Proline 300/500

The future-oriented flow measuring technology

For more safety, quality and availability in your plant

- Robust and reliable: multi-functional transmitter for the ultimate measuring performance in the process industry
- Complies with all industry requirements: Proline 300/500 is available with each of the Promass (Coriolis) and Promag (electromagnetic) sensors, which have been tried-and-tested for decades
- Fast commissioning: simple and intuitive operation via display, web server, WLAN, operating tools or fieldbuses
- Maximum operational safety:
  - Developed in accordance with SIL (IEC 61508)
  - Device verification with Heartbeat Technology during operation
  - Permanent self-diagnostics
  - Automatic recovery of device data (HistoROM)
- Seamless system integration: wide variety of fieldbus technologies such as HART, PROFIBUS PA/DP, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP, PROFINET
- Proline 300/500 is Industry 4.0 ready: embedded OPC-UA server via WLAN and Ethernet

Endress+Hauser

People for Process Automation

Proline
simply clever

Process monitoring is becoming more demanding and the need for maximum product quality is steadily increasing. This is why Endress+Hauser continues to provide industry-specific flow measurement solutions optimized for future technology requirements.

The new generation of our Proline flowmeters is based on a uniform device concept. This means time and cost savings, as well as maximum safety over the entire plant life cycle.

Perfect integration Proline can be integrated seamlessly into your plant asset management, providing reliable information for optimizing production and business processes.

Innovative and proven in use Proline is based on a versatile, continually updated technology concept, guaranteeing that you are always implementing state-of-the-art technology.

Ingeniously simple Proline is user-friendly through and through, ensuring that your process can be securely controlled with confidence.

Added value in every respect

HistoROM
- Automatic data storage ensures maximum plant safety
- Simple data restoration enables quick exchange of components
- Event logbook and data logger for quick failure analysis

Heartbeat Technology
- Permanent self-monitoring for all Proline measuring technologies
- Diagnostics for reduced maintenance and quick remedy
- Verification of measuring point, e.g. printing documents for quality reporting (ISO 9001 compliant)

Seamless system integration
- Direct and transparent due to a wide range of fieldbuses
- Risk-free through extended host testing and certification
- Compatibility over the entire product life cycle enables device replacement without expert know-how

W@M Life Cycle Management
- Open information system for device documentation and management
- Device-specific information for everyday work
- Quality of information unparalleled in scope and depth

Web server
- Time-saving local operation without additional software
- Comprehensive access to device, diagnostics and process information
- Fast data upload/download for maintenance and service

Simple operation
- Time-saving Endress+Hauser operating concept
- Optimal usability through guided parameterization
- User-specific menu structures and device access

Proline 300/500

Innovation and practical experience combined

For over 40 years Endress+Hauser has been providing its customers with one of the most comprehensive flow measurement product portfolios for liquids, gases and steam. And for 25 years Proline has guaranteed that users receive the best possible flowmeter for their applications: Over 3 million magmeters and Coriolis flowmeters have been shipped since 1977.

However, as modern challenges in the process industry have increased drastically, plant operators are subject to an increasing level of competition and cost pressure. In addition, there are more and more legal regulations to ensure process safety. This means that flexibility in planning plants, optimal plant efficiency and the highest level of product quality are key to defining the success of a company today.

These challenges are met by Proline 300/500 without compromise. This is because the Proline series is based on years of industry experience and the permanent development of our transmitter technology. Proline has been designed in accordance with the SIL requirements and, as a result, guarantees the maximum level of safety, quality and availability in operation. Unique diagnostic functions and a sophisticated data storage concept also help to ensure these standards.

Proline 300/500 already meets and exceeds the future requirements of your process facility. This is accomplished by using numerous functions adapted to your application, as well as by the industry-optimized device portfolio with all relevant approvals and certifications.

Proline is prepared for digital networking, as well as for process automation with Industry 4.0 and the Internet of Things.

Proline 300/500 is innovative with its connectivity into Industrial Internet of Things applications via wired or wireless networks. A built-in OPC-UA server along with Wireless LAN network access is an enabler for advanced Industrial Internet of Things application in major cloud platforms.

