

## Proline Promass A

The lightweight champion  
with the highest accuracy  
for the lowest flow rates

### Fits for every application

- Highest measuring accuracy for the lowest flow quantities:  
±0.1% (at min. 8 g/min)  
±1% (at min. 0.8 g/min)
- Space-saving installation:
  - Compact, low-weight sensors
  - No inlet/outlet runs
- Highest product quality in hygienic and sterile applications thanks to a self-drainable single-tube system
- Excellent measuring performance and robustness, even in case of strongly fluctuating process and ambient conditions
- Optimal process reliability:
  - High resistance to corrosive process and ambient conditions
  - Developed according to IEC 61508 (SIL)
  - Heartbeat Technology for permanent self-diagnostics as well as for device verification during operation
- Full access to all process and diagnostic data through freely combinable inputs/outputs, fieldbuses or WLAN



# 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



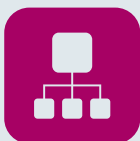
### HistoROM

- 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 points, 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



Compact and space-saving: Promass A (DN 1 to 4 / 1/24 to 1/8") can also be installed in extremely tight spaces, such as in skids.

## Promass A

The compact Coriolis single-tube system for the precise measurement of the lowest flow quantities of just a few grams per minute

Measuring the smallest amounts of liquids with worldwide unmatched precision – that's the top discipline of the new Promass A Coriolis flowmeter of Endress+Hauser.

No matter where or in which process: Promass A ensures maximum robustness and accurate values measured with unique repeatability – independent of external interference. This is ensured by the innovative sensor concept (► page 8), which sets new standards in Coriolis measurement technology.

➔ Promass A's unique advantages and product properties are captivating ► pages 5–7

### The lightweight champion

Not only because its measuring performance is unbeatable, but also because...

- ... extremely tight spaces are not a knock-out criterion for the compact Promass A. The smallest sensor is just as large as a wallet.
- ... Promass A masters all kinds of mounting positions – regardless whether horizontally or vertically.
- ... Promass A can't be compromised by varying viscosities or densities.



# Promass A fits for every application

Reliable, robust and highly accurate

Reliable



## Long-term reliability

Promass A is equipped with Heartbeat Technology as standard which guarantees reliable operation around the clock. It permits permanent self-diagnostics with the highest diagnostic coverage (>95%) and optional device verification during operation without removal.

Robust



## Maximum robustness

Promass A has a particularly robust device and sensor design. This protects the sensor system from external pipe vibrations and pipe forces effectively, thereby guaranteeing first-rate measuring results.

Promass A is lightweight and compact without limiting performance and robustness. Promass A is therefore especially suitable for space-saving installation in skids.

Highly accurate



## Unique measuring performance

Promass A has a new, innovative sensor concept, which guarantees maximum operable flow range and accuracy for the lowest flow rates – even under fluctuating process and ambient conditions.

# Promass A in the process industry

When precise and robust measurement technology is essential

## For maximum process reliability

- Wide variety of process connections with pressure ratings up to 430.9 bar (6250 psi): flanges, lap joint flanges, VCO couplings or internal threads
- Optionally with non-destructive material testing, e.g. with positive material identification testing (PMI) and weld seam testing according to ISO, ASME and Norsok
- Optionally with built-in rupture disk  
Trigger pressure: 10 to 15 bar (145 to 217.5 psi)
- Usable in safety-related SIL applications
- Single-tube measuring system with low risk of clogging in comparison with two-tube measuring systems (of comparable flow capacity)

## For demanding conditions

Ideally suited:

- for use in onshore and offshore areas
- for applications with chemically aggressive fluids

## For maximum corrosion resistance

- Sensor housing made of stainless steel (316L)
- Wetted parts:
  - Made of stainless steel (316/316L) or Alloy C22
  - According to NACE MR0175/MR0103

## For optimal operational safety in hazardous areas

- Two-wire device (Promass A 200):
  - Intrinsically safe design (Ex ia)
  - Reduced costs for installation and wiring
- Four-wire devices with worldwide recognized Ex approvals (ATEX, IECEx, cCSAus, NEPSI, INMETRO, EAC, etc.)



