



Proline Prosonic Flow G 300/500

Redefines process gas measurement

Whether raw or processed natural gas, wet gas or gas mixtures – Prosonic Flow G is the ideal flowmeter for all gaseous fluids. It combines tried-and-tested ultrasonic flow measuring technology with decades of experience in the oil and gas as well as chemical industries:

- Unique gas analysis functions for pure gases or user-defined gas mixtures
- Maximum reliability also in wet gas applications
- Optimum process control due to integrated pressure/temperature measurement
- Robust design for long-term operation
- High accuracy ($\pm 0.5\%$) and turndown ($>133:1$)
- Worldwide approvals: SIL; PED, CRN; 3.1, NACE; Ex, etc.



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Robust and innovative sensor design

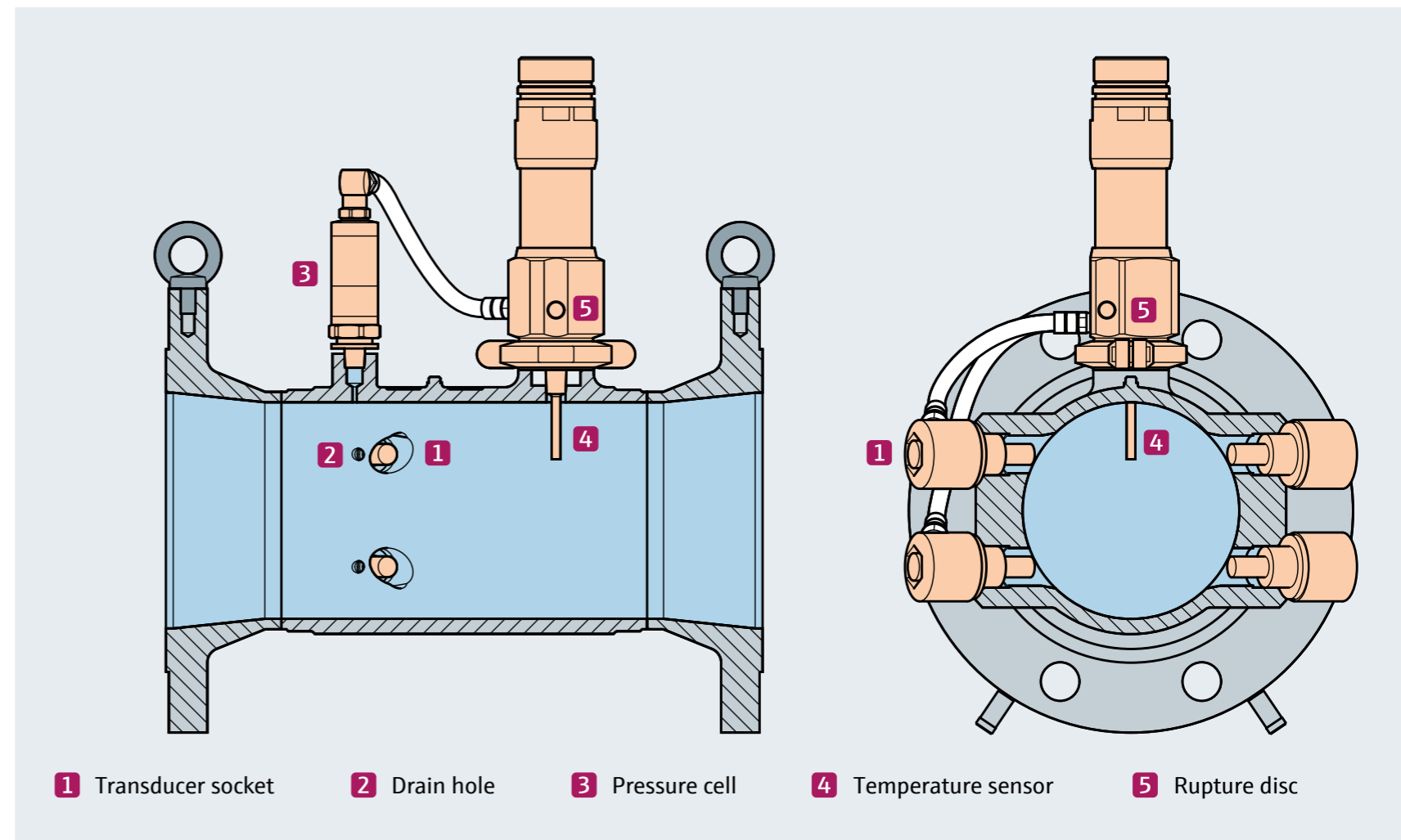
Process safety around the clock – also with wet gases