Your benefits close-up

Proline 300/500 – for permanently increased safety, quality and availability in your plant

Safe all-around – you can count on that

Safe installation and measuring – using Proline 300/500 flowmeters puts you in the right position from the very beginning to deal with the growing challenges of plant safety. In concrete terms, this means avoiding failures and property damage in plants, and thus avoiding hazards for people and the environment.

In this respect you can rely on our new generation of devices one hundred percent. This new generation is based on decades of experience in safety-related applications and long-standing partnerships with international testing, certifying and other organizations. As a result, the new Proline 300/500 device design exceeds even the highest levels of safety standards:

- Ideal suitability for application in safety instrumented systems (Functional Safety applications)
- Optimum accessibility to all user interfaces via a single connection compartment from the front
- Permanent device diagnostics thanks to Heartbeat Technology with a total test coverage of over 95%
- Quick and secure remedying of device and process errors, thanks to clear and unambiguous categorization of errors according to NAMUR NE107
- Backwards compatibility with previous Proline measuring points and applications: mechanical, electronical and functional
- Digital networking ability and integrated OPC-UA server for SCADA visualization. Cloud connectivity and predictive maintenance

High-quality – for smooth processes

The expectations for process facilities and measuring instruments in the field are constantly increasing: the highest levels of process and product quality coupled with low maintenance effort and low total cost of ownership. Precisely for this reason was the Proline 300/500 developed.

The sophisticated diagnostics, monitoring, and verification concept of Heartbeat Technology allow for a comprehensive level of process monitoring that cannot be found anywhere else in the world. You benefit from this in several ways: through fewer failures, lower costs and thus, sustainable competitiveness. A measuring device, however, is only as good as the quality of its measured data. For this reason all of our calibration rigs are accredited by national accreditation bodies. This ensures reliable measurement results around the clock.

- Reliable device/process monitoring and predictive maintenance thanks to Heartbeat Technology:
  - Continuous self-diagnostics in accordance with NAMUR NE107
  - Early recognition of disturbances in the process, such as empty pipes (partial filling), deposits, abrasion, corrosion, multiphase fluids, etc.
- Service-friendly data storage (HistoROM):
  - Automatic data storage for maximum plant safety
  - Automatic restoration of data after a case of service
  - Complete system integration compatibility through automatic restoration of firmware
- Highest measurement quality due to the fact that each Endress+Hauser flowmeter is checked on accredited, and therefore traceable, calibration rigs (ISO/IEC 17025)

