Presenting the face of the future

First standardized two-wire concept for flow and level increases safety and reliability and reduces costs

Endress+Hauser
People for Process Automation

Presenting the face of the future.

The future of field instrumentation has one face and stands for "Efficiency by Endress+Hauser".


FLOW + LEVEL
FLOW + LEVEL

" Uniform device concepts across measurement parameters create invaluable advantages."

Presenting the face of the future

The first standardized two-wire concept for flow and level increases safety and reliability and reduces costs

As a worldwide provider of automation solutions, we set ourselves the objective of supporting our customers' processes with excellent products and forward-looking services and solutions.

In the process industry, the requirements for automation engineering are constantly rising. Systems that are ever more powerful and more flexible, covering the entire range of measuring applications, are to be operated at the lowest possible costs. The complexity for the user is continuously increasing due to the wide variety of measuring tasks and the devices available for them from various vendors. Simultaneously, the requirements with respect to the operational safety, reliability and availability of plants are rising.

Both aspects result in the call for uniformity and consistency in field instrumentation.

The new standardized two-wire concept for flow and level from Endress+Hauser raises the bar for consistency and uniformity in field instrumentation.

The new concept standardizes
- Operation/Software/Interfaces/ Data management/ System integration
- Housing components and electronics modules
- Product structures and documentation with incomparable consistency.

Uniform device concepts across measurement parameters create invaluable advantages.

The basis for this was laid by numerous industry and Endress+Hauser standards that will be binding for all new Endress+Hauser device concepts in the future. They enable a conceptual change to simplicity through uniformity across the entire product portfolio for field instrumentation. These innovations create long-term benefits over the entire life cycle.

Unified Instrumentation – Efficiency by Endress+Hauser Endress+Hauser field devices are based on a wide variety of industry standards. Uniform implementation of these standards yields high benefits for the user – Efficiency by Endress+Hauser.

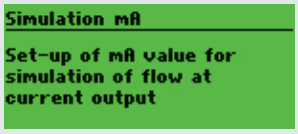
The uniformity is displayed, for example, in documentation, operation, diagnostics, the Ex and spare parts concepts as well as many other details, and leads to cost reduction in planning, purchasing, and operation.

This benefits our customers

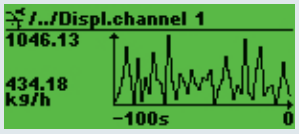
Whether in planning, purchasing, operation, or maintenance, the new concept features impressive, long-term, and outstanding benefits.

Perfectly standardized

Intuitive, standardized operation



Integrated help comments



Integrated line recorder

"Simplicity through uniformity creates safety and reliability in action and reduces expenses!" That is a clear and simple statement that may sound trivial, but due to the complexity and diversity in today's field instrumentation, it is difficult to implement.

Endress+Hauser standardizes device operation with "Unified Instrumentation" across product families and measurement parameters.

- Uniform onsite operating elements (3-key operation)
- Uniform operating menu/software (structure and designation of the parameters)
- Uniform interface (CDI – Common Data Interface) for parameter configuration via PC
- Uniform parameter configuration software (FieldCare) according to the DTM standard
- Uniform system integration into the control system level

The operating menu is optimized for three user groups:
- Operator/plant operator
- Maintenance personnel
- Experts/service

The corresponding operating levels enable target-oriented and easy access to the required parameters.
Integrated Brief Operating Instructions for all operating and display parameters ensure easy commissioning and maintenance. Various special functions, such as a 4-channel line recorder, enable maximum transparency for the measuring point.

This benefits our customers

The uniform operating concept reduces expenses and brings safety and reliability to training, commissioning, maintenance, and operation.

Perfectly standardized

Modular device concept for spare parts and components

The overall device concept has a comprehensive modularity and flexibility for

- housing components (cover, threaded joints, terminal strips, and much more)
- I/O electronics modules and displays

The uniform components can be used flexibly for flow and level transmitters. That reduces the complexity and is easy on the budget for the spare parts stock.

The uniform dual-compartment housing concept is optimized with respect to compactness and operating convenience. The design allows easy access for cable connection and trouble-free replacement of components. The electronics modules are sealed and the additional Teflon filter vents the housing and thereby protects it from moisture. This guarantees maximum operational safety and reliability even in a harsh environment and the greatest convenience for commissioning and maintenance.