Robust sensor design

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Prosonic Flow G is an extremely robust sensor for long-term operation. Its wetted materials are made of stainless steel and titanium Grade 2. The sensor has no moving parts and creates no pressure loss. The innovative design of the measuring tube ensures a high measuring accuracy ($\pm 0.5\%$) and a trouble-free measurement also with moist or wet gases:

- Active draining system for occurring condensate between sensor/housing
- Faultless continuation of ultrasonic measurement without impeding signal quality



Robust and innovative sensor design

Process safety around the clock – also with wet gases

Measuring principle

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Prosonic Flow G has two or more sensors, set opposite each other in the measuring tube. Each sensor can alternately transmit and receive ultrasonic signals while simultaneously measuring the signal transit time. As soon as the fluid in the tube starts to flow, the signals are accelerated in the direction of flow but delayed in the opposite direction. The differential transit time, measured by the sensors, is directly proportional to the flow rate.

i Since the ultrasonic velocity is a gas-specific parameter, further process variables and fluid properties can be calculated – above all by means of a pressure and temperature measurement ([▶ see Gas Analysis](#)).



Robust and innovative sensor design

Process safety around the clock – also with wet gases

Technical data

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Prosonic Flow G (sensor)

Subject to modification

Nominal diameters	<ul style="list-style-type: none"> 1-path version: DN 25 (1") 2-path version: DN 50 to 300 (2 to 12") 		
Process connections	Flanges: EN, ASME		
Min./max. flow	0.5 to 9426 m ³ /h (17.7 to 332 890 ft ³ /h)		
Max. flow velocity	Up to 40 m/s (131 ft/s)		
Process pressure	0.7 to 100 bara (10.2 to 1450 psi)		
Process temperature	-50 to +150 °C (-58 to +302 °F)		
Degree of protection	IP66/67 (Type 4X enclosure)		
Max. measured error	Volume flow: Standard: ±1.0% o.r. at 3 to 40 m/s (9.84 to 131.2 ft/s) Option: ±0.5% o.r. at 3 to 40 m/s (9.84 to 131.2 ft/s) Temperature: ±0.35 °C ± (0.002 · T) °C (±0.63 °F ± 0.0011 · [T - 32] °F)		Pressure: ±0.5% o.r. Sound velocity: ±0.2% o.r.
Turndown	Over 133:1		
Materials	<ul style="list-style-type: none"> Sensor housing: aluminum, stainless steel die-cast (CF3M) Measuring tube: stainless steel 1.4408/1.4409 (CF3M) 	<ul style="list-style-type: none"> Process connections, temperature and pressure sensor: stainless steel 1.4404 (316, 316L) 	<ul style="list-style-type: none"> Ultrasonic transducer: stainless steel (316, 316L), titanium Grade 2
Pressure loss	No pressure loss		
Approvals	<ul style="list-style-type: none"> ATEX, IECEx, cCSAUs SIL 	<ul style="list-style-type: none"> PED, CRN NACE MR0175/MR0103 	<ul style="list-style-type: none"> Radio approval

Transmitters – Proline 300/500

For seamless system integration

Overview

Click to navigate



Proline 300

Compact, easily accessible transmitter



- Multifunctional, four-wire transmitter
- Reduced complexity thanks to freely combinable I/Os
- Heartbeat Technology for device verification during operation

Proline 500

Remote transmitter with up to 4 I/Os



- Functionality and operation as Proline 300
- Remote installation: up to 300 meters between sensor and transmitter
- Heartbeat Technology for device verification during operation