Available at any time – process and device information

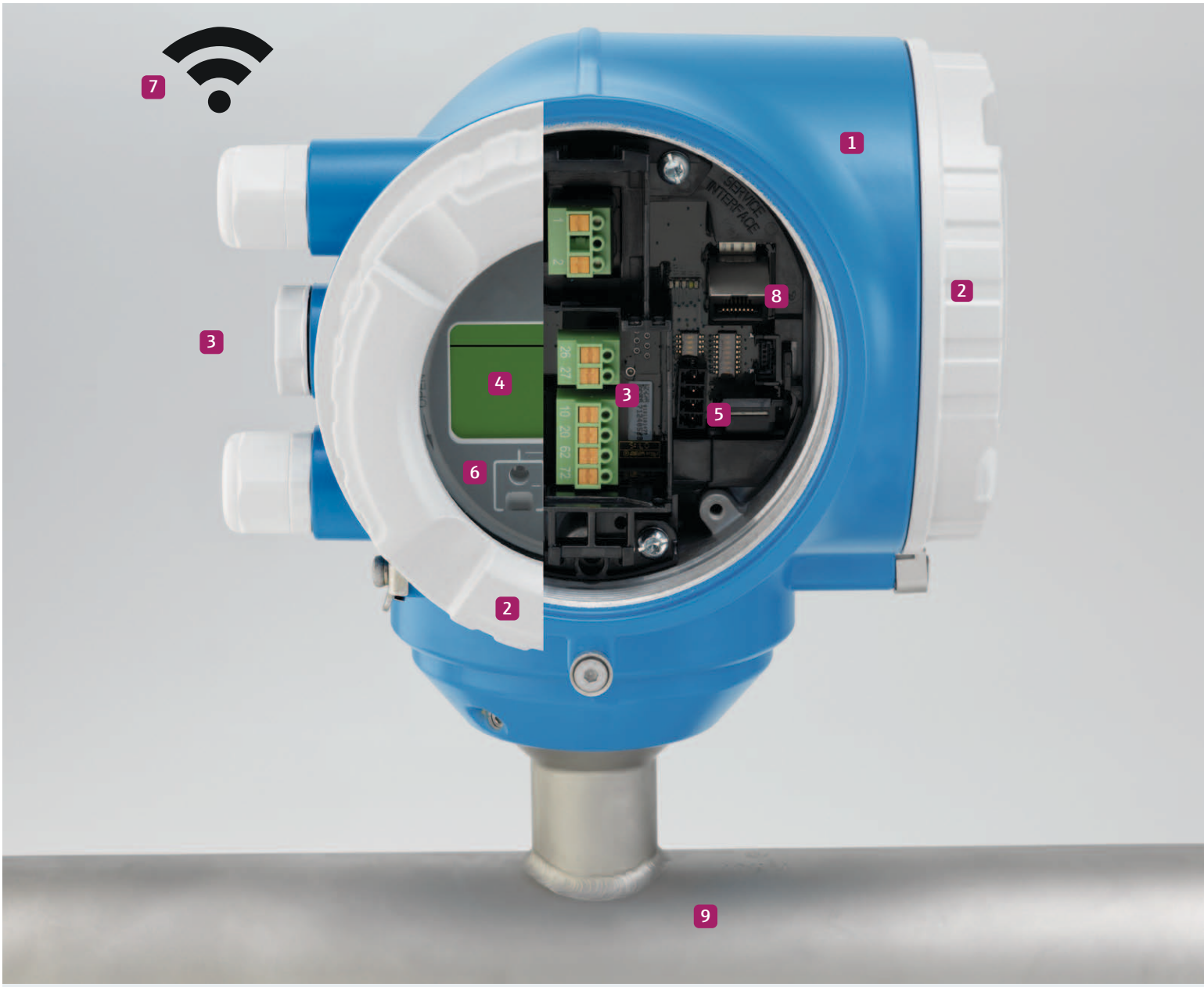
In large industrial plants with thousands of field devices, not only are the measured values accumulated, but often an endless amount of process and diagnosis information is also gathered and never used. Proline 300/500, with its wide variety of fieldbus interfaces, makes it possible to access all of this data directly and thus ensures optimal measuring operation.

The availability of process-critical measuring points is vital, particularly in safety-related or custody transfer applications. Proline 300/500 can check its own operational reliability using sophisticated verification functions – wherever and whenever you want. And last but not least, Proline has numerous operating options for accessing device and diagnostic data directly during commissioning or service.

- Extensive access to process and diagnostic data using a broad range of fieldbuses, as well as Industrial Ethernet (EtherNet/IP and PROFINET)
- Reliable and metrologically traceable device verification during operation with Heartbeat Technology (TÜV inspected). No field presence is required; verification can be triggered at any time
- Versatile operating options using display, web server (service interface), WLAN or fieldbus interfaces
- Standardized Endress+Hauser operation concept with guided parameter configuration and over 17 display languages
- Continuous monitoring of critical process and device parameters through IT connectivity (e.g. OPC-UA) in cloud-based applications (App)

The Proline transmitter

Highlights at a glance



Hygienic housing (IP69)

- For hygienic and sterile applications
- Ideal for high-pressure cleaning
- Corrosion-proof (316L)
- Gap- and joint-free housing surface
- Gap-free sealing concept
- Non-glass display

Stainless steel die-cast housing

- For environmentally demanding applications
- Ideally suited for offshore areas
- Robust, corrosion-resistant housing made of 3FCM (316L) for harsch environments
- IP66/67 (Type 4X enclosure)

1 Transmitter housing – industry-optimized

- Robust housings (materials ▸ page 11)
- Compact version (Proline 300) with/without display, or remote display
- Remote version (Proline 500) can be installed up to 300 meters from the sensor

2 Two-chamber system – securely separated

- Connection compartment with all interfaces easily accessible from the front
- Separate electronics compartment:
  – Fully protected against dust
  – With modular electronics design concept

3 Inputs and outputs – seamless system integration

- Can be integrated into existing plants at any time using HART, WirelessHART, PROFIBUS PA/DP, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP or PROFINET
- Numerous inputs/outputs available, including a freely configurable I/O module

