

Electromagnetic flowmeters

Over 2 million units installed





Electromagnetic flow measurement

Trusted for decades in numerous industries

The worldwide success that the electromagnetic flow measurement principle has had over the last 60 years is constantly being reaffirmed by its popularity in numerous industries. Electromagnetic flowmeters (magmeters) measure all conductive liquids, for example water, wastewater, slurries, pulps, pastes, acids, alkalis, solvents, juices or fruit mashes.

The rule of thumb for magmeters is: Anything that can be pumped and is electrically conductive can also be measured – a trait much in demand in measurement technology. Typical measuring tasks for magmeters are the recording and monitoring of continual flow rates, filling and dosing as well as custody transfer applications.

In industrial environments, magmeters are primarily used in water management, in the process industry, in life sciences and food industries. In tunnel construction and mining, robust magmeters are often the only option for measuring highly abrasive ore slurries with entrained solids, sand-water mixtures, filler materials or bulk solids with the required accuracy.

Decades of ongoing research and development in sensors and signal processing have resulted in a sophisticated product that can be integrated optimally into highly complex applications using measuring, controlling and regulating technology.

Electromagnetic flowmeters since production start 1977



The measuring principle

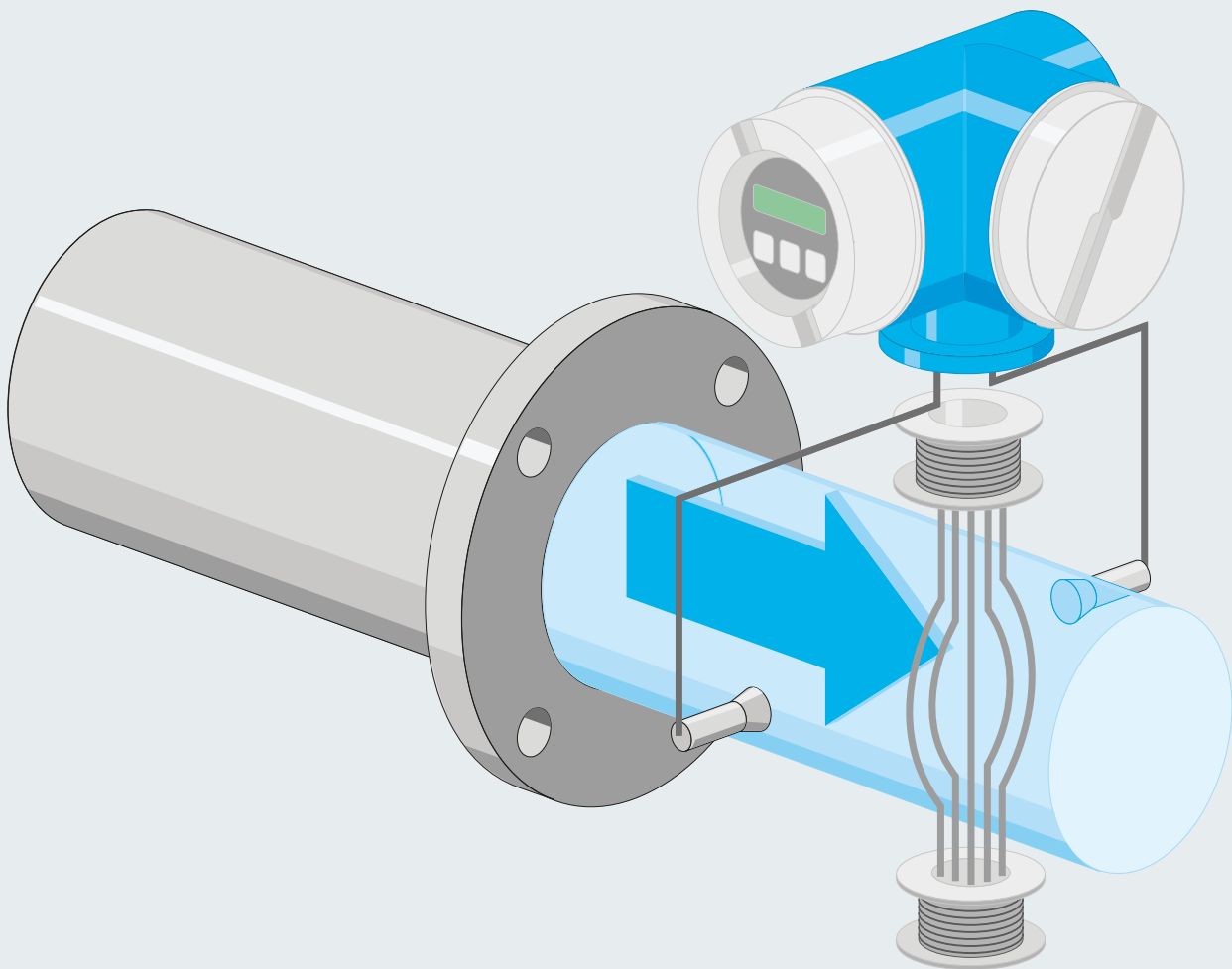
For electrically conductive liquids – with or without solids

Since 1939, electromagnetic flowmeters have been built for practical use. The pioneer of the industrial application of this measuring technology was the Swiss inventor, Father Bonaventura Thürlemann (1909–1997). The physical phenomenon underlying the core of this measuring principle has been well-known for a significantly longer time and can be traced back to the English physicist Michael Faraday (1791–1867).

According to Faraday's law of magnetic induction, electrical voltage is generated in a conductive fluid that moves within a magnetic field. Magmeters also work according to this "dynamo principle."

Magmeters have two field coils positioned on either side of the measuring tube, which generate a magnetic field with constant strength. Two measuring electrodes are located perpendicular to these coils on the inner wall of the tube.

The principle of electromagnetic flow measurement



As soon as the electrically charged particles of a liquid pass through the magnetic field, electrical voltage is induced. This voltage, detected by the two measuring electrodes, is directly proportional to velocity of flow and therefore to flow volume.

A magnetic field is generated by a pulsed direct current with alternating polarity. This ensures a stable zero point

and makes measurement insensitive to multiphase or inhomogeneous liquids, as well as low conductivity.



Measuring principle movie





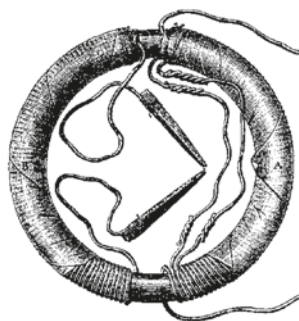
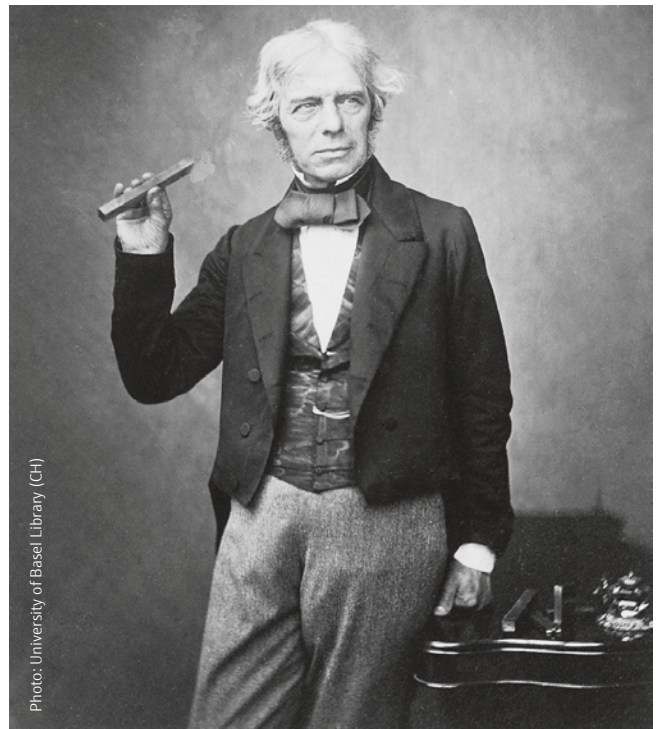
Pioneers and inventors