Moreover, the device concept has other useful performance characteristics:

- A separate display with up to 50 m of cable for easy operation with measuring points that are hard to access
- Second cable entry for wiring additional output signals
- A housing that can be rotated 350°
- An inclined, rotatable display for convenient operation and good readability
- Also available are version with a flameproof enclosure or materials plastic, aluminum, and stainless steel
- Easy fieldbus address selection via the terminal compartment

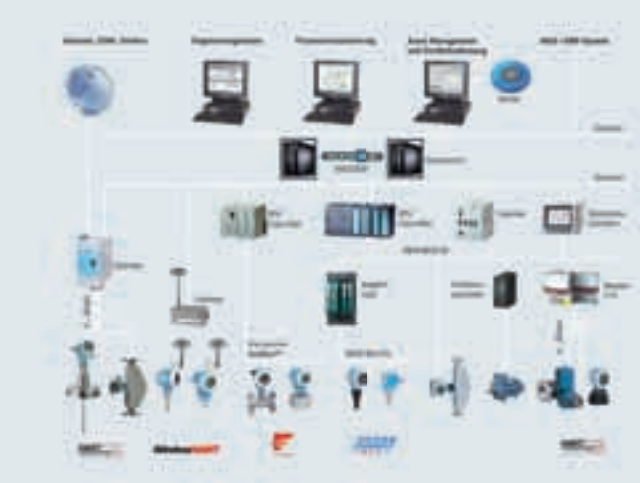
"The modular concept and the uniform and intuitive operation of the devices help prevent errors and thus help increase plant safety and reliability."

This benefits our customers

- The modular device concept reduces storage costs and increases the availability of the plant by means of the flexible interchange-ability of subcomponents
- The compact and robust housing design ensures operating and installation convenience as well as maximum operational safety and reliability even in a harsh process environment

Perfectly standardized

Seamless system integration as well as easy ordering and documentation



Smooth integration of the field devices into the system environment

Seamless system integration With the introduction of communication technologies like HART®, PROFIBUS® and FOUNDATION™ fieldbus, the borders between the field and system levels began to disappear. Intelligent measuring devices that provide additional information about the device or process status increase the availability of the plant and are now firmly entrenched in the automation architecture.

As one of the leading providers of fieldbus technology, Endress+Hauser ensures smooth integration of the field devices into the system environment and consistently guarantees interoperability of the devices with the new two-wire concept. With the ability to keep established software versions available for the long-term, interoperability conflicts are avoided. By means of its uniformity, the new two-wire concept offers an enormous savings potential particularly for automation engineering.

Easy ordering and documentation The complexity of measuring point documentation is constantly growing with the increasing safety, reliability and quality requirements on process plants. This extends from the product structure to the technical documentation, from the Operating Manual or Brief Operating Instructions to the safety data sheets of the devices. The uniformity reduces the complexity and creates clarity and reliability when planning the measuring point both in the ordering process and for the documentation of the measuring point.

This benefits our customers

Standardized product structure, identification and documentation of the devices optimizes workflows by reducing complexity.

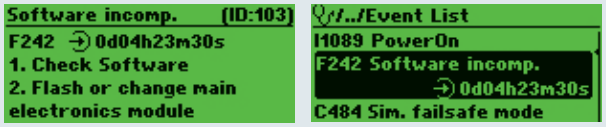
Precise device and process diagnostics

Diagnostics according to NE 107

The trend in operating and maintaining process plants is moving towards preventive maintenance. In its Recommendation NE 107, NAMUR (Standardization Committee for Measurement and Control in chemical and petrochemical industries) formulates basic aspects of self-monitoring and diagnostics of field devices. These should provide information about the condition of the devices so that corresponding actions can be taken by the plant operator, control system, or maintenance personnel.

The new two-wire concept for flow and level consistently implements this requirement. The accurate device and process diagnostics and categorization according to NE 107 (combined with full-text help in the event of an error) enable fast and targeted repair.

The integrated event counter logs fault conditions and device accesses and indicates the event time via an operating hour counter.



"A fast decision-making aid in the event of an error prevents or shortens plant downtime!"

