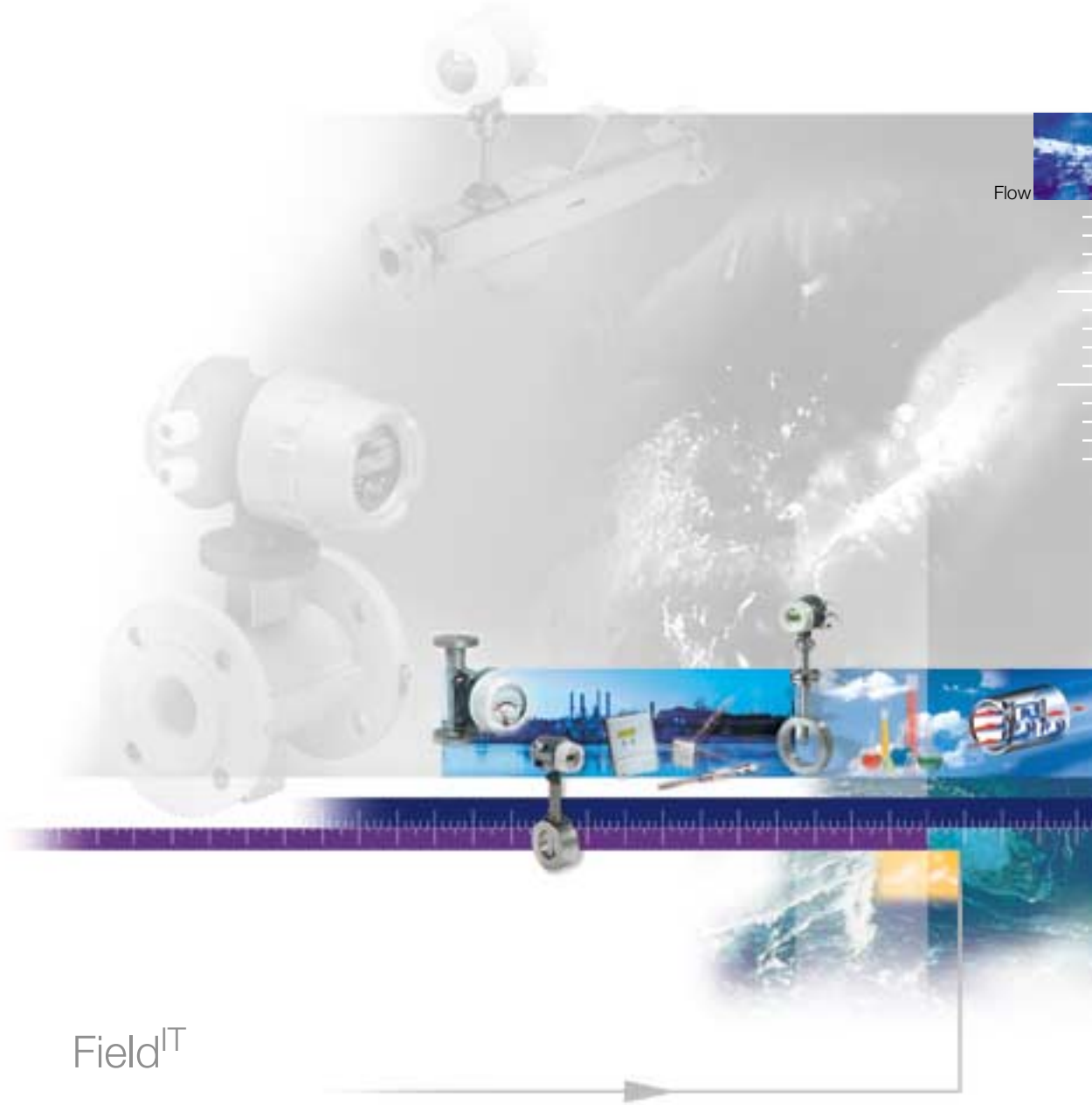


First for Flow

For knowledge. For reliability. For performance.