Michael Faraday (1791–1867) – The law of magnetic induction

Michael Faraday was born in 1791 in the south of London as the son of a poor blacksmith. Already at 13 years of age, Faraday had to earn his keep as a bookbinder. The scientific books that he bound fascinated him, and he enthusiastically visited public lectures about electricity – a very popular topic at the time. Through fortunate circumstances he became the assistant of the then famous electrochemist Sir Humphrey Davy at the Royal Institute. In 1825, Faraday himself was made Director of the Institute, leading it while beginning his own independent scientific research. In his diary, he noted a personal objective: “Transform magnetism into electricity.”

Then on August 29, 1831, he succeeded with a crucial experiment in which he discovered magnetic induction and produced electricity with it. Faraday then carried out this laboratory experiment on a greater scale by stretching a wire across London’s Waterloo Bridge and dangling both ends in the Thames. He hoped that, by means of the earth’s magnetic field and the river Thames, he could generate electricity and a measurable current, as well as being able to determine the flow rate of the Thames. The actual measuring signal was, however, too weak in contrast to the electrochemical interference in the heavily polluted Thames. But the concept of an oversized dynamo was born.

Faraday’s discoveries were seminal for the future of mankind as shown by commercial exploitation 150 years later. Faraday died, highly respected, in 1867.



Iron ring with two copper wire, with which Michael Faraday discovered magnetic induction in 1831.



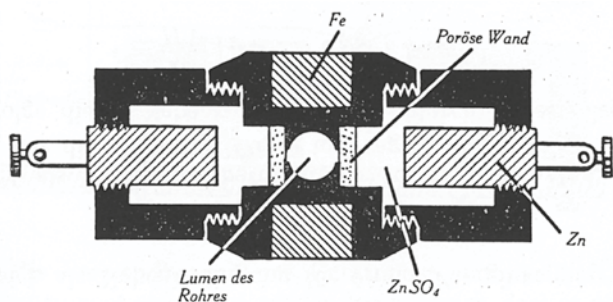
Bonaventura Thürlemann (1909–1997) Swiss priest builds the first magmeter

Did you know that the mastermind behind the first magmeter was Swiss inventor and Benedictine priest, Bonaventura Thürlemann?

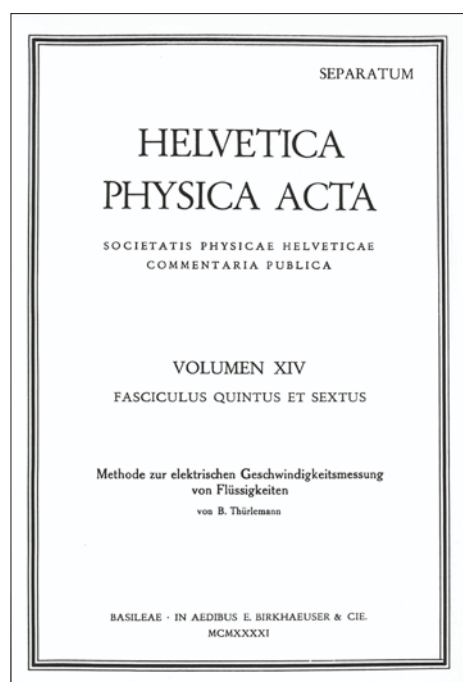
His 1941 publication “Method of Electrical Velocity Measurement in Liquids” prepared the way for the practical application of Faraday’s laws to volume flow measurement of liquids. The hundreds of thousands of magmeters used worldwide to measure conductive liquids are based on Father Bonaventura’s research. His experiments with laminar and turbulent flow demonstrated that the average flow velocity in a pipe could be determined by measuring the difference in potential of two boundary points in a pipe – without knowing the velocity distribution in the pipe itself being known.

The first magmeters were not used in industrial instrumentation until the 1950s, but the real breakthrough only came in the 1970s.

As a mathematics and physics teacher at the monastery’s school in Engelberg (Switzerland), Father Bonaventura never made a commercial profit from his invention because he never patented it. In a 1984 speech at the opening of the magmeter production facility at Endress+Hauser Flowtec AG (Reinach, Switzerland), Father Bonaventura remarked that the patenting process had been too complicated for him. This speech was the first time he had ever spoken publicly about the history of his invention. He was 89 years old when he died on May 30, 1997.



Positioning and design of the “nonpolarizable” measuring electrodes developed by Bonaventura Thürlemann.





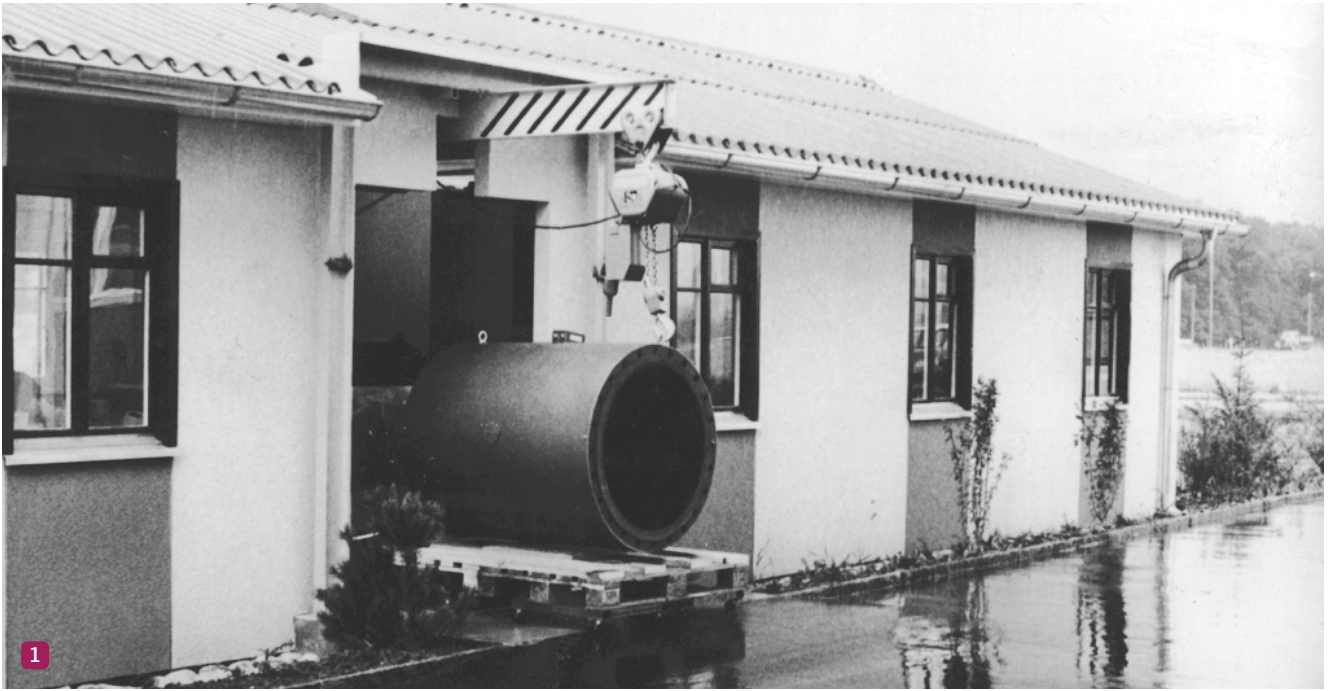
The history (1977–2016)