This benefits our customers

- A fast decision-making aid in the event of an error, in acc. with NE 107, prevents or shortens plant shutdowns.
- The event counter offers maximum transparency and traceability of plant and device statuses.

Maintenance required

Out of specification

Check function

Failure

Safety first!

Attractive Ex ia two-wire concept

In the last decades, two-wire technology has revolutionized many of the available measuring device technologies. Through further development of low-power electronics components, two-wire technology has established itself by now for many measurement methods and offers valuable advantages compared to four-wire devices:

- Intrinsic safety guarantees a high level of operational safety
- Easy and cost-effective integration and installation
- Use of the existing infrastructure
- Common installation practice/expertise

In addition to the general advantages of two-wire technology, the new device concept offers numerous other advantages:

- Worldwide Ex approval (ATEX, IEC, NEPSI, FM, CSA, TIIS)
- Maximum safety and application bandwidth with a comprehensive Ex ia concept
- Uniform Ex documentation reduces expenses
- Flexible spare part management through Ex-tested individual components

In addition, the devices have been developed in accordance with DIN EN/IEC 61508 and certified by SIL.

This benefits our customers

A uniform Ex concept reduces costs and complexity and guarantees the highest level of safety along with maximum flexibility in the handling of spare parts.

Safe and reliable plant operation

The purpose of safety devices is to reduce the risk associated with plants and processes to a reasonable level. The new two-wire devices for flow and level measurement were developed in accordance with the 2010 revised version of IEC 61508 and are therefore suitable for use in safety systems. The operator can choose from IEC 61511-compliant "prove-in-use" devices or devices developed in accordance with IEC 61508.

Devices that were developed in accordance with IEC 61508 have the advantage of their development process incorporating a management system that largely prevents systematic errors. This high quality makes it possible to use them in safety devices right from market launch.

The hardware for the new devices was developed in accordance with SIL 2 and software in accordance with SIL 3. This means they can be used in safety instrumented systems in SIL 2, but also SIL 3 in homogeneous redundancy. This series of devices has a hardware and software lock to ensure that errors resulting from unauthorized access are prevented. Furthermore, a special SIL menu guarantees correct configuration of parameters.

Reducing the cost and time required for proof testing
Regular proof tests must be carried out to ensure that the safety device is carrying out its safety function correctly. Operators of process engineering plants constantly bemoan the excessive cost and time associated with these tests particularly for systems which measure continuously.

The new two-wire devices for flow and level measurements are the answer to all of these user problems. With these devices, it is possible to extend the inspection interval (usually one year) to up to three years and to cover a very high inspection depth without interrupting operation when built-in – and all of this without needing any specialized knowledge.

By means of a test sequence integrated in the software, the position and amplitude of the level devices' sensor signals are tested. A simulation then verifies activation of the safety function. This is possible either with the free FieldCare operating tool provided by Endress+Hauser or the device display.

"When it comes to safe and reliable plant operation, there are no compromises."

Simply unforgettable – HistoROM™

The captive memory

Easy replacement of components without loss of data. This user requirement is something the memory of the HistoROM™ with the new two-wire concept fulfills in an elegant way by automatically saving the entire device configuration during start-up. The HistoROM™ module is connected to the housing in such a way that it cannot be detached and automatically copies the complete device configuration to the new electronics. It can't get any easier!

HistoROM™ is part of an intelligent device data management system. In addition to flexible management of the configuration data, the HistoROM™ enables cyclic recording of up to 1000 measured data units, including presentation as line recorders in the display.

In combination with the additional memory functions in the display, the following options are available for data handling:
1 Saving data – Storing the selected configuration
2 Restoring data – Reloading a previous configuration
3 Comparing data – with a previous configuration
4 Duplicating data – Copying the configuration to other devices

This benefits our customers

- Automatic data storage capability enables time-saving replacement of electronics without recalibration
- Loss of data is prevented by an automatic backup copy of the configuration data
- Easy reproduction of measuring point configurations on other devices
- Maximum safety and reliability through the comparison function

"Automatic data backup means that electronics can be easily replaced without the need for recalibration."