## ! Application examples

### Chemical injection

For the continuous or intermittent dosing/injecting of a precise amount of chemicals to protect the system from accelerated corrosion or to prevent formation of scale.

### Reactor feed

For accurate and precise mixing repeatability of a required quantity in the reaction process.

### Ensuring successful oil and gas production

Injection of monoethylene glycol (MEG) to prevent hydrate build-up and blockages in pipelines.

# Promass A in hygienic and sterile applications

When maximum product quality is key

## For guaranteed hygiene

- Compact, lightweight and hygienic device design with Tri-Clamp connections
- Food: 3-A, FDA, Food Contact Materials Regulation (EC) 1935/2004
- Pharmaceuticals: FDA, USP Class VI, TSE/BSE Certificate of Suitability
- IP69 degree of protection (option) with gap-free and joint-free housing surfaces, suitable for high-pressure cleaning

## For guaranteed process quality and reliability

- Self-drainable measuring tube for all diameters
- Single-tube measuring system with low risk of clogging in comparison with two-tube measuring systems (of comparable flow capacity)

## For maximum compliance and product quality

- Wetted parts made of stainless steel 1.4435 (316L) in pharmaceutical quality
- Polished surfaces:  
Ra<sub>max</sub> = 0.76 µm (30 µin) or 0.38 µm (15 µin)

## For maximum measuring performance

- Shorter downtimes thanks to immediate availability after CIP or SIP cleaning
- Highest accuracy and repeatability, e.g. for measuring, dosing and mixing applications with very small quantities

## For space-saving installation

- Compact and lightweight sensor design, ideally suited for installation into skids
- No inlet or outlet runs required

Promass A 500



## ! Application examples

### Blending, dosing and mixing

Maintaining the correct ratio of ingredients in a process, e.g. flavoring agents, vitamins, coloring agents or fragrance additives.

### Pharmaceutical production

Precise dosing of valuable active ingredients.

### Pilot plants

Development and verification of processes on a pilot scale before implementation in a full-scale production plant.

# The sensor concept

For first-rate measuring results, even under fluctuating ambient and process conditions