Electromagnetic flow measurement
Endress+Hauser

The beginnings

Endress+Hauser has been involved in flow measurement since the 1960s. However, the real breakthrough only comes in the mid-1970s when the group gears its business

strategy towards environmental technology and enters the water and wastewater market.

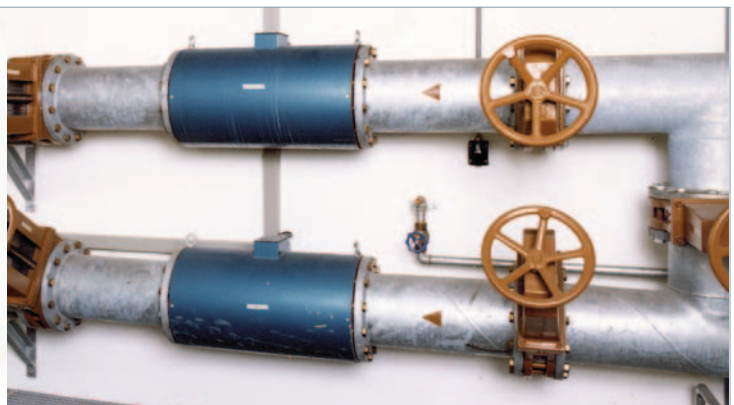
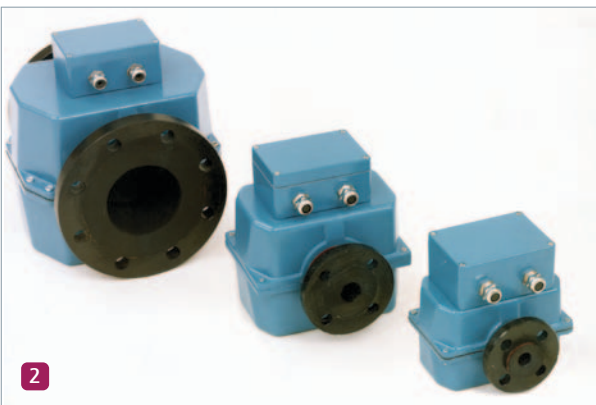
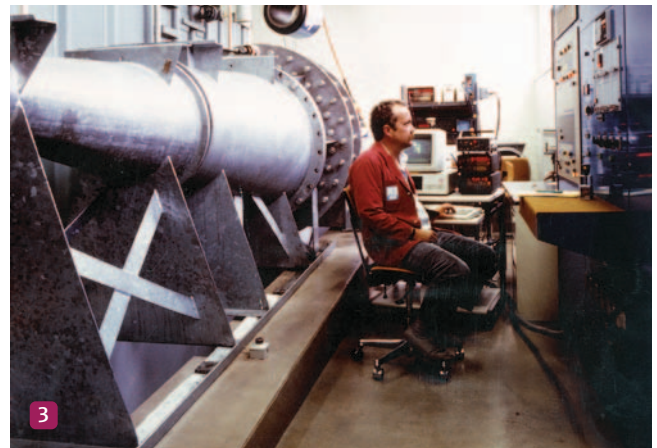


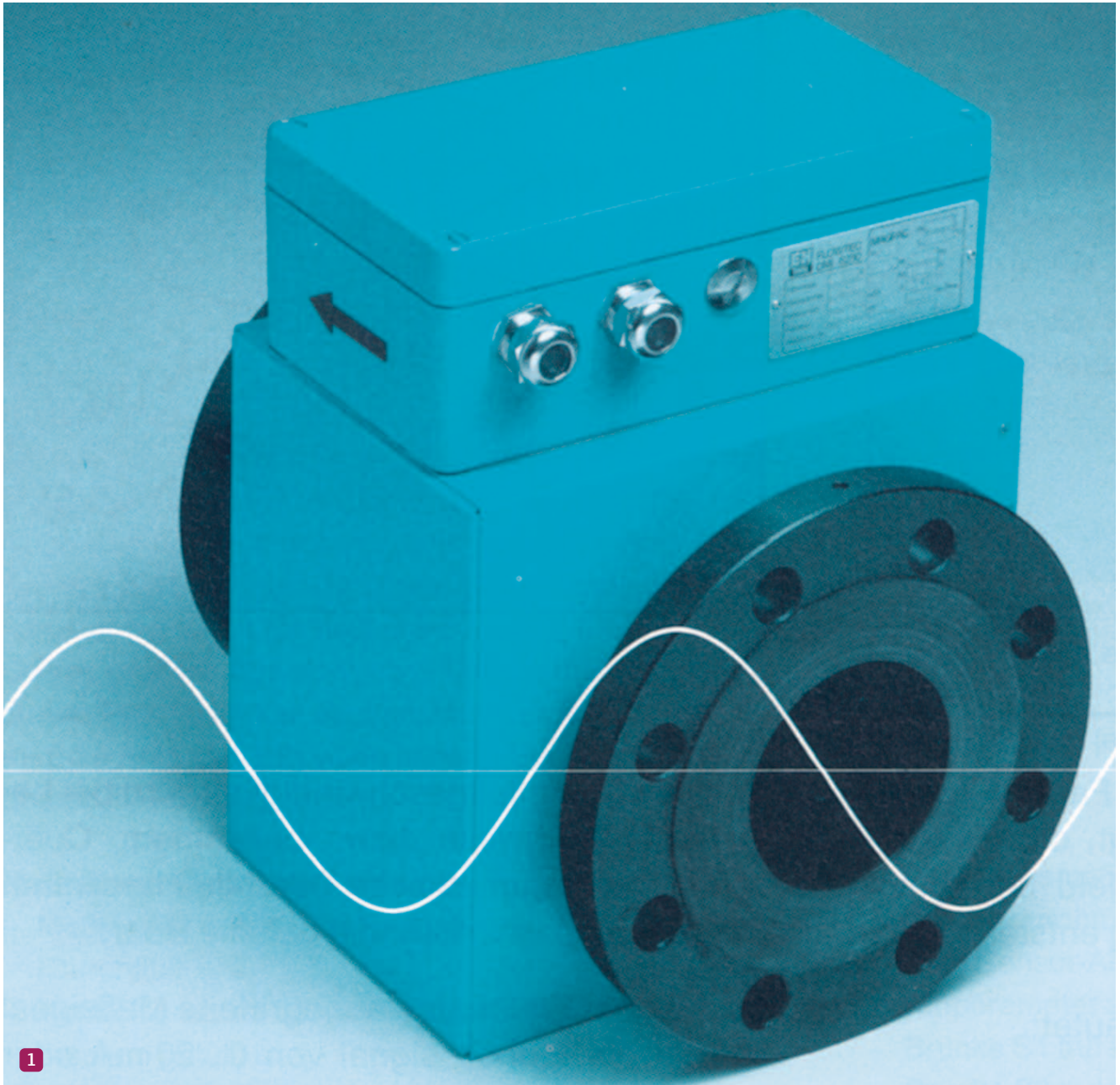
“Production begins on the first magmeters”

1977 In March, Endress+Hauser buys “Flowtec” in Bern, Switzerland. In the same month, the company is moved to Reinach in the Swiss canton of Basel-Landschaft and is re-named “Endress+Hauser Flowtec AG.” The young company commences work with three employees at the new site in a former **military barracks** **1**.