4 Display acc. to NAMUR NE107 – precise fault identification

- Clear and unambiguous categorization of errors (NAMUR NE107) for precise correction of faults, thus preventing plant shutdowns
- The history of plant and device statuses retrievable at any time (logbook with an "event counter")

5 HistoROM – simply unforgettable

- Maximum security due to an automatic data storage (3 data storage units)s
- HistoROM device memory: complete system integration compatibility through automatic restoration of the original firmware in service cases
- Easy transfer of device configurations after device replacement

6 HMI operation concept – intuitive and secure

- Guided parameter configuration with plain text in structions
- Over 17 operating languages for worldwide use
- Standardized menu structures for all flow measurement technologies.
  Advantage: Less training effort and higher safety in operation

7 WLAN connection – wireless service interface

- Full access to measured values, diagnostic data, process information and device parameter configuration
- WLAN (infrastructure modus) for integration into wireless networks

8 Web server – easy configuration in the field

- Time-saving operation via a standard Ethernet cable or WLAN
- Comprehensive access to all device, diagnosis and process information
- Fast upload/download of device configurations
- Embedded OPC-UA server – full IT connectivity:
  – Enables Industrial Internet of Things (IIoT) connectivity
  – For easy connectivity in SCADA applications

9 Proline sensors – robust and proven

- Industry-optimized sensors with high measuring accuracy even in long-term operation
- Proven in use – over 3 million Promass and Promag sensors installed since 1977
- Immune to process and environmental influences (temperature, vibrations, dust, humidity)
- Guaranteed measurement quality thanks to traceable and worldwide accredited calibration rigs

All highlights (1–9) apply equally to the Proline 500 remote version

Approvals and certificates (examples)

Industry-optimized sensors

For your application

Coriolis (gases, liquids)		
	**Promass F** Universally applicable ▪ High-accuracy measuring of liquids and gases under fluctuating process conditions ▪ DN 8 to 250 (⅜ to 10")	
	**Promass E** Minimum operating costs ▪ Accurate measurement of liquids and gases for a broad spectrum of standard applications ▪ DN 8 to 80 (⅜ to 3")	
	**Promass X** Four-tube device (up to 4100 t/h) ▪ For the highest flow rates and outstanding performance in onshore/offshore applications (oil & gas) ▪ DN 300 to 400 (12 to 16")	
	**Promass O** High-pressure measuring device ▪ High-precision measurement for very high process pressures in the onshore/offshore area (oil & gas) ▪ DN 80 to 150 (3 to 6")	
	**Promass H** For aggressive fluids ▪ Single-tube measuring device for the safe measurement of corrosive liquids and gases ▪ DN 8 to 50 (⅜ to 2")	
	**Promass P** For the life sciences industry ▪ Specifically for sterile processes in biotechnology ▪ DN 8 to 50 (⅜ to 2")	
	**Promass S** Drainable single-tube system ▪ Specifically for hygienic applications that require optimal cleaning ▪ DN 8 to 50 (⅜ to 2")	

Coriolis (gases, liquids)

Promass Q
For demanding applications

- Highest accuracy for mass flow, volume flow and density measurement, especially in custody transfer or with gassy fluids
- DN 25 to 100 (1 to 4")

Promass I
With in-line viscosity measurement

- Straight, single-tube measuring device for liquids and gases with low pressure loss
- DN 8 to 80 (⅜ to 3")

Promass A
For the smallest flow rates

- Self-draining single-tube device for the accurate measurement of the smallest amounts of liquids and gases
- DN 1 to 4 (1/24 to ⅛")

Cubemass C
Ultra-compact device

- For the accurate measurement of the smallest amounts of liquids and gases
- DN 1 to 6 (1/24 to ¼")

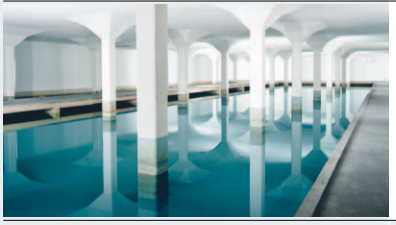
Electromagnetic (conductive liquids)

