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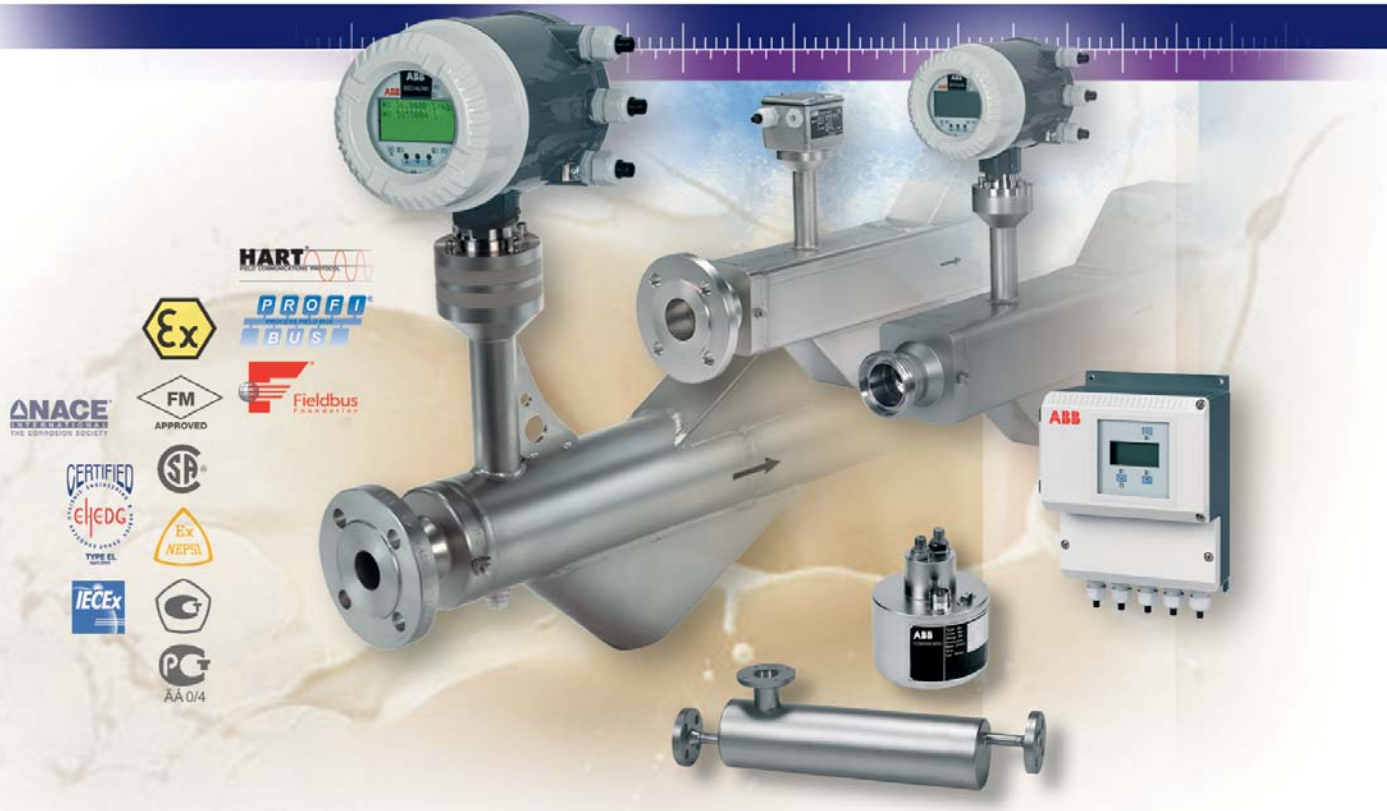


Reprint



ABB Coriolis Mass Flowmeter

High Accuracy and Intuitive Operation



High Accuracy and Intuitive Operation

Introducing the next generation of Coriolis mass flowmeters from ABB – modular, easy to use and with selectable accuracy classes to meet customer requirements

Coriolis continues to gain points. The technology to beat for high accuracy mass flow measurement can now also claim the title “easy to use”. With the new generation of Coriolis flowmeters from ABB, users benefit from the standardized electronics with modular design, standard tube geometries for a variety of accuracy classes and ease of use.