Production begins on the first magmeters with the **76 series** **2**. Flowtec tries to make a bigger mark on the flow market with this instrument for measuring liquid volumes. The follow-up model – the **77 series** – uses a pulsed DC field to excite the two magnetic field coils and, with automatic zero point correction, facilitates accuracy levels of $\pm 0.2\%$.

1977–1978 Shortly after moving to Reinach, work begins on building the first magmeter calibration rig (DN 200 to 1300) right beside the military barracks. This rig remains in service until the end of 2000 and lays the foundation for the high level of expertise Endress+Hauser acquires in the area of **flow calibration** **3** over the course of the following years.





*“Endress+Hauser produces
the world’s first low-cost compact
magmeter”*

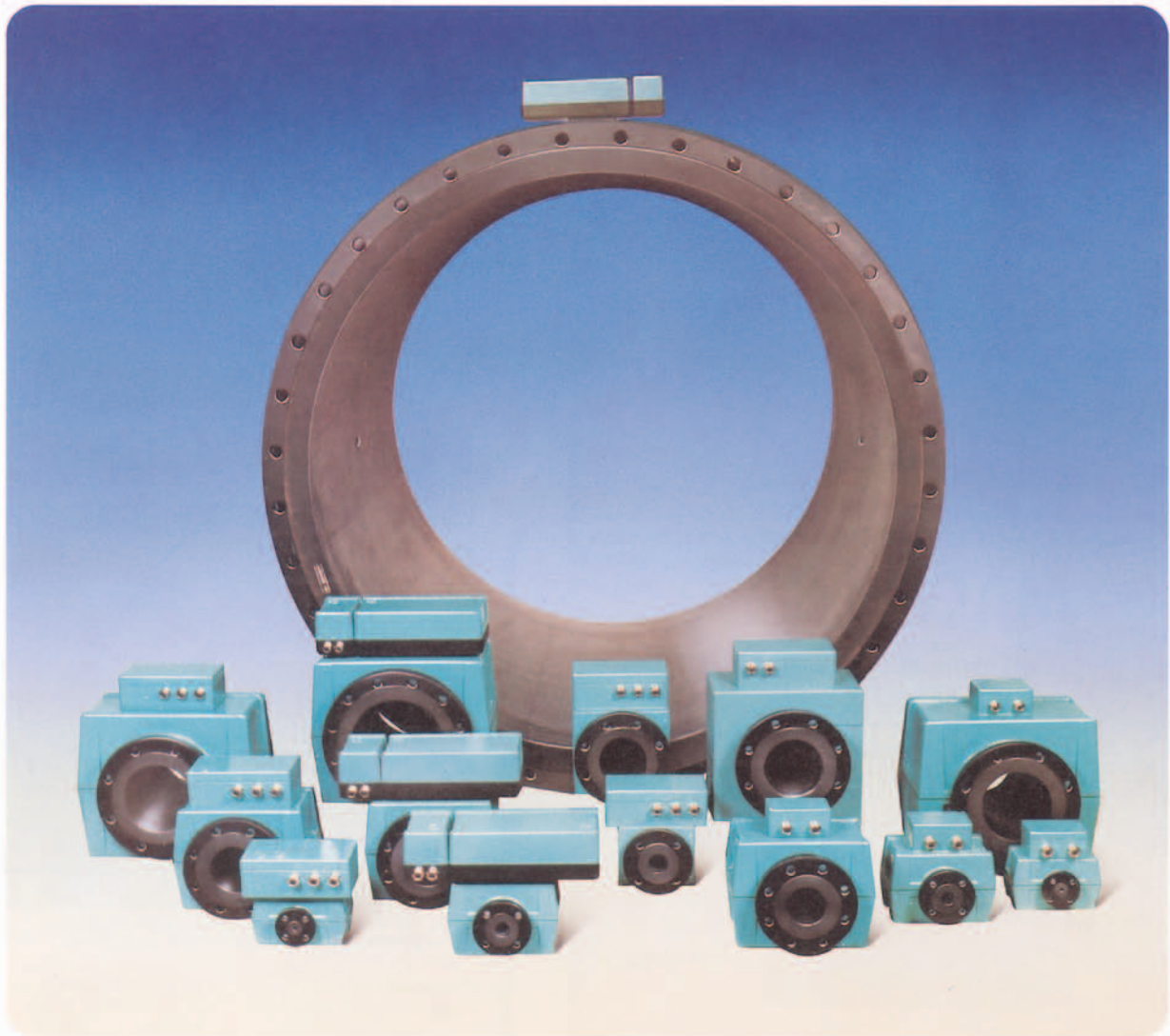
1980 Endress+Hauser produces the world’s first low-cost compact magmeter – the **Magpac 1**. The company’s goal is to open up additional markets and applications as an alternative to mechanical measuring systems, such as displacement meters.

1981–1982 Endress+Hauser sets new standards with the **Autozero 2000 2**. This magmeter can even measure demanding or non-homogeneous fluids such as fruit mash, yoghurt, paper pulp or sludge containing stones with the

world’s highest accuracy of $\pm 0.2\%$. It is an immediate success, with sales and demand constantly on the increase.

As it is expanding rapidly, the company has to move to a rented building in Aesch while a bigger building is constructed in Reinach. At this stage, the instrument range covers all pipe diameters up to 2 meters.

Choose the right one Magnetic flowmeters from FLOWTEC



Flowtec AG

Flow measurement
Kägenstrasse 4, CH-4153 Reinach BL 1
Telefon 061/76 05 05, Telex 967014 msr ch



Flowmeters

**Flow
Sensors**

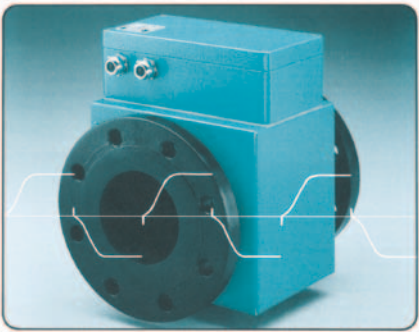


1982 As an alternative to Magpac, the cost-effective **Pulsmag 1** is launched for standard industrial applications. The Pulsmag has a pulsed DC field system to generate a magnetic field, and thus also boasts automatic zero point correction.

