



ABB Instrumentation

Instrumentation for the  
water & waste water industries  
Enhanced plant performance,  
efficiency and reliability

# Talk to ABB first

ABB has more expertise in water & waste water applications globally than any other supplier.

Based on this experience, we have refined and developed the performance of our portfolio of intelligent instrumentation products to ensure you get a solution that meets your precise requirements every time.

Getting the best levels of efficiency from your plant and processes calls for reliable, accurate instrumentation. Equally important is being able to count on access to an intelligent, informed support network that can assist you throughout all stages of your process, regardless of your location.

#### A heritage to be proud of

ABB Instrumentation's ability to satisfy customers' needs has never been greater, being built upon the leading names and brands in the automation world:

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Bush Beach Engineering  
Limited



**Hartmann & Braun**



Schoppe & Faeser



*Taylor*

**TBI-Bailey**

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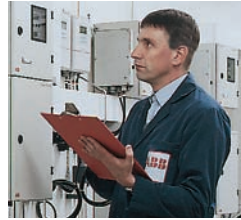
# ABB Instrumentation Service keeps you a step ahead.



Installation and Commissioning



Preventive Services



Calibration Services



Parts and Repair



Migration/Upgrades



Training



Consulting



Maintenance

We anticipate your needs and deliver instrumentation solutions that keep your productivity up and your people efficient and effective... around the globe. Additionally, ABB provides the monitoring, control and documentation to ensure that your plant is in compliance. With ABB Instrumentation, you can be confident that you've made the best choice.

ABB's technologically superior instrumentation products are designed to reduce operational costs in your plant. ABB products can be replaced and configured without shut-down, installed at a fraction of the typical cost, use lower quantities of consumables and enable optimal efficiency for your technical staff.

ABB understands that productivity means profitability. Our innovative, intelligent products, deployed with the fieldbus technology of your choice, monitor real-time values, identify potential problems, and proactively notify support before productivity is affected.

Our broad scope of services lay the foundation for end-to-end support for your enterprise. ABB's automated monitoring and reporting products are simple and accurate, so critical information is always available – even when skilled technicians are not. ABB Instrumentation Service delivers

the knowledge and global experience required to keep your assets operating at maximum reliability and accuracy, with a full scope of services from start-up and commissioning through lifecycle support. Plus, the global strength of ABB means our service contracts support you wherever and whenever help is needed.