Field^{IT}

Analyze^{IT} Control^{IT} Engineer^{IT} Field^{IT} Inform^{IT} Operate^{IT} Power^{IT} **Industrial^{IT}**



Reliability that pays off:

ABB flowmeters

ABB offers one of the world's largest ranges of flow measurement products. It is unsurpassed in the number of proven measurement techniques, variety of models and scope of applications. These include continuous measurements in the water and waste water industries, applications in the chemical, pharmaceutical and paper industries, plus batch applications in the food & beverage industries. For decades, these devices have provided reliable and accurate service in countless applications.

Quality assurance

ABB's manufacturing plants have site approval to EN ISO9000 and 9001 to ensure the highest quality of design, manufacture and calibration of products. Flow calibration test facilities are NIST certified with uncertainties of flow calibration to 0.1%. Our calibration facility is one of the largest, continuous pumped facilities in the U.S., capable of calibrating instruments up to 30" in diameter. Products are certified and available with a wide range of international standards including FM, CSA, CENELEC, 3A, GOST, FDA and ATEX.

Technical expertise, application-orientated service

- Emergency support
- Repairs to process equipment
- On-demand and scheduled maintenance
- On-site service
- Training courses

Not just a flowmeter: It's Industrial IT Enabled



Through the broadest technology initiative in its history, ABB is "Industrial IT Enabling" its products – bundling documentation, configuration and connectivity tools, lifecycle support and more in consistent electronic format.

Using patented ABB Aspect Object technology, these electronic characteristics are built into a powerful software shell which represents the physical instrumentation device in every sense. Simply copy and paste the Aspect Object into your automation platform, then point and click for faster device installation, operation and asset management.

Industrial IT Enabled Product Features (depends on level of certification)

- Consistent, electronic asset information in every box
- Plug-and-produce installation and integration of devices
- Asset optimization & pre-configured tools

Leading edge technology with roots: ABB's experience

Application-orientated expertise, international presence and comprehensive service are the things that make ABB a leading provider in the area of flow measurement. Our 120-year success story began in 1882 with the Kent Metering Company. The company continued to grow with the acquisition of Taylor Instruments in the 1980's and, more recently, the purchase of Fischer & Porter in 1998. ABB is now the world leader in flow products, ranging from simple mechanical meters to 'state of the art' flowmeters with fieldbus communications and DSP electronics.

Today ABB, as an international leader in energy and automation technology, provides one of the most innovative and high-quality ranges of products on the market. This is made possible by development teams with applications experience, high-performance laboratories and the very latest in manufacturing facilities – all supported by an international marketing and service presence.

Customer support starts in the planning phase and continues far beyond installation and commissioning. Our specialists are ready to assist you for the full service life of the equipment. Customer training courses, both on-site and in training centers, complement our services.



	Electromagnetic	Swirl	Vortex	Coriolis	Wedge	Variable Area
Clear liquids	Fully usable	Fully usable	Fully usable	Fully usable	Fully usable	Fully usable
Turbid liquids	Fully usable	Fully usable	Fully usable	Fully usable	Fully usable	Not usable
Corrosive liquids	Usable under certain conditions	Usable under certain conditions	Usable under certain conditions	Usable under certain conditions	Fully usable	Usable under certain conditions
Hygienic/Sanitary	Fully usable	Usable under certain conditions	Usable under certain conditions	Fully usable	Not usable	Not usable
Gas vapor	Not usable	Usable under certain conditions	Usable under certain conditions	Not usable	Fully usable	Fully usable
Steam	Not usable	Fully usable	Fully usable	Not usable	Fully usable	Fully usable
High-temperature applications	Usable under certain conditions	Fully usable	Fully usable	Usable under certain conditions	Fully usable	Fully usable
Cryogenic applications	Not usable	Not usable	Not usable	Usable under certain conditions	Fully usable	Not usable
Partially filled pipes	Usable under certain conditions	Not usable	Not usable	Not usable	Not usable	Not usable

■ Fully usable
 ■ Usable under certain conditions
 ■ Not usable

Ready for any application: the product range



Electromagnetic

- Large range of sizes
- Obstructionless with no intrusive parts
- Works in both flow directions (forward and reverse flow)
- High accuracy

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Swirl

- Short straight pipe requirements
- Outstanding reproducibility
- High accuracy
- Increased reangeability