1983 Endress+Hauser negotiates a cross-license agreement with the Japanese company Oval Engineering, and exchanges its expertise in magmeter technology for knowledge concerning vortex flow measurement.

**PULSMAG
DMI 6430**

Magnetisch-induktiver
Durchflussmesser



Der Durchflussmesser PULSMAG DMI 6430 ist ein kompaktes, magnetisch-induktives Durchflussmessgerät mit dem günstigen Preis magnetisch-induktiver Kompaktkörper, jedoch dem Vorteil des geschalteten Feldes: Automatische Nullpunkt-Korrektur. Das Gerät misst den Volumendurchfluss von elektrisch leitenden Flüssigkeiten in geschlossenen Rohrleitungen. Damit können Durchflüsse der meisten Flüssigkeiten wie Wasser, Abwasser, Säuren, Laugen, wässrige Lösungen, Emulsionen, aber auch Nahrungsmittel verschiedenster Konsistenz, Pasten, Breie und Schlämme genau erfasst werden. Die Messung erfolgt ohne Druckverlust und ist unabhängig von Druck, Temperatur, Dichte, Viskosität und Leitfähigkeitsschwankungen des Messmediums (sofern die Mindestleitfähigkeit nicht unterschritten wird). Der Durchflussmesser PULSMAG DMI 6430 kann mit 12 verschiedenen Nennweiten Durchflüsse zwischen 0 und 7069 m³/h bestimmen.

- Keine Nullpunkteinstellung erforderlich
- Stabiler Nullpunkt durch automatische Spannungskompensation (AUTOCENT)
- Kompaktkörper: Messaufnehmer und Messumformer teilen eine mechanische Einheit, daher kostengünstiger und einfacher Einbau und Anschluss
- Eigene Induktivität ohne Spezialkabeln
- Keine Einbauten im Strömungsquerschnitt, keine bewegten Teile, dadurch verschleiß- und wartungsfrei
- Weitgehend unabhängig von Strömungsverhältnissen durch inhomogenes Magnetfeld
- Lineare Durchflussmessung mit hoher Genauigkeit
- Galvanische Trennung des Ausgangs standardmäßig
- Hohe Strömungsfähigkeit
- Für den elektrischen Anschluss sind keine Spezialkabel erforderlich



Flowtec AG
Durchfluß-Messtechnik

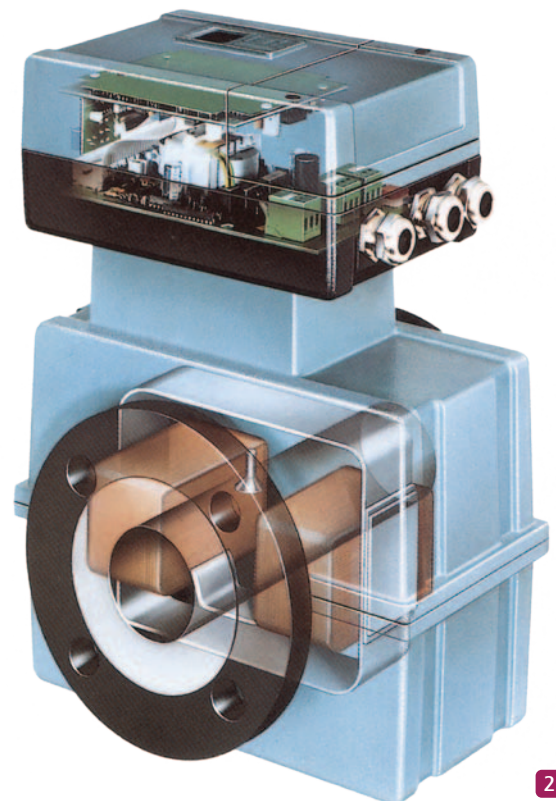
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Telefon 083-78 05 05, Telex 987 014 Flow dh



“Variomag is the first microprocessor-controlled flowmeter in the world”

1984 Endress+Hauser sets another milestone in industrial measuring technology with **Variomag** ². Variomag is the first microprocessor-controlled flowmeter in the world. The digital display and – should problems occur during measuring operation – the display of corresponding error codes are also regarded as thoroughly innovative features.

At the same time, the sensor portfolio is markedly expanded with the **Discomag** for wafer mounting and **Picomag** for measuring very low flows. This successful product line is discontinued in 1997, with almost 110 000 instruments having been sold.



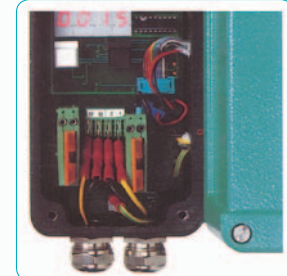
Mastermag

Mastermag – the unique electromagnetic flowmeter for custody transfer applications

PTB certificates for fiscal metering of milk, beer, wort, etc. also water and effluent metering.

Measuring Instrument DI 685 Z
Suitable for CIP cleaning.
No extra costs incurred,
if it is not necessary to dismantle for
cleaning.

1



1985 The measurement of flow in pipes is often associated with cost accounting. To cover such applications, Endress+Hauser's **Mastermag 1** is the company's first magmeter suitable for custody transfer applications. Once again this opens up new markets, particularly in the water and wastewater sector.

1987 The flow market continues to witness ongoing growth in all industries. Sales of innovative and industry-specific magmeters are on the up and up. For this reason, Endress+Hauser presents several products in 1987, namely: Speedmag, Autozero 3000, Eximag and Pulsmag V.

“With a sampling frequency of up to 250 Hz, Speedmag is the fastest batching measuring instrument to date”

Speedmag is the first magmeter from Endress+Hauser that is specially designed for batching applications. With a sampling frequency of up to 250 Hz, Speedmag is the fastest batching measuring instrument to date. It can also be used to measure fluids in difficult applications with rapidly changing flow rates.

Eximag 2 is the world's first magmeter with two-wire technology for hazardous areas. This intrinsically safe instrument (Ex i) with rubber compound-cast field coils opens the door to completely new applications in the chemical, pharmaceutical and petrochemical industries.



2

Autozero 3000 represents a refinement of Autozero 2000 with greatly improved meter electronics and microprocessors. It has programmable panel installation electronics.

Pulsmag V is a refinement of the Pulsmag sensor with flange connections. It can be combined with the time-tested Variomag electronics.



“This ‘Rolls-Royce’ transmitter is the first to have a function matrix and a multi-line plain-text display”

1990 Release of the refined Picomag sensor – the **Picomag II** **3** with stainless steel housing for measuring very low flow in pipes just 2 millimeters in diameter.

The **Tecmag** **4** transmitter electronics also launched in 1990 aim at meeting even the toughest customer requirements in measuring operations. This “Rolls-Royce” transmitter is the first to have a “function matrix” and a multi-line plain-text display which the customers can use to directly configure numerous process and instrument parameters.

Tecmag can be used in conjunction with the Picomag II, Discomag and Pulsomag V sensors.



3



4



1991 The global market is booming and the number of magmeters produced by Endress+Hauser continues to grow at an enormous pace. To increase capacity, a new production building (Division Cernay) is constructed in the northwest of Mulhouse in France. This center primarily concentrates on magmeters but later expands production to instruments based on other measuring principles.

