

Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Modern measurement on filling machines

Filling, cleaning and sterilizing

Endress+Hauser – People for Process Automation

From production shed...

In 1953, when Dr Georg Endress and his partner Ludwig Hauser converted an old shed in the small southern German town of Loerrach into their company's first production site, neither of them could have imagined that they were about to write the first chapter in a success story which has yet to meet its equal in the field instrumentation industry. The two entrepreneurs could not have

been more different: Endress, a 29-year-old Swiss, was an unconventional technical enthusiast who was always experimenting with new ideas, while his German business associate Hauser, more than twice his age at 59, was a level-headed bank director with both feet planted firmly on the ground.

Together they began to produce and sell electronic level measurement instruments.

The use of an electronic rather than mechanical measuring technique was considered a technical revolution in those days. The first level measurement devices measured capacity and were fitted with vacuum tube amplifiers. They eliminated awkward clambering over tanks and silos, as information could be transmitted to the office and displayed there.





G.H. Endress founded the company together with Ludwig Hauser in 1953



Close to our customers with more than 45 locations worldwide

Innovators' Meeting and award presentation by Klaus Endress



...to a global company network

The rest is history. Today Endress+Hauser offers products, systems, services and solutions for process automation on a worldwide scale. In close cooperation with our customers and partners all over the globe we solve measurement, control and automation tasks in production and logistics of the process industry. Our sensors and systems acquire, transmit and use information from processes. Our products and systems enable our customers to monitor and control processes reliably, ensuring cost-effective, safe and environmentally-friendly operation.

The past 50 years have seen the development of a tight global network of production centers, sales companies and local associates, with the aim of providing optimum support for our customers all over the world.

A thriving company

One thing has not changed since the founding days of Endress+Hauser. As a financially independent company, our concern for our customers has remained at the heart of all our activities. This principle is firmly anchored in our company credo and is actively practiced by the Endress family, the sole owners of the company since the departure of Ludwig Hauser in the 1970s.

What advantages are there in store for you as a customer in partnership with Endress+Hauser? Our constantly increasing turnover and an equity capital ratio of over 50% are clear indications of a thriving company. They are our assurance that our products and solutions are safe investments. What's more, an enterprise with healthy figures and a positive company culture is also a happier place to work in. This explains the outstanding motivation and commitment of our employees in the service of our customers – as your 'People for Process Automation'.



Measurement technology for plant engineering and construction

Our palette of products for filling machines and plant engineering covers a wide range of sensors (example: for flow, pressure, temperature and level measurement), recording technology and complete systems with controls and appropriate application software. A core competence of Endress+Hauser, based on decades of practical experience, of measurement technology, actuation, control and fluid properties. Some of our devices are application-specific designs developed to meet the demanding requirements of plant engineering and construction. Additionally, we offer competent advice, planning and realization of custom-

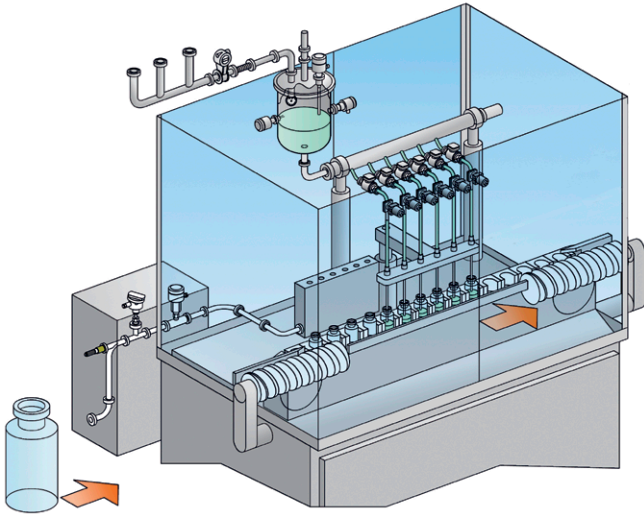
built solutions, as well as support in the form of simple, optimized design-in. Our customers can also rely on fast, inexpensive commissioning.

Quality is of paramount importance in every product. This applies to measurement technology as well as to mechanical engineering. Quality is also an infallible indicator of a company's reliability and success. Endress+Hauser's experience is reflected in the exceptional quality of its products and solutions. Many of our "solutions" are unique on the market. They confirm that we are on the right path in our constant endeavor to improve ourselves and our measurement technology.