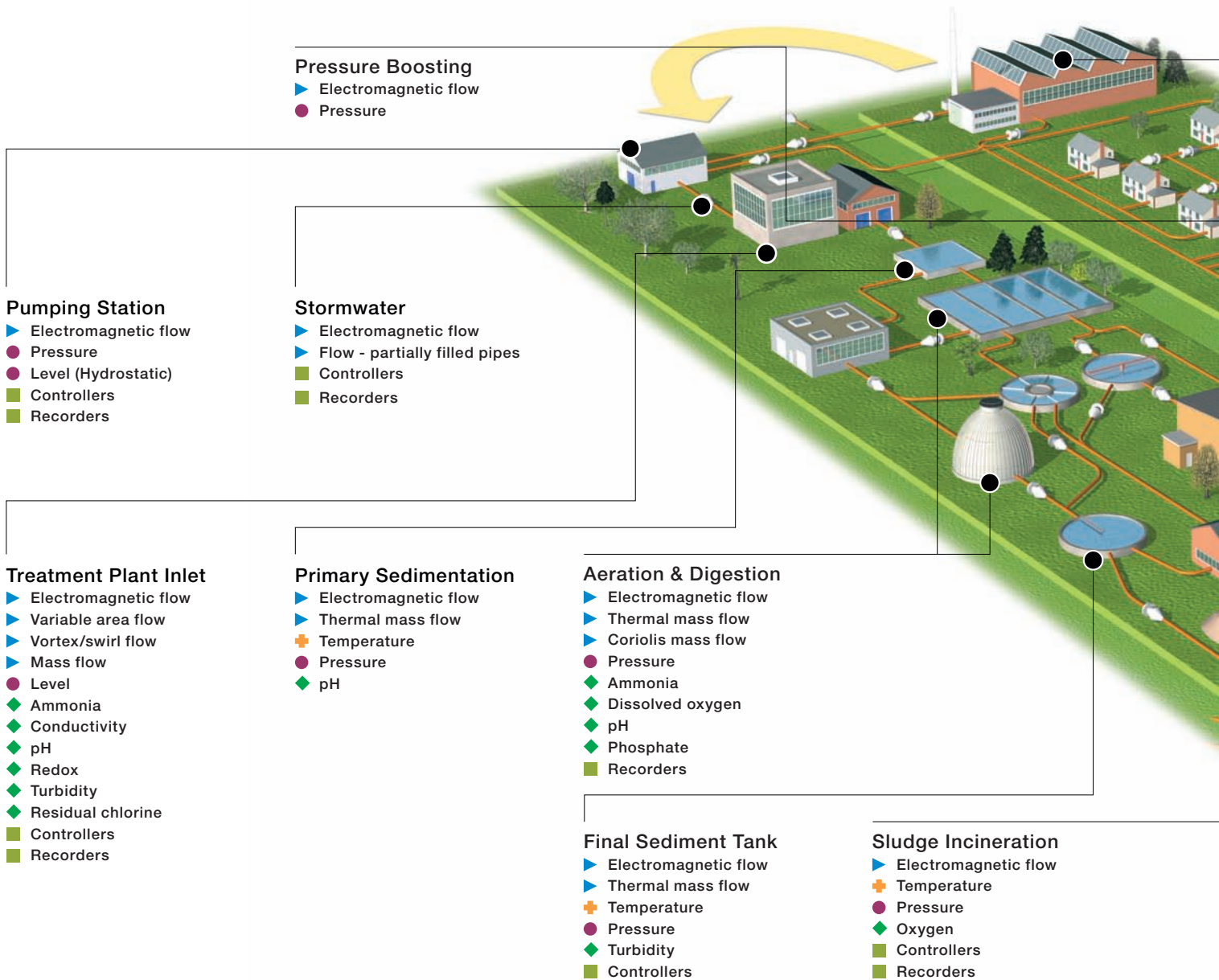


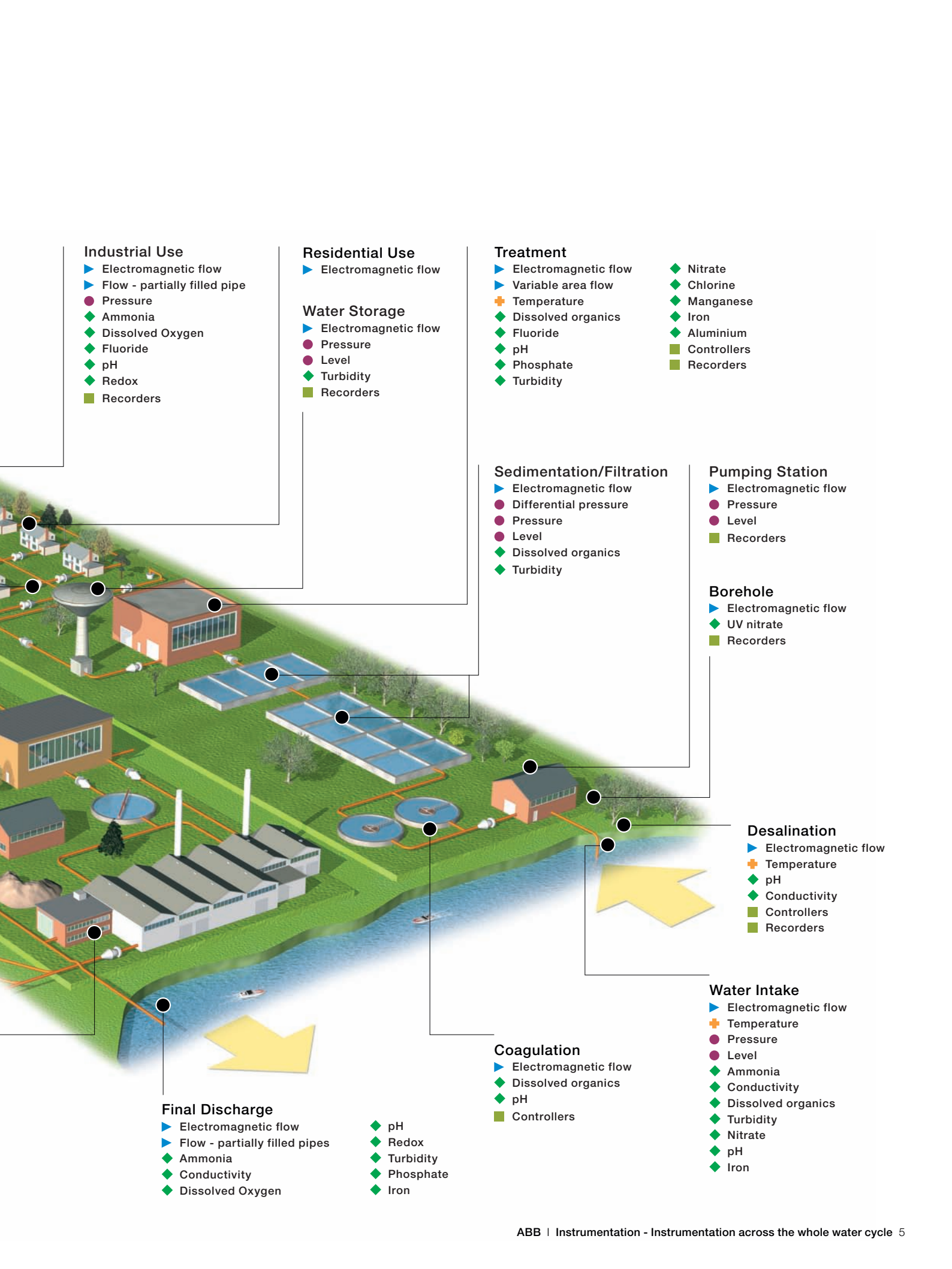
# Instrumentation for the complete water cycle

ABB is your partner throughout the entire water cycle, from extraction and treatment through to distribution and the management and reprocessing of waste. We supply an extensive range of instrumentation equipment and systems for use throughout all stages of the cycle.

## Key to Products

- ▶ Flow Measurement
- ✚ Temperature Measurement
- Pressure and Level Measurement
- ◆ Analytical Instruments
- Recorders and Controllers





### Industrial Use

- ▶ Electromagnetic flow
- ▶ Flow - partially filled pipe
- Pressure
- ◆ Ammonia
- ◆ Dissolved Oxygen
- ◆ Fluoride
- ◆ pH
- ◆ Redox
- Recorders

### Residential Use

- ▶ Electromagnetic flow

### Water Storage

- ▶ Electromagnetic flow
- Pressure
- Level
- ◆ Turbidity
- Recorders

### Treatment

- ▶ Electromagnetic flow
- ▶ Variable area flow
- ✚ Temperature
- ◆ Dissolved organics
- ◆ Fluoride
- ◆ pH
- ◆ Phosphate
- ◆ Turbidity

- ◆ Nitrate
- ◆ Chlorine
- ◆ Manganese
- ◆ Iron
- ◆ Aluminium
- Controllers
- Recorders

### Sedimentation/Filtration

- ▶ Electromagnetic flow
- Differential pressure
- Pressure
- Level
- ◆ Dissolved organics
- ◆ Turbidity

