Technical Information
Proline Prosonic Flow G 300

Ultrasonic time-of-flight flowmeter

Highly robust gas specialist for fluctuating conditions with compact, easily accessible transmitter

Application

- The measuring principle is unaffected by gas composition
- Accurate measurement of natural and process gas in the chemical as well as oil and gas industries

Device properties
- Direct measurement: flow, pressure & temperature
- Wetted parts: titanium / 316L
- Maximum measuring accuracy: 0.5 %
- Compact dual-compartment housing with up to 3 I/Os
- Backlit display with touch control and WLAN access
- Remote display available

Your benefits

- Flexible device with user-definable gas mixtures for demanding measuring tasks
- Maximum reliability even with humid or wet gas – sensor design insensitive to condensate
- High-performance process control – real-time pressure- and temperaturecompensated values
- Efficient solution – multivariable, no pressure loss
- Full access to process and diagnostic information – numerous, freely combinable I/Os
- Reduced complexity and variety – freely configurable I/O functionality
- Integrated verification – Heartbeat Technology

Endress+Hauser [EH]

People for Process Automation

Symbols in graphics

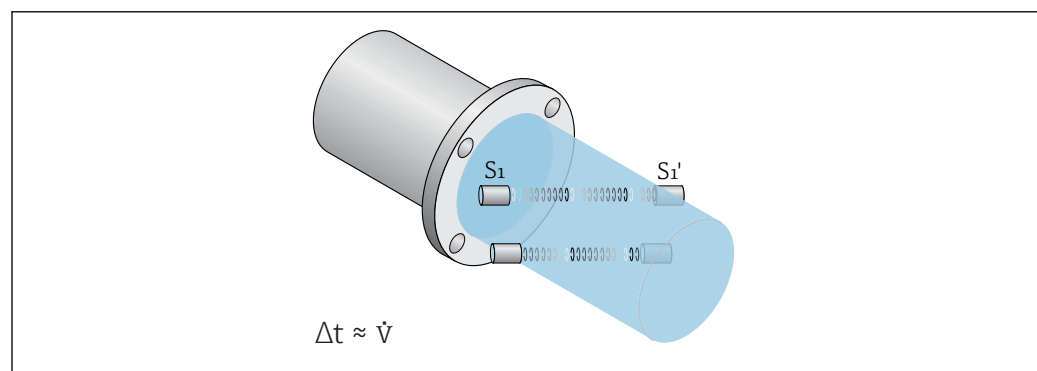| Symbol	Meaning
1, 2, 3, …	Item numbers
1. , 2. , 3. , …	Series of steps
A, B, C, …	Views
A-A, B-B, C-C, …	Sections
⚠EX	Hazardous area
⚠EX	Safe area (non-hazardous area)
≈➡	Flow direction

Function and system design

Measuring principle

The measuring device measures the flow velocity in the measuring tube based on an offset arrangement of ultrasonic sensors downstream. The design does not cause any pressure loss and does not have any moving parts.

The flow signal is established by alternating an acoustic signal between the sensor pairs and measuring the transit time of each transmission. Then utilizing the fact that sound travels faster with the flow versus against the flow, this differential time (D T) can be used to determine the fluid's velocity between the sensors.

The volume flow rate is established by combining all the flow velocities determined by the sensor pairs with the cross sectional area of the meter body and extensive knowledge about fluid flow dynamics. The design of the sensors and their position ensures that only a short straight run of pipe upstream of the meter is required after typical flow obstructions such as bends in one or two planes.

Advanced digital signal processing and innovative sensor design facilitate constant flow measurement evaluation and reduce sensitivity to multiphase flow conditions and increase measurement reliability.

$$\Delta t \approx \dot{V}$$

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Measurement of the gas quality (Advanced gas analysis)

The sound velocity, temperature, pressure, chemical composition and other properties of a gas mixture are dependent on each other. For example, the higher the temperature or the methane fraction, the higher the sound velocity in a natural gas.

As the measuring device accurately measures the sound velocity, gas temperature and gas pressure, the properties of the gas mixture can be calculated directly and displayed on site without the need for an additional measuring instrument. In this way, the measuring device can, for example, determine the density and gross calorific value of a natural gas whose composition is variable or not known.
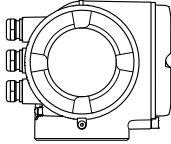
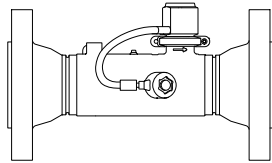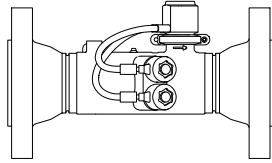| **Measuring system** | The device consists of a transmitter and a sensor.