Transmitters – Proline 300/500

For seamless system integration

Technical data – Proline 300

Click to navigate

Proline 300 (compact)		Subject to modification
Display	Standard 4-line backlit display with Touch Control (operation from outside)	Option With remote display
Operation	Via local display, web server, WLAN, as well as various operating tools (FieldCare, HART handheld terminal, etc.)	
Materials	Transmitter Aluminum, stainless steel die-cast	Remote display Aluminum
Power supply	AC 100 to 230 V (50/60 Hz), DC 24 V (50/60 Hz)	
Ambient temperature	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)	
Outputs	Port 1 Current output (4–20 mA, HART)	Port 2/3 Freely selectable I/O settings:
Inputs	or digital communication via Modbus RS485	– Current output (4–20 mA) – Pulse/frequency/switch output – Pulse output (phase-shifted) – Relay output
Communication		– Current input (4–20 mA) – Status input

Transmitters – Proline 300/500

For seamless system integration

Technical data – Proline 500

Click to navigate

Proline 500 (remote)

Subject to modification

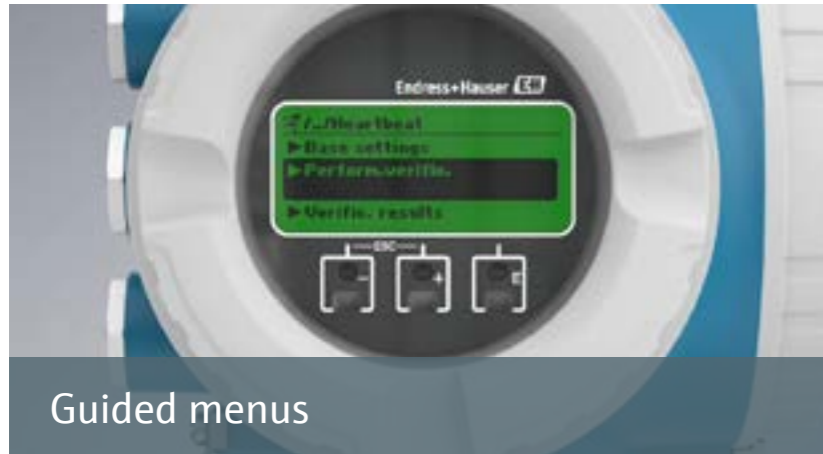
Display	4-line backlit display with Touch Control (operation from outside)	
Operation	Via local display, web server, WLAN, as well as various operating tools (FieldCare, HART handheld terminal, etc.)	
Materials	Sensor connection housing aluminum, stainless steel die-cast	Proline 500 transmitter digital aluminum, polycarbonate
Power supply	AC 100 to 230 V (50/60 Hz), DC 24 V (50/60 Hz)	
Ambient temperature	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)	
Outputs	Port 1	Port 2/3/4 (Proline 500 digital)
Inputs	Current output (4–20 mA, HART)	Freely selectable I/O settings:
Communication	or digital communication via Modbus RS485	<ul style="list-style-type: none"> – Current output (4–20 mA) – Pulse/frequency/switch output – Pulse output (phase-shifted) – Relay output – Current input (4–20 mA) – Status input

Operation

Concept and possibilities

Operation concept

Click to navigate



Guided menus

Operator-oriented menu structure

- For commissioning
- For operation
- For diagnostics
- For expert level functions



SmartBlue App

Fast and safe commissioning

- Guided menus ("Make-it-run" wizards)
- Menu guidance with brief parameter/function descriptions
- Device access via web server or SmartBlue App
- WLAN access via mobile handheld terminal, tablet or smartphone



Web server

Reliable operation

- Operation in 17 local languages
- Uniform operating concept for devices and operating tools
- HistoROM: Data storage concept (automatic backup, copy, compare or restore data). No need for reconfiguring after a service case.