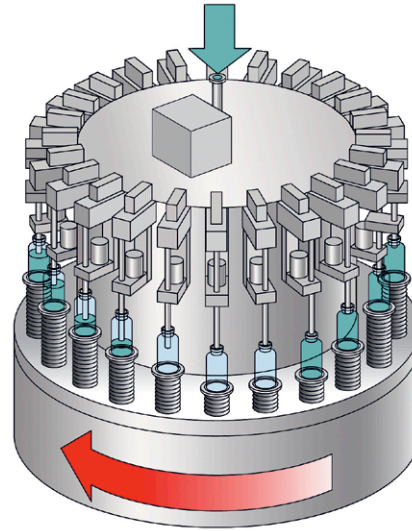
This is why Endress+Hauser is also the right partner for mechanical engineering.

Our service support includes both Factory Acceptance Tests (FAT: a test typically carried out before delivering a machine) and, if required, Site Acceptance Tests (SAT: for example, testing a system before operation), as well as an extensive selection of services ranging from device maintenance to asset management.

Optimized filling systems using modern measuring technology



The diagram shows an inline filling system



Typical example of a rotary filling system

From filling to cleaning and sterilizing

Endress+Hauser's measurement technology enables you to optimize your filling system and reduce costs while increasing productivity and flexibility. Electronic measurement of flow quantity and pressure combined with control of the filling valves produces optimized filling quantities (no overfilling or underfilling). This has a direct impact on the cost of the medium, as optimum filling quantity reduces product waste, saves money and increases productivity. Sample calculations give concrete demonstrations of the potential in individual cases.

Filling

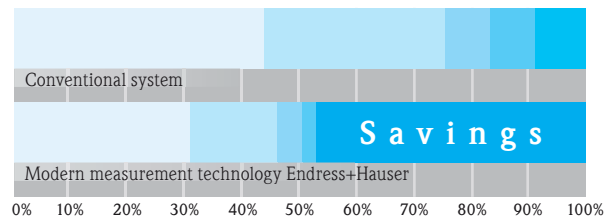
The costs and productivity of a filling system can be optimized with Endress+Hauser's ultramodern measurement technology – in all types of filling system:

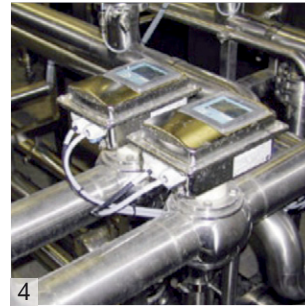
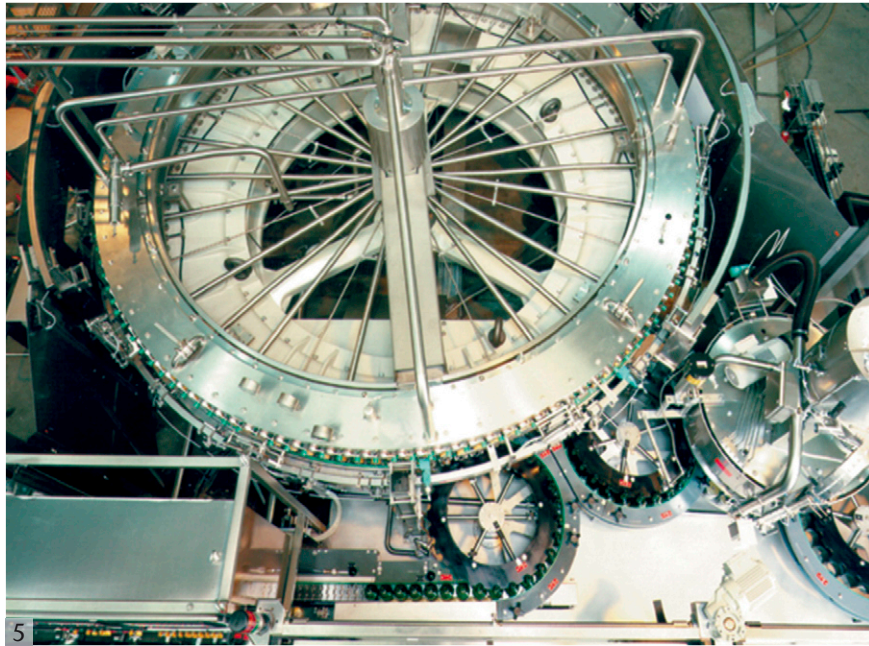
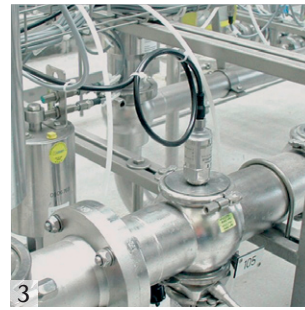
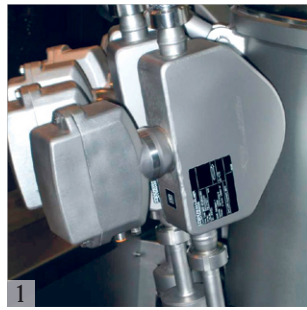
- Manual or automatic machine/system
- One filling point or a larger number of filling stations
- Point, inline or rotary filling systems
- Continuous production with a single filling product or flexible production with a number of products
- With or without cleaning cycle and sterilization
- Filling based on volume or weight (mass)
- Media with high or low viscosity
- Independent of the electric conductivity of the medium