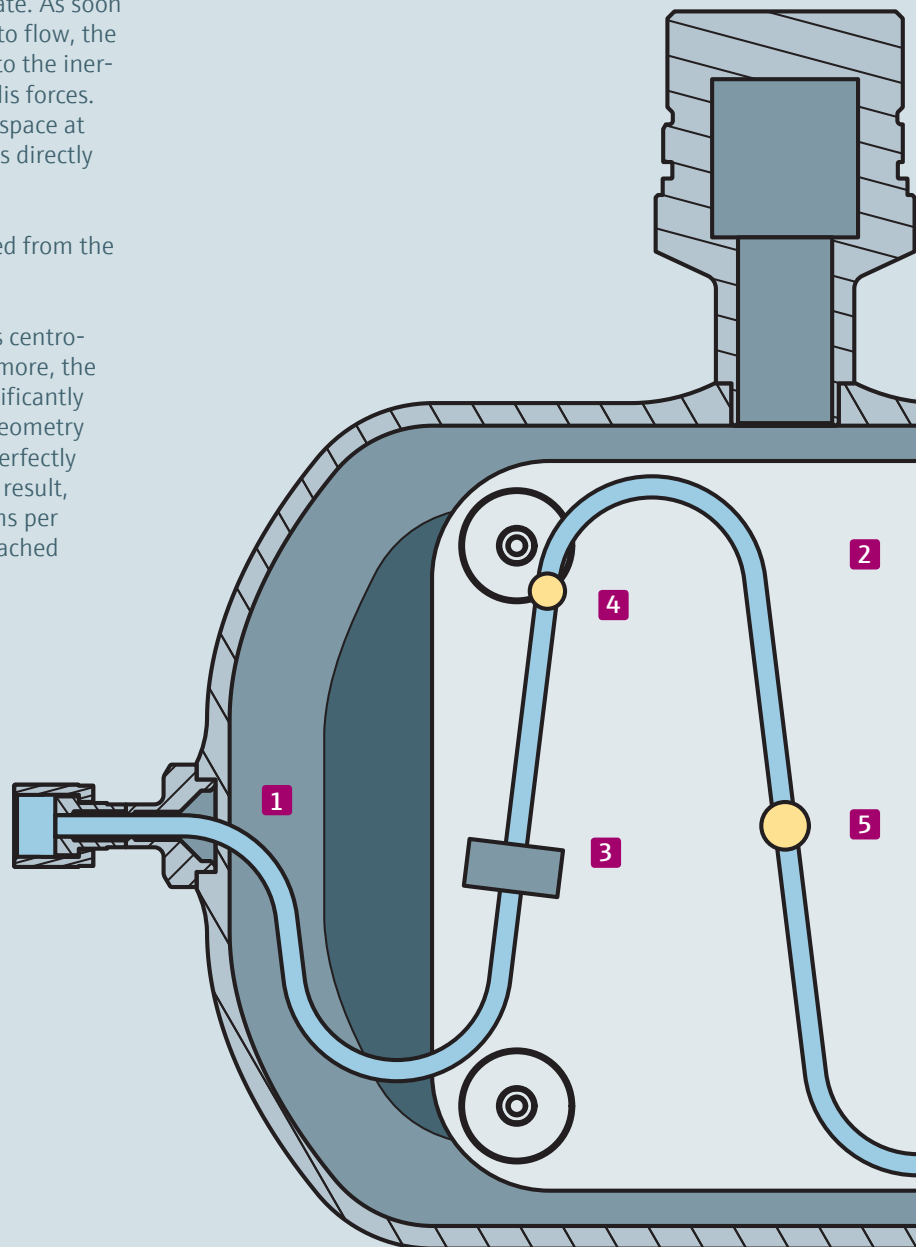
The interior of Promass A contains a measuring tube **1**, which an exciter **5** causes to constantly oscillate. As soon as the fluid inside the measuring tube begins to flow, the geometry of the pipe oscillation changes due to the inertia of the flowing fluid and the resulting Coriolis forces. This change is picked up in terms of time and space at the inlet and outlet by two sensors **4, 6** and is directly proportional to the mass flow.

In addition, the fluid density can be determined from the oscillation frequency of the measuring tube.