■ Ulla Reutner

Reading manuals is time-consuming and annoying. Few activities are as boring. Cellphone users, for instance, expect to use their new model without studying the manual. The operating functions are essentially the same as previous models – buttons are located in relatively the same position, the menu is familiar and so forth. The same is expected

of meters in the future, according to Frank Frenzel, who is responsible in Product Management at ABB Automation Products for marketing the new generation of Coriolis mass flowmeters. “With intuitive operation and a user-friendly menu structure, CoriolisMaster makes reading the instructions a thing of the past,” states Frenzel. “We apply this philosophy to our complete port-

folio of instrumentation products.”

Attendees at the Hannover Messe trade show in April 2007 experienced the CoriolisMaster’s ease of use firsthand. Initial users such as the Austrian company Mayr-Melnhof, one of the leading global manufacturers of recycled cardboard boxes, were impressed by the new operating concept. Intuitive operation in the future will be based on

three control keys and a text display, according to the manufacturer. Plausibility routines ensure reliability.

Standard design for all accuracy classes

For many customers, the outstanding accuracy of the meter is another argument: state-of-the-art Coriolis devices outdo scales under production conditions. However, high accuracy is not required in all applications. As a result, some manufacturers have launched low-budget lines.

ABB, in contrast, focuses on a standardized device design and the same installation length for each meter size, regardless



CoriolisMaster models:
Each meter size features three different accuracy classes with identical installation length.

Hastelloy C, prices can be higher.

By measuring resonant frequency, Coriolis flowmeters can also be used to determine the density of a medium. In

density measurements to a new level. Instead of simply measuring the temperature of the medium for temperature compensation, we read the temperature of the entire housing and piping. As a result, we are achieving levels of accuracy and stability previously unknown in the market."

Good long-term memory for calibration data

ABB is driving the evolution process – to encompass transmitter electronics.

The proven FCM2000-DSP technology has been reengineered to provide a higher dynamic (up to 1:2,000) and offset accuracy. "DSP or digital signal processing is becoming increasingly popular.

These special microprocessors are extremely fast and powerful – and are one reason for the jump in performance of five to ten times over older Coriolis models," states Frenzel. >



"The CoriolisMaster provides an attractive cost-performance ratio. For larger meter sizes, the ratio is especially good."

*Frank Frenzel,
product manager for Coriolis mass flowmeters,
ABB Automation Products*

of accuracy class. Users of Class 0.4 meters in processes or 0.1 percent meters can benefit from deploying CoriolisMaster meters globally and significantly reduce the spare parts stockpile compared to the alternative of using other lines of meters.

"Absolute accuracy is usually less important in the process than reproducibility," explains Frenzel. "Since sensor mechanics and process stability are the same for our devices regardless of accuracy class, the less expensive device often meets customer requirements." The high quality of the measuring tube for Coriolis mass meters is ultimately the decisive factor.

However, there is a difference in price due to calibration requirements. For instance, a 0.4 Class device requires less effort than a 0.1 Class device. "We offer a very attractive cost-performance ratio, in particular, for large meter sizes 100 and 150," states Frenzel. "With its stable measurements, the CoriolisMaster has already developed a large following." List prices range from approximately 3,000 to 25,000 euros. In special designs such as the largest size 150, using expensive materials such as

addition, the meters compensate for temperature effects.

ABB uses complex algorithms to process signals, depending on the device option selected, from up to three integrated temperature sensors. "Existing Coriolis devices are able to measure density with a high degree of accuracy," states Frenzel. "We have now brought the quality of



The self-draining installation in all mounting positions and the Weihenstephan EHEDG certification make the CoriolisMaster ideally suited for applications in the food and beverage industry.