### Pumping Station

- ▶ Electromagnetic flow
- Pressure
- Level
- Recorders

### Borehole

- ▶ Electromagnetic flow
- ◆ UV nitrate
- Recorders

### Desalination

- ▶ Electromagnetic flow
- ✚ Temperature
- ◆ pH
- ◆ Conductivity
- Controllers
- Recorders

### Water Intake

- ▶ Electromagnetic flow
- ✚ Temperature
- Pressure
- Level
- ◆ Ammonia
- ◆ Conductivity
- ◆ Dissolved organics
- ◆ Turbidity
- ◆ Nitrate
- ◆ pH
- ◆ Iron

### Coagulation

- ▶ Electromagnetic flow
- ◆ Dissolved organics
- ◆ pH
- Controllers

### Final Discharge

- ▶ Electromagnetic flow
- ▶ Flow - partially filled pipes
- ◆ Ammonia
- ◆ Conductivity
- ◆ Dissolved Oxygen
- ◆ pH
- ◆ Redox
- ◆ Turbidity
- ◆ Phosphate
- ◆ Iron



### WaterMaster

WaterMaster is ABB's innovative, world class flowmeter solution for the vast majority of water and waste water applications.

With a wide flow range and unsurpassed accuracy, WaterMaster improves control and quality for applications in water treatment works.

In the size range DN40 – DN300 (1.5 to 12in) it utilizes a revolutionary octagonal internal bore design that reduces sensitivity to flow profile disturbances. This results in outstanding performance in less than ideal installation conditions, allowing the flowmeters to meet the most stringent internal accuracy standards.

Its buriable sensor eliminates the need for expensive meter chambers thereby providing a long, productive and maintenance-free asset life.

- Size range DN40 to DN2200 (1.5 to 88in)
- Accuracy to 0.2% or 0.4%
- Approved for use in hazardous areas
- IP68, buriable to 2m (80in) depth
- VeriMaster validation and calibration software



### AquaMaster

AquaMaster is a revolutionary instrument providing a total water management solution for revenue generation, district metering, water distribution, customer billing and leakage control.

Whether your water network is performing at high or low flow, AquaMaster delivers unrivalled accuracy, across an extremely wide range. This enables operators to pinpoint leaks – even those difficult small, slow leaks – virtually as and when they happen, giving them the opportunity to rectify leaks quickly. And as AquaMaster can monitor flow in either direction, isolating leaks is even easier.

- Low end accuracy for low night flow measurement  
-1000:1 dynamic range
- Integrated flow and pressure logging
- Battery power means no electrical connections are required, reducing installation costs
- Wireless access via GSM (Global System for Mobile communication) for configuration, meter reading and retrieval of logged data
- CalMaster2 in-situ verification and validation tools



### AquaProbe

A battery or mains powered, electromagnetic insertion flowmeter for clean water, offering an economic alternative to in-line flowmetering for both permanent and temporary applications. Featuring 'hot tap' capability, the AquaProbe can be installed without disrupting the water supply.

- Suitable for use as a portable survey tool or a permanent monitor
- Can be used on pipe sizes 200mm to 8,000mm (8 to 315in)
- Measures flow in both directions
- Wireless access via GSM for configuration, meter reading and retrieval of logged data



### In-situ verification and validation tools

#### VeriMaster

A unique software calibration and condition monitoring system, which enables users to validate the calibration and accuracy of an installed WaterMaster flowmeter, without interruption to the process. This is invaluable for custody transfer applications and condition monitoring of installed meters.

#### CalMaster2

For use with AquaMaster flowmeters, the CalMaster2 suite addresses two very different areas of the flow metering industry market; the low cost validation area; and the high accuracy, verification end.

CheckMaster is a battery-powered field validation device that checks whether AquaMaster electromagnetic flowmeters have been installed properly and are functioning correctly. By using a CheckMaster, an installation contractor has the ability to perform a functional conformance test at time of installation or commissioning. They can produce a printed conformance report certifying that the meter was functioning to specification at that time.