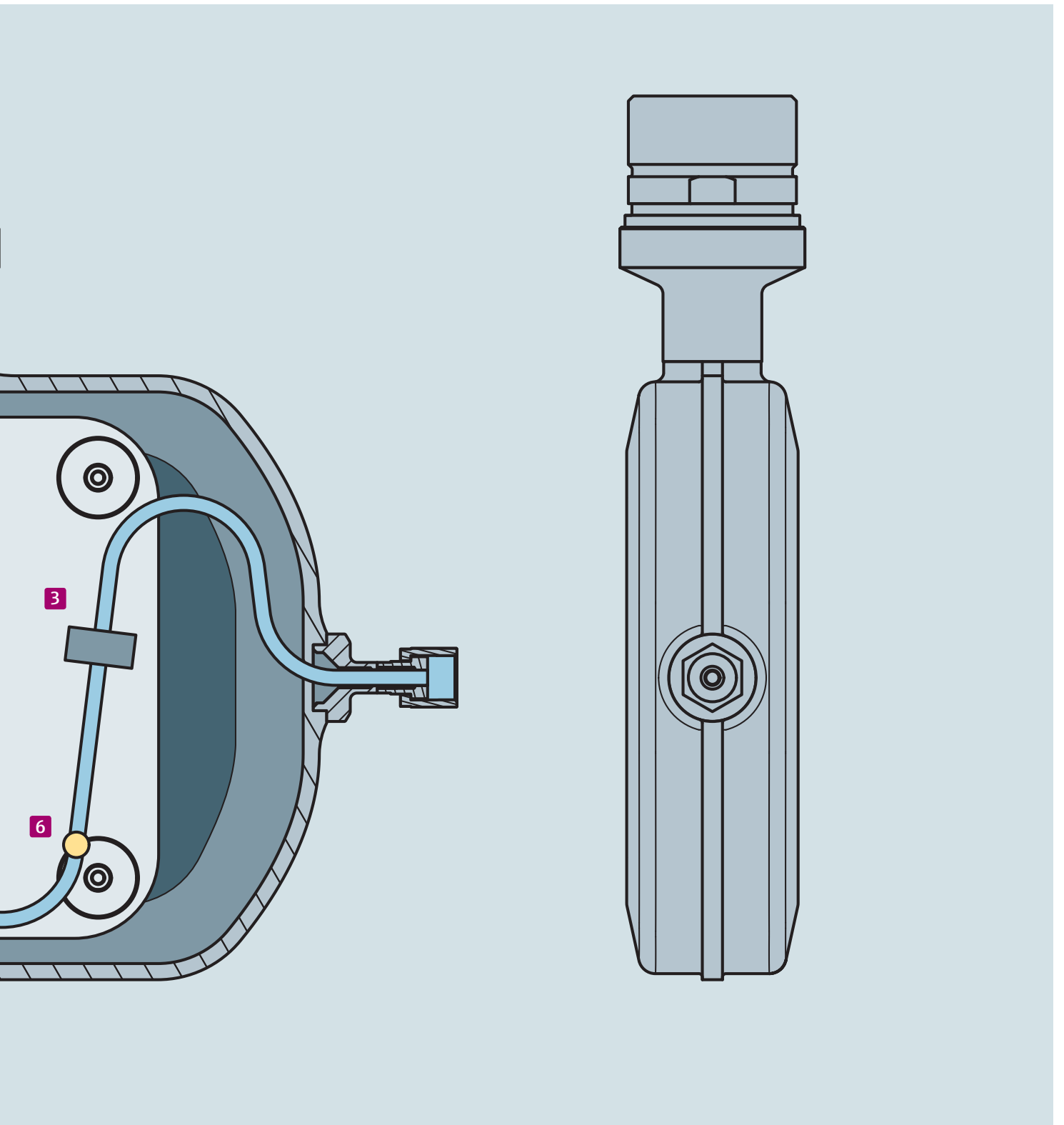
The measuring tube geometry of Promass A is centrosymmetrical in relation to the exciter. Furthermore, the measuring tube is excited to oscillate at a significantly higher frequency than usual. The oscillation geometry generated is therefore also symmetrical and perfectly balances the measuring tube movement. As a result, even the smallest flow rates of just a few grams per minute can be measured with previously unreached zero point stability and accuracy.