Page 8

Vortex

- No moving parts
- For high-temperature applications
- Optional temperature sensor
- DSP technology eliminates effects of pipe vibration

Page 8

Coriolis Mass

- One instrument measures flow, temperature and density
- Independent of pressure, temperature & viscosity
- Self-draining
- 3 sensor design eliminates unstable zero covered by pipe vibration

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Variable Area

- Low-cost glass and metal tube flowmeters
- No external power required for local indication
- No straight pipe requirements
- Low flow measurement of liquid and gas

Page 10

Wedgometer

- Clean fluids to abrasive slurries
- For extreme temperatures and pressures
- Low maintenance
- Highly durable

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Performance that shines through: the electromagnetic flowmeter

An aurora arises when electrically charged particles originating from the Sun are deflected towards the poles by the Earth's magnetic field, where they become luminous as the result of collisions with particles in the atmosphere. Faraday's discovery of electromagnetic induction in 1831 utilizes magnetic fields used today in motors and generators that drive, light and heat the modern world. ABB electromagnetic flowmeters are based on Faraday's discoveries.

Whenever the substance to be measured is conductive and in a liquid, slurry or paste state, ABB electromagnetic flowmeters are in their element. For many years, they have been among the most successful range on the market and are used across the entire industrial landscape. A very large range of product lines and models, meeting practically all needs, cover nearly every application.



Economical sensors for all applications: the XE line

Inexpensive, versatile and modular: that's the basic concept of the ABB XE line. A large variety of models, including wafer models, all stainless steel models for sanitary processes and explosion proof models for the chemical and process industries, offer a solution for every application. Here flexibility is paramount: all stainless-steel models are available with numerous types of process connections, while all models are available as compact devices or with remote converters.

The converter has the same degree of flexibility and performance – configuration via an easily understandable menu structure, configuration data stored in EEPROM, a locally configurable pulse output and HART, Profibus DP, Profibus PA and Foundation Fieldbus capability.

The highest performance under the most difficult conditions: the XM line

Superlative measurement accuracy (0.25% of rate), a wide range of sizes (1/2" to 24") and suitability for difficult measurement conditions characterize the devices in this high-end line. With lines and electrode selections available to meet a wide range of applications. Designed to meet your most demanding application.



50XM1000 Transmitter



10DX3111 Primary

Slurry applications: The SM Line

The toughest mining and paper applications require the power and noise immunity of the SM Line of magmeters. Their high accuracy under reference conditions is aided by microprocessor controlled, digital signal processing. The user friendly keypad allows easy access to key configurable functions with the push of one button. AC coil excitation and rugged lines construction give the SM line a key advantage over the competition.



50SM Transmitter

The flexible sensor for potable water: Aquaprobe

Aquaprobe is a fully portable insertion type electromagnetic flow meter for clean water applications. It is suitable for both temporary and permanent installation in pipe lines up to 3 meters diameter and can be fitted whilst the pipe is under full working pressure "Hot Tapped". Its bi-directional flow meter measuring capability makes it a cost effective and versatile tool in the monitoring of potable water distribution systems and leakage management.



The sales leader for water and waste water: MagMaster.

ABB's MagMaster is the world's best-selling flowmeter in the water and wastewater management industry. With unrivalled $\pm 0.2\%$ accuracy, rangeability of 1000:1 and bi-directional flow measurement it is widely used in many applications. Its pulsed DC technology, submersible and buriable sensors and a wide variety of corrosion and abrasion resistant liners make it durable and reliable. In addition its designed, manufactured and calibrated to internationally recognized standards and is FM approved and CSA certified for use in hazardous locations.

One of the biggest benefits to MagMaster is that it's CalMaster insitu calibration verification system enabled. This means that even when installed, its calibration can be easily checked by an ABB service technician whenever and wherever it is necessary. This has resulted the MagMaster being the flowmeter of choice for custody transfer applications.



The calibration verification system: CalMaster.

ABB CalMaster is the first commercially available calibration verification system that can check the calibration of flowmeters without access to the pipe or sensor, without any disruption to normal operations. The CalMaster service quickly provides an extensive test log in the form of a hard copy or file. Its ability to generate histories and recognize trends, combined with the possibility of taking corrective measures at an early stage, makes CalMaster a flexible and economical predictive maintenance tool.