1993–1994 Innovative instruments are in greater demand than ever before. With the Promag 30 and 33, Endress+Hauser presents its **new generation of magmeters** **1** to meet the increasing demands of measuring and control technology. The transmitter, sensor, process connections and other instrument components can now be combined together in a modular system, so “customers only pay for what they need.”

Promag 30 is a low-cost magmeter with key-based operation. A total of 10 process and instrument parameters can be configured via DIP switches.

Promag 33 is a high-end magmeter with the world’s first optical “touch control” that causes quite a sensation. Instruments no longer have to be opened to operate and configure them. This is particularly important for hazardous areas.

Existing sensors are renamed:

Picomag is changed to **Promag A** and Pulsmag to **Promag F**. Discomag for wafer mounting is no longer included in the program; on the other hand, a sensor especially designed for hygienic applications is offered – the **Promag H** (hygiene).



“Its compact design allows installation in very confined spaces, such as on rotary filling systems”

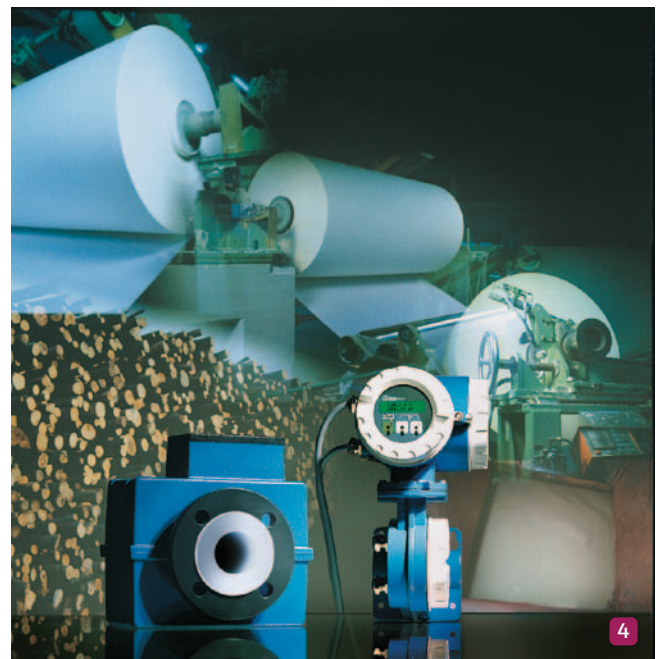
Thanks to special bow electrodes, fruit mash that is very fibrous and has a high percentage of air can now be measured, although this was previously considered to be “difficult to measure.” In addition, the transmitter electronics taken from Promag ensure the highly accurate signal processing needed.

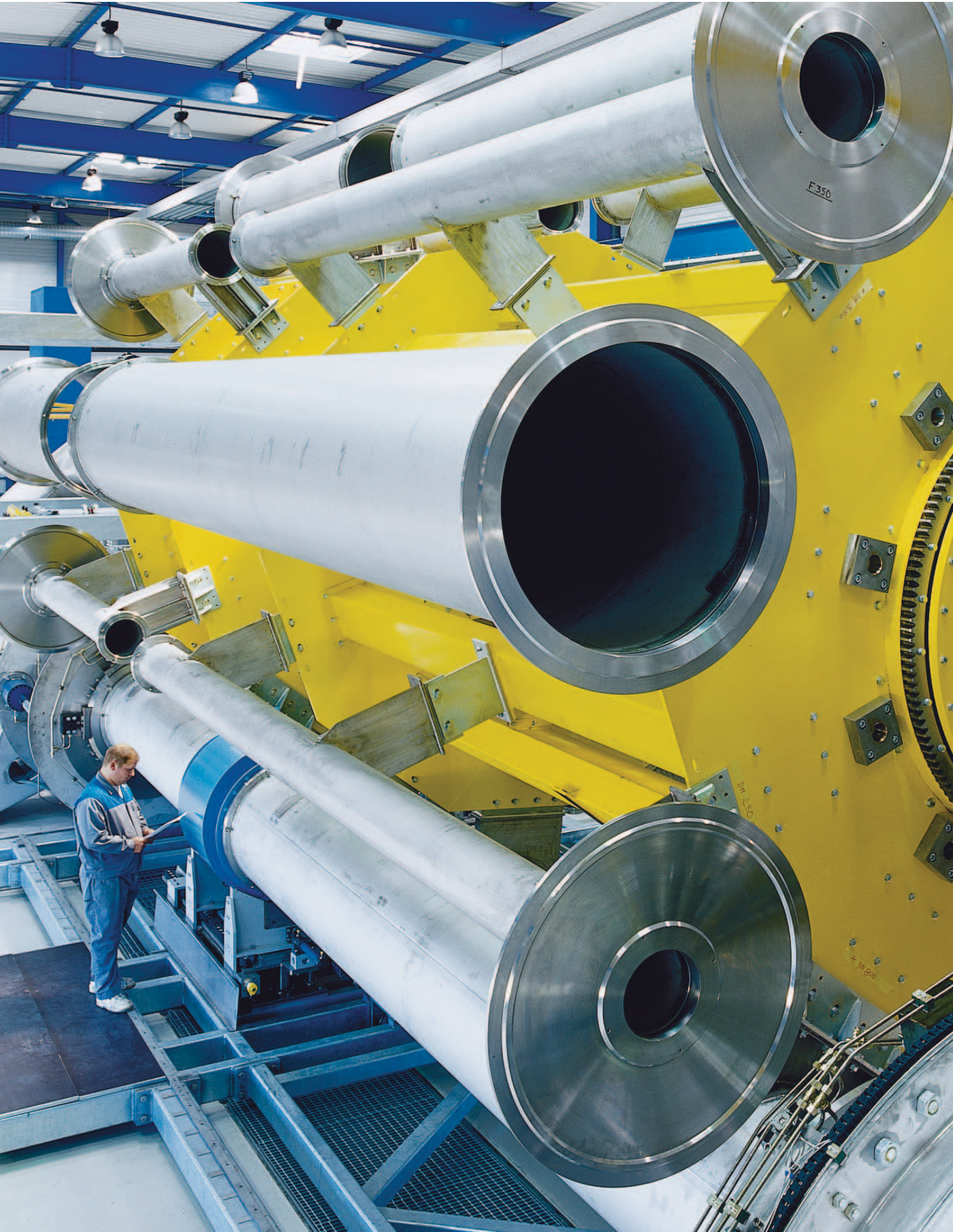
1995 The Promag line becomes a complete success within two years. Another member of this instrument family, **Promag 31F** covers applications for custody transfer.

There is also a lot of activity in the batching market. For this reason, Endress+Hauser launches **Dosimag 2** as a follow-up to Speedmag. This sensor (without a display) has been developed with the special needs of the batching industry in mind. Its compact design allows installation in very confined spaces, such as on rotary filling systems.

Since plant operators often prefer to invest limited funds in simple flow monitoring applications, Endress+Hauser develops **Magphat 3**, an insertion sensor that facilitates cost-effective flow monitoring in metal and plastic pipes. Typical applications include flow indication for dry-running protection in pumps, for cooling circuit monitoring and for simple switching functions.

For the measurement of difficult fluids, such as fruit mash, paper pulp or ore slurry, **Promag 35S** **4** is launched on the market as the follow-up instrument to Autozero 3000.