The key factors in optimization are the selection of the right flowmeter, the application requirements and the system technology. Thus, the system's flexibility is enhanced by flowmeters without moving parts, which also means savings on maintenance costs. In contrast to mechanical systems, automated control of modern flow sensors enables swift changes of filling volume or filling media without the need for recalibration or resetting. This increases productivity to a maximum. Our offering also includes filling solutions for various types of measuring devices, central control and application-specific software.

Comparison of costs in a shampoo-filling system with 17 filling heads. Costs incurred for:

- Cleaning/production shut-downs
- Start-up failures after changes of medium
- Failures caused by process influences
- Cleaning agents
- Maintenance (for example: changing gaskets and repairs)
- Savings potential using modern measurement technology





- 1 Rotary filling system with Coriolis Dosimass flowmeters for filling shampoo
- 2 Cerabar M transmitter with on-site display for pressure measurement
- 3 Empty pipe detection in a filling system with the Liquiphant T limit switch
- 4 Smartec conductivity transmitter for phase measurement of cleaning liquid and rinsing water
- 5 Rotary filler with magnetically inductive flowmeters for filling liquid media

Cleaning and sterilizing

Apart from the actual filling process, the cost and safety of cleaning and sterilization processes can also be optimized. Laws regulating the life science industry, for example, require assurance of the traceability of the cleaning process (CIP “Cleaning In Place” and SIP “Sterilization In Place”).

With CIP there is no need to remove parts from the system for cleaning. CIP is extremely time-saving, with no loss of valuable filling time due to shut-downs. There are two types of procedures: “batch cleaning process” (closed systems, no loss of cleaning agent) and “lost cleaning process” (high wastewater pollution and detergent consumption). Endress+Hauser measuring instruments offer great advantages in both cases.

Cleaning times and cleaning cycles can be optimized by controlled measurement of the cleaning liquid, rinsing water and sterilization medium. This results in a minimum consumption of cleaning liquid, rinsing water and sterilization media and a considerable reduction in cleaning time.

Approved recording technology provides documentation on the cleaning cycle and guarantees traceability. In addition to the cleaning processes already mentioned, there is the sterilization process (SIP), which consists of steaming the system in an encapsulated state so as to sterilize the entire “wetted” part of the system, external cleaning with special cleaning foams and flushing with hot or cold water. In addition, the entire system can be dried with sterile air. In their design and function, all Endress+Hauser products for filling systems are specially tailored to the increasingly stringent demands of cleaning processes. This means special construction of the housing and gaskets as well as flexible adaptation of the measurement technology.

Maximizing productivity

Productivity can be increased by optimizing system flexibility – irrespective of different media properties (viscosity, mass, electric conductivity etc.) and filling quantity (depending on the volume, shape and material of the container).

- Cost reduction
 - Longer life due to optimized electronic measurement technology (many parameters Q, T, P, Lf...); no moving parts, therefore no wearing of sensors.
- Flexibility
 - Faster changeovers with different filling media and filling volumes.
- Productivity
 - Fast response sensors enable filling quantities not achievable with mechanical solutions.
- Quality
 - More accurate measurement of filling quantities (less loss); higher reproducibility in filling, cleaning and sterilization.
- Safety
 - (compliance with legal regulations)
 - Documented, traceable cleaning and sterilization processes.

Products that fit in your process

Pressure transmitters

The Cerabar M/Cerabar T with its stainless steel housing has a compact metallic membrane with small process connections, flush-mounted with no dead space, or a ceramic membrane for abrasive media and vacuum applications. This ensures optimum compliance with stringent sanitary requirements.



Temperature measuring devices

RTD assemblies and easytemp™ TSM470F compact temperature transmitters can be used in containers and pipes with various measurement ranges. They are specially designed for the sanitary requirements of the food and life science industries and are available for many process connections.



Level limit switches

Liquiphant M / Liquiphant T: Limit switches for all fluids, even in situations with build-up, turbulence or air bubbles. Independent of the electrical properties of the medium. Can be used in various temperatures and pressure ranges.



Electromagnetic flowmeters

Dosimag, Promag: Universal measuring principle for all conductive fluids. Virtually independent of pressure, density, temperature and viscosity. With integrated batching and fieldbus connection on certain models. Available in various nominal diameters.



Coriolis flowmeters

Dosimass/Promass: Universal measuring principle for fluids. Simultaneous, direct measurement of mass flow, density, temperature and viscosity. Independent of the physical properties of the medium. With integrated batching and fieldbus connection on certain models. Available in various nominal diameters.



