

Proline Prowirl 200

The vortex revolution for steam, gas and liquid

Robust, multifunctional, proven

- Tried-and-tested maintenance-free sensors: installed in over 300 000 applications worldwide
- Best long-term stability thanks to lifetime calibration factor
- Robust sensors for high resistance to vibration, temperature shocks and water hammer
- High repeatability ($\pm 0.2\%$)
- Seamless and cost-effective system integration through uniform two-wire concept for flow and level
- High process reliability: devices developed completely to IEC 61508 for SIL 2/3
- Efficient steam plant operation thanks to the only wet steam detection of its kind in the world
- Accurate calculation of heat and energy flows using a multivariable measuring concept
- Traceable measurement results due to accredited calibration facilities: SAS (Switzerland), A2LA (USA) and CNAS (China)



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.

Consistent and uniform Proline is a proven and uniform product concept, designed to do the same things the same way, thereby increasing the safety and efficiency of your operations.

Optimal application solutions Proline incorporates all modern flow measuring technologies, thus optimizing plant up-time – true to our motto: “The industry-optimized flowmeter for your application”.

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.

Added value in every respect



HistoROM

- No loss of data – automatic data storage
- Quick restoration of device data in case of service
- High plant availability and process reliability



Heartbeat Technology™

- Maximum process reliability due to continuous self-diagnosis
- Clear diagnostic messages with instructions for action
- Verification “at one’s fingertips” without process interruption



Seamless system integration

- High flexibility due to wide variety of fieldbus technologies
- Highest quality of available components (drivers, operating tools)
- Efficient process control with simultaneous transmission of multiple process variables



W@M

- Open information system that brings together products and services from Endress+Hauser
- Worldwide availability of device and plant data
- For everyday work – in operation, for maintenance and repair



Easy operation

- Time-saving Endress+Hauser operating concept
- Guided menu with “make-it-run wizards”
- 17 display languages for worldwide use



Prowirl 200

The reliable multi-talented device

Whether it is reliable control at high pressures and temperatures, or reliable measured values during continuous operation, the new Prowirl 200 has been designed to meet your needs. The fields of application in the chemical, petrochemical, pharmaceutical, power engineering and foodstuff industries, for example, involve a wide variety of fluids:

- Wet steam, saturated steam, superheated steam
- Compressed air, nitrogen, oxygen, natural gas
- Liquefied gases, cryogenic liquids
- Demineralized water, boiler feedwater, condensates
- Solvents, coolants, heat-transfer oils, etc.

In addition, Prowirl 200 has several functions that are unique worldwide, thus ensuring maximum flexibility for plant design and highest reliability in operation:

- Wet steam alarm for reliable and efficient steam plant operation
- Inlet-run correction function for exact measurements even when installation space is at a minimum
- Heartbeat Technology for continuous self-diagnosis and simple device verification at one's fingertips without process interruption
- Gas mixtures can be freely defined with up to eight components
- Steam and gas data in accordance with international standards: IAPWS-IF97, AGA8, AGA5, SGERG, ISO 6976, etc.





Endress+Hauser [E]

Provir

256.40

m³ kg/h

GF800



max. 777



830503

E-H DIN 1082-1 DN 100 PN 10

E-H DIN 1082-1 DN 100 PN 10

KKS9 NR. 635

Prowirl 200

Advantages at a glance

Easy operation

- Uniform Endress+Hauser operating concept
- Fast commissioning via guided configuration of parameters
- 17 display languages for use anywhere in the world
- Optimal on-site process control via simultaneous display of up to four measured variables, e.g. mass flow, volume flow, temperature or energy

Maximum operational safety

- Heartbeat Technology™
 - Continuous self-diagnosis
 - Traceable device verification “at one’s fingertips”. No dismantling or process interruption required
- Developed for SIL 2/3 applications
- Continuous monitoring of the steam quality via wet steam detection

Seamless system integration

- Simple and seamless integration into existing process control and asset management systems via an optimized, uniform two-wire concept
- Tried-and-tested W@M information system:
 - Global access to all device information
 - Cost-effective support of business processes
- Compatibility between field device and process control system ensured at all times, as firmware/device drivers are available during the entire life cycle