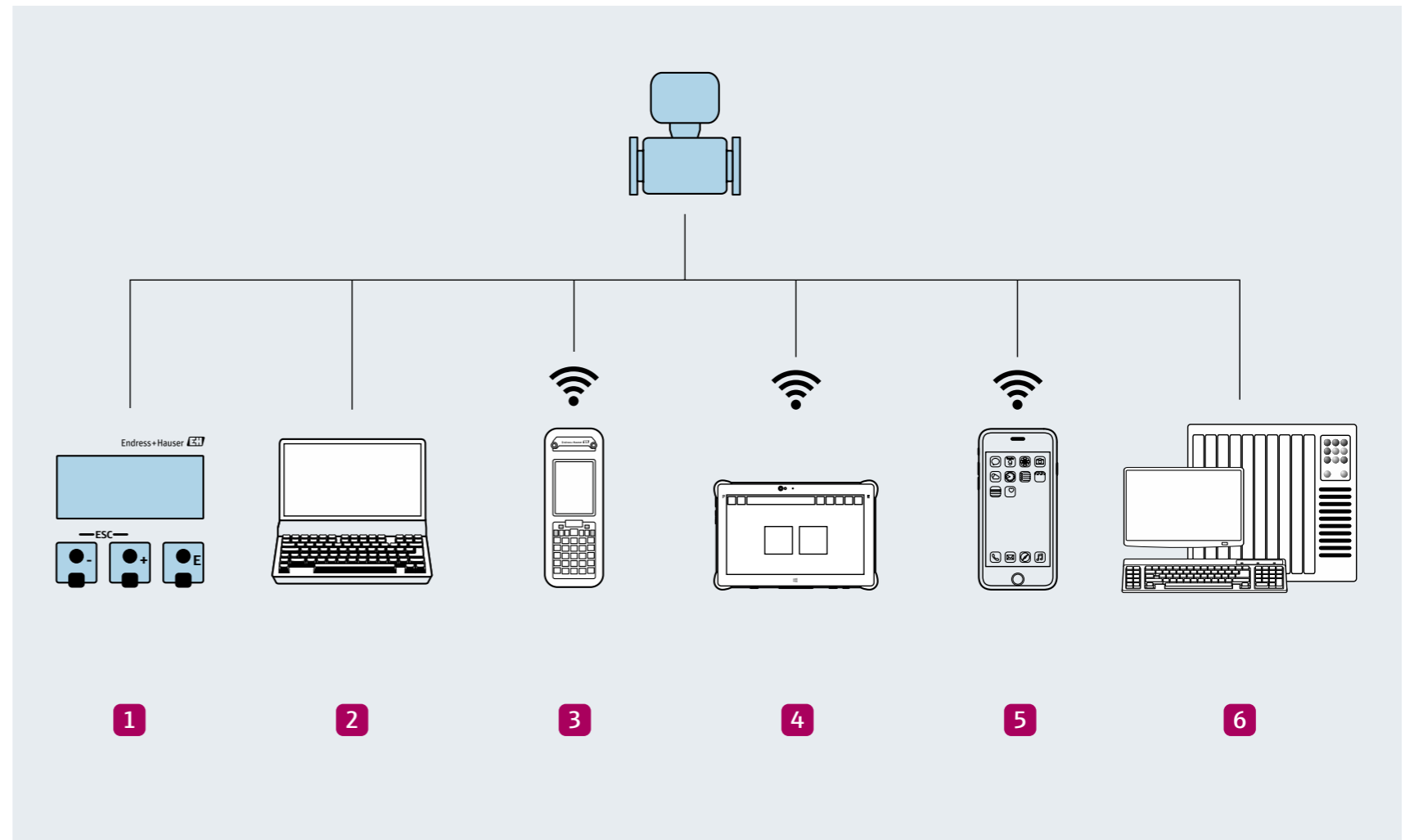
Operation

Concept and possibilities

Operation possibilities

Click to navigate

- 1 Local operation via **display** module
- 2 Computer with **web browser** (e.g. Internet Explorer) or with operating tool (e.g. FieldCare, DeviceCare, AMS Device Manager, SIMATIC PDM)
- 3 **Field Xpert** SFX350 or SFX370
- 4 **Field Communicator** 475
- 5 **Mobile** handheld terminal, tablet or smartphone
- 6 **Control system** (e.g. PLC)