“After four years under construction, the result is one of the most modern and accurate calibration rigs in the world with an accredited overall accuracy of $\pm 0.05\%$ ”

1996–2001 The number of magmeters produced each year hits the 50 000 mark. There is an urgent need to expand the production resources required. For this reason, the production area at Cernay is increased by 4500 m² in a number of expansion stages. At the same time, planning commences for a new calibration center.

After four years of construction, the result is one of the most modern and accurate calibration rigs in the world with an accredited overall accuracy of $\pm 0.05\%$. A **mobile revolver system** with adapters for calibrating large magmeters with pipe diameters of up to 2 meters forms the core of this impressive system.

The second magmeter generation (as of 2000)



“The Promag sensors now also reflect the branch segmentation of industrial applications”

2000–2003 The Promag line is systematically advanced, refined and improved. As part of the significantly more comprehensive “Proline family” concept – which covers all flow measuring principles –, Endress+Hauser launches the next magmeter generation with Promag 10, 23, 50, 51 and Promag 53. The Promag sensors now also reflect the branch segmentation of industrial applications:

Promag W **1** for the water and wastewater market, **Promag P** **2** for the process industry and **Promag H** **3** for hygienic applications in the food and pharmaceutical industries. The transmitter electronics also have a modular design, thereby guaranteeing that customers get exactly what they need for their measurement.

Promag 10 is a cost-effective magmeter for basic applications.

Promag 50 is used for all standard applications. Programming is carried out via a function matrix.

Promag 53 is a magmeter with advanced functions for complex and demanding measuring tasks. Additional software options can be integrated anytime with a plug-in F-CHIP. These include batching and dosing functions, electrode cleaning, advanced diagnostics, calculation of solids flow, etc.

Promag 51 is suitable for custody transfer measurement and is the follow-up to Promag 31F.

Promag 23 with two-wire technology is deployed in hazardous areas. This is the follow-up to Eximag.

Support and maintenance of flowmeters directly in the field (life cycle management) is becoming increasingly important. With the **Fieldcheck** **4** tester and simulator, as well as the **Fieldtool** service software, it is possible to check the operational reliability of flowmeters directly on site in places where changes to the measuring point – resulting from abrasion, corrosion or the formation of buildup inside the pipe – have to be detected at an early stage.





2004 The batching market continues to develop. Demand is particularly high for very compact magmeters that can be installed in even the most confined locations. As a result, Endress+Hauser develops a new **Dosimag 1** which enjoys an extremely positive reception on the market, and meets the needs of the customer in practice perfectly.

“Thanks to the wide range of liners and electrode types available, practically anything ‘that can be pumped’ can be measured with great accuracy”

2006 The global economy is booming, as is the demand for industrial measuring and control technology. Production centers and calibration rigs in the USA, India and China are built and expanded successively.

Endress+Hauser extends the magmeter product portfolio once again with **Promag 55S** for measuring extremely difficult fluids. Thanks to a wide range of liners and electrode types available, practically anything “that can be pumped” can be measured with great accuracy. For example, one unique combination is that of a natural rubber liner and brush electrodes which proves to be extremely resistant to abrasion when measuring stony ore slurry in mining. Endress+Hauser also boasts the world’s only bow electrodes which have been proven in use for many years and even allow the measurement of fruit mash with a high percentage of solids and air.

In 2008, the **Promag 55H** is released for similar applications but with strict hygienic design requirements.





“In 30 years to the worldwide leading provider of flowmeters”

2008 Endress+Hauser Flowtec AG has just recently turned 31 and is now one of the world’s leading providers of flowmeters. The numbers speak for themselves: The number of magmeters sold since the company was founded reaches the astounding figure of 1 million in mid-2008.

Production occurs at five divisions with state-of-the-art logistics: in Reinach (Switzerland, 1977), Cernay (France, 1991), Greenwood (USA, 1996), Aurangabad (India, 1999) and Suzhou (China, 2002). The number of employees has grown to over 1000.

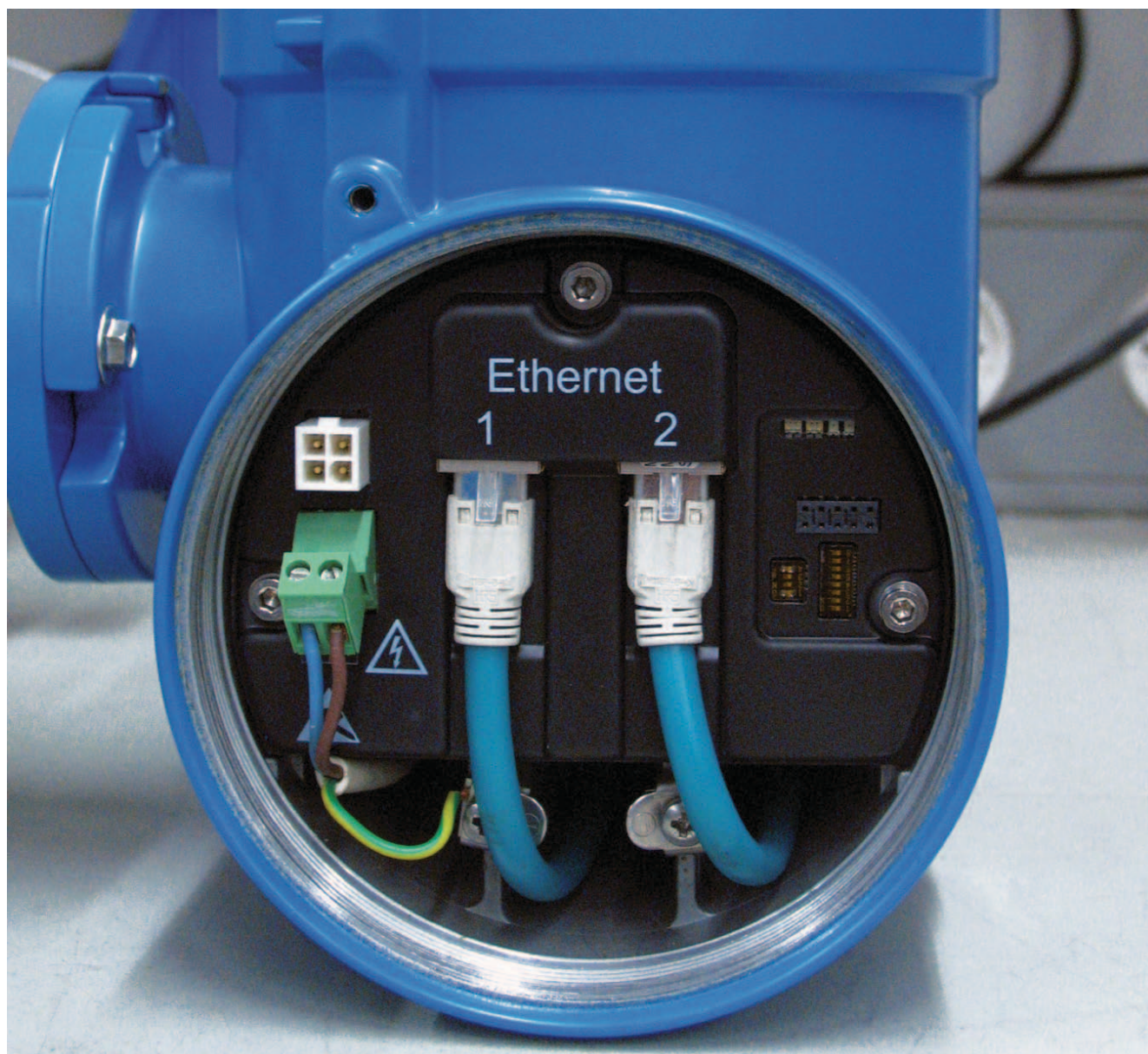
2009 In order to gain a market share in the ever-growing water and wastewater market, Endress+Hauser launches two new sensors: **Promag D 2** and **Promag L 3**. Both sensors meet the industry-specific standards even better than before and do so with a significantly more compact design and a considerably lower installation weight as a result.