Sensors proven in real-world applications

- Successfully installed in over 300 000 applications worldwide
- High accuracy and reliable measurement results thanks to lifetime calibration factor
- Unmatched long-term stability in operation thanks to capacitive DSC sensor (patented)
- High repeatability ($\pm 0.2\%$)
- Traceable measurement results – each device is tested on accredited calibration rigs (ISO/IEC 17025)



Your benefits throughout the life cycle

- Minimum operating and maintenance costs
- Maximum reliability in operation
- Highest measuring accuracy for internal costing and billing
- Highest plant efficiency for energy management

Two-wire technology at Endress+Hauser

Combining the benefits of the vortex flow measuring principle with efficient two-wire technology no longer requires compromises. Prowirl 200 enables seamless integration into existing plant systems along with tried-and-tested sensors:

- High operational safety in Ex areas due to intrinsically safe design (Ex ia)
- Reduced costs for installation and wiring
- Seamless system integration into existing infrastructures
- Common installation practice

Perfectly standardized

Uniform operation, menu structures, function designations, software, interfaces, data management, system integration, documentation, product structures, etc.

High flexibility

Modular housing components and electronic modules

Increased safety

Consistent implementation of all requirements of common industrial standards and recommendations

Precise diagnostics

Clear categorization of device or process errors according to NE107: Maintenance/Out of specification/Function check/Failure

Simply unforgettable

Customer-friendly data storage concept (HistoROM): back up, copy, compare or restore data





Fulfills industry standards

Interference immunity, data retention, signal level, software, pressure equipment directive, self-monitoring, etc.



Tailor-made flowmeters

Our solutions for your application

Prowirl D 200 Wafer device	Prowirl F 200 Standard device	Prowirl R 200 For low flows	Prowirl O 200 High-pressure specialist
<ul style="list-style-type: none">▪ With centering rings for high fitting accuracy▪ Worldwide standardized installation length (65 mm) enables one-to-one replacement of orifice plates▪ DN 15 to 150 (½ to 6")	<ul style="list-style-type: none">▪ Suitable for detecting wet steam▪ Correction function for short inlet runs▪ Worldwide standardized installation lengths▪ DN 15 to 300 (½ to 12")	<ul style="list-style-type: none">▪ With a single and even double line size reduction for:<ul style="list-style-type: none">– Increasing the flow velocity– Extending the lower measuring range▪ DN 25 to 200 (1 to 8") single reduction▪ DN 40 to 250 (1½ to 10"), double reduction	<ul style="list-style-type: none">▪ Flange or butt-weld version▪ DN 15 to 150 (½ to 6")
			

For more technical data: see last page



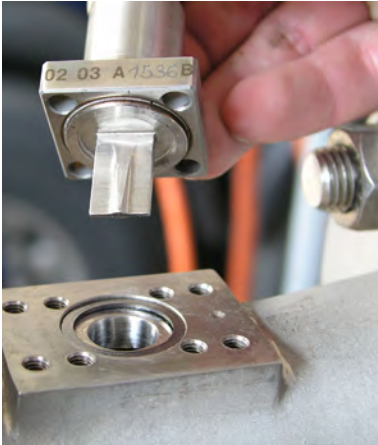
Dualsens version

Due to safety reasons, critical applications often require redundant measurements. Therefore all Prowirl sensors are also available in a Dualsens version; in other words, they have two separate DSC sensors and two measuring electronics. Through development in accordance with IEC 61508, the redundant measuring system can even be used in SIL 3 applications. This means high reliability at low cost!



Robust, multifunctional and intelligent

Three reasons why choosing Prowirl



Patented DSC sensor

Robust sensor – reliable measuring technology

Endress+Hauser's unique DSC (Differential Switched Capacitor) sensor technology ensures high-precision measured values even under the toughest conditions. With an installed base of over 300 000 devices, this sensor concept has been proving its value for decades. The patented DSC sensor is highly resistant to:

- Vibration
- Dirty fluids
- Water hammer
- Temperature shocks (>150 K/s)

Even after being used for decades, DSC sensors did not exhibit any drift – proof of their exceptional long-term stability.