Uses industry standards

Sustainability and investment protection

In the Operational Safety Ordinance valid in Germany for plants requiring monitoring, the plant operator is assigned responsibility for the plant's operation and safety. At the same time, the safety and reliability requirements as well as the cost pressure for process plants rise and compel many branches of industry to codify the state of the art of technology with regulations, standards, or recommendations. The NAMUR drafts recommendations to establish requirements that are valid for devices used within process plants in the chemical and petrochemical industry. Over the years, many of these recommendations have been adopted as best practice for this branch of industry. Newer recommendations are well on their way to becoming established.

In the new, forward-looking and uniform two-wire concept for flow and level, Endress+Hauser is consistently implementing all of the industry's requirements from applicable standards and recommendations. In doing so, Endress+Hauser is once again setting the benchmark for the current state of the art of technology.

Compliance with the relevant German DIN standards and VDI/VDE guidelines as well as NAMUR recommendations

- NE 21: Electromagnetic compatibility (EMC)
- NE 32: Data retention
- NE 43: Consistent signal level
- NE 53: Software of field devices
- NE 80: Application of the Pressure Equipment Directive
- NE 100: Use of lists of properties
- NE 105: Specifications for integrating fieldbus devices
- NE 107: Self-monitoring and diagnosis of field devices
- NE 131: NAMUR standard device
- NE 132: Coriolis mass meter

NAMUR

CE

VDI

VDE

DIN

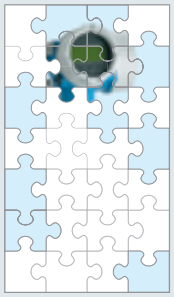
This benefits our customers

Consistent implementation of industry standards guarantees high operational safety and reliability and maximum plant availability and efficiency.

Overview of level measuring devices

Guided radar

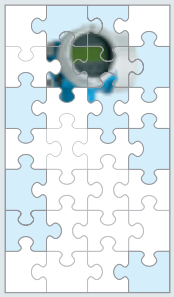
Levelflex FMP50	Levelflex FMP51	Levelflex FMP52	Levelflex FMP53	Levelflex FMP54
				
Cost-effective basic model for simple applications in liquids	Probe for the highest demands for use in liquids	Coated version for use in aggressive liquids	Hygienic probe for use in liquids	High temperature/high pressure probe for use in liquids
▪ Maximum measuring range: Rod probe 4 m Rope probe 12 m ▪ Output signal: 4 to 20 mA with HART® protocol (standard), PROFIBUS PA, FOUNDATION™ fieldbus (optional) ▪ Process temperature range: -20 to +80 °C ▪ Process pressure: -1 to 6 bar ▪ Permittivity: 1.6 or higher; rod probes in the bypass 1.4 or higher ▪ Certificates: ATEX II 1/2G EEx ia II C T6, WHG ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogeneous redundancy	▪ Maximum measuring range: Coaxial probe 6 m Rod probe 4 m Rope probe 45 m ▪ Output signal: 4 to 20 mA with HART® protocol (standard), PROFIBUS PA, FOUNDATION™ fieldbus (optional) ▪ Process temperature range: -40 to +200 °C ▪ Process pressure: -1 to 40 bar ▪ Permittivity: 1.6 or higher; coaxial probes or rod probes in the bypass 1.4 or higher ▪ Certificates: ATEX II 1/2G EEx ia II C T6, WHG ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogeneous redundancy	▪ Maximum measuring range: Rod probe 4 m Rope probe 45 m ▪ Output signal: 4 to 20 mA with HART® protocol (standard), PROFIBUS PA, FOUNDATION™ fieldbus (optional) ▪ Process temperature range: -50 to +200 °C ▪ Process pressure: -1 to 40 bar ▪ Permittivity: 1.6 or higher; coaxial probes or rod probes in the bypass 1.4 or higher ▪ Certificates: ATEX II 1/2G EEx ia II C T6, 3-A, WHG ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogeneous redundancy	▪ Maximum measuring range: Rod probe 4 m ▪ Output signal: 4 to 20 mA with HART® protocol (standard), PROFIBUS PA, FOUNDATION™ fieldbus (optional) ▪ Process temperature range: -20 to +150 °C ▪ Process pressure: -1 to 16 bar ▪ Permittivity: 1.6 or higher; ▪ Certificates: ATEX II 1/2 EEx ia II C T6, 3-A, EHEDG, WHG ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogeneous redundancy	▪ Maximum measuring range: Rod probe 4 m Rope probe 45 m Coaxial probe 6 m ▪ Output signal: 4 to 20 mA with HART® protocol (standard), PROFIBUS PA, FOUNDATION™ fieldbus (optional) ▪ Process temperature range: -196 to +450 °C ▪ Process pressure: -1 to 400 bar ▪ Permittivity: 1.6 or higher; coaxial probes or rod probes in the bypass 1.4 or higher ▪ Certificates: ATEX II 1/2G EEx ia II C T6, WHG, boiler approval ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogeneous redundancy