Designs according to the Nokia principle

Bernd Kammann and Cornelia Giebenhain-Wagner discuss the common components strategy and business development at ABB Automation Products

■ **P&A: Mr. Kammann, as head of the division Flow Products worldwide within ABB Automation Products, you manage the flowmeter business of ABB. We are here in Göttingen. Would it be safe to say that this site is the heart of the company's flowmeter operations?**

Kammann: It is part of the heart. The former company Fischer & Porter, located in Göttingen, is now a key part of ABB Instrumentation. This site is a global center and develops flowmeters for the entire Process Technology division.

■ **P&A: Does this mean the flowmeters are engineered entirely in Göttingen?**

Kammann: International teams have for some time been analyzing market requirements. The teams write the market requirements and provide them to development in the form of project specifications. The development teams are also internationally based. They are brought together for specific projects and managed centrally. The teams are supported and managed by engineering project managers and steering committees. The latter check regularly during the course of a project whether specifications are being implemented.

■ **P&A: You have become more international since the days of Fischer & Porter.**

Kammann: Indeed, we are currently on the client list in more than 70 countries and must comply with numerous

international standards and regulations such as the pressure equipment directive in Europe. We are also international in our approach to material procurement as well as the decision on the production site. It does not make sense to manufacture a 2400 meter in Göttingen and



"To meet customer requirements for products that are easy to operate, we launched one of the most ambitious development projects in recent years."

Bernd Kammann, head of Flow Products worldwide in ABB Automation Products

ship it to Australia. The logistic costs and delivery times are prohibitive.

■ **P&A: Is the production of flowmeters distributed globally?**

We still produce the majority of devices in Central Europe and the USA. Two and a half years ago we began production in China and India. We will continue to expand these sites. We are supported by an international sales team that works together with a service network. Our global clients want partners who can help them to implement this technology in sites throughout Asia and other regions of the world.

■ **P&A: What are the market requirements that played an important role during development of the new Coriolis-Master?**

Kammann: Our customers expect high accuracy with easy handling and operation. Against this background we started one of the most important development projects in recent years – the Common Components project. Hartmann & Braun, Fischer & Porter,

sted. The operating and display concept, that is, the HMI, is defined as a common component – from the number of keys to the menu navigation. As a result, customers benefit from savings based on a one-time investment in training. You can compare this to a Nokia telephone: Regardless of the model, the

ABB Kent-Taylor are only a few of the companies acquired by ABB, but they each had their own design philosophies and operating concepts. This resulted in considerable development time and required additional effort on the part of customers.

■ **P&A: How did you finally correct this situation?**

Kammann: We began with common components in the hardware, e.g., the housing. Requirements such as explosion protection, vibration resistance, protection against environmental factors and so forth were harmonized, and on this basis a modular system was created so that a separate housing is not required for each market. We applied the same approach to the electronics: we began with a basic electronic unit for which essentially only the front end, the signal input, has to be adju-

display and keys are always the same.

■ **P&A: Do OEM customers such as plant construction companies appreciate the value added? Or is a shared operating philosophy and modular design the most important thing for this type of company?**

Kammann: There is particularly high acceptance in this sector. Plant construction companies install the fewest devices in Germany. By assigning the commissioning of one of our devices in Chile, the Philippines or India to an on-site team, possibly with phone support, these companies save considerably by reducing travel costs. Companies also benefit from the conceptual planning phase: If requirements change during this phase, for example, in case of new accuracy

requirements, the modular design and common installation lengths allow for relatively easy adjustments. In the past, it would have been necessary to replace the entire line of devices.

