most customers are looking for ways to reduce the amount of air required to maintain the correct bacteria level in the beds. One simple answer is to monitor the oxygen levels to ensure the correct amount of oxygen is present and then not to exceed that level. Customers can save over 25% of their total electrical costs by installing one or more oxygen monitors in combination with simple changes to the control scheme.

The solution is a dissolved oxygen analyzer

ABB's intelligent optical dissolved oxygen sensors provide accurate measurement in the harshest environments. Featuring ABB's EZLink technology, users benefit from plug-and-play connectivity, automatic sensor recognition / set-up, predictive diagnostics and enhanced measurement accuracy. Consistent, reliable and accurate, they can help operators to realize significant savings through reduced energy consumption and maintenance.

- Highly accurate with no sensor drift
- EZLink plug-and-play connectivity
- Predictive maintenance diagnostics
- Flexible installation options

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Measuring thickened sludge and two-phase liquids

When all other meters fail, FSM4000 takes over. FSM4000's advanced flowmetering technology combined with cutting edge filtering technology ensures the most stable signal output in applications such as thickened sludge or two-phase fluids in wastewater treatment plants applications. The most stable flow signal results in benefits such as tighter control of control loops, less energy consumption of actuators or positioners, reduced system stress leading to reduced downtime, maintenance, and component replacements. FSM4000 – the perfect, no compromise solution, optimized for your wastewater industry application

- ABB award-winning, simple to use display and menu system
- Plug-and-play data storage eliminates the need to match sensor and transmitter

Measuring gases with mass flowmeters

Throughout the wastewater process, several critical gas measurements are required. The measurement of biogas and activation air are becoming increasingly more common and can be difficult due to low velocities and pressures. Additionally, many customers prefer these measurements be displayed in mass units rather than volumetric format. The answer to this application issue is the use of thermal mass meters, which directly measure mass flow even in harsh environmental conditions.

The answer is a new generation of mass flowmeters

To meet the needs of the wastewater market, ABB offers its Sensyflow thermal gas mass flowmeters. Using a thermal measuring principle (hot film anemometer), the mass flowmeter is capable of measuring all technical gases and gas mixtures directly: biogas and compressed air.

- Highly accurate and reliable
- Short inlet and outlet length
- Manufacturer calibrated
- High-repeatability measurement
- No moving parts, no obstructions

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Industrial water measurement

Helping to protect the environment

—
01 ProcessMaster installed at a filter drain pipe in a water treatment plant

—
02 ABB's measurement products help to protect the environment

—
03 LLT100 measuring level in wastewater well

—
04 ABB's 261 pressure transmitter for repeatable accurate measurements

Cleaning industrial water

In industrial water treatment plants, hazardous and toxic substances need to be removed from the process water before disposal. Products and methods used to treat municipal waste are not suited for use in the treatment of sufficient industrial waste. The solutions to this are products designed with the application in mind.

Meeting the needs of the industrial user

ABB's ProcessMaster is used in water and wastewater applications that contain caustic and acids. It is used in treatment areas of plants and has proven to be easy to work with, tough and reliable. Whatever and wherever the application, the ProcessMasters intelligent design, state-of-the-art technology and advanced features work harder and smarter to make your operations more cost effective. The ProcessMaster delivers more than reliable and accurate measuring values. When integrated with an asset management solution, such as ABB's Asset Master, the instrument plays a key role in maximizing asset optimization.

- Pressure rating up to PN100, CI600
- Choice of liner, electrode and flange materials
- Choice of approvals and certificates
- Enhanced diagnostics such as gas bubble detection or electrode coating detection
- Intuitive operation
- Accuracy up to 0.2%
- Universal transmitter
- In situ verification capabilities

Water analysis solutions

Regulations for the treatment and disposal of industrial water, have become extremely stringent and are well monitored by government agencies. Customers are finding traditional lab methods of sampling time consuming, expensive and no longer sufficient to meet the standards. Continuous monitoring of their processes is now required.

Packaged monitoring solutions

A monitoring solution is often much more than a measurement device. ABB's Systems Integration Units are regionally located to support customers by providing a complete package to meet the needs of any given application. This can range from a simple panel with sample conditioning through to large shelter systems for turnkey projects.

Our SIUs have the experience to offer expert advice in water monitoring and work closely with customers to achieve a best-value offer.

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Mastering tough level applications

Reliable wastewater level measurement in the treatment unit of any industrial or municipal plant can present challenges to the level measurement instrumentation. Tough level measurement applications lead to intensive maintenance or loss of uptime. ABB level transmitters are able to overcome even the toughest application conditions such as: fog, mist and vapors, harsh acids and alkaline chemicals, high pressures and temperatures, foaming surface conditions, changes in dielectric constant, changes in density and turbulent or aerated surfaces.

The solution is available today

The LLT100 laser level transmitter is the latest innovation to the non-contact level measurement market. LLT100 is used in several wastewater applications: wells, lift stations, digesters, wastewater overflow, and sludge monitoring. With a beam divergence of 0.3°, by far the lowest divergence of any technology in the level market, and range up to 30 m (100 ft.) for liquids and 100 m (330 ft.) for solids, the LLT100 can perform level measurement in confined spaces, through protective cover grids, inside narrow deep wells and near walls.