Levelflex FMP55	Levelflex FMP56	Levelflex FMP57		
				
Probe for continuous interface and level measurement of two liquids	Basic probe for continuous level measurement of powdery, fine-grained bulk solids	Probe for the toughest demands in level measurement of bulk solids		Plans are in place for additional instrument families for various measurement parameters.
▪ Output signal: 4 to 20 mA with HART® protocol (standard), 2*4 to 20 mA (1* with HART® protocol), PROFIBUS PA, FOUNDATION™ fieldbus (optional) ▪ Process temperature range: -50 to +200 °C ▪ Process pressure: -1 to 40 bar ▪ Upper permittivity: 1.6 or higher ▪ Certificates: ATEX II 1/2G EEx ia II C T6 ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogeneous redundancy	▪ Maximum measuring range: Rope probe 12 m ▪ Output signal: 4 to 20 mA with HART® protocol (standard), PROFIBUS PA, FOUNDATION™ fieldbus (optional) ▪ Pulling force: 12 kN ▪ Process temperature range: -40 to +120 °C ▪ Process pressure: -1 to 16 bar ▪ Permittivity: 1.4 or higher ▪ Certificates: ATEX II 1/2D ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogeneous redundancy	▪ Maximum measuring range: Rod probe 4 m Rope probe 45 m ▪ Output signal: 4 to 20 mA with HART® protocol (standard), PROFIBUS PA, FOUNDATION™ fieldbus (optional) ▪ Pulling force: 30 kN ▪ Process temperature range: -40 to +150 °C ▪ Process pressure: -1 to 16 bar ▪ Permittivity: 1.4 or higher ▪ Certificates: ATEX II 1/2D ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogeneous redundancy		

Overview of level measuring devices

Free-space radar

Micropilot FMR50	Micropilot FMR51	Micropilot FMR52	Micropilot FMR53	Micropilot FMR54
				
Cost-effective basic model for simple applications in liquids	Sensor for the highest demands for use in liquids	Flush-mounted sensor with PTFE antenna for highly aggressive liquids and hygienic applications	Sensor with PTFE rod antenna for aggressive liquids	Sensor for the highest demands in liquids
▪ Maximum measuring range: 30 m, (40 m with increased turndown) ▪ Output signals: 4 to 20 mA with HART® protocol, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process temperature range: -40 to 130 °C ▪ Process pressure: -1 to 3 bar ▪ Permittivity: 1.4 or higher ▪ Certificates: ATEX II 1 G EEx ia IIC T6, IEC Ex/FM/CSA/NEPSI/ TIIS ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogene-ous redundancy	▪ Maximum measuring range: 40 m, (70 m with increased turndown) ▪ Output signals: 4 to 20 mA with HART® protocol, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process temperature range: -196 to 450 °C ▪ Process pressure: -1 to 160 bar ▪ Permittivity: 1.4 or higher ▪ Certificates: ATEX II 1 G EEx ia IIC T6, ATEX II 1 D Ex tD IIIC IP6x, IEC Ex/FM/CSA/ NEPSI/TIIS ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogene-ous redundancy	▪ Maximum measuring range: 40 m, (60 m with increased turndown) ▪ Output signals: 4 to 20 mA with HART® protocol, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process temperature range: -40 to 200 °C ▪ Process pressure: -1 to 16 bar ▪ Permittivity: 1.4 or higher ▪ Certificates: ATEX II 1 G EEx ia IIC T6, IEC Ex/FM/CSA/NEPSI/ TIIS, FDA, 3A, CoC-ASME BPE ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogene-ous redundancy	▪ Maximum measuring range: 20 m ▪ Output signals: 4 to 20 mA with HART® protocol, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process temperature range: -40 to 150 °C ▪ Process pressure: -1 to 40 bar ▪ Permittivity: 1.9 or higher ▪ Certificates: ATEX II 1 G EEx ia IIC T6, IEC Ex/FM/CSA/NEPSI/ TIIS ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogene-ous redundancy	▪ Maximum measuring range: 20 m ▪ Output signals: 4 to 20 mA with HART® protocol, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process temperature range: -60 to 400 °C ▪ Process pressure: -1 to 160 bar ▪ Permittivity: 1.4 or higher ▪ Certificates: ATEX II 1 G EEx ia IIC T6, IEC Ex/FM/CSA/NEPSI/ TIIS ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogene-ous redundancy

