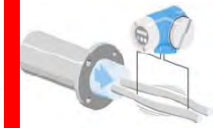
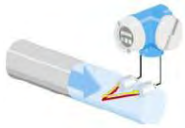
E+H Flow Product

E+H Flow Product

Flow Measurement Principle

Flow technologies overview

Promag	Promass	Prowirl	Prosonic	Thermal
				
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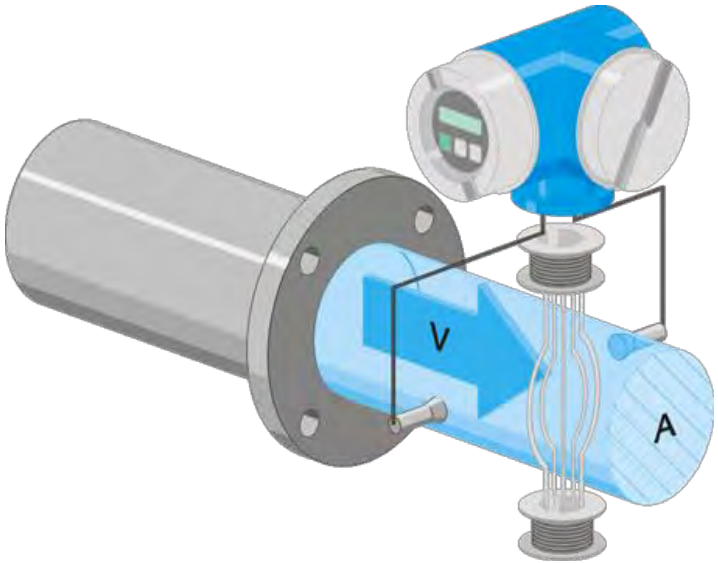
Measuring Principle



$$U_e = B \times L \times v$$

B = Strength of Magnetic Field
L = Length of Conductor
v = Velocity of Conductor

U ~ v

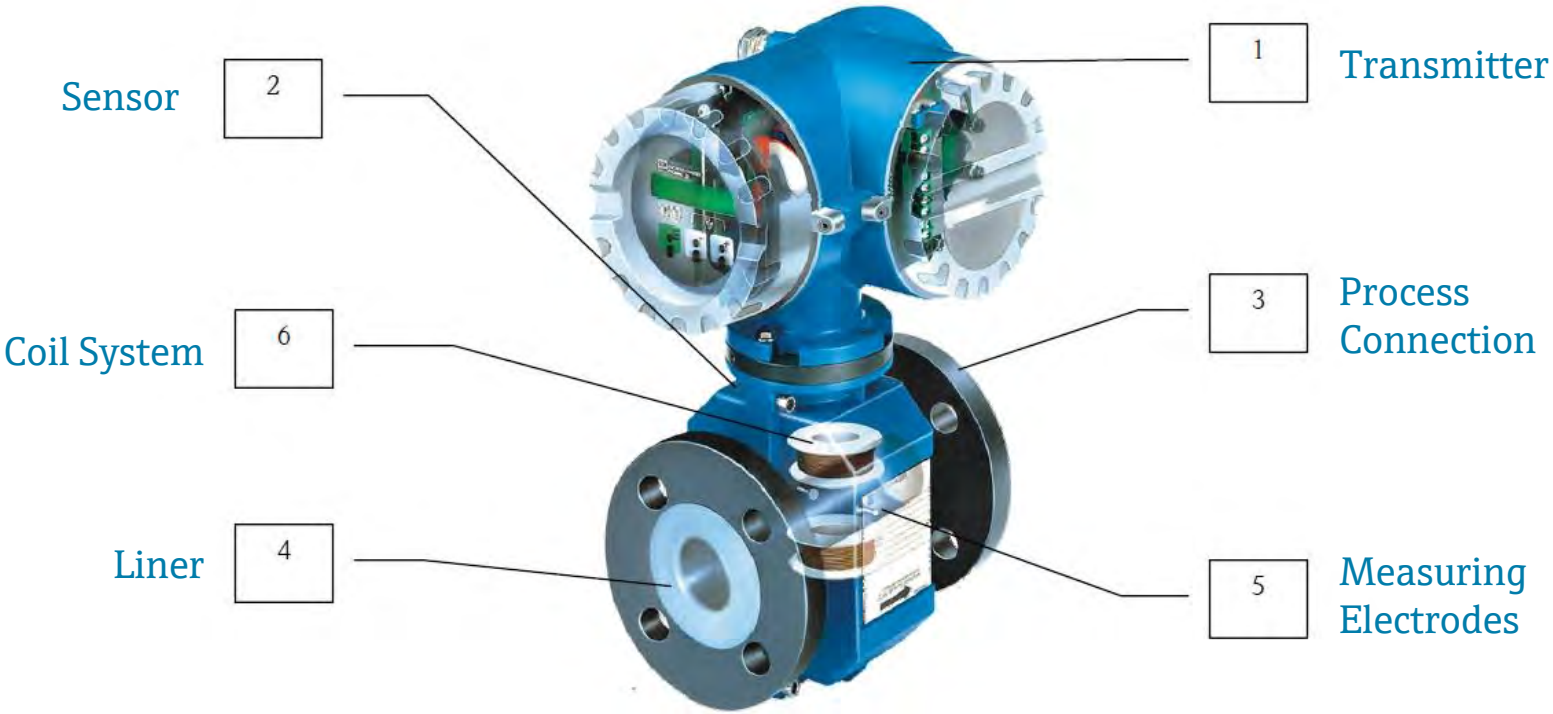
U = Induced voltage
v = Flow velocity

Approx. 300 µV per m/s

Q = v x A

Q = Volume flow
v = Flow velocity
A = Pipe area

Main Components of an EMF



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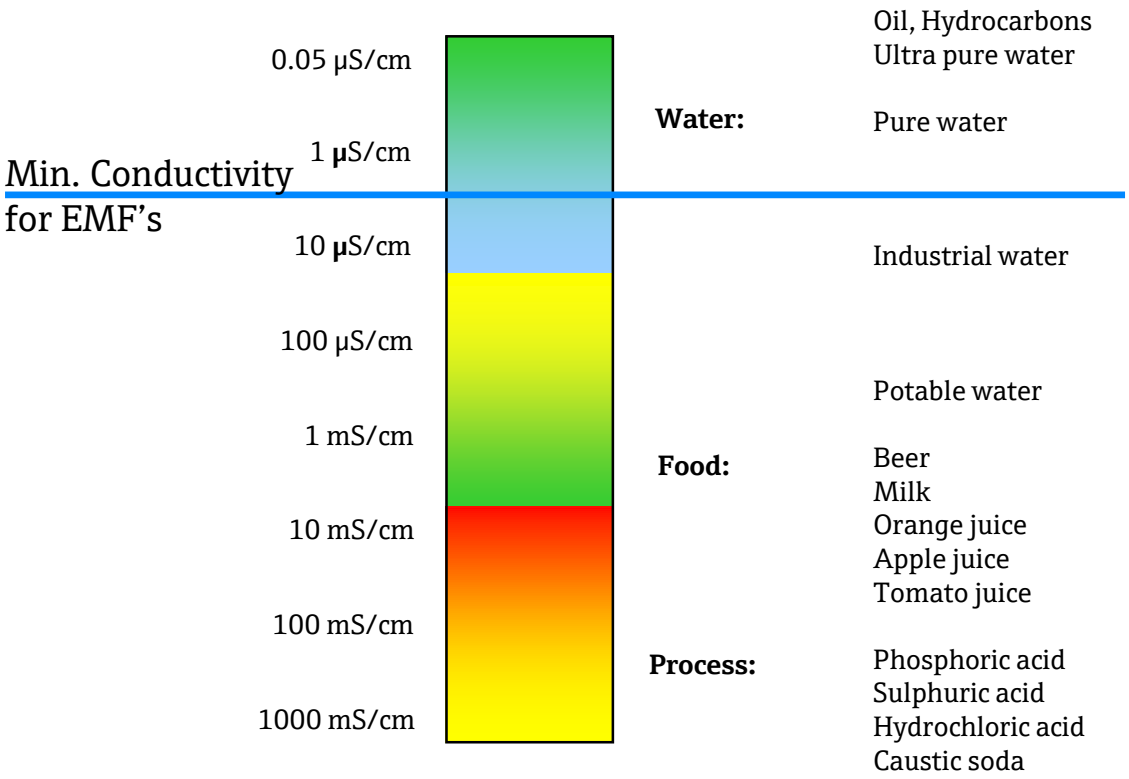
Ranges of Conductivity in Liquids



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	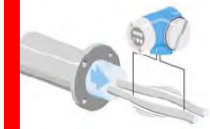		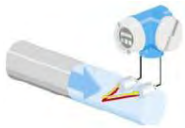	
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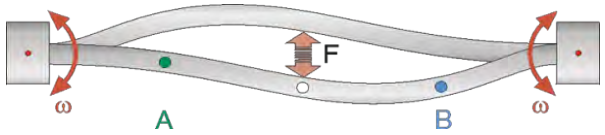
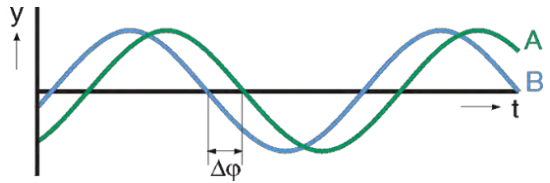
Visualization of Coriolis force in the meter tube

Mass flow measuring signal





- A, B = sensor location
- y = pipe movement at A, B
- t = time
- Δφ = phase shift
  (= time shift between
  pipe movement at A, B)

The larger the mass, the higher the phase shift.
The faster the mass, the higher the phase shift.

$$\Delta\varphi \sim m^{*}v = \dot{m}$$

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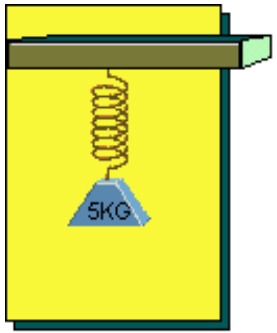
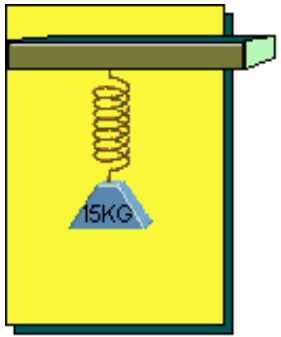
Density measurement (using the resonance frequency)