Innovation that creates a stir:

Swirl and vortex flowmeters

As fluid flows around a bluff body, a Karman vortex street forms on the downstream side of the body. Swirl and vortex flowmeters take advantage of the frequency of the vortices created behind the obstacle to accurately and reliably measure flows of liquids, gases and steam.

The TRIO-WIRL Series of high performance swirl and vortex flowmeters use innovative digital signal processing (DSP) to produce measurements with impressively high reliability. All meters in the Series use two-wire technology for low cost, simple installation. The measurement converters have analog outputs, freely configurable switching outputs and are available in intrinsically safe, explosion or dual certified versions.

Stream flow in a swirl flowmeter



The clever sensor for difficult locations – TRIO-WIRL S (Swirl)

With its minimal upstream and downstream piping requirements, high accuracy and wide turndown, this unique Swirl-type flowmeter can provide better performance for orifice plate applications. It's great for steam applications and its HART, Profibus PA and FOUNDATION Fieldbus communications also make it easy to add to your existing process.



TRIO-WIRL ST



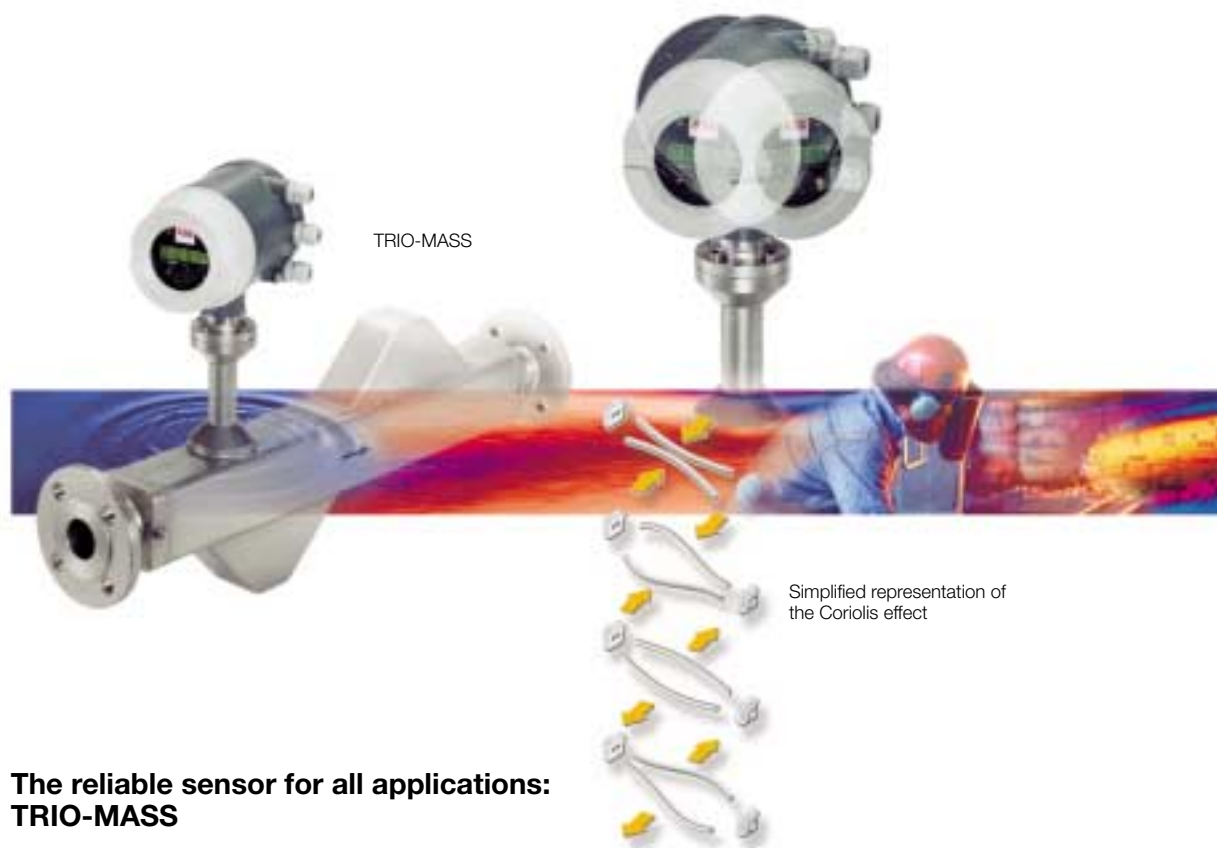
TRIO-WIRL VR

The clever sensor for difficult materials – TRIO-WIRL V (Vortex)