Promag D Is a compact wafer device for installation where space is at a minimum as well as for installation in plastic pipes. In terms of maintenance and operating costs, Promag D is primarily designed for efficient and cost-effective flow measurement in water applications.

Promag L This flowmeter is designed specifically for standard applications in the water industry, with high measuring accuracy, optimized installation length, up to 30% lower dead weight and a wide variety of possible uses. The world’s first lap-joint flange design (up to DN 300) guarantees the greatest flexibility in installation, regardless of the orientation of the pitch circle in the pipe flanges.

Promag L and Promag D for water and wastewater applications





“Endress+Hauser, as the first manufacturer worldwide, launches the Promag 53P, 53H and 53W with EtherNet/IP

2011 Process facilities are constantly becoming larger and more complex. In such cases traditional fieldbus technologies for data transmission reach their limits in such cases. It is not just measured values that are accumulated, an endless amount of process and diagnosis information is also accumulated and is often never used. This is especially true in large industrial plants, some with thousands of field devices. To enable the efficient use and evaluation of this process information and of such amounts of data, Endress+Hauser, as the first manufacturer worldwide, launches the Promag 53P, 53H and 53W with **EtherNet/IP technology**.

This technology allows for real-time data transmission rates of up to 100 Mbit per second as well as completely new perspectives for process monitoring, thanks to the comprehensive access to process and device data. With EtherNet/IP users can integrate our measuring devices flawlessly into all important automation systems such as RSLogix 5000 from Rockwell Automation or Unity from Schneider Electric, as well as into plant-asset management operating tools such as FieldCare from Endress+Hauser.

With the new **webserver** integrated as a standard, it is possible to carry out device configurations or request diagnostic data directly in the field using a laptop – without any additional software.

Proline

simply clever

“Inspired by the keyword ‘added values,’ the new Proline offers countless unique functions and device properties which remain unmatched on the flow market”

2012 Throughout the industries, requirements with regard to safety, legal standards, efficiency and product quality are continually increasing. Plant operators must also deal with rising costs and competitive pressure. And finally, it is becoming more and more crucial to take advantage of the emerging opportunities for digital connective networking through the “Internet of Things” as well as through “Industry 4.0.”

Endress+Hauser responds to these mega-trends by releasing a **third generation of Proline flowmeters**. These flowmeters not only measure the flow rate with the highest level of accuracy, they also provide a view into the process and, in doing so, ensure plant operators receive a wealth of important diagnostic and process data.

Inspired by the keyword “added values,” the new Proline offers countless unique functions and device properties which remain unmatched on the flow market, e.g. an integrated webserver, data retrieval via WLAN or WirelessHART, HistoROM for maximum data security, Heartbeat Technology with comprehensive diagnostic and verification functions as well as a wide range of fieldbus protocols for seamless system integration and data transmission.

The new Proline generation has been developed entirely in accordance with SIL guidelines (IEC 61508) and thus guarantees the greatest safety in processes. For the first time ever, a market launch takes place with the motto: “The perfect measuring device for every industry.”

Promag 200 ¹ Endress+Hauser develops the Promag 200 transmitter, the first device line in the third generation of Proline magmeters, especially to meet the increased requirements for hazardous areas in the chemical industry. With the new two-wire concept from Endress+Hauser, Promag 200 sets standards with regard to safety and uniformity in flow measurement.

Promag 400 ² Endress+Hauser hopes to gain new market share for the measurement of drinking water and wastewater with Promag 400 (L 400, W 400, D 400), which has been designed specifically for the water industry. It features the new “fully welded” Promag W sensor option (IP68/Type 6P), which enables the device to be permanently installed under water or underground. Flowtec builds a magmeter (Promag L) with a pipe diameter of 2.4 meters to supply water to a large city in Asia. This is the largest measuring device ever built in the company’s history.

Promag W 800 ³ Endress+Hauser develops the battery-operated Promag 800 to cover an important market segment in the water industry: the measurement of water in geographically isolated regions with no power supply. The Promag 800 is offered with a corrosion-resistant transmitter housing made of plastic together with the fully welded Promag W for the harshest environmental and climate conditions. Data transmission occurs using a built-in GSM modem. The modem can be used to send measurement data or device information via e-mail or SMS.

To serve the flow market in Central and South America with greater speed and efficiency, Flowtec sets up a sixth production facility (Division) in Itatiba (Brazil).





2013 Process plants are being installed increasingly often in the smallest of spaces and in the shortest possible time according to a “building block” principle. In line with this trend, Endress+Hauser launches the ultra-compact **Promag 100 (H 100, P 100)**, a magmeter designed specifically for the life sciences and food industry. Promag 100

features an integrated web server for simple data retrieval in the field via a laptop, automatic data storage (Histogram), integrated temperature and conductivity measurement, the highest protection class (IP69K), a hygienic housing and numerous fieldbus protocols for seamless system integration.

Promag P and Promag H with PROFINET



“As the world’s first flowmeter manufacturer, Endress+Hauser presents the Promag H/P 100, a magmeter with the PROFINET protocol”

2015 As the world’s first flowmeter manufacturer, Endress+Hauser presents the Promag H/P 100, a magmeter with the PROFINET protocol, thus enabling seamless integration into systems with state-of-the-art industrial Ethernet technology.



“This success has only been possible thanks to our customers. Your trust – and, above all, your knowledge – have given us the incentive to develop high-quality products and future-oriented solutions”

2016 Endress+Hauser Flowtec AG has been in operation for nearly 40 years and is still a world leader in the area of electromagnetic flow measurement. The number of mag-meters sold since the company was founded reaches the astounding figure of **2 million**. Over the past eight years, the number of employees has grown from 1000 to over 1700.

This success has only been possible thanks to our customers. Your trust – and, above all, your knowledge – have given us the incentive to develop high-quality products and future-oriented solutions for all branches of industry and for a wide range of applications. With this in mind, we would just like to say **“Thank you”** to our customers!



Endress+Hauser

The Endress+Hauser Group is one of the leading international suppliers of measuring instruments and automation solutions for industrial process engineering. The Swiss enterprise has been a family-owned company for over 60 years.

Endress+Hauser Flowtec AG in Reinach, Switzerland, is one of the biggest providers of modern industrial flowmeters for liquids, gases and steam in the world. Production commenced in 1977 with three employees. Today, the company boasts a global headcount of over 1700 at its production facilities in Reinach (Switzerland) **1**, Cernay (France) **2**, Greenwood (USA) **3**, Aurangabad (India) **4**, Suzhou (China) **5** and Itatiba (Brazil) **6**.

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