Promag P
For very high temperatures

- For chemical and process applications with corrosive liquids and high fluid temperatures up to +180 °C (+356 °F)
- DN 15 to 600 (½ to 24")

Promag H
For hygienic applications

- With temperature measurement and temperature-compensated conductivity measurement
- DN 2 to 150 (1/12 to 6")



Promag W
The water specialist

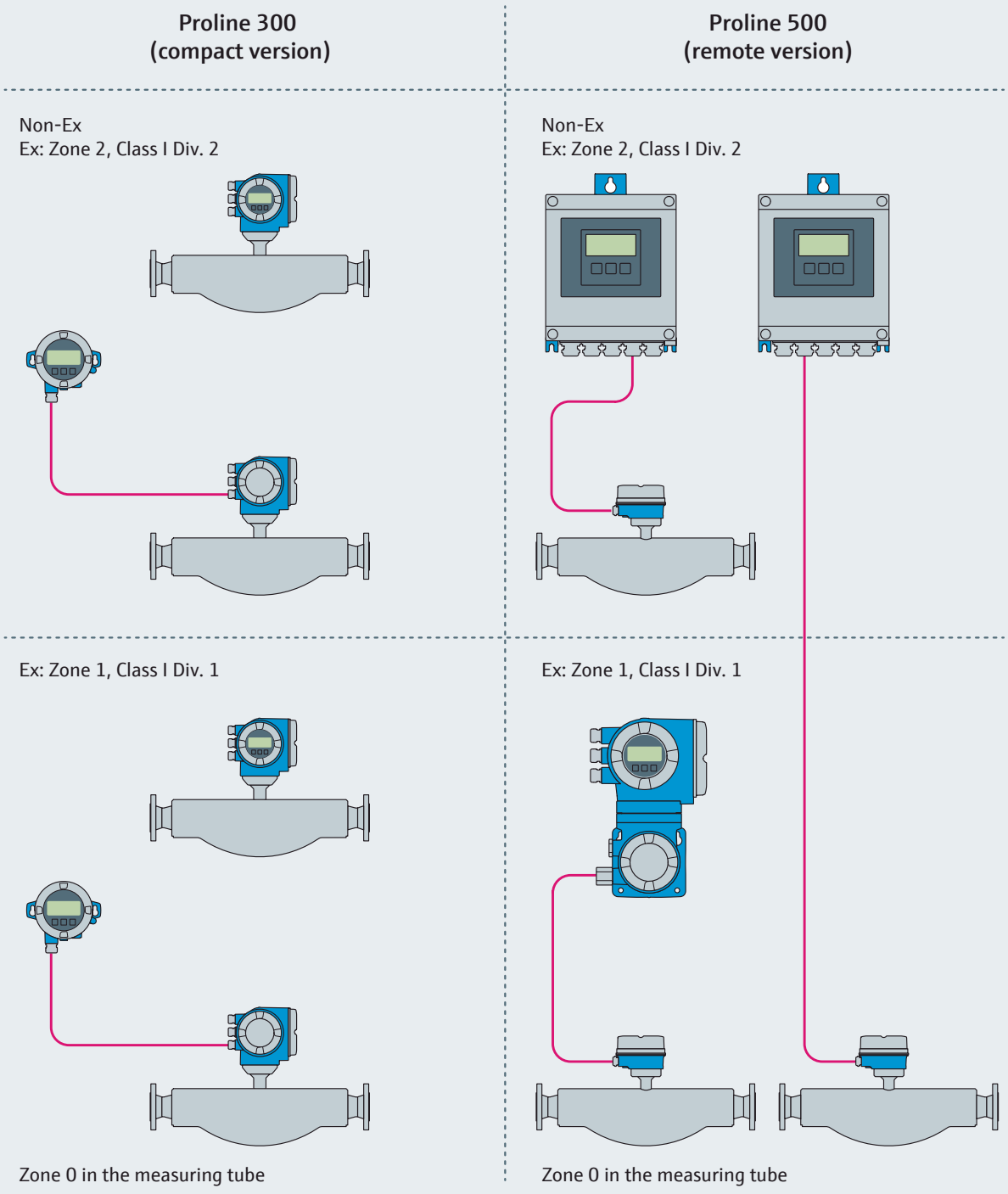
- For demanding applications in the water and wastewater industry (optional: IP68/Type 6P)
- DN 25 to 2000 (1 to 80")

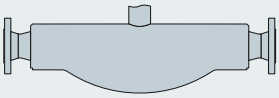
Installation concept – Proline 300/500

For flexible installation and secure operation

Regardless of which application: You can integrate Proline 300/500 flowmeter systems perfectly into your plant and adapt them to your process conditions, thanks to the variety of designs, sensors, nominal diameters, fieldbusses and installation options.