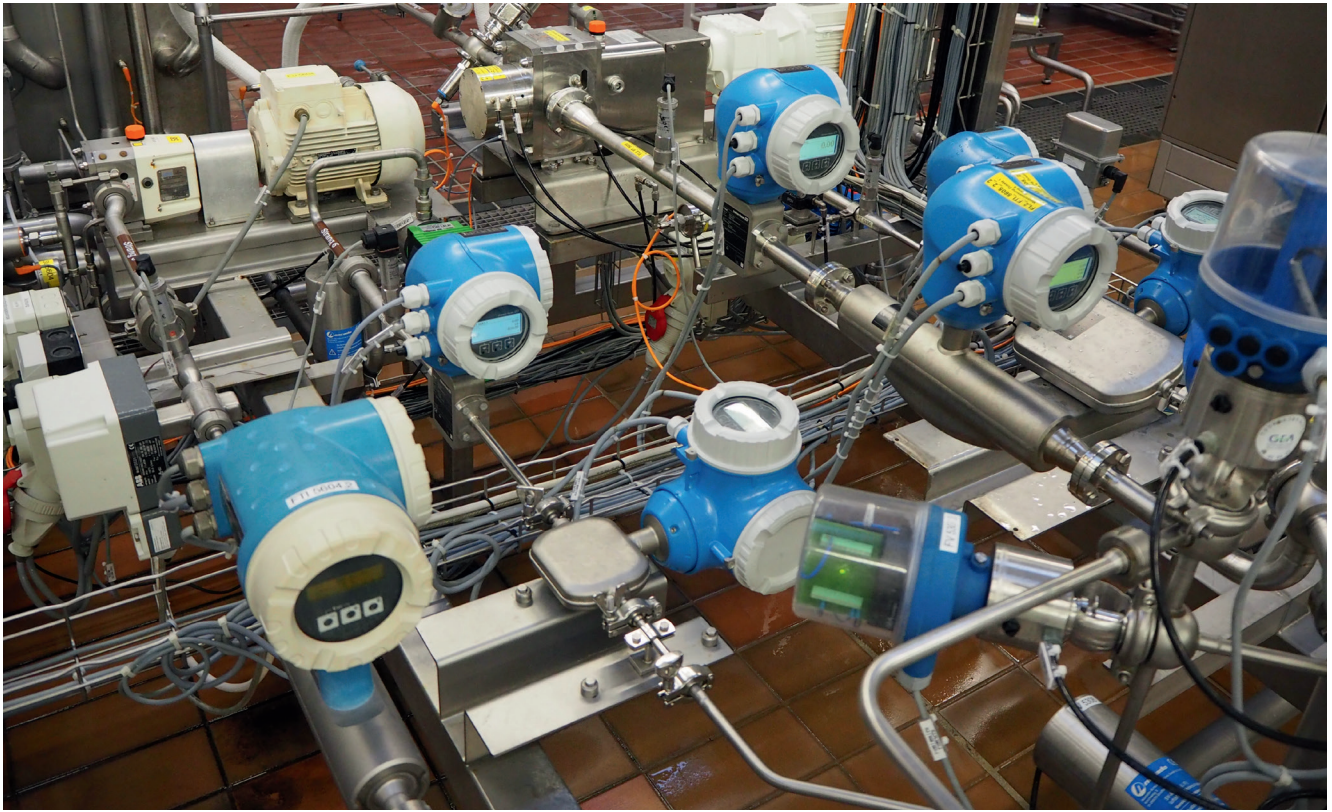
## Caption

- 1** Measuring tube
- 2** Base plate
- 3** Coupler
- 4** Sensor (inlet)
- 5** Exciter
- 6** Sensor (outlet)












## Technical data

### Promass A – Sensor



Nominal diameter	DN 1 (1/24"), DN 2 (1/12"), DN 4 (1/8")
Max. flow rate	20 to 450 kg/h (dependent on nominal diameter)
Process connections	Flanges and lap joint flanges: EN, ASME, JIS; Tri-Clamp; 4-VCO-4 couplings; internal threads (G, NPT)
Process pressure	Max. 430.9 bar (6250 psi)
Process temperature	-50 to +205 °C (-58 to +401 °F)
Max. measured error	<ul style="list-style-type: none"> <li>■ Mass flow, volume flow (liquids): ±0.10% o.r.</li> <li>■ Mass flow (gases): ±0.35% o.r.</li> <li>■ Density:               <ul style="list-style-type: none"> <li>– Reference operating conditions: ±0.0005 g/cm<sup>3</sup></li> <li>– Wide-range density specification: ±0.002 g/cm<sup>3</sup></li> </ul> </li> </ul>
Measuring dynamic	Over 1000:1
Degree of protection	IP66/67 (Type 4X enclosure); Option: IP69 (stainless steel, hygienic)
Materials	Sensor: stainless steel (316L) Process connections/Measuring tube: stainless steel (316/316L), Alloy C22
Approvals	<ul style="list-style-type: none"> <li>■ Food: 3-A, FDA, Food Contact Materials Regulation (EC) 1935/2004</li> <li>■ Pharmaceuticals: FDA, USP Class VI, TSE/BSE certificate of suitability</li> <li>■ SIL: Use for flow monitoring up to SIL 2 (single-channel architecture) or SIL 3 (multi-channel architecture with homogeneous redundancy)</li> <li>■ Radio approval</li> <li>■ ATEX, IECEx, cCSAus, NEPSI, INMETRO, EAC, etc.</li> </ul>