Spring and mass system

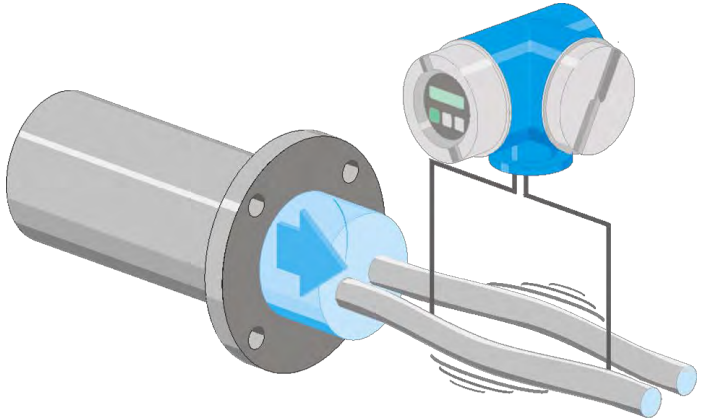


Spring and mass system

- The density of a fluid is its mass divided by the volume:
  $\rho = m/V$ (Density = mass / volume)
- Fluids with same volume but different mass ⇒ different density
- A fluid with higher density produces lower resonance frequency
  (= frequency at which the lowest energy has to be supplied to keep the system oscillating)

Overview of direct measuring variables

- $\Delta\varphi$ = Phase shift
- m = Mass flow
- f_R = Resonance frequency
- ρ = Density
- Ω = Resistance (PT1000)
- T = Temperature



$\Delta\varphi \sim m$

$f_R \sim \rho$

$\Omega \sim T$

Overview of calculated values

- V = Volume flow
  V = m/ρ

- V_N = Normvolume flow = Volume flow at fixed p and T
  V_N = m/ρ_N (note: ρ_N is a fixed value for each fluid)

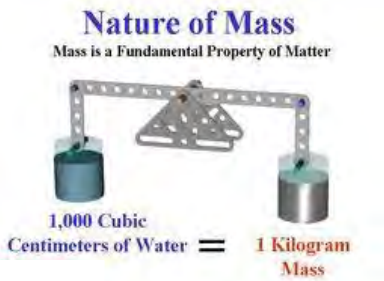
- c = Concentration
  Concentration can be calculated from density

- ν = Viscosity
  Viscosity can be calculated from oscillation damping.
  - *Viscosity measurement is only available with the Promass I sensor*

Why measure mass?

- Chemical Reactions are Based on Mass
- Mass is Primary Standard (like Time). It Does Not Change which Changes in Process Conditions
- Consistency of Batching / Blending is Dependent on Mass due to Solubility Issues
- Products are Generally Sold Based on Weight (Mass)of Contents
- Plant Efficiency and Costs are Based on Mass Balances
- Direct Mass Measurement is More Accurate than Measuring Volume and Compensating for Temperature, Pressure or Density

….Because Mass is the Flow Parameter You really want to measure….



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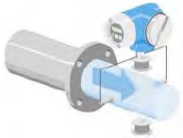	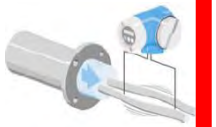		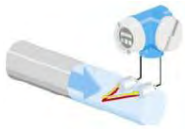	
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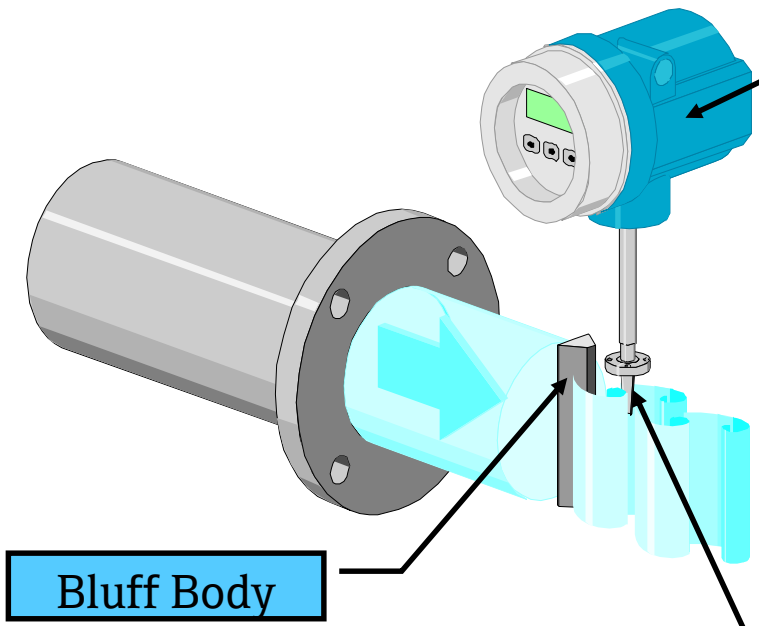
All you need for vortex measurement



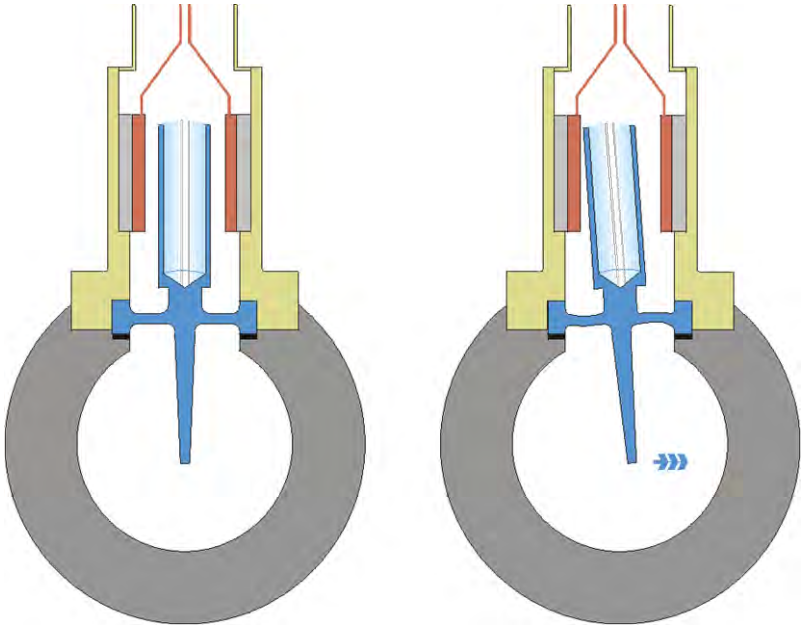
f = Vortex frequency

V = Volume flow

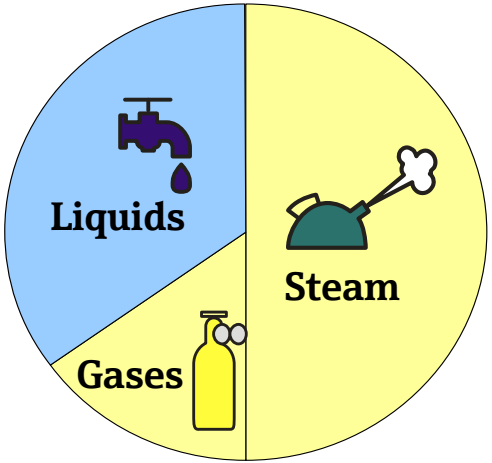
f ~ V

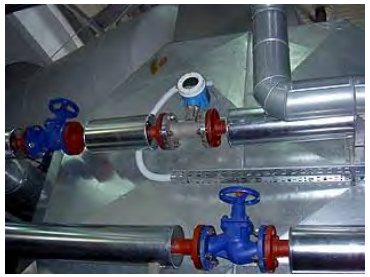
Vortex sensing element: DSC sensor

- Capacitive sensor
- Primary vibration compensation (center of gravity)



Vortex – a universal principle





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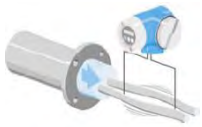			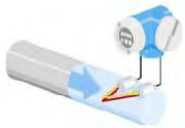	
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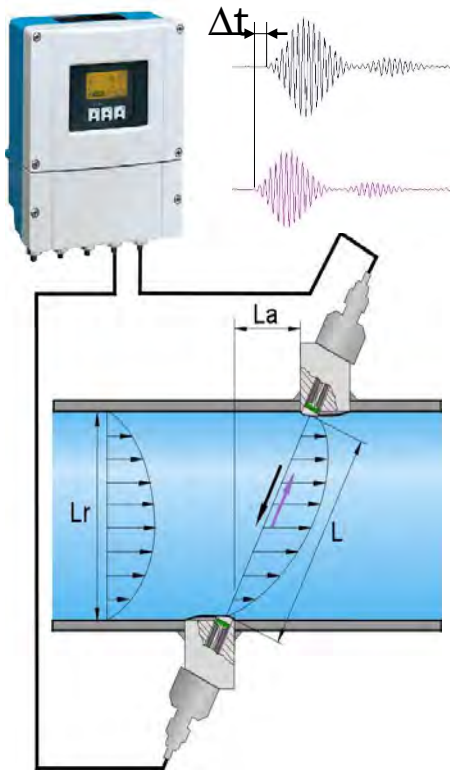
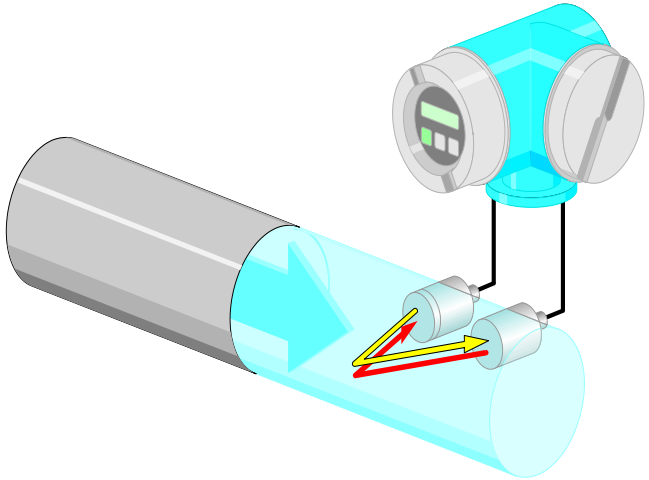
Prosonic Flow: The Principle