Multivariable measurement

Energy management made easy

All industries have utilities with steam, cooling water or hot water. Generating, transporting and distributing these fluids consumes a lot of energy. Efficiently controlling such processes is becoming ever more important. Therefore Prowirl 200 offers everything in one device for a comprehensive energy management:

- Integrated flow computer for calculating:
 - Mass, heat and energy flow of steam and liquids
 - Corrected volume flow and energy flows of gases (e.g. air, natural gas)
- Reading in external temperature and pressure values via HART, PROFIBUS PA and FOUNDATION Fieldbus as well as via the optional current input
- Integrated temperature measurement for the direct mass measurement of saturated steam and liquids (temperature compensation)



One-of-a-kind wet steam detection

Process reliability and efficiency

Many industries use large quantities of steam, whether for heating, cleaning and sterilizing, or as a source of energy. The costs for generating steam are extremely high. Moreover, the transfer of heat energy is energetically efficient only for "saturated steam". Often, however, "wet steam" is what predominates, since fluctuations in pressure and temperature cause water to condense out, or water gets into the steam lines due to disruptions in the boiler system. The consequences are usually serious:

- Low efficiency for the transmission of energy
- Hazardous water hammer
- Heavy corrosion from the salts dissolved in the water carried over

Prowirl 200 is the world's first vortex flowmeter with the option of monitoring the steam quality and immediately generating an alarm message in case of wet steam.

Technical data

Prowirl 200 (transmitter)		Prowirl D, F, R, O (sensors)	
Display	4-line display with push buttons or with touch control (backlit)	Max. measured error	<ul style="list-style-type: none"> – Volume flow – liquids: $\pm 0.75\%$; gases/steam: $\pm 1.0\%$ – Mass flow – liquids: $\pm 1.0\%$; gases/steam: $\pm 1.7\%$
Operation	<ul style="list-style-type: none"> – Via local display (17 operating languages) – Via operating tools, e.g. "FieldCare" from Endress+Hauser 	Nominal diameters	<ul style="list-style-type: none"> – Prowirl D: DN 15 to 150 (½ to 6") – Prowirl F: DN 15 to 300 (½ to 12") – Prowirl R: DN 25 to 250 (1 to 10") – Prowirl O: DN 15 to 300 (½ to 12")
Power supply	DC 12 to 35 V	Process connections	<ul style="list-style-type: none"> – Prowirl D: Wafer – Prowirl F/R/O: flange (EN [DIN], ASME, JIS) – Prowirl O: flange (EN [DIN], ASME, JIS), butt-weld version
Ambient temperature	–40 to +80 °C (–40 to +176 °F) Optional: up to –50 °C (–58 °F)	Process pressure	<ul style="list-style-type: none"> – Prowirl D, F, R: PN 10 to 40, Class 150 to 300, 10 to 20K – Prowirl O: PN 63 to 250, Class 600 to 1500, 40K
Degree of protection	IP66 and IP67 (Type 4X enclosure)	Process temperature	<ul style="list-style-type: none"> – Standard: –200 to +400 °C (–328 to +752 °F) – Option (Prowirl F, R, O): up to +450 °C (+842 °F)
Design Housing material	<ul style="list-style-type: none"> – Compact or remote – Aluminum or stainless steel housing 	Degree of protection	IP66 and IP67 (Type 4X enclosure)
Galvanic isolation	All circuits for outputs and power supply are galvanically isolated from each other	Materials	Stainless steel, Alloy C22
Output/Input	Current output (4–20 mA, HART); 2nd current output (optional); pulse/frequency/switch output; passive current input (optional)	Approvals	Marine approvals; PED, CRN, AD 2000; SIL 2/3; degreased according to BS-IEC-60877; 1999 (e.g. for oxygen)
Communication	HART, PROFIBUS PA; FOUNDATION Fieldbus (in prep.)	Ex approvals	ATEX, IECEx, FM, cCSAus, NEPSI, TIIS
Ex approvals	ATEX, IECEx, cCSAus, NEPSI, TIIS		
Ignition protection type	Intrinsically safe (Ex ia/IS) Flame-proof (Ex d/XP), Ex n		
Subject of modification			

The Prowirl 200 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 **UL** mark.

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