Application areas and examples

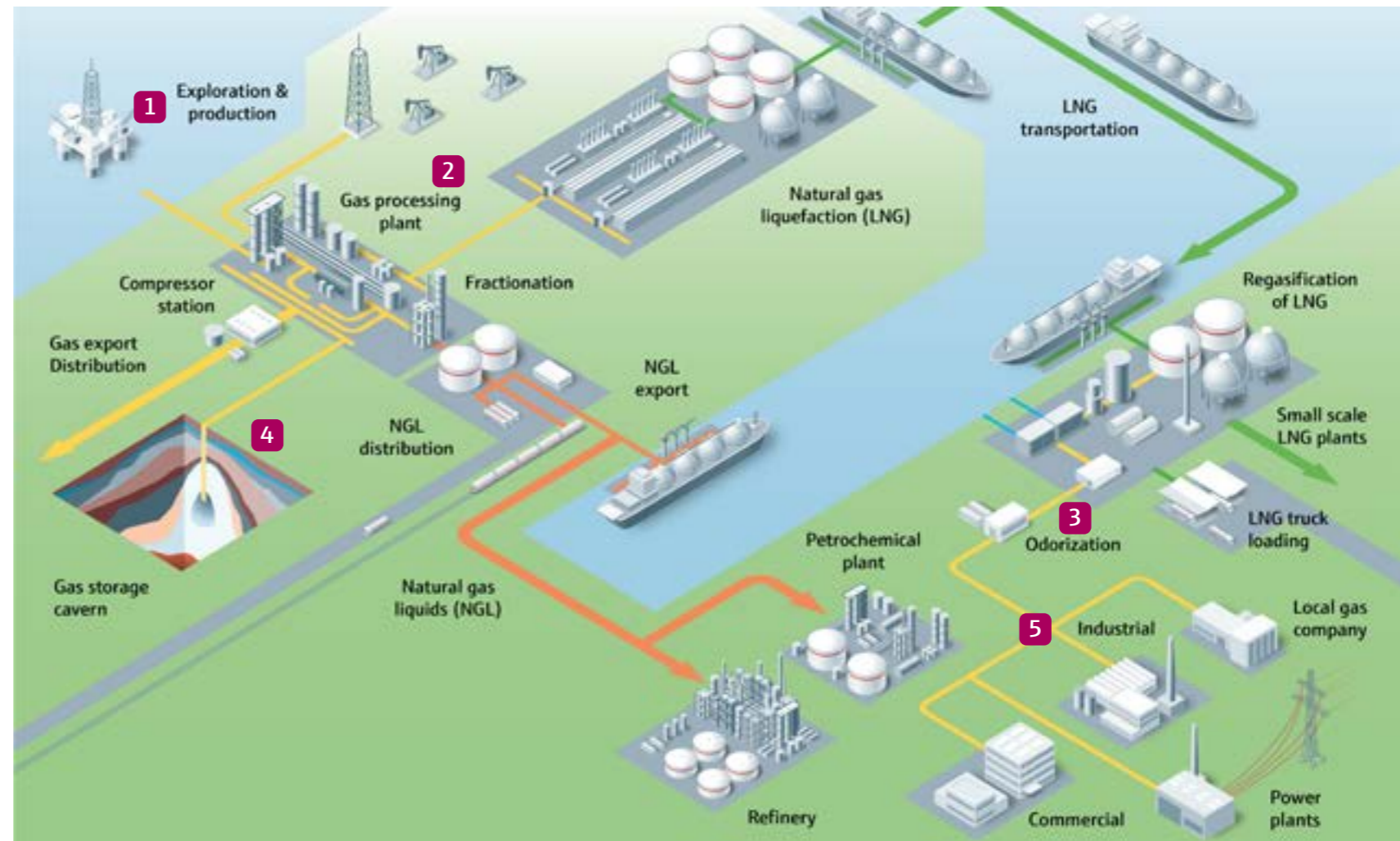
Prosonic Flow G in the gas industry

Application sites (overview)

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Sites for quantity metering and gas analysis (examples)

- 1 At the outlet of a test or production separator gas leg
- 2 In gas processing plants (e.g. during dehydration, sweetening, filtering, etc.)
- 3 At the outlet of regasification plants for LNG
- 4 At the inlet/outlet of natural gas storage caverns
- 5 At the inlet to petrochemical plants, refineries, power plants, gas companies, industrial or commercial areas (e.g. for cost allocation)



Application areas and examples

Prosonic Flow G in the gas industry

Process gas

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Process gas measurement

For continuous process gas control in the chemical and petrochemical industries, e.g. in ethylene production or in the production of polymers with a high level of accuracy and safety.