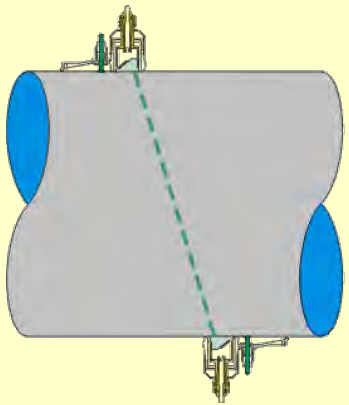




$$Q = k \frac{\Delta t}{T1 \times T2}$$

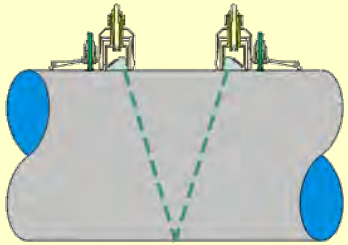
$$\Delta t \sim Q$$

Sensor-configuration



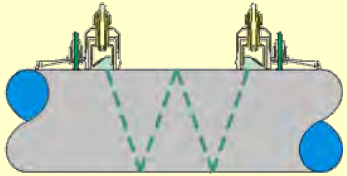
1 Traverse

> DN 600



2 Traverses

DN 50 ... DN 600



4 Traverses

DN 50

E+H Ultrasonic Flow Meter General Product Portfolio

- Liquid

1. Clamp-on / insertion type designs e.g. 93P, 91W

2. Inline e.g. 92F, E100

- Gas

1. B 200
2. G 300/500

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Clamp - On

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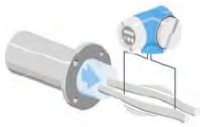				
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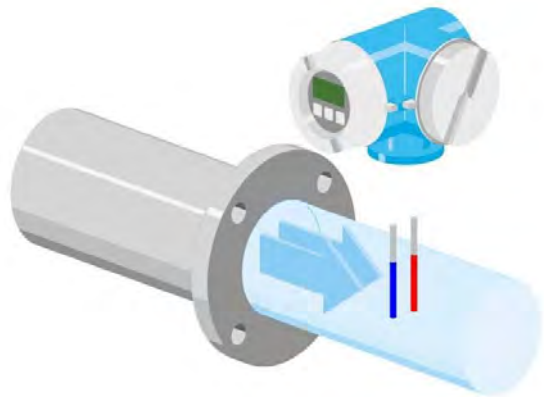
The measuring principle

- Mass flow measurement based on thermal dispersion
- A heated temperature sensor is kept at a constant differential temperature from the gas reference sensor.
- The cooling effect generated by mass flow causes an increase in sensor power to maintain the temperature differential.
- The power supplied to the heated sensor is proportional to the mass flow.

$$Qm = \frac{H}{A * Cp * \Delta T}$$

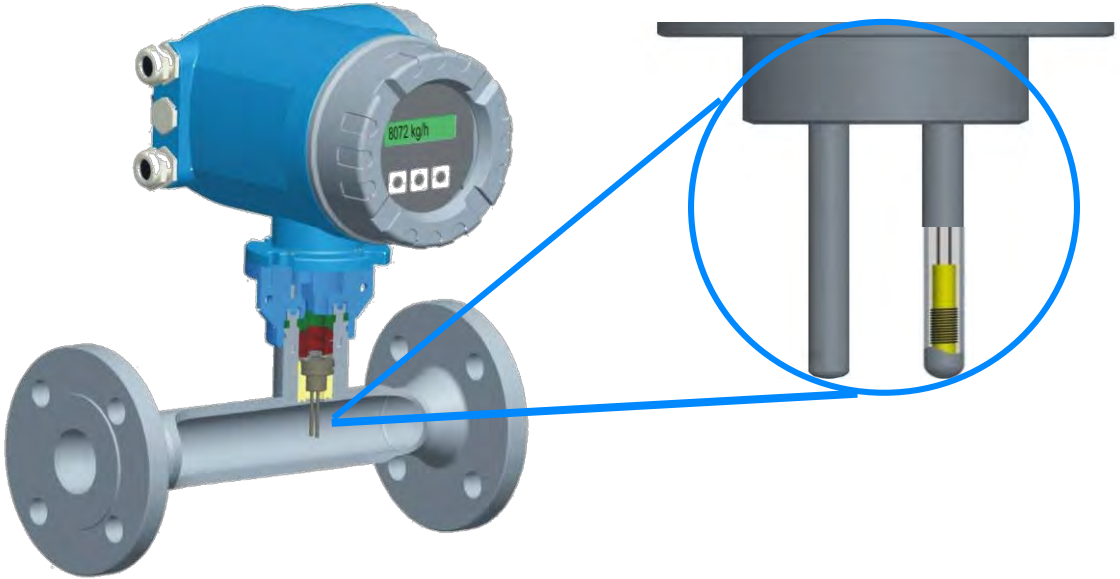
Qm	: Mass Flow Rate (kg/h)
H	: Heat Input (Cal/h)
A	: Constant
Cp	: Specific heat at constant pressure (Cal/kg*C)
ΔT	: Measured temperature difference (C)



Mass flow is measured directly

Thermal sensors (PT100)

- 2 x Resistive Temperature Detectors (RTD) = PT100 (100R @ 0’C)
- High tolerance construction
- Better gas temperature sensing



t-mass 300/500 – for flexible gas flow measurement

The flowmeter with long-term stability and a keen sense for utility gases

Reliable industrial gas flow monitoring and control

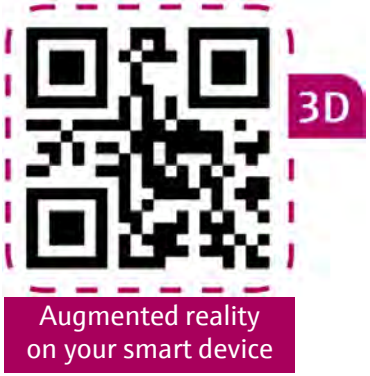
t-mass 300/500 boosts efficiency and safety through comprehensive monitoring of gas consumption, process stability and device health.

For all industries and customers who want exceptional performance and device verification to ensure efficient use of their utility gases, enduring plant availability and compliance with regulatory requirements.

- 22 configurable gases and mixtures thereof up to 8 components
- Patented drift-free sensor with optional bidirectional flow
- Automatic device verification without process interruption
- Premium performance: 1% accuracy; 0.25% repeatability
- Warning in case of condensate or pulsating flow
- SIL 2 compliant
- Flexible operation via display, webserver, WLAN, operating tools
- Transmitters: Proline 300 and 500

eBook

Movie



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Welcome to Heartbeat Technology!

Directive 17 Compliant, TUV Certified!
Technology Day – Calgary

Heartbeat Technology

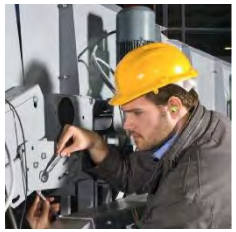
Endress+Hauser
People for Process Automation

Addressing Your Metering Challenges

Measurement & Compliance Manager:

“How do I ensure our AER D17 requirements are met?”

Quality/Compliance



Maintenance Manager:

“Is my meter working properly?”

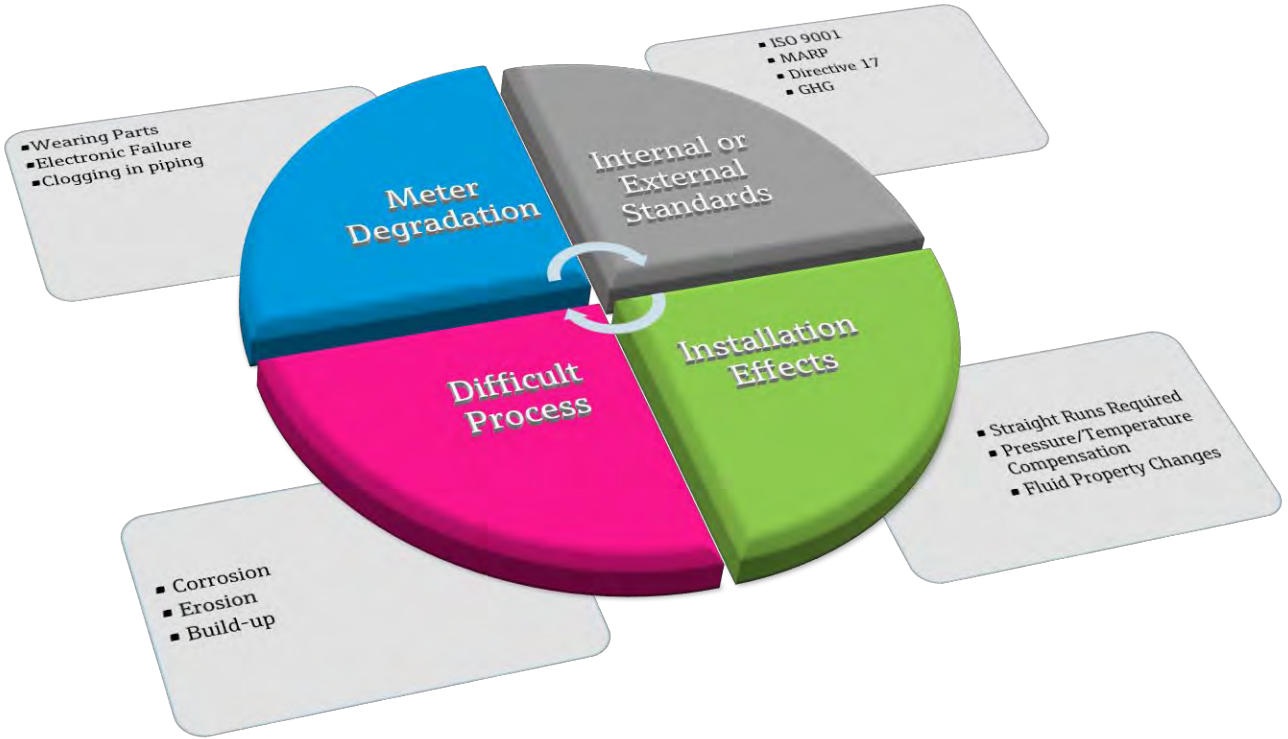
Availability

Process Engineer:

“Is my process running as designed?”

Safety

Why Check Flow Meters?