■ **P&A: Ms. Giebenhain-Wagner, what is the role of Business Development, which you belong to? Do business development activities also have an influence on product development strategies?**

Giebenhain-Wagner: Business Development is part of Sales and works closely with Product and Sector Management as well as Marketing. Business Development was created three years ago within ABB Automation Products in order to develop new operating areas in close collabo-

ration with the abovementioned departments. In Business Development, we also conduct custo-



"When developing new business areas, we regularly identify potential for improvement that we incorporate in upcoming development activities."

Cornelia Giebenhain-Wagner, Business Development Manager, Instrumentation/Flow, ABB Automation Products

mer surveys in future target markets. This enables us to regularly identify potential for improvement and incorporate this in future development activities.

■ **P&A: What results are you experiencing for the development of your division?**

Giebenhain-Wagner: Our

approach has enabled us to achieve growth rates well above the market average for

a variety of flow products. In addition, we have gained specific market shares and our strategic focus has proven its worth. We have also established that our analyses of potential reflect actual market realities.

■ **P&A: Do your customers expect SIL certification?**

Kammann: Yes, of course. All of our devices are SIL-certified. We also believe that explosion

protection is an important topic. We place considerable value in ensuring that all new devices comply with international Ex standards – from ATEX/IEC approval to FM, CSA and NEPSI and GOST. All Ex certificates will be available for CoriolisMaster, at the latest, as of its release in June. ■

The best thing with regard to the user-friendly design is that the accuracy is unaffected by replacing the transmitter electronic unit. Sensor-specific information such as calibration data is stored in an external FRAM chip. If a user decides to switch to fieldbus communication, the electronic unit can be replaced in minutes without needing to recalibrate or reconfigure the device.

Typically, a number of power outputs would be needed to meet the requirements of a device with four primary measuring variables (mass, volume, density and

temperature) and related variables such as concentration. However, the communication platform for ABB devices supports Hart, Profibus PA and Foundation Fieldbus. ABB believes users should be free to decide and provides devices with a DTM as well as an EDD. Additional usage options are available with the special software Densimass, which calculates values such as concentration, Brix or PLATO from density.

The new generation of Coriolis devices offers several new features. Yet the device stays true to its roots: the characteristic S-shaped double pipe remains unchanged. The measurement pipe loop has a point symmetrical design. "This ensures the system is balanced optimally in all mounting positions," states the product manager. "The accuracy remains unaffected."

"As a result, the measuring tube is constantly draining in vertical, oblique and horizontal positions." The design eliminates dead spaces, edges and gaps, providing a hygienic solution.

ABB has documented the ability to clean the double-pipe system: At the Center for Mechanical Engineering and Process Technology at the University of Munich, the piping loops were subjected to numerous cleaning tests. The EHEDG approval office in Weihenstephan tests

devices for hygienic applications, not only surface conditions. They are contaminated under realistic conditions and purified 100% with a cleaning solution.

EHEDG-approved cleanability

A polished 0.5 micrometer processing pipe serves as reference. The result for the CoriolisMaster: the double S-pipe demonstrates the same cleaning characteristics as the reference pipe, which is EHEDG-certified.

"With the new generation of our Coriolis mass flowmeters, we are targeting the demanding volume business," states Frenzel. Beginning in June, the first devices will be shipped. Then we'll begin to see whether ABB can begin to change current market conditions, with Micromotion and Endress + Hauser at the top.

Frenzel: "In our opinion, the CoriolisMaster line – with standard device designs, customizable accuracies, self-draining installation and superb cleanability – provides a universal solution with a wide range of advantages. We are positive that this multivariable device and its user-friendly menu navigation – one of the best on the market in our opinion – will continue to gain significant market share." ■



Company info

ABB

Founded	1890 (ASEA), 1891 (BBC)
Employees	108,000 worldwide, 11,600 in Germany
Sales	2.61 billion EUR (Germany)
Operating areas	Process Automation, Automation Products, Energy Technology Products and Systems, Robotics
ABB Automation Products GmbH:	
Headquarters	Ladenburg
Sales	330 million EUR (2006)
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ABB is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 104,000 people.

www.abb.com/instrumentation

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