Micropilot FMR56	Micropilot FMP57			
				
Cost-effective basic model for simple applications in bulk solids	Sensor for the highest demands for use in bulk solids			Plans are in place for additional instrument families for various measurement parameters.
▪ Maximum measuring range: 30 m ▪ Output signals: 4 to 20 mA with HART® protocol, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process temperature range: -40 to 80 °C ▪ Process pressure: -1 to 3 bar ▪ Permittivity: 1.6 or higher ▪ Certificates: ATEX II 1 G EEx ia IIC T6, ATEX II 1 D Ex tD IIIC IP6x, IEC Ex/FM/CSA/ NEPSI/TIIS ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogene-ous redundancy	▪ Maximum measuring range: 70 m ▪ Output signals: 4 to 20 mA with HART® protocol, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process temperature range: -40 to 400 °C ▪ Process pressure: -1 to 16 bar ▪ Permittivity: 1.6 or higher ▪ Certificates: ATEX II 1 G EEx ia IIC T6, ATEX II 1 D Ex tD IIIC IP6x, IEC Ex/FM/CSA/ NEPSI/TIIS ▪ SIL 2 as per IEC 61508 (MIN/MAX/range) SIL 3 in homogene-ous redundancy			

Overview of flow measuring devices

Flow measurement technology

Promass F 200	Promass E 200	Promag P 200	Promag H 200	Prowirl F 200
				
Tried-and-tested Coriolis mass flow measurement with efficient two-wire technology fulfills all of the requirements of the chemical industry	Reliable Coriolis mass flow measurement with efficient two-wire technology for all basic applications, complies with the requirements of the chemical industry	Reliable electromagnetic volume measurement with efficient two-wire technology	Reliable electromagnetic volume measurement with efficient two-wire technology	Reliable Vortex flowmeter with efficient two-wire technology in standard flanged version
▪ Measured variable: Mass flow, density, volume flow, temperature ▪ Measuring range: 0 to 70 t/h (for liquids) ▪ Turndown: 1000: 1 ▪ Output signal: Maximum of two outputs freely selectable, 4 to 20 mA HART®, pulse, frequency, switch output, PROFIBUS PA, FOUNDATION™ fieldbus (under development) ▪ Process pressure: -1 to 100 bar ▪ Measured error: 0.1 % from meas. val. ▪ Medium temperature: -50 to +200 °C ▪ Nominal diameters: DN 8 to 50 ▪ Material: Alloy, stainless steel ▪ NAMUR installation lengths	▪ Measured variable: Mass flow, density, volume flow, temperature ▪ Measuring range: 0 to 70 t/h (for liquids) ▪ Turndown: 1000: 1 ▪ Output signal: Maximum of two outputs freely selectable, 4 to 20 mA HART®, pulse, frequency, switch output, PROFIBUS PA, FOUNDATION™ fieldbus (under development) ▪ Process pressure: -1 to 100 bar ▪ Measured error: 0.25 % from meas. val. ▪ Medium temperature: -40 to +140 °C ▪ Nominal diameters: DN 8 to 50 ▪ Material: Stainless steel ▪ NAMUR installation lengths	▪ Measured variable: Volume flow ▪ Measuring range: 0 to 10m/s ▪ Turndown: 1000: 1 ▪ Output signal: Maximum of two outputs freely selectable, 4 to 20 mA HART®, pulse, frequency, switch output, PROFIBUS PA, FOUNDATION™ fieldbus (under development) ▪ Process pressure: -1 to 40 bar ▪ Measured error: 0.5 % from meas. val. ▪ Medium temperature: PTFE: -40 to +130°C, PFA: -20 to 150°C (Ex i: maximum +150 °C) ▪ Nominal diameters: DN 25 to 200 ▪ NAMUR installation lengths	▪ Measured variable: Volume flow ▪ Measuring range 0 to 10m/s ▪ Turndown 1000:1 ▪ Output signals: Maximum of two outputs freely selectable, 4 to 20 mA, pulse, frequency, switch output, PROFIBUS PA/FOUNDATION™ fieldbus ▪ Process pressure: -1 to 40 bar ▪ Measured error: 0.5 % from meas. val. ▪ Medium temperature: -20 to 150 °C ▪ Nominal diameters: DN 2 to 25 ▪ NAMUR installation lengths	▪ Measured variable: Volume and mass flow, temperature, heat quantity ▪ Measuring range: Liquid: max. 9 m/s Gas/steam: max. 75 m/s ▪ Turndown: 30:1 ▪ Output signals: Maximum of two outputs freely selectable, 4 to 20 mA, pulse, frequency, switch output, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process pressure: Max. PN 40 ▪ Measured error: Liquid: 0.75 % from meas. val. Gas/steam: 1 % from meas. val. ▪ Medium temperature: -200 °C to +400 °C ▪ Nominal diameters: DN 15 to 300 ▪ NAMUR installation lengths