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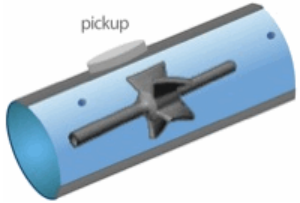
Traditional Meters May Lose Accuracy

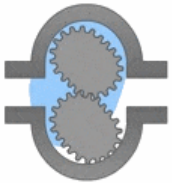
Turbine meters:

- Over spinning damage
- Worn or broken blades



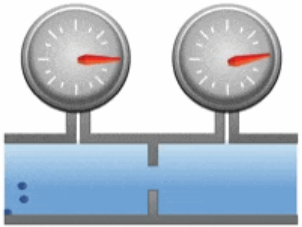
PD Meters:

- Debris in line
- Entrained gases
- Slippage due to viscosity



Differential Pressure:

- Worn edges of element
- Element deformed from excess pressure



Endress+Hauser

Intelligent Field Devices – Today!

Why keep sending the meter back for re-calibration?
- Most meters returned for re-calibration do not require adjustment

In fact only Endress+Hauser Vortex meters have a lifetime Calibration!

Coriolis

Vortex

Magmeter

Ultrasonic

Endress+Hauser

Heartbeat Technology™ – The Universal Solution

For all Endress+Hauser flow measurement technologies

- **Heartbeat Technology** is at the heart of the new Proline flowmeter platform, ensuring reliable measurement operation – whatever the flow measurement technology

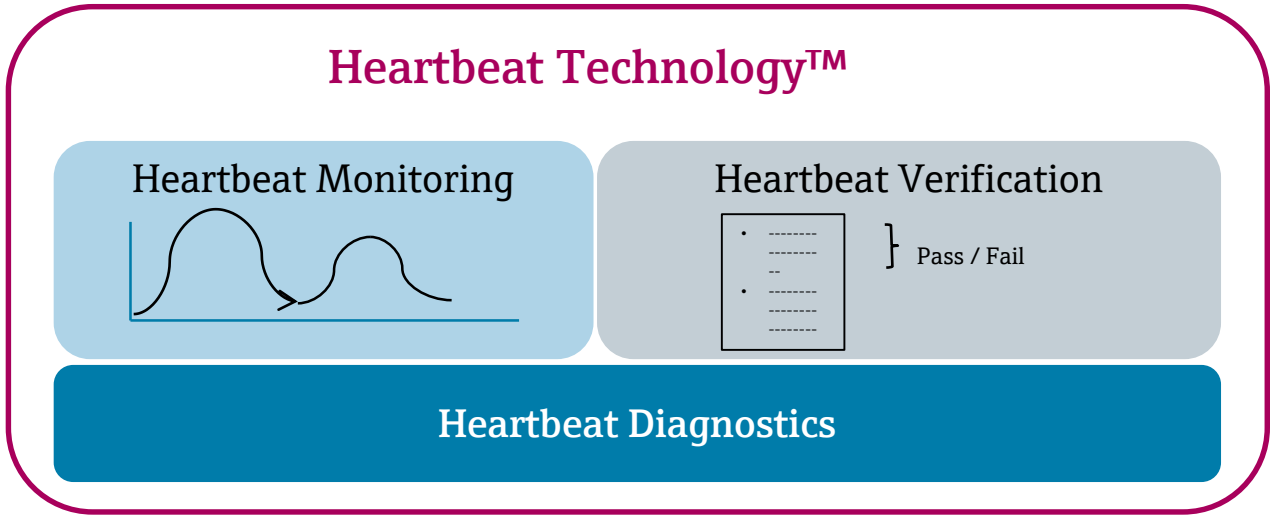
Coriolis

Vortex

Magmeter

Ultrasonic

Heartbeat Technology™ - The Elements



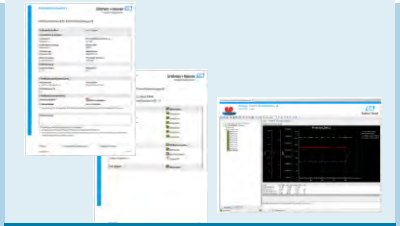
At a glance: What Heartbeat Technology can achieve

Diagnostics

Reliable self-monitoring

- Continuous, built-in diagnostic functionality
- Broadest test coverage
- Quick, concise guidance in case of errors (NE 107)

Verification



Compliant testing

- On-demand, effortless procedure
- Easy handling, no process interruption
- Electronic quality reporting

Monitoring

Condition-based maintenance

- Permanent reading of process-related variables
- Impact assessment
- External trend analysis

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Heartbeat Diagnostics™ - Standard with Proline

Heartbeat Diagnostics

Flowmeter health
→ information

Maintenance required

Out of specification

supports

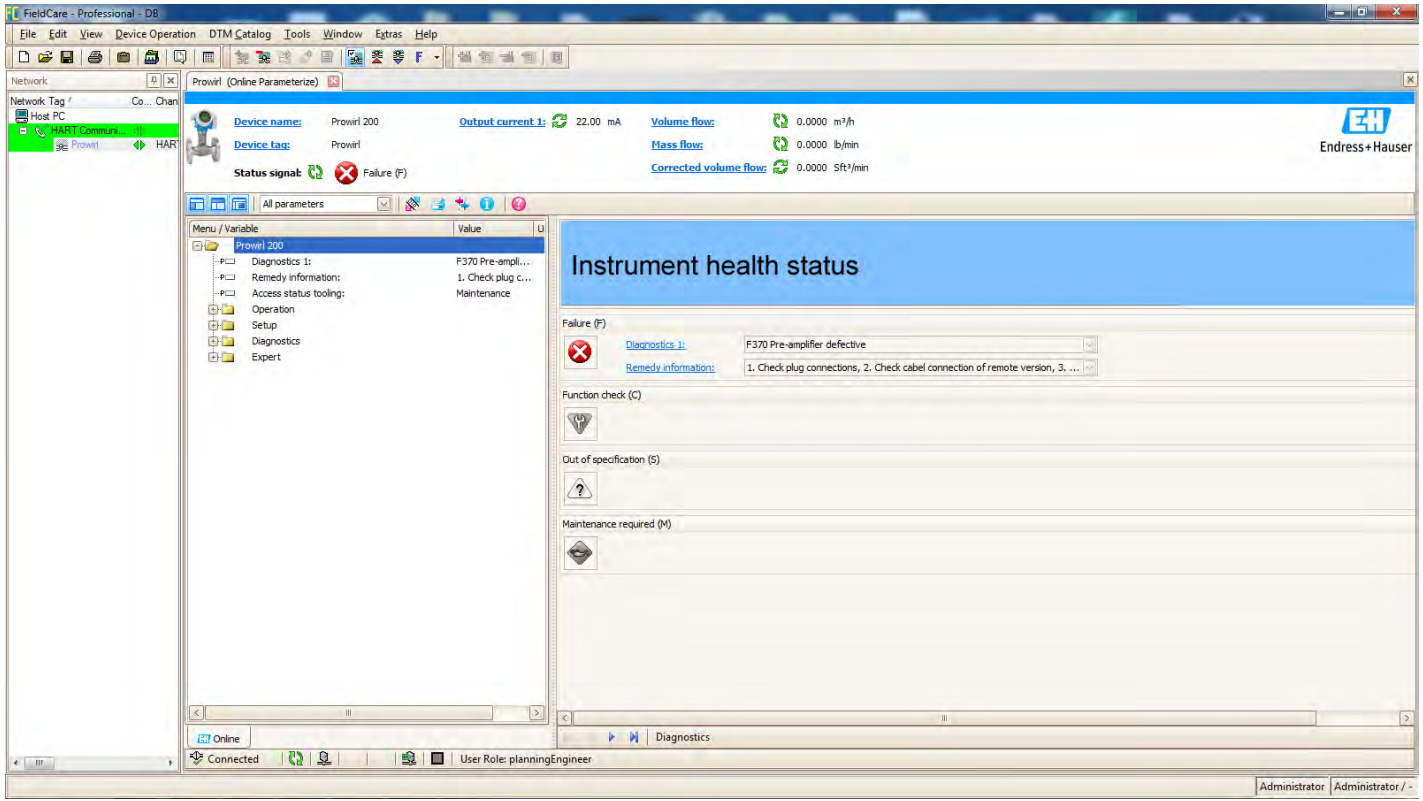
OK

Failure

Check

- Process safety
- Product quality
- Operation & Maintenance

Heartbeat Diagnostics™
FieldCare DTM – Conforms to Namur NE 107



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Terminology: Accredited, Calibration, Proving, Verification

- **Accreditation** demonstrates technical competence for a defined scope and operation of a laboratory ***quality*** management system through 3rd party ***audit compliance*** and traceable calibration. Result: Quality Calibration

- **Calibration** is a ***performance*** comparison of a meter under test and a standard under laboratory conditions. Result: Calibration Factor

- **Proving** is a ***performance*** comparison of a meter under test and a standard under actual process conditions to account for installation and actual process fluid effects. Result: Meter Factor

- **Verification** is a ***functional*** test comparing a meter under test to a known standard to determine quality of measurement which may be traceable to laboratory calibration. Used to extend Calibration intervals. Result: Pass / Fail indicating that the Calibration is still valid.

Endress+Hauser Portfolio of testing methods

Verification

On-site

Heartbeat Verification

Fieldcheck
(not for new Proline)

Flow-meter functional assessment
(comparison still vs. traceable references)

- **Internal parameters**
- **Operating conditions**

Calibration

On-site

Mobile Bench Prover

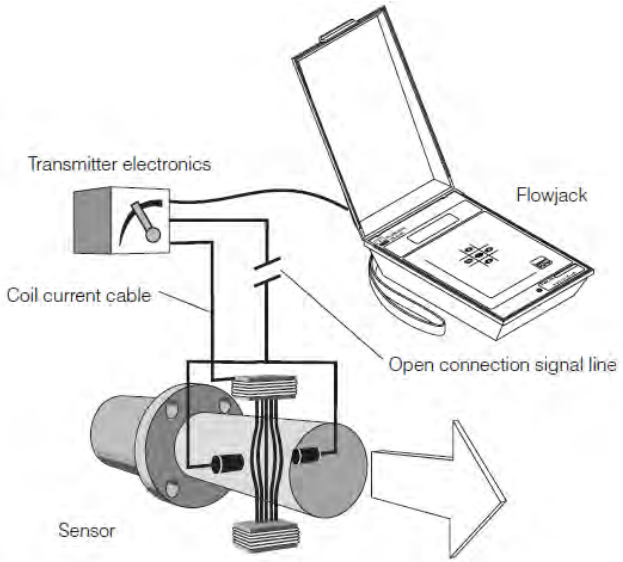
In Laboratory

Fixed Bench Prover (Edmonton 2015/2016)

Metrological performance assessment
(adjustment via calibration factor, certificate)

- **Primary measurand ($\dot{v}$)**
- **Reference conditions (fluid, p, T)**

Flowjack: First signal simulator for entire flow portfolio



Flowjack

Uncontested benefits:

- Quick and reliable testing
- Flowmeter remains in place
- Flowmeter calibration data manually inputted
- Traceability of all components
- Good proof-test coverage

Improvement areas:

- Cumbersome equipment
- Manual reports
- Mandatory trip to the field
- Disconnected output, interruption of measurement
- Potential handling errors

Endress+Hauser

Fieldcheck: Recognized method (signal simulation)

Fieldcheck ™

Uncontested benefits:

- Quick and reliable testing
- Flowmeter remains in place
- Flowmeter calibration data automatically downloaded
- Automated report
- Traceability of all components
- Excellent proof-test coverage

Improvement areas:

- Cumbersome equipment
- Mandatory trip to the field
- Disconnected output, interruption of measurement
- Potential handling errors

Endress+Hauser

Lets Perform a Heartbeat Verification Now!

