

measuring
means savings



**SMARTSONIC - new generation
of multi-beam
ultrasonic flowmeters
of the company ELIS PLZEN a.s.**

ultra-precise, cost effective,
based on **30** years of our own **R&D**

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- The project has been solved on the basis of more than 30 years of experience in the development, production and sale of more than 10,000 ultrasonic liquid flowmeters of larger dimensions, mainly within the range of DN32 - DN1200
- The goal of the project was to develop technically advanced universal multi-beam ultrasonic flowmeters for liquids using long-term development and production experience, the latest measurement algorithms developed, the use of the most modern electronic component base and production technology. The modular concept makes it possible to implement ultrasonic flowmeters with great variability according to the requirements of specific applications. These are mainly requirements for different dimensions, pressures, temperatures and properties of the measured medium, accuracy and measurement ranges, etc.
- The development concept was chosen so that the maximum number of developed solutions could be used in the future for the possible development of multi-beam ultrasonic gas flowmeters.
- The solution of the project is at a very advanced stage. On the basis of the previous several years of research and development, two prototypes of dimensions DN100 with three ultrasonic beams and DN200 with five ultrasonic beams were produced in the year 2023.

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- Extensive functional tests were carried out on the mentioned prototypes. These tests confirmed that the measuring system achieves the expected main parameters, i.e. measurement accuracy and measurement range. For example, we present the verified parameters of the maximum measurement error E_{max} and the measurement range R of the five-beam prototype flowmeter of size DN200, for which the maximum flow rate is $Q_{max} = 1000 \text{ m}^3/\text{h}$:
 - $R > 100$ for max. measurement error $E_{max} = \pm 0.15\%$ at min. flow rate $Q_{min} = 10 \text{ m}^3/\text{h}$
 - $R > 400$ for max. measurement error $E_{max} = \pm 0.5\%$ at min. flow rate $Q_{min} = 2.5 \text{ m}^3/\text{h}$
 - $R > 1000$ for max. measurement error $E_{max} = \pm 1\%$ at min. flow rate $Q_{min} = 1 \text{ m}^3/\text{h}$
- In order to complete the development project, it is necessary to make some HW adjustments resulting from prototype tests and add some FW and SW user functionalities that do not affect the mentioned main measurement parameters. Certifications, especially MID, OIML, ATEX and IECEx, will be necessary for the most demanding applications, especially for measurements in the chemical and petrochemical industry, or in the area of heat and cold energy measurement.
- For serious interested parties, we can provide more detailed information in Business and technical report on the state of development project solutions in 2024 regarding SMARTSONIC, possibly demonstrate the measurement parameters on the test stand in ELIS PLZEŇ.

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