Easy and dependable level measurement

With years of experience applying the MT5 Series GWR and the world leading LMT magnetostrictive transmitters in water treatment and wastewater applications, ABB K-TEK Level is able to help you select the best level device for your application needs such as in traveling screens, chemical storage and holding tanks, sumps and lift stations, coagulant and flocculate storage and digesters.

With easy installation, setup and reliable performance, ABB K-TEK Level devices reduce maintenance time and help maintain profit margin

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Critical pressure measurement solutions

Accurate results from pressure measurement in a pumping or lift station application are critical to the success of water processes. If the nominal process pressure is exceeded or not maintained, the entire system could be subject to failure or inefficiencies. If a water system pressure is too high, pumps will struggle to maintain pressure while the excess pressure will cause additional cost and leakage throughout the system.

The answer is the perfect mix of features

The 2600T pressure transmitter family meets these expectations and delivers previously unattainable operational benefits. All instruments can provide the intuitive four-button HMI (Human Machine Interface) for quick commissioning, saving cost and time. The 261 high-quality, cost-effective transmitters are the result of ABB's uncompromised focus on pressure and level measurement. When it comes to differential pressure measurements, the ABB 266 transmitter is the performance choice for long and stable maintenance free operations. They offer high accuracy, large turn down ratio and a stainless steel housing optimized for use in extreme conditions.

- Repeatable accurate measurements
- Maintenance-free due to ABB's sensor technology
- Easy operation and set up via the graphic display
- Wide choice of process connections to suit multiple installations

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Proven measurement products

A comprehensive industry portfolio 1/2

Flow measurement

ABB has decades of experience in flow measurement for the water industries. Based on a thorough understanding of industry requirements, innovative flow measurement products have been developed to control processes, increase profits and save costs.

Highest precision in flow measurement is available, for example when dosing chloride or other chemicals, measuring flow rate of wastewater or detecting leaks in drinking water infrastructure. Flow measurement products featuring self-diagnostics and process information make it easy for the customer to be in control of any process.

Product category	Electromagnetic flow					Vortex/Swirl	Thermal mass	DP flow
Product name	WaterMaster	ProcessMaster	SM4000	AquaMaster	AquaProbe	VortexMaster / SwirlMaster	SensyFlow	Torbar
Product type	FEV100 FER100 FEW300	FEP610 FEP630	SE41F	FEV200 FER200	FEA100 FEA200	FSV400 FSS400	FMT400 FMT500	
Product image								
Aeration and digestion	•		•			•	•	•
Borehole	•			•				
Desalination	•	•	•			•		
Coagulation	•							
Final discharge	•				•			
Final sedimentation	•						•	
Irrigation	•			•	•	•		
Network management	•			•	•	•		
Pressure boosting	•	•						
Primary sedimentation	•	•					•	•
Pumping station	•							
Sedimentation / filtration	•	•	•			•	•	
Storm water	•				•			
Sludge incineration		•	•					
Treatment	•	•	•			•	•	•
Treatment plant inlet	•	•	•			•		•
Water intake	•							
Water storage	•			•	•			

Proven measurement products

A comprehensive industry portfolio 2/2

Analytical measurement

As a world leading supplier of analytical measurement technologies, ABB offers an unmatched line of instruments for a variety of applications in the water and wastewater industry. The liquid and gas analytical products enable cost-effective measurements when

monitoring product quality and controlling chemical usage. Designed to maximize product quality, they support the customer in meeting process requirements and conform to local and global regulations. ABB is the single source supplier of reliable analytical measurement products for the water industries.

Product category	Recorders			Controllers	Analytical instruments		
Product name	ScreenMaster 500	ScreenMaster	Circular chart recorder	ControlMaster	pH / Redox	Conductivity	Turbidity / Total suspended solids
Product type	SM500F	RVG200	C1900	CM10 CM30 CM50	AP100 AP200, AP300 TB(X)5	AC2 TB2	4690 ATS430
Product image							
Aeration and digestion	•	•			•		•
Borehole	•						•
Coagulation				•	•		•
Desalination	•	•		•	•	•	•
Final discharge	•	•	•		•	•	•
Final sedimentation							•
Irrigation	•		•				
Network management	•						
Primary sedimentation					•		•
Pumping station	•	•					
Sedimentation / filtration							•
Sludge incineration		•	•	•			
Storm water	•	•		•			
Treatment	•	•	•	•	•		•
Treatment plant inlet	•	•	•	•	•	•	•
Water intake	•	•		•		•	•
Water storage					•	•	•

ABB understands the value of accurate and reliable measurement. Our service specialists are located strategically to support all products and systems globally. Professional installation enables efficient operation and ensures reliable lifecycle management. Use of genuine spare parts minimizes risks and increases equipment uptime.

All services can be provided as a Measurement Care service agreement, tailored to specific customer needs.

[illegible]

ABB Measurement & Analytics

For your local ABB contact, visit:
www.abb.com/contacts

For more product information, visit:
www.abb.com/measurement