Subject to modification

## Proline 200/300/500 – Transmitter

			
	<b>Proline 200 (compact)</b>	<b>Proline 300 (compact)</b>	<b>Proline 500 (remote)</b>
Display	<ul style="list-style-type: none"> <li>– 4-line display with push buttons or with Touch Control (operation from outside)</li> <li>– Option: backlit display</li> </ul>	<ul style="list-style-type: none"> <li>– 4-line backlit display with Touch Control (operation from outside)</li> <li>– Option: with remote display</li> </ul>	4-line backlit display with Touch Control (operation from outside)
Operation	<ul style="list-style-type: none"> <li>– Via local display</li> <li>– Via operating tools (FieldCare, HART handheld, etc.)</li> </ul>	Via local display, web server, WLAN, WirelessHART, as well as various operating tools (FieldCare, HART handheld, etc.)	
Materials	<ul style="list-style-type: none"> <li>– Aluminum</li> <li>– Stainless steel die-cast</li> </ul>	Transmitter: Aluminum, stainless steel 316L (hygienic)  Remote display: Aluminum, stainless steel die-cast	Proline 500 transmitter digital: Aluminum, polycarbonate  Proline 500 transmitter: Aluminum, stainless steel die-cast  Sensor connection housing: Aluminum, stainless steel die-cast, stainless steel 316L (hygienic)
Power supply	DC 12 to 35 V (two-wire technology)	AC 100 to 230 V, DC 24 V (Zone 1, Div. 1); AC/DC 24 to 230 V (Zone 2, Div. 2)	
Ambient temperature	Standard: –40 to +60 °C (–40 to +140 °F)	Standard: –40 to +60 °C (–40 to +140 °F) Option: –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)
Degree of protection	IP66/67 (Type 4X enclosure)	IP 66/67 (Type 4X enclosure), Option: IP69 (stainless steel, hygienic)	
Outputs Inputs Communication	<ul style="list-style-type: none"> <li>– Current output (4–20 mA, HART)</li> <li>– 2nd output (option):                              Current output (4–20 mA, HART), pulse/frequency/switch output</li> <li>– Passive current input (option)</li> </ul> Digital communication: PROFIBUS PA, FOUNDATION Fieldbus	<b>Port 1</b> Current output (4–20 mA, HART) or digital communication: PROFIBUS PA/DP, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP, PROFINET  <b>Port 2/3</b> Freely selectable I/O modules: – Current output (4–20 mA) – Pulse/frequency/switch output – Pulse output (phase-shifted) – Relay output – Current input (4–20 mA) – Status input	<b>Port 1</b> Current output (4–20 mA, HART) or digital communication: PROFIBUS PA/DP, FOUNDATION Fieldbus, Modbus RS485, EtherNet/IP, PROFINET  <b>Port 2/3 (Proline 500)</b> <b>Port 2/3/4 (Proline 500 digital)</b> Freely selectable I/O modules: – Current output (4–20 mA) – Pulse/frequency/switch output – Pulse output (phase-shifted) – Relay output – Current input (4–20 mA) – Status input

Subject to modification

The Promass A 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  and the .

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