Heartbeat Verification to succeed Fieldcheck

Similar functionality, now embedded in the device electronics

- Permanently available, no mandatory accessories
- Accessible via all available interfaces
- Testing of the entire signal chain without service interrupt
- Simplistic handling, clear / automated procedure
- Verification results stored in the device (8 most recent datasets)
- FieldCare© PC can be connected, so the verification DTM can upload results, generate a report, and manage the entire verification history

Heartbeat Technology

Heartbeat Verification vs. Fieldcheck

Proline
simply clever

Fieldcheck

- External
- Simulation and sensor checking
- 30 to 60 minutes
- Proof-test coverage 90% or better

Heartbeat Verification

- Built-in, with remote options
- Embedded test functionality
- App. 10 minutes
- Total test coverage* TTC > 95% acc. to IEC 61508

*Cumulative rating of safe failure across entire device electronics

BESCHEINIGUNG ◆ ATTESTATION ◆ 证明书 ◆ СВИДЕТЕЛЬСТВО ◆ CONSTANCIA ◆ ATTESTAZIONE

ATTESTATION

The Certification Body of
TÜV SÜD Industrie Service GmbH
Business Area Plant Engineering

certifies that the product

Proline Promag 200
with Heartbeat Technology™

manufactured by

Endress + Hauser AG
Kägenstraße 7
4153 Reinach BL
Switzerland

complies with the following requirements:

Heartbeat Technology™ is a test method integrated in the measuring device for the diagnostics and verification of flowmeters when used in a particular application throughout the useful lifetime of the measuring device. Testing is based on internal factory-traceable references which are redundantly reproduced in the device.
Heartbeat Technology™ includes Heartbeat Diagnostics and Heartbeat Verification.

Test specifications:
DIN EN IEC 61508-2:2011-02, Appendix C
DIN EN IEC 61508-3:2011-02, Section 6
DIN EN ISO 9001:2008, (Section 7.6 a), Control of monitoring and measuring equipment

Test results:
Heartbeat Verification verifies the function of Proline Promag 200 on demand within the specified measuring tolerance with a total test coverage ("TTC") of TTC > 95%.

Heartbeat Technology™ complies with the requirements for traceable verification according to DIN EN ISO 9001:2008 – Section 7.6 a) "Control of monitoring and measuring equipment". In accordance with this standard, the user is responsible for providing a definition of the verification interval that satisfies the particular requirements.

This Attestation is based on report no. TR 2085342 008 14 dated October 16, 2014.
Attestation no. PC/209/03/144/04/14

Munich, October 18, 2014

Jörg Steimer
Certification Body Plant Engineering

Gerhard Klein
Dept Risk Management

Endress+Hauser

Heartbeat Verification™ - TUV Certified, Directive 17 Compliant!

Due to our Safety-by-Design philosophy Endress + Hauser flow meters that have Heartbeat Technology™ are **independently certified by TUV** and **comply with the requirements of AER Directive 17.**

TÜVRheinland®

ZERTIFIKAT
CERTIFICATE

Nr./No.: 968/EZ 645.00/14

Prüfgegenstand Product tested	Durchflussmessgerät für die sichere Messung von Volumendurchfluss Flow rate meter for the safe measurement of volume flow	Zertifikats-inhaber Certificate holder	Endress + Hauser Flowtec AG Kägenstraße 7 4153 Reinach BL 1 Switzerland
Typbezeichnung Type designation	Prowirl 200 with the IO-Modules: "IO211 Ex-i, 212 Ex-d" (Option A, B) or "IO216 Ex-i, 217 Ex-d" (Option C) or "IO218 Ex-i, 219 Ex-d" (Option D)	Hersteller Manufacturer	wie Zertifikatsinhaber see certificate holder
Prüfgrundlagen Codes and standards forming the basis of testing	IEC 61508 Parts 1-7:2010		
Bestimmungsgemäße Verwendung Intended application	Das Gerät erfüllt die Anforderungen der Prüfgrundlagen (HW Sicherheitsintegrität SIL 2 und systematische Sicherheitsintegrität SIL 3 nach IEC 61508) und kann in Anwendungen bis SIL 2 (HFT = 0) bzw. SIL 3 (HFT = 1) nach IEC 61508 für die Sicherheitsfunktion Messung von Volumendurchfluss an der ersten 4-20mA Stromschnittstelle eingesetzt werden. The device complies with the requirements of the relevant standards (HW Safety Integrity SIL 3 and Systematic Capability SIL 3 acc. to IEC 61508) and can be used in applications up to SIL 2 (HFT = 0) resp. SIL 3 (HFT = 1) acc. to IEC 61508 for the safety function measurement of volume flow rate at the first 4-20mA current interface.		
Besondere Bedingungen Specific requirements	Die Hinweise in der zugehörigen Installations- und Betriebsanleitung sind zu beachten. The instructions of the associated Installation and Operating Manual shall be considered.		
Dieses Zertifikat ist gültig bis 25.02.2019. This certificate is valid until 2019-02-25.			

TÜVRheinland CERTIFIED
Functional Safety Type Approved
www.tuv.com ID 0000000000

Der Ausstellung dieses Zertifikates liegt eine Prüfung zugrunde, deren Ergebnisse im Bericht-Nr. 968/EZ 645.00/14 vom 25.02.2014 dokumentiert sind.

Der Inhaber eines für den Prüfgegenstand gültigen Genehmigungs-Ausweises ist berechtigt, die mit dem Prüfgegenstand übereinstimmenden Erzeugnisse mit dem abgebildeten Prüfzeichen zu versehen.

The issue of this certificate is based upon an examination, whose results are documented in report-no.: 968/EZ 645.00/14 dated 2014-02-25.

The holder of a valid licence certificate for the product tested is authorized to affix the test mark shown opposite to products, which are identical with the product tested.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit
Am Grauen Stein, 51105 Köln

Köln, 2014-02-25

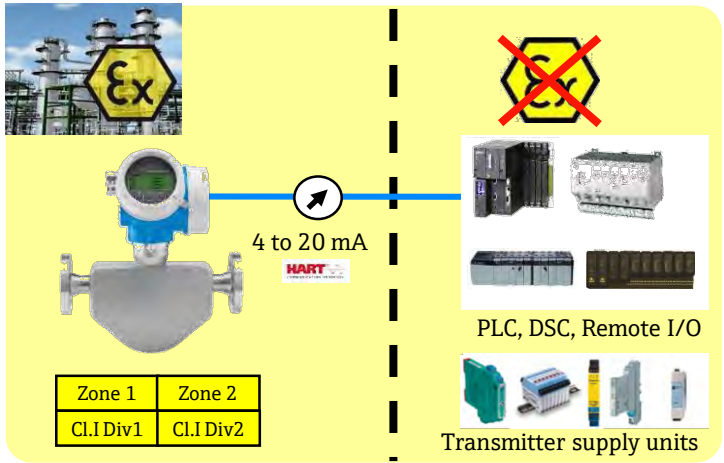
Certification Body for FS-Products

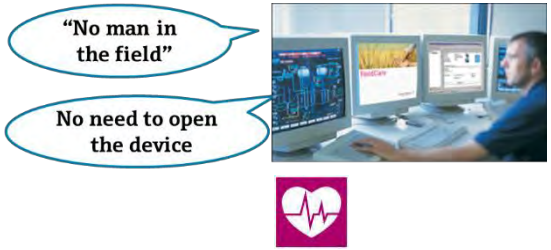
Dr.-Ing. Thorsten Gantevoort

Endress+Hauser

Safety in perfection – developed according to IEC 61508

- Safety in hazardous environments
- Minimized risk of random failures
- Simple and seamless integration into existing plant infrastructure





Remote monitoring, verification

- Control system
- Asset management tool, e.g. FieldCare®

Endress+Hauser

Heartbeat addresses your most serious challenges

Endress+Hauser

Challenges in the Process Industry ...