CalMaster2 IRIS (Intelligent Recognition Information System) is a test device that enables the user to perform in-situ verification on ABB's mains and battery powered AquaMaster flowmeter systems. Additionally, the CalMaster2 IRIS has the facility to verify a confirmed accuracy for those systems. Coupled with condition monitoring and trend analysis software, IRIS permits controlled and predictive diagnostics, allowing the user to trend and capture results on a test-by-test basis.



### PARTI-MAG II

Used to measure flow in partially filled pipes, the PARTI-MAG II (FXP4000) reduces construction costs and provides users with accuracy, short inlet and outlet sections, simple and easy operation, and maintenance free technology.

Its superiority has been confirmed by many years of successful use in wastewater treatment facilities, disposal sites or for channel network management.

- Approved for use in hazardous areas
- Size range DN150 to DN2000 (6 to 80in)



### ProcessMaster

ProcessMaster is used for aggressive fluids and high pressure applications. It offers a broad range of liner materials plus a choice of flanged type process connections and sensors. It is approved for use in hazardous areas and can be accessed through a modern DTM.

- Size range: DN3 to DN2000 (0.1 to 80in)
- Wide variety of liner materials and flange types
- Accuracy to 0.2% or 0.4%
- High pressure rating
- Approved for use in hazardous areas



### Electromagnetic Flowmeter FSM4000

The FSM4000 delivers performance measurement on tough pump metering applications such as heavy sewage and slurry (better than  $\pm 0.5\%$  of rate accuracy). The FSM4000 is also the ideal flowmeter for reverse osmosis applications, where the water may contain undesirable gases such as carbon dioxide and oxygen.

Enhanced AC coil excitation in combination with our new Digital Signal Processing (DSP) provides stable outputs without the need for excessive damping and filtering. Pulsating flow applications as found on chemical skid injection packages can be handled smoothly and accurately with our piston pump operation function.

- Fast response times of down to 50 milliseconds
- Flowmeter primary element available from 1mm to 1000mm (0.04 to 40in) with a variety of process connections including DIN or ANSI flanged connections
- Supports PROFIBUS PA, FOUNDATION Fieldbus and HART communications protocols



### Vortex and Swirl Flowmeter

These flowmeters are particularly reliable for liquids, gases and steam applications due to their innovative DSP technology (digital signal processing). Pollution or deposits will not affect the signal generation when using the vortex measuring method. Applicable for flow measurement of air or non-conductive water in the treatment process.

- Extremely short, straight pipe section for the swirl meter
- High accuracy up to 0.5% of reading
- Approved for use in hazardous areas
- Supports PROFIBUS, FOUNDATION Fieldbus and HART communications protocols



### Thermal Mass Flowmeter

A digital mass flowmeter for use in aeration and digestion applications. The system is supplied with LCD display, integrated gas temperature measurement, totalizer functions and useful diagnostic functions, based on unique DSP technology.

- Digital measuring system PROFIBUS DPV1 or HART communication
- Certified high accuracy
- Very short response times
- Approved for use in hazardous areas





### Variable Area Flowmeter

VA flowmeters offer proven, cost effective solutions for measuring moderate to very low flow rates of a wide variety of liquids and gases. The various model types – glass & metal tubes, provide a suitable flowmeter for most applications found in the water and wastewater treatment facilities. These include sampling systems, tank level measurement with bubbler systems, make up water systems and solution panels.

- Local, easy to read indication without requiring external power
- Easy installation – no straight run piping requirements
- Excellent repeatability,  $\pm 0.5\%$  of full scale
- Pipe sizes from 1.5mm to 100mm (1/16 to 4in)
- Unique “snap-in” glass tube design eliminates meter removal
- Approved for use in hazardous areas



### Coriolis Mass Flowmeter

The CoriolisMaster enables mass and volume flow, density, concentration and temperature measurement with a single measuring instrument. It is well-proven for lime dosing applications such as lime milk density measurement and, unlike radioactive density measurement, no radioactive material is required for Coriolis measurement. Other typical applications are the dosing of expensive biocides and chemicals.