Gas generation systems

For accurate and repeatable gas flow measurement in the gas generation processes, e.g. with nitrogen.

Power & Energy

Boiler inlet natural gas measurement for efficiency monitoring and Wobbe index calculation/control.



Application areas and examples

Prosonic Flow G in the gas industry

Wet/unconventional gas

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Wellhead gas measurement

For high reliability measurement and high robustness with wet gas under fluctuating process conditions.

Separator gas outlet

Perfect solution under fluctuating flow, wet gas conditions with high turndown, and high pressure.

Gas processing facility

Raw natural gas measurement for dehydration, sweetening, filtering and fractionation processes.



Application areas and examples

Prosonic Flow G in the gas industry

[Click to navigate](#)

Combined heat and power inlet

For the innovative, industry-optimized flow measurement of biogas. Accuracy and reliability are unaffected by changing gas composition and moisture content of the gas. Applicable up to 100 bar (1450 psi).



Biogas

Biogas upgrading

For natural gas feed into biogas to meet pipeline specs (i.e. natural gas quality). Complement to the Prosonic Flow B 200 flowmeter when process pressure is above 10 bar (145 psi).



Application areas and examples

Prosonic Flow G in the gas industry

Utilities

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Gas turbine inlet

For accurate fuel mixture control at the turbine inlet.
Excellent reliability and repeatability at pressures up to 100 bar.



Cost allocation in industrial complexes

For detailed control and cost allocation to consumer points in distribution networks. Highly accurate and multivariable flow measurement including energy flow.



Advanced gas analysis

For one-of-a-kind process monitoring and control

Advanced gas analysis

[Click to navigate](#)

Prosonic Flow G 300/500 can also be supplied with the order option "Advanced Gas Analysis" for special applications or for increased process control requirements.

Depending on the selected gas type, this function package enables the calculation of a large number of additional parameters and process variables which are available to the user as output signals for an optimum process control.



Advanced gas analysis

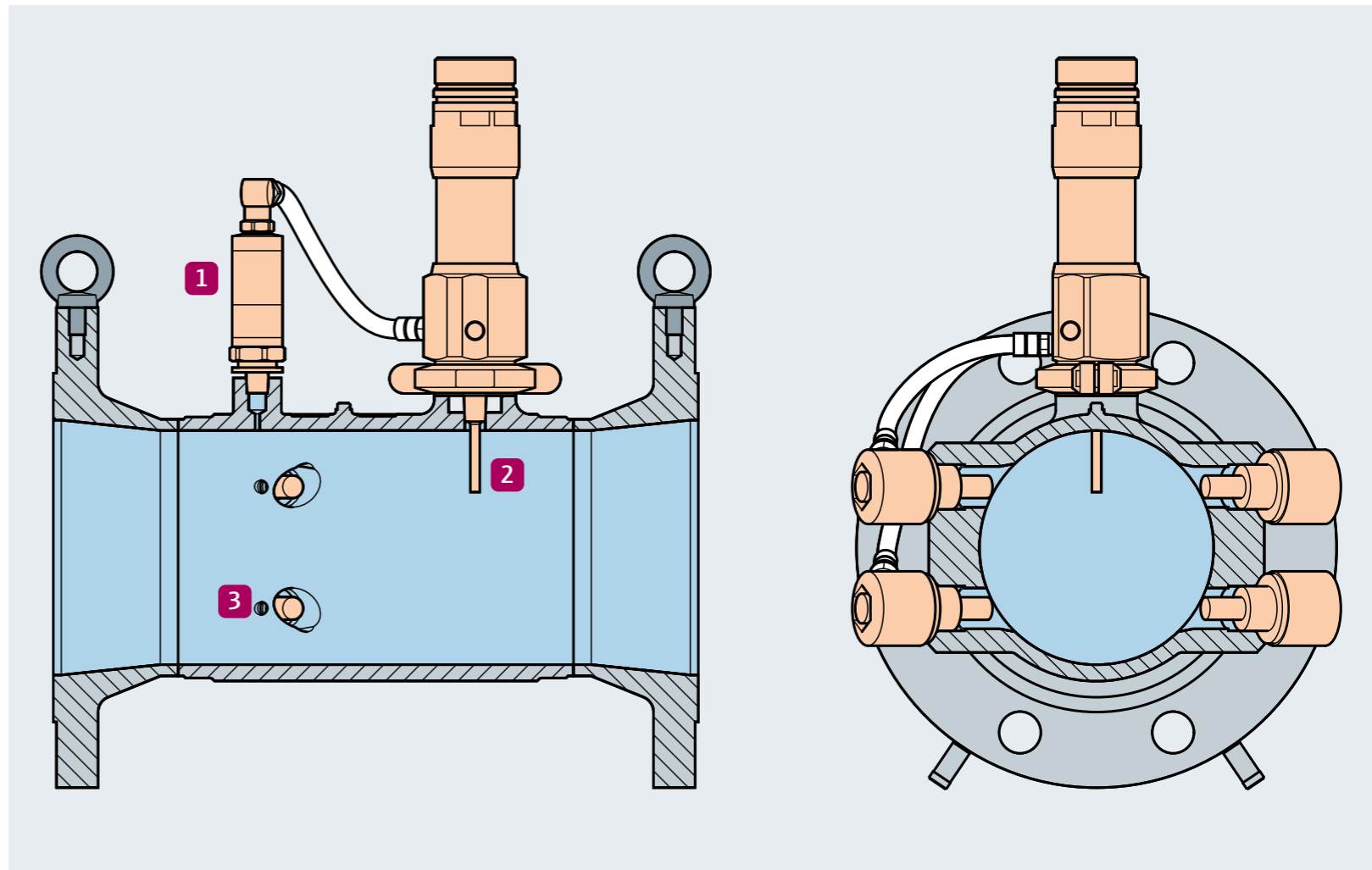
For one-of-a-kind process monitoring and control