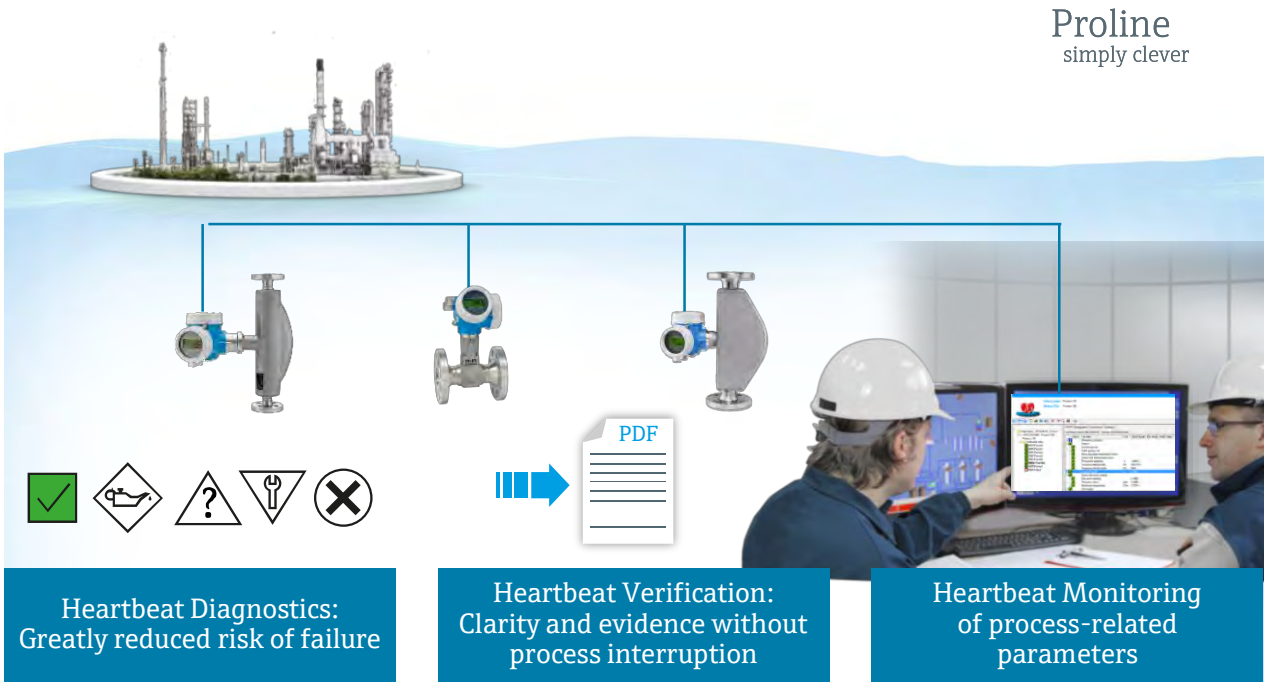
Maintenance Costs:
High costs and constraints for preventive maintenance

D17 Compliance:
Keep up trust in the integrity of measurements

Erosion inside the measuring tube of a Coriolis flowmeter

Endress+Hauser

What Heartbeat Technology can do ...



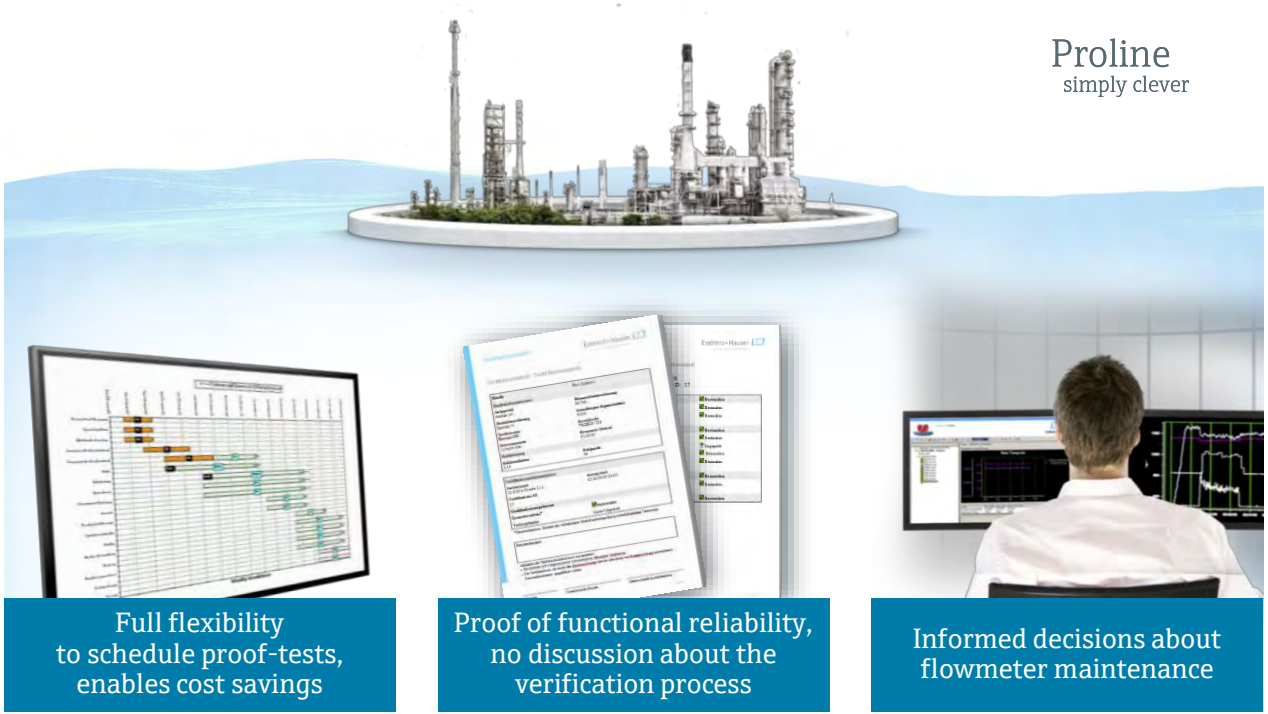
Heartbeat Diagnostics:
Greatly reduced risk of failure

Heartbeat Verification:
Clarity and evidence without process interruption

Heartbeat Monitoring
of process-related parameters

Endress+Hauser

What‘s in it for you ...



Full flexibility
to schedule proof-tests,
enables cost savings

Proof of functional reliability,
no discussion about the
verification process

Informed decisions about
flowmeter maintenance

Endress+Hauser

Heartbeat Technology – what makes it unique

Reliability

Audited and attested: Traceable, redundant references inside the device

Seamless integration

Fieldbus Foundation
PROFIBUS®
HART COMMUNICATION PROTOCOL
Modbus
EtherNet/IP

Large variety of seamless integration options

Uniform handling

For all new Proline flowmeters

Endress+Hauser

Heartbeat Technology™ – reliable self-monitoring

IEC 61508 audits completed

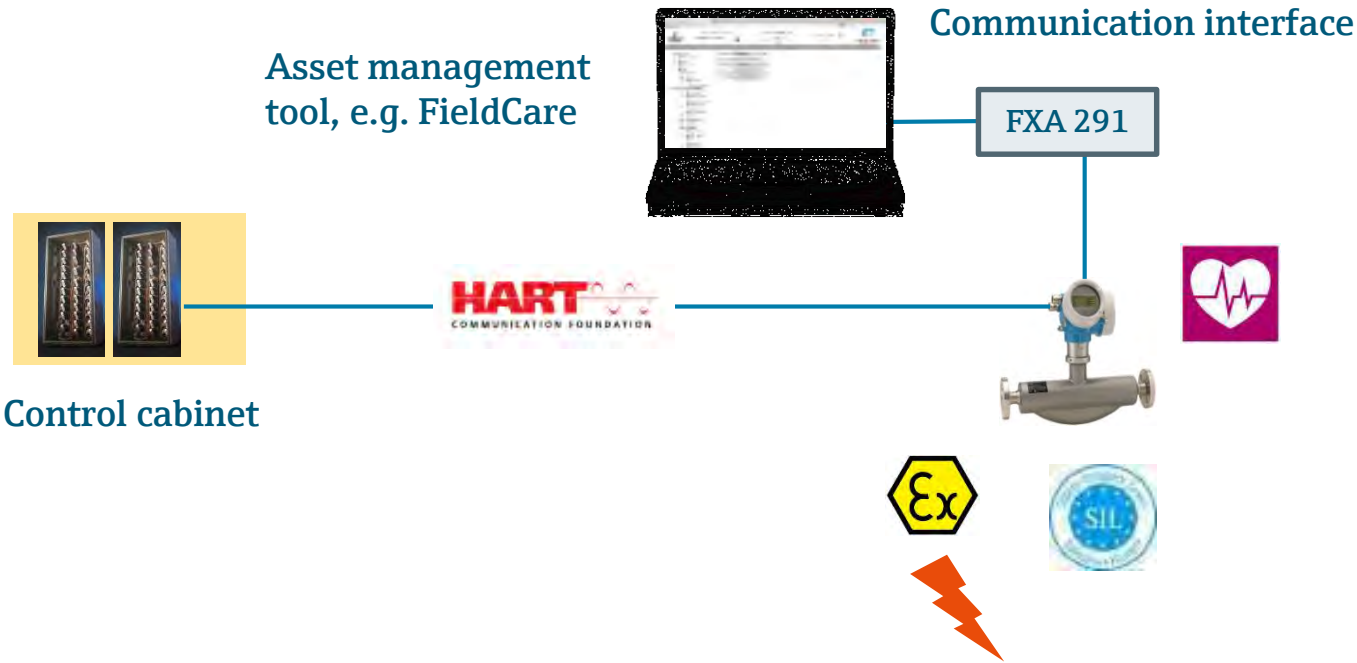
ISO 9001 conformity certification, audits completed on Proline 200

Long-term stability	▪ Measuring electronics ▪ Test electronics
Redundant internal references	▪ Dual frequency generators (Promass, Prowirl) ▪ Multiple voltage references (Promag)
Traceable factory calibration according to ISO 17025 on accredited facilities	▪ Flow measurement ($\dot{m}$, $\dot{v}$) ▪ Electronic modules

- Ex-factory status is stored invariably in the device
- Each single test is passed only if the current parameter value remains within tight, unchangeable tolerances supporting the device specification

Heartbeat Verification – onsite access

SIL loop integrated via 4..20mA HART



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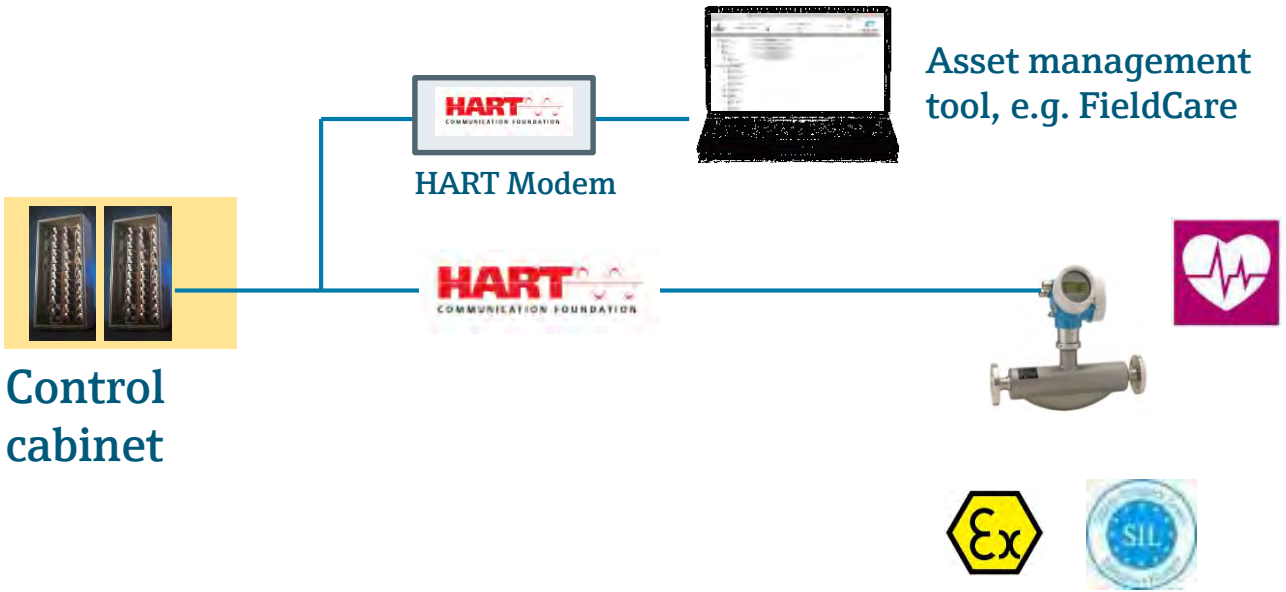
Heartbeat Verification – access via HART modem