This 2-wire compact vortex flowmeter with digital-signal-processing (DSP) converter technology is a great solution for those difficult fluids and gases. The volumetric flowrate of steam, gases and liquids can be measured over wide flow ranges independent of the fluids properties. Its HART, Profibus PA and FOUNDATION Fieldbus communications also make it easy to add to your existing process.

A force to be reckoned with: the Coriolis mass flowmeter

The rotation of the earth was first demonstrated in 1851 at the Pantheon in Paris using a Foucault pendulum. The rotation of the earth gives rise to a Coriolis force on a moving pendulum, which causes it to deflect. ABB's successful TRIO-MASS flow meter operates by using this principle.



The reliable sensor for all applications: TRIO-MASS

The TRIO-MASS Coriolis mass flowmeter may be used to measure the flow of all liquids, slurries or pastes, since the measurement principle is independent of conductivity, temperature and density changes.

Its main features are space-saving design, robust construction, insensitivity to vibration and pipe stresses as well as economy and reliability. TRIO-MASS is available in a wide range of sizes, is easy to install and is self-draining. Thanks to its digital signal processor (DSP), the TRIO-MASS is versatile, reliable and has long-term stability.

Experience that really takes off:

Variable area flow meters

When ABB acquired the Fischer & Porter Company a new era in variable area history began. Building on the strength of 65 years of variable area innovations and one of the largest installed customer bases, ABB has the best variable area flowmeters in the market today.



Variable area flowmeter

Functional diagram of the metal tube variable area flowmeter



Proven and inexpensive - ABB variable area flowmeters. For the measurement of gases, liquids and steam at low flow rates, a large range of models ensure that there is a suitable device for every application.

The series starts with the low-volume SNAP-IN flowmeter, which can be used as a purge instrument or in the laboratory for dosing and measuring small flows. It continues with an extensive selection of glass tube flowmeters and finishes with metal tube flowmeters (available in various versions, ranging from indicator only devices to models with two-wire transmitters). Metal tube flowmeters are particularly suitable for use with aggressive or opaque liquids and for steam measurements.

Fully metallic low-volume flowmeters and low-volume flowmeters with differential pressure regulators for maintaining a constant flow at a pre-set rate complete the series.

Expertise that makes a difference:

Differential-pressure flowmeters

Daniel Bernoulli was born in 1700 in the Netherlands. A Swiss mathematician who, while working in St Petersburg, made his most important discovery. To become known as the Bernoulli principle, it describes the relationship between the pressure and velocity of a fluid with constant density flowing in a pipe. It is the principle on which all differential pressure flow meters are based.

The efficient sensor for non-homogeneous materials: Wedge Meter II

Wedge Flow Meters are ideal for making measurements on substances with a high proportion of air or foam, abrasive substances, highly viscous substances and low-conductivity substances. It combines the structural advantages of the wedge element (low maintenance and an extremely low pressure drop) with the precision of the high-performance, multivariable 2010TC measurement converter.

In combination with an extensive range of primary components, such as baffles, orifices and venturi tubes, the 2010TC measurement converter used in the Wedge Meter II series satisfies all applications in the broad field of differential pressure measurement.

$$qm = K \cdot \frac{C}{\sqrt{1-\beta^4}} \cdot \sqrt{\rho_1 \cdot dp}$$



Wedge Meter II

NIST certified calibration lab: Keeps flow accurate

Our NIST certified calibration laboratory provides water calibration on flowmeters up to 30" in diameter. ABB can help you keep your flowmeter measurements accurate and is equipped to calibrate almost any flow technology and brand name available.



NIST certified calibration lab

ABB has Sales & Customer Support
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Printed in USA (05.03)

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