Pressure/temperature compensation

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The advanced gas analysis functions are not only applicable if Prosonic Flow G 300/500 is ordered with an integrated pressure **1** and temperature measurement **2**. Together with the measurement of the sound velocity **3**, these three measured values serve as input variables for mathematical models which describe the properties of gas mixtures:

- For high-performance process control thanks to pressure and temperature-compensated values measured in real time
- For greater measuring accuracy in density calculation for determining the mass flow or corrected volume flow
- For minimizing additional pressure and temperature measuring points



Advanced gas analysis

For one-of-a-kind process monitoring and control

Selectable gas types
Calculable process variables

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The calculation of additional process variables is possible for six different selectable gas types. This allows you to adapt Prosonic Flow G exactly to your application:

- Pure gases
- Gas mixtures (up to 8 components)
- Coal seam gas/biogas
- Natural gas (standardized calculation)
- Natural gas (use of sound velocity)
- Customer-specific gases

Based on various gas models, Prosonic Flow G 300/500 is able to calculate a large number of additional process variables, depending on the selected gas type. These variables can be used for optimum process monitoring and control:

- Volume flow
- Corrected volume flow
- Mass flow
- Energy flow
- Calorific value
- Wobbe index
- Molar mass
- Methane content
- Density and viscosity



Process safety

Around the clock

- 1 SIL-compliant device development according to IEC 61508
- 2 With built-in rupture disk (10 to 15 bar/ 145 to 217.5 psi) as a standard feature for controlled releasing of over-pressure in case of leakage
- 3 Reliable device/process monitoring thanks to Heartbeat Technology ([▶ see Heartbeat Technology](#))
- 4 Clear diagnostic messages according to NAMUR NE107 with remedy instructions (Failure/Function check/ Out of specification/Maintenance required)

1



3



2



4



Heartbeat Technology

For increased plant availability and safe operation



Diagnostics

Permanent process / device diagnostics

- Permanent self-diagnostics around the clock
- Developed acc. to IEC 61508 (SIL)
- Clear diagnostic messages according to NAMUR NE107 with remedy instructions

Verification

Documented verification without process interruption

- Metrologically traceable verification results (ISO 9001, TÜV-certified)
- Reduced verification effort: verification can be triggered at any time on the device or via higher level systems (no field presence required)

Monitoring

Additional information for predictive maintenance

- Process optimization and maintenance planning
- Early recognition of disturbances in the process, e.g. transducer fouling, changes in gas composition, etc.