The device is available as a compact version:
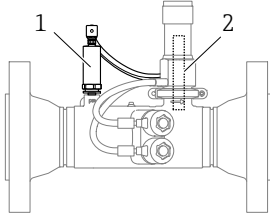The transmitter and sensor form a mechanical unit. |

Transmitter

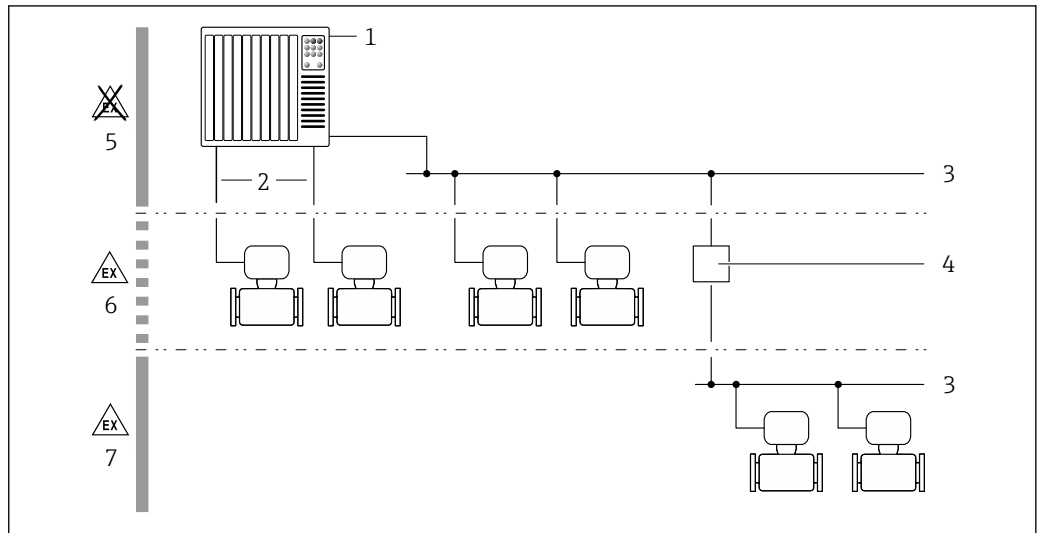| **Prosonic Flow 300**	Device versions and materials:

A0026708	• Transmitter housing
	  • Aluminum, coated: aluminum, AlSi10Mg, coated
	  • Cast, stainless: cast, stainless steel, 1.4409 (CF3M) similar to 316L
	• Material of window in transmitter housing:
	  • Aluminum, coated: glass
	  • Cast, stainless: glass
	
	Configuration:
	• External operation via 4-line, backlit, graphic local display with touch control and guided menus ("Make-it-run" wizards) for application-specific commissioning.
	• Via service interface or WLAN interface:
	  • Operating tools (e.g. FieldCare, DeviceCare)
	  • Web server (access via Web browser, e.g. Microsoft Internet Explorer, Microsoft Edge)

Sensor

| **Prosonic Flow G**

Single-path version: DN 25 (1")

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Two-path version: DN 50 to 300 (2 to 12")

A0037527 | • Measurement of:
  • Process gases and gas mixtures
  • Natural gases
  • Coal gases
  • Shale gases
  • Biogases/sewage gases
• Nominal diameter range: DN 25 to 300 (1 to 12")
• Materials:
  • Measuring tube:
    Stainless steel: 1.4408/1.4409 (CF3M)
  • Welding neck flanges:
    Stainless steel: 1.4404 (316, 316L)
  • Ultrasonic transducer:
    Stainless steel: 1.4404 (316, 316L)
    Grade 2 titanium
  • Seal for ultrasonic transducer:
    FKM material group |

Pressure measuring cell and temperature sensor

| 1 2

A0037496

1 Pressure measuring cell
2 Temperature sensor | Versions:
• Pressure components
  • Pressure measuring cell 2 bar (29 psi) absolute
  • Pressure measuring cell 4 bar (58 psi) absolute
  • Pressure measuring cell 10 bar (145 psi) absolute
  • Pressure measuring cell 40 bar (580 psi) absolute
  • Pressure measuring cell 100 bar (1 450 psi) absolute
• Temperature sensor
  Covers the entire measuring range without variance