Continuous level transmitters

Liquicap (capacitance) and Deltapilot S (hydrostatic): Continuous level measurement of all liquids, even with build-up. Hermetically sealed CONTITE™ measuring cell, condensate proofed and long-term stability. Corrosion-resistant material and FDA-listed materials for wetted parts.



Data recording

Safety Data Manager Memograph S: The powerful solution for use in safety-relevant applications. It plots and evaluates signal curves and monitors limit points. Special application-oriented software packages are available for sterilization.



Conductivity measuring devices

Smartec S CLD132 compact measuring system with Indumax CLS54 sensor. EHEDG and 3A certified, are used to determine the concentration of acids, caustics and salts in the food and life sciences industries.



More than products

System integration

With the introduction of digital communication technologies in the early 1990s, frontiers between field and system levels began to disappear. Measuring instruments became more intelligent and soon became an integral part of the system architecture. This gave the user more functionality and brought added benefits. It thus became possible to transmit information in addition to the measurement value such as device status or servicing and diagnostic messages from the field. This had a powerful effect on increasing plant availability and process optimization. Endress+Hauser was quick to recognize these developments at an early stage and became involved in various standardizing committees and users associations from the very start of fieldbus technology. Due to this active commitment, our customers are kept constantly aware of new trends and can draw maximum benefit from them.

Components

As a supplement to its field measurement technology, Endress+Hauser offers components such as display devices, isolators or power supply units designed to complete your measuring point at field level. In addition we offer systems for optimum integration of field measurement technology into your system world, for example, process control systems and multiple-branch solutions for production, logistics and maintenance. Endress+Hauser is your competent partner, from sensor to process automation.

Fieldbus

Endress+Hauser maintains an excellently equipped Fieldbus Competence Center in Reinach, Switzerland. It is officially accredited as a PROFIBUS® Competence Center by the PROFIBUS® Users Association. This enables us to ensure problem-free integration of all our instruments into the system environment and plant asset management tools of other manufacturers. We naturally also supply this knowledge for FOUNDATION fieldbus™ and HART®. In the area of DTM certification we were one of the first companies to test Device Type Managers (DTMs) of the Field Data Tools Joint Interest Group using the fieldbus laboratory and have them certified by the group. To share all this knowledge we offer a professional training program for you. Endress+Hauser is in the position of being one of the few companies to offer certified training courses for PROFIBUS® and FOUNDATION fieldbus™.

Process control

For the optimum layout of a process management system, intelligent field instruments must be connected to the right system components. On the basis of our experience and application know-how, we offer a complete system for process automation, which assures optimum integration of field device technology into the system world.

To this end we concentrate on small to medium-sized applications based mainly on our own products plus supplied components. Endress+Hauser designs and delivers, cares for and coordinates the management of these automation projects from a central control position, whether we create the whole solution ourselves or collaborate with system partners and installation companies of the customer's choice.

W@M – Life Cycle Management for your plant

W@M – Life Cycle Management from Endress+Hauser provides up-to-date and complete information on all your measuring and control assets, including products from other suppliers. From engineering, procurement, installation and commissioning through to operations, maintenance and the replacement of individual components, W@M is an open and flexible information platform with on-site tools and services.



Hand in hand support

We always work hand in hand with our customers and offer them the support they need in every situation – whether trouble-shooting, speedy delivery of spare parts, calibration or target-specific advice. Our support encompasses a wide range of services centered on industrial measurement and process automation. We are quick, efficient and always available. With Endress+Hauser as your partner you benefit from an expanded service network and qualified customer service engineers all over the world.

Our service support will supply you with everything you need for the entire lifetime of your system.

For complete service of your measurement technology we offer you:

- Commissioning support and servicing concepts
- Calibration and calibration concepts
- Workshop repairs and spare parts service
- Seminars and courses for the training and further education of your qualified staff
- Help desks for immediate answers to your questions on our instruments and systems.



One stop shopping

Connecting business processes – ERP to ERP integration

Completely in line with your strategic orientation and in accordance with your business processes, we assist you individually with solutions for integration into your procurement process. This means that you obtain from us the exact solution that suits you – electronic catalogs, defined shopping cart interfaces such as OCI, and ERP to ERP connections. The complete integration of a procurement solution into your system offers today's

highest degree of automation for the entire procurement process. Here, all transaction data for quotations, orders, order confirmations and invoices is efficiently exchanged between the ERP systems. Transactions are processed completely without any manual inputs. This rules out the possibility of errors, reduces costs and prevents longer lead time. As a result, the procurement process is made considerably faster and the process quality is simultaneously increased.



ISO 9001:2000 Certified

09.07/SC USA

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