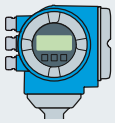
Installation concept (with Promass F 300/500 as an example)





Sensors
– Promass (description ▸ page 8–9)
– Promag (description ▸ page 9)

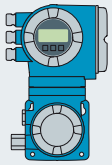
Materials (housing)



Proline 300 transmitter (compact version)

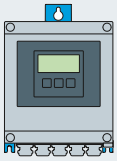
Compact housing:
– Aluminum
– Stainless steel die-cast
– Hygienic housing (316L)

Remote display (cable length up to 300 m):
– Aluminum
– Stainless steel die-cast



Proline 500 transmitter (remote version)

Wall-mount housing (cable length up to 20 m for Coriolis, or 200 m for magmeters):
– Aluminum
– Stainless steel die-cast



Proline 500 transmitter (“digital” remote version)

Wall-mount housing (cable length up to 300 m):
– Aluminum
– Polycarbonate

Proline 500 sensor (remote version)

Connection housing:
– Aluminum
– Stainless steel die-cast
– Stainless steel, hygienic

Technical Data

Transmitter	Proline 300 (compact)	Proline 500 (remote)
Display	– 4-line backlit display with Touch Control (operation from outside) – Optional: with remote display	4-line backlit display with Touch Control (operation from outside)
Operation	Configuration via: display, web server, WLAN, WirelessHART, as well as via various operating tools (FieldCare, HART handheld, etc.)	
Housing material	Transmitter: Aluminum, stainless steel die-cast, stainless steel 316L (hygienic) Remote display: Aluminum, stainless steel die-cast	Proline 500 transmitter "digital": Aluminum, polycarbonate Proline 500 transmitter: Aluminium, stainless steel die-cast
Power supply	AC 100 to 230 V, DC 24 V (Zone 1, Div. 1); AC/DC 24 to 230 V (Zone 2, Div. 2, Non-Ex)	
Ambient temperature	Standard: –40 to +60 °C (–40 to +140 °F) Option (Coriolis only): –50 to +60 °C (–58 to +140 °F)	Standard: –40 to +60 °C (–40 to +140 °F) Option: –50 to +60 °C (–58 to +140 °F) Option (Coriolis only): –60 to +60 °C (–76 to +140 °F)
Degree of protection	IP 66/67 (Type 4X enclosure), Option: IP69 (stainless steel, hygienic)	
Outputs Inputs Communication	**Port 1** (communication): HART (4–20 mA), PROFIBUS PA/DP, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP, PROFINET **Port 2/3** (freely selectable): – Current outputs (4–20 mA) – Pulse/frequency/switch outputs – Status inputs – Current inputs (4–20 mA) – Relay outputs – Freely configurable in/outputs (I/O)	**Port 1** (communication): HART (4–20 mA), PROFIBUS PA/DP, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP, PROFINET **Port 2/3/4** (freely selectable, Proline 500 "digital"): – Current outputs (4–20 mA) – Pulse/frequency/switch outputs – Status inputs – Current inputs (4–20 mA) – Relay outputs – Freely configurable in/outputs (I/O) Proline 500: With up to 3 inputs and outputs
Ex approvals	ATEX, cCSAus, NEPSI, INMETRO, EAC, etc.	
Approvals	SIL: Use for flow monitoring up to SIL 2 (single-channel architecture) or SIL 3 (multi-channel architecture with homogeneous redundancy); OIML R117; custody transfer approvals; CRN, PED; 3A, EHEDG, etc.	

Subject to modification

The Proline 300/500 measuring system fulfills the EMC requirements according to IEC/EN 61326 and NAMUR NE21. It also conforms to the requirements of the EU and ACMA directives and thus carries the CE and the mark.

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