- Direct mass flow measurement with an accuracy of 0.1%
- Density measurement with an accuracy of 0.001 kg/l
- Sturdy design and construction; virtually wear-free, no moving mechanical parts
- Insensitive to noise from gas or solid content
- Best concentration measurement device on the market
- Approved for use in hazardous areas

### pH/Redox (ORP) & Conductivity

High specification, high performance analyzers for the measurement of pH/Redox (ORP) and conductivity.

- Cost effective measurement of one or two parameters in one instrument
- Reduced maintenance with continuous in-line pH diagnostics and auto-water wash/chemical clean
- Problem-free conductivity using auto-compensation of sensor fouling
- On-board PID controller
- PROFIBUS DP or analog communication



### Dissolved Oxygen

High-level (ppm) measurements for sewage treatment, rivers and process water – features immersion, floating ball, or flow-through sensor.

- Auto jet wash significantly reduces maintenance
- Integrated PID controller for aeration control
- Dual-input analyzer minimizes capital outlay
- Low maintenance, long-life sensor



### Residual Chlorine, Chlorine Dioxide and Ozone

A simple and reliable system for measuring residual chlorine (free and total), chlorine dioxide or ozone in water. Optional pH and ORP measurements are also available.

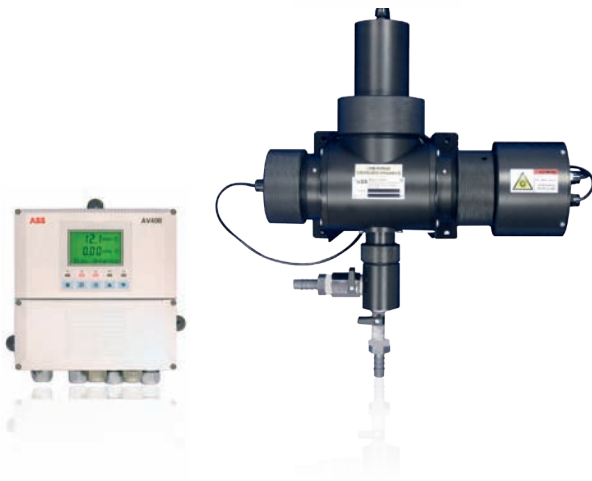
- Continuous on-line operation
- Self cleaning sensor assembly prolongs sensor life and maintains accuracy
- Optional PID control
- Up to 3 sensor inputs



### Turbidity

ABB's rugged turbidity systems are suitable for turbidity monitoring in raw water and effluent discharge applications.

- A variety of measuring technologies – absorption for high levels, or nephelometric scattering for turbidity levels near zero NTU
- Automatic cleaning and minimum maintenance
- Reliable, easy to use, dry standards in a broad range of values to make calibration a simple, safe and repeatable task
- Stable light source reduces calibration frequency



### UV Dissolved Organics & UV Nitrate

A range of single and dual input dissolved organics and nitrate monitors for use in potable water treatment applications.

- Rugged maintenance-free analyzers
- Reagentless operation – significantly reduces operational costs
- Automatic compensation for:
  - Turbidity on dissolved organics monitors
  - Turbidity and/or dissolved organics on nitrate monitors
- Dual input option provides lower capital and installation costs
- Automatic cleaning enables additional maintenance cost savings



### Aluminium, Iron, Manganese & Phosphate

The Aztec 600 range provides compact, yet reliable on-line colorimetric analyzers for the key parameters in water treatment. Each unit is designed for ease of use and maintenance simplicity.

- Graphical trending analysis and diagnostic displays
- Self cleaning measurement cell
- Automatic 2-point calibration
- Analysis of up to three sample streams
- Flexible communications including embedded web server

### Ammonia, Fluoride & Nitrate

Designed for use in a wide range of applications, providing continuous, rapid on line measurement with automatic calibration.