Material
• Wetted parts:
  • Membrane: stainless steel, 1.4435 (316L)
  • Process connection: stainless steel, 1.4404 (316, 316L)
  • Temperature sensor: stainless steel, 1.4404 (316, 316L)
• Non-wetted parts:
  Housing: stainless steel, 1.4404 (316, 316L) |

Equipment architecture

☒ *2   Possibilities for integrating measuring devices into a system*

1   Control system (e.g. PLC)
2   Connecting cable (0/4 to 20 mA HART etc.)
3   Fieldbus
4   Segment coupler
5   Non-hazardous area
6   Hazardous area: Zone 2; Class I, Division 2
7   Hazardous area: Zone 1; Class I, Division 1

Safety

IT security

Our warranty is valid only if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the settings.

IT security measures, which provide additional protection for the device and associated data transfer, must be implemented by the operators themselves in line with their security standards.

Device-specific IT security

The device offers a range of specific functions to support protective measures on the operator's side. These functions can be configured by the user and guarantee greater in-operation safety if used correctly. An overview of the most important functions is provided in the following section.

Function/interface	Factory setting	Recommendation
Write protection via hardware write protection switch → 🖺 8	Not enabled.	On an individual basis following risk assessment.
Access code (also applies for Web server login or FieldCare connection) → 🖺 8	Not enabled (0000).	Assign a customized access code during commissioning.
WLAN (order option in display module)	Enabled.	On an individual basis following risk assessment.
WLAN security mode	Enabled (WPA2-PSK)	Do not change.
WLAN passphrase (password) → 🖺 8	Serial number	Assign an individual WLAN passphrase during commissioning.
WLAN mode	Access Point	On an individual basis following risk assessment.
Web server → 🖺 8	Enabled.	On an individual basis following risk assessment.
CDI-RJ45 service interface → 🖺 8	–	On an individual basis following risk assessment.

Protecting access via hardware write protection

Write access to the device parameters via the local display, Web browser or operating tool (e.g. FieldCare, DeviceCare) can be disabled via a write protection switch (DIP switch on the motherboard). When hardware write protection is enabled, only read access to the parameters is possible.

Hardware write protection is disabled when the device is delivered.

Protecting access via a password

Different passwords are available to protect write access to the device parameters or access to the device via the WLAN interface.

- User-specific access code
  Protect write access to the device parameters via the local display, Web browser or operating tool (e.g. FieldCare, DeviceCare). Access authorization is clearly regulated through the use of a user-specific access code.
- WLAN passphrase
  The network key protects a connection between an operating unit (e.g. notebook or tablet) and the device via the WLAN interface which can be ordered as an option.
- Infrastructure mode
  When the device is operated in infrastructure mode, the WLAN passphrase corresponds to the WLAN passphrase configured on the operator side.

User-specific access code

Write access to the device parameters via the local display, Web browser or operating tool (e.g. FieldCare, DeviceCare) can be protected by the modifiable, user-specific access code.

WLAN passphrase: Operation as WLAN access point

A connection between an operating unit (e.g. notebook or tablet) and the device via the WLAN interface, which can be ordered as an optional extra, is protected by the network key. The WLAN authentication of the network key complies with the IEEE 802.11 standard.

When the device is delivered, the network key is pre-defined depending on the device. It can be changed via the **WLAN settings** submenu in the **WLAN passphrase** parameter.

Infrastructure mode

A connection between the device and WLAN access point is protected by means of an SSID and passphrase on the system side. Please contact the relevant system administrator for access.

General notes on the use of passwords

- The access code and network key supplied with the device should be changed during commissioning.
- Follow the general rules for generating a secure password when defining and managing the access code or network key.
- The user is responsible for the management and careful handling of the access code and network key.

Access via Web server

The device can be operated and configured via a Web browser with the integrated Web server. The connection is via the service interface (CDI-RJ45) or the WLAN interface.

The Web server is enabled when the device is delivered. The Web server can be disabled if necessary (e.g. after commissioning) via the **Web server functionality** parameter.

The device and status information can be hidden on the login page. This prevents unauthorized access to the information.

For detailed information on device parameters, see:
The "Description of Device Parameters" document

Access via service interface (CDI-RJ45)

The device can be connected to a network via the service interface (CDI-RJ45). Device-specific functions guarantee the secure operation of the device in a network.