SIL loop integrated via 4..20mA HART



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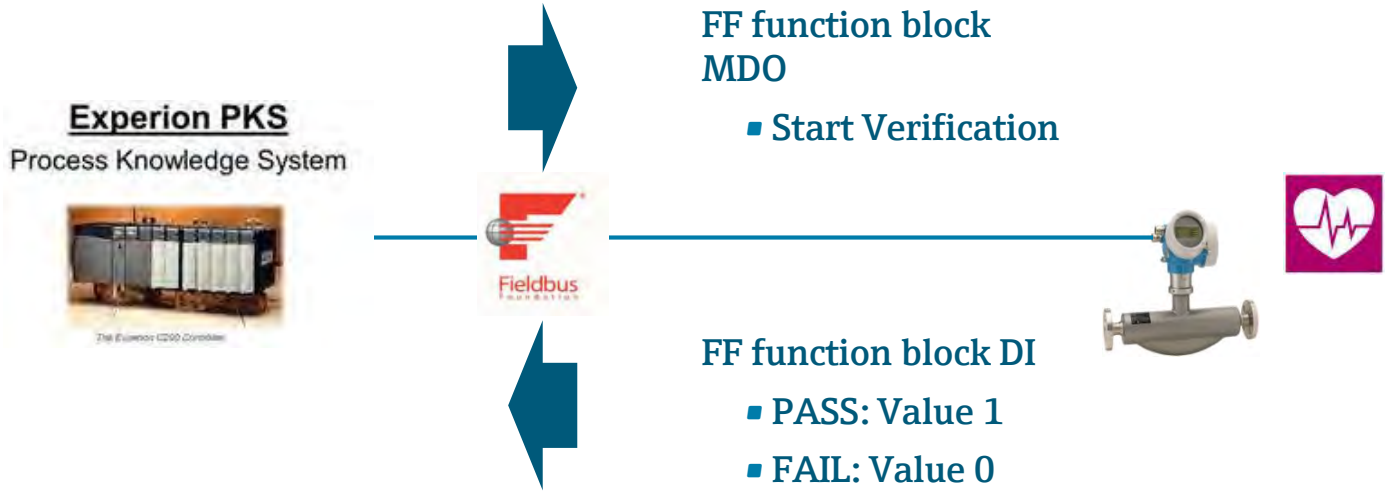
Heartbeat Verification – access via Foundation Fieldbus

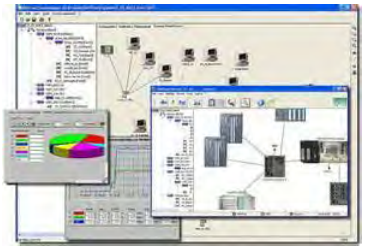
Honeywell DCS environment



Endress+Hauser

Heartbeat Verification – access via Foundation Fieldbus

Honeywell DCS environment



Asset management tool

- Field Device Manager
- FieldCare

Heartbeat Technology™ fundamentals

Long-term stability

Redundant internal references

Traceable factory calibration

Electronic modules

- Designed to minimize risk of failure
- 100% testing against traceable references

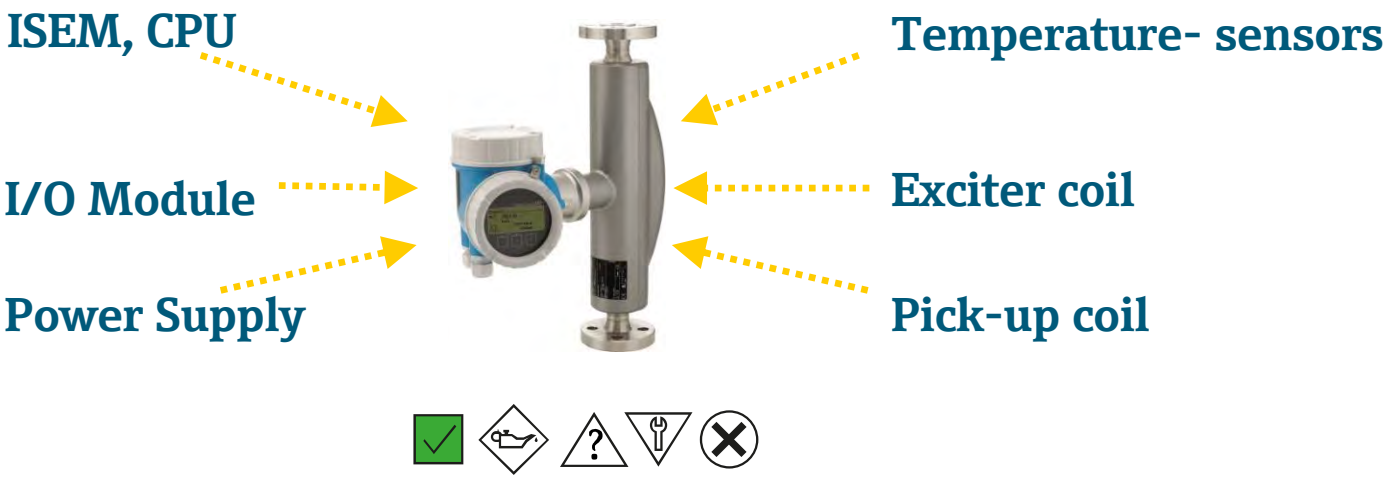
Completed device

- Accredited calibration
- Primary measurand (ṁ, v̇)

Total Test Coverage from sensor to outputs

Flowmeter development according to IEC 61508
Continuous self-monitoring based on NE 107

Example: Proline Promass F 200



Diagnostic messages securely stored in the event logbook

Proline Promass: Overview of test groups

Proline Promass 100 / 300 / 500

Continuous

I/O module

- 4...20 mA output loop-back test

Sensor electronic module

- Zero-point tracking
- Reference clock
- Reference temperature

Sensor

- Inlet / Outlet pick-up coil
- Measuring / Carrier tube temperatures
- Pick-up coil symmetry
- Frequency lateral / torsion mode

On demand

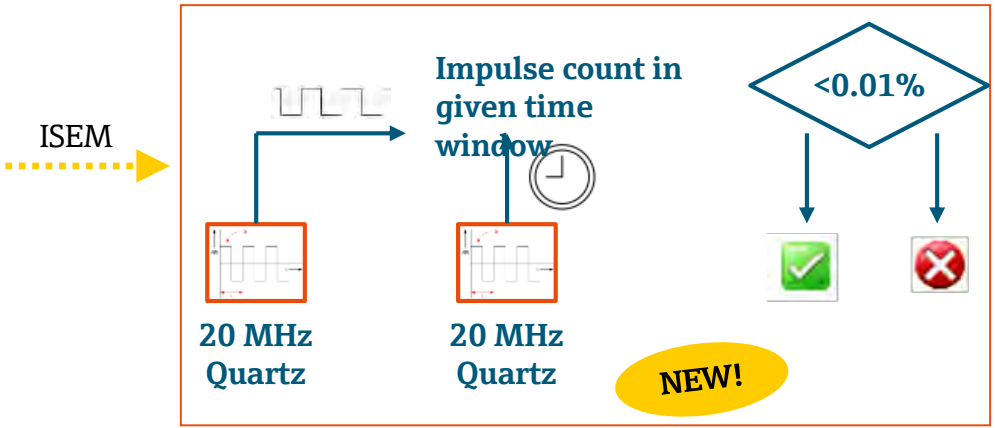
Sensor Integrity (HBSI)

- Electromechanical integrity of Promass

Traceable internal references for measurement + testing

High-precision frequency generators

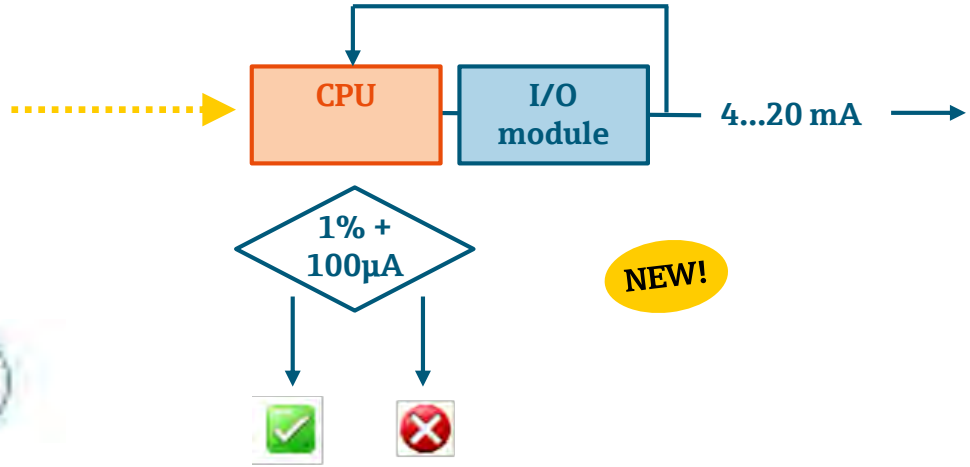
- Continuous **synchronous-run test** in the device reliably detects ambient and process influences potentially causing drift in the electronics
- Traceable test of each module against accredited reference standard prior to **traceable factory calibration** of the entire device



Endress+Hauser

Current output loop-back test

- Drift and aging of electronics
- Internal connectivity problems
- External influences (load resistance)