Prowirl D 200	Prowirl R 200	Prowirl O 200	Prosonic Flow B 200	
				
Reliable Vortex flowmeter with efficient two-wire technology in basic, connection-flange version	Reliable Vortex flowmeter with efficient two-wire technology and integrated diameter reduction by one line size or two line sizes	Reliable Vortex flowmeter with efficient two-wire technology as high-pressure version	Reliable ultrasonic gas volume measurement with two-wire technology	Plans are in place for additional instrument families for various measurement parameters.
▪ Measured variable: Volume and mass flow, temperature, heat quantity ▪ Measuring range: Liquid: max. 9 m/s Gas/steam: max. 75 m/s ▪ Turndown: 30:1 ▪ Output signals: Maximum of two outputs freely selectable, 4 to 20 mA, pulse, frequency, switch output, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process pressure: Max. PN 40 ▪ Measured error: Liquid: 0.75 % from meas. val. Gas/steam: 1 % from meas. val. ▪ Medium temperature: -200 °C to +400 °C ▪ Nominal diameters: DN 15 to 150	▪ Measured variable: Volume and mass flow, temperature, heat quantity ▪ Measuring range: Liquid: max. 9 m/s Gas/steam: max. 75 m/s ▪ Turndown: 30:1 ▪ Output signals: Maximum of two outputs freely selectable, 4 to 20 mA, pulse, frequency, switch output, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process pressure: Max. PN 40 ▪ Measured error: Liquid: 0.75 % from meas. val. Gas/steam: 1 % from meas. val. ▪ Medium temperature: -200 °C to +400 °C ▪ Nominal diameters: DN 25 to 200 DN 40 to 250 ▪ NAMUR installation lengths	▪ Measured variable: Volume and mass flow, temperature, heat quantity ▪ Measuring range: Liquid: max. 9 m/s Gas/steam: max. 75 m/s ▪ Turndown: 30:1 ▪ Output signals: Maximum of two outputs freely selectable, 4 to 20 mA, pulse, frequency, switch output, PROFIBUS PA, FOUNDATION™ fieldbus ▪ Process pressure: PN 63 to PN 250 ▪ Measured error: Liquid: 0.75 % from meas. val. Gas/steam: 1 % from meas. val. ▪ Medium temperature: -200 °C to +400 °C ▪ Nominal diameters: DN 15 to 150 ▪ NAMUR installation lengths	▪ Measured variable: Gas volume flow, detection of methane content ▪ Measuring range: 0 to 30 m/h ▪ Turndown: 30:1 ▪ Process pressure: -0.2 to 10 bar ▪ Measured error: 1.5 % from meas. val. ▪ Measured error methane content: 2 % of full scale ▪ Medium temperature range: 0 to 80 °C ▪ Nominal diameters: DN 50 to 200 ▪ Output signal: Maximum of two outputs freely selectable, 4 to 20 mA HART®, pulse, frequency, switch output, PROFIBUS PA/ FOUNDATION™ fieldbus (under development)	

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