- Low operational costs – long life pump tubing and minimal reagent consumption keep maintenance costs to a minimum
- Automatic two-point calibration ensures continued accurate operation without the need for manual intervention
- On-line diagnostics provide automatic confirmation of the integrity of performance



### Water Monitoring Systems

ABB offers comprehensive, custom designed solutions along with professional commissioning and installation services, all of which can be tailored to your own specification.

- Backboard-mounted systems supplied plumbed and wired for samples, power and I/O
- Self-contained monitoring cabins
- Range of sample preparation equipment to meet your application requirements
- Rapid installation with minimal on-site costs
- Minimal maintenance and reliable operation



### Temperature Transmitters

ABB's temperature transmitters provide the interface from the temperature sensor to the PLC and offer excellent long-term stability with enhanced self-diagnostic capability.

- Supports 4-20mA, PROFIBUS PA, FOUNDATION Fieldbus and HART communications protocols
- Range of mounting options: head-mounted, DIN-Rail or on rack with field housing (IP66/67)
- Optional display available

### Temperature Sensors

ABB supplies a range of temperature sensors for use in a host of environments, including abrasive, high pressure & temperature and high vibration applications.

Options include:

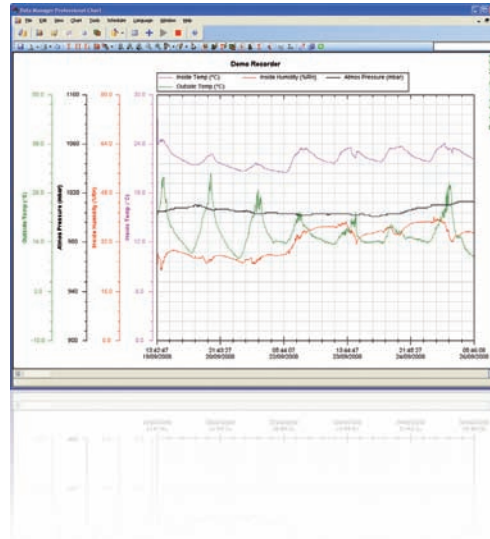
- Modular program – suitable for a wide range of applications
- Customized program – suitable for meeting individual needs
- Available with direct sensor output in 4-20mA, PROFIBUS PA, FOUNDATION Fieldbus and HART versions
- Optional display available



### Pressure and Level Measurement

ABB's 2600T pressure transmitter series offers one of the most complete ranges of pressure measurement equipment currently available.

- Range of options – multivariable, high static working pressure, differential pressure, hydrostatic level and safety versions
- High accuracy – 0.04% to 0.075%
- Available in 4-20mA, HART, PROFIBUS PA and FOUNDATION Fieldbus versions
- Reduced downtime – high, long term stability
- Complete family of remote seals plus a choice of materials and fill-fluids



### Advanced Videographic Recorders

ABB's ScreenMaster range of advanced videographic recorders deliver the latest in electronic data recording technology and convenience for water industry applications.

- Available in four models, from 1 to 36 recording channels
- IP66 & NEMA 4X rated, panel and field mountable
- Flow totalization with automatic generation of detailed flow total logs
- Remote supervision and data access solutions provided via Ethernet communications
- Powerful data management and analysis via DataManager Pro software



### Process Controllers

ABB's range of process controllers set the highest standards in industrial instrumentation. From simple single loop to advanced control options (including feed forward, cascade and ratio control), a controller is available to match any application. Features available in most units include:

- In-built 2 wire transmitter power supply
- Links to central PLC or SCADA systems via MODBUS
- Front plate rated to NEMA 4X/IP 66 protection
- Windows™ based PC Configuration Software



### Process Recorders

A comprehensive range of strip and circular chart recorders suitable for a wide range of applications, based on many years practical experience.

- 1 to 24 trace strip chart recorders
- 1 to 4 trace circular chart recorders
- Integrated process control
- Data logging to Compact Flash memory cards

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Printed in UK (08.2009)