Proline Promass 100 example

Heartbeat Verification – electronic Pass / Fail report

Promass F 200 Verification report

Endress+Hauser
People for Process Automation

Verification report flowmeter

Plant operator
Device information
Location
Endress + Hauser
Module name
V15
Device name
Promass 200
Serial number
D5105702000
Calibration
Calibration factor
2.1700

Verification information
Operating time
84d12h24m31s
Verification ID
1
Verification results
Overall result
Detailed results

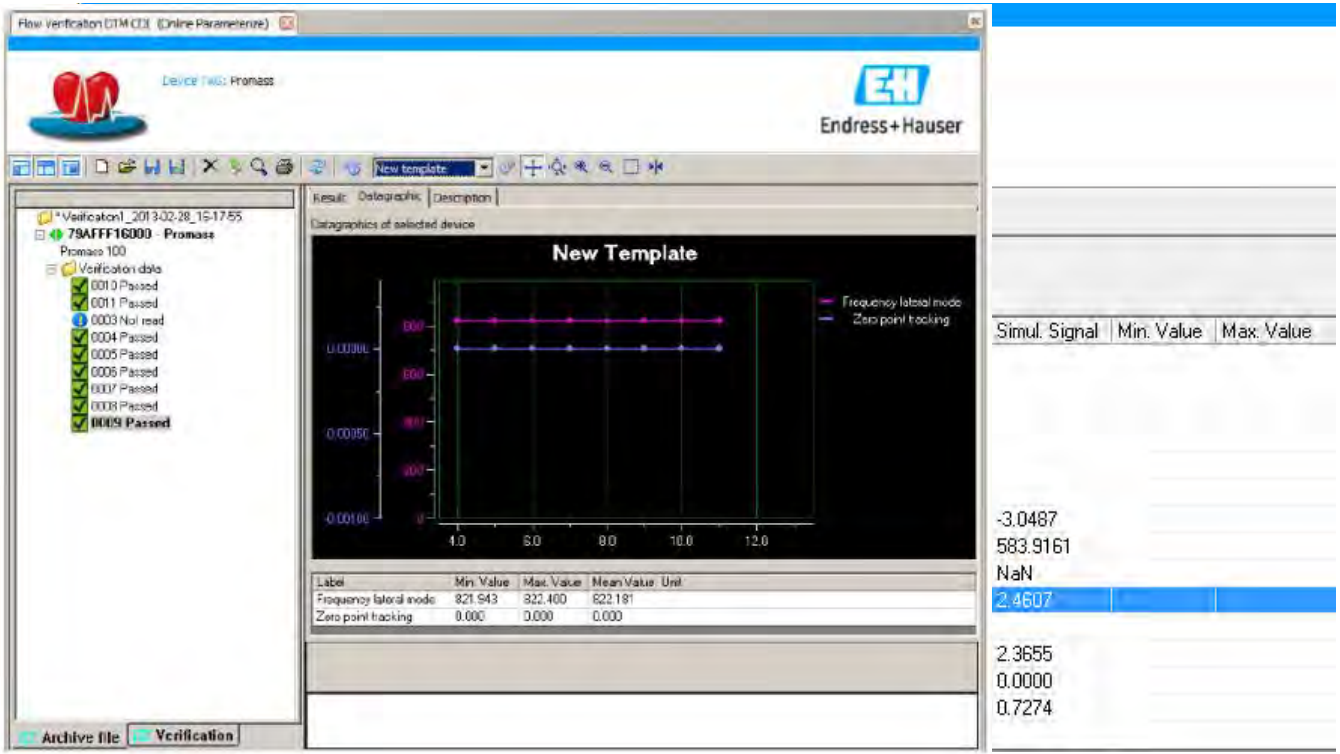
Verification report flowmeter

Serial number: D5105702000

Verification ID: 1

Sensor	☑	**Passed**
Pickup coil	☑	Passed
Measuring tube temperature sensor	☑	Passed
Pickup coil symmetry	☑	Passed
Frequency lateral mode	☑	Passed
Sensor circuit leakage	☑	Passed
Main electronic module	☑	**Passed**
Supply voltage	☑	Passed
Zero point tracking	☑	Passed
Reference clock	☑	Passed
Reference temperature	☑	Passed
I/O module	☑	**Passed**

Verification DTM for FieldCare© asset management tool



Endress+Hauser

Lets look at our Heartbeat Verification Report!

Proline Prowirl 200: Summary of test groups

On demand

Main Electronic Module

- Supply Voltage

I/O module

- 4...20 mA output loop-back test

Sensor electronic module

- Reference frequency drift
- DSC sensor reference
- Temperature measuring path
- DSC sensor measuring path

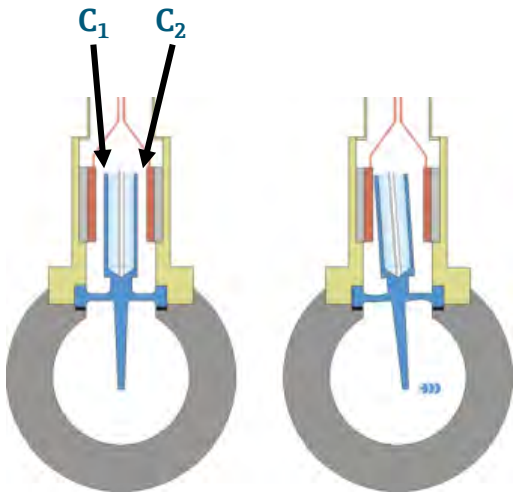
Sensor

- DSC Sensor
- Temperature Sensor

Only Prowirl C (Canada) has inspection ports for shedder bar inspection

DSC sensor: Gap capacity difference test

- Capacitive sensor to count the vortex frequency
- Warning level yields a “Fail” in the test, but still allows to measure
- Small impact on measurement accuracy, strong indicator for device functionality



$$dC = | C_2 - C_1 |$$

Level	dC in pF
Normal	0 to < 4.6
Warning	4.6 to 6.8
Failure	> 6.8

Proline Promag: Summary of test groups

On demand

Main Electronic Module

- Supply Voltage

I/O module

- 4...20 mA output loop-back test

Sensor electronic module

- Reference voltage
- Linearity of electrode measuring circuit
- Offset of electrode measuring circuit

Sensor

- Coil current shot time
- Coil hold voltage
- Coil current

Proline Promass condition monitoring applications

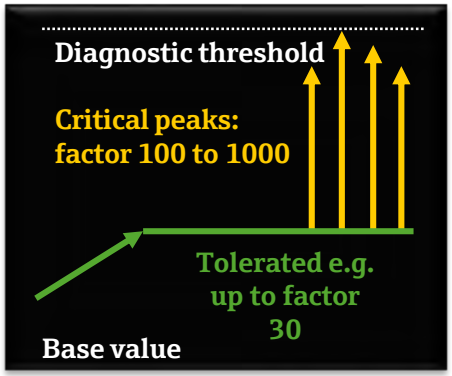
Types of process impact	Relevant parameters
Entrained gas, cavitation, as well as empty tube	▪ Tube damping ▪ Damping fluctuation ▪ Frequency fluctuation
Coating build-up, corrosion, erosion	▪ Tube damping ▪ Signal asymmetry ▪ Resonance frequency

Interpretation requires sound understanding of the measuring point and the process influence on the oscillation system of the specific Coriolis device type

Heartbeat Monitoring for entrained gas

Entrained gas is a challenge in Coriolis measurement in general. In can therefore be useful to monitor its impact below the limit values of Heartbeat Diagnostics

$$\text{Tube damping} = \frac{\text{Exciter current}}{\text{Amplitude}}$$

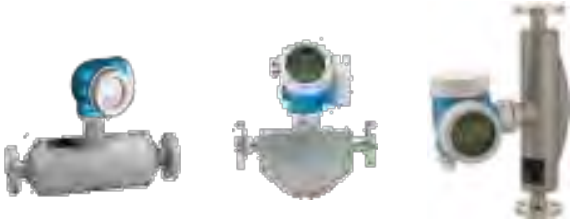


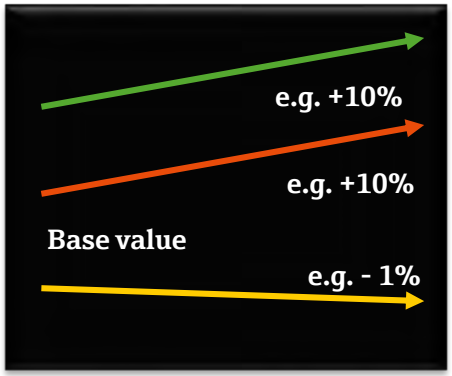
Tube damping is also a parameter of continuous diagnostics, and leads to a warning above a threshold of 200,000 A/m.

Damping fluctuation and frequency fluctuation are powerful indicators of cavitation and entrained gas as well.

Heartbeat Monitoring: Coating build-up in the tube

If the fluid's density and viscosity are stable, coating build-up can be detected by decreasing frequency, and concurrent increase in tube damping or signal asymmetry.





The density measurement can be tracked in addition, if the fluid is unchanged.

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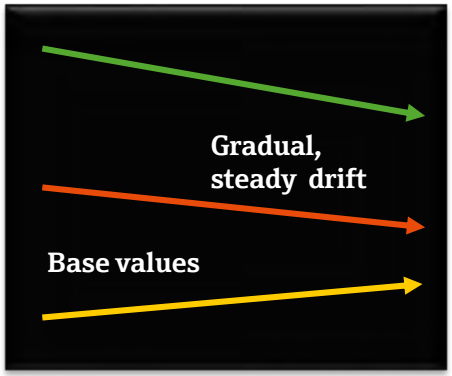
Heartbeat Monitoring: Corrosion

Corrosion may occur in manifold forms, so condition monitoring requires a variety of parameters, particularly here.

Tube damping

Signal asymmetry

Resonance frequency



The density measurement can be tracked in addition, if the fluid is unchanged.

Heartbeat Monitoring: Abrasion

Abrasion particularly impacts the curved sections inside the tube.
Promass 100 offers the HBSI test, Promass 200 does not!

Promass I 100

- **Straight / Titanium mono-tube, suitable in abrasion use cases**
- **Only Promass I offers HBSI as a continuous monitoring parameter!**

Signal asymmetry (Inlet / outlet amplitude ratio)

HBSI: Heartbeat Sensor Integrity

HBSI: Warning at 2%, failure at 4%

Endress+Hauser

Heartbeat Technology – Technology beating reliably!

Endress+Hauser

E+H Flow Product

Q & A

Thank you very much for your attention