BELUGA A/V
Open Channel Digital Acoustic Flow Meter Sensor

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The BELUGA A/V is the newest digital ACOUSTIC area/velocity flow meter sensor for open channel flow measurements from FLOW-TRONIC. It is suitable for partially filled pipes and surcharged pipes without primary devices such as flumes or weirs.

This sensor combines advanced digital Doppler ultrasonic velocity sensing technology with most modern and powerful DSP processor technology, allowing **real-time spectral analysis** of the velocity distribution through the cross-sectional area.

The sensor is designed for permanent or portable applications.

The BELUGA A/V is a powerful measuring system. With its integrated and **replaceable pressure level sensor**, it outputs flow directly without needing any other intermediate controller. All **computations** are made **inside the sensor**.

The **Smart Velocity feature** can be activated for velocity and flow estimation when water level does not permit an efficient velocity reading (typically below 2 cm / 0.8 in).

The **RS485 Modbus RTU/ASCII** allows an easy integration with a large variety of third-party loggers or controllers. For studies or measuring campaigns, it can be associated to the RTQ-IoT battery powered system with remote communication and remote configuration capabilities.

Optionally, the BELUGA A/V can be equipped with a **4-20 mA output** for flow allowing an easy connection to any existing system.

The **side-mounted** cable ensures efficient and space-saving mounting.

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Technical Specifications

Velocity Measurement

Method	Ultrasonic Doppler
Frequency	1 MHz (twin crystals)
Analysis type	Advanced Digital Spectral Analysis
Range	-2 to +6 m/s (-6.56 to +19.68 ft/s)
Measurement	Bi-directional
Accuracy	±1% ± zero stability (according to hydraulic and installation conditions compliance)
Zero Stability	± 0,01 m/s (± 0.03 ft/s)
Resolution	0,001 m/s (0.003 ft/s)
Typical Minimum Operating Depth	2 cm (0.8 in)

Combined Level Measurement

Method	Differential pressure transducer
Range	0,00 to 2,00 m (0.00 to 6.56 ft)
Material	Stainless steel diaphragm
Accuracy	±0,25% full scale (incl. non-linearity & hysteresis)
Resolution	1 mm (0.04'')
Max. allowable Level	25 m (82 ft)

General Attributes

Air Intake	Atmospheric pressure reference is desiccant protected
Level sensor	Replaceable module
Water temp.	Embedded sensor to monitor the water temperature
Flow comp.	Flow computation is made inside the sensor.
Configuration	Sensor is configured with FUZION (system config., site config., real time data, spectral analysis, etc.)
Connector (opt.)	8 pin, IP68 (NEMA 6P) corrosion-proof plastic housing with 1/3 bayonet coupling, UV resistant
Smart Vel.	Feature for enhanced accuracy (shallow flow)

Flow Measurement

Method	Conversion from measured velocity to average velocity based on integrated spectral analysis of the velocity distribution in the cross-sectional area. Conversion of water level and pipe size to wetted area. Multiplication of wetted area by average velocity to obtain the flow rate.

Communication
RS-485 communication port with Modbus RTU or Modbus ASCII slave communication protocol.

Outputs (optional)

4-20 mA	1 for flow (Q), validated velocity (vQP) or validated velocity including median filter (vQPMF).

Technical Specifications

Temperature Measurement
Method   Temperature sensor
Range   -40°C to +80°C (-40° to +176°F)

Material & Dimensions
Enclosure   HIGH IMPACT PVC-C
Dimensions   153 mm L, 43 mm W, 22 mm H
                  (6.03'' L, 1.69'' W, 0.87'' H)
Weight   0,26 kg (0.57 lb)(without cable, level sensor
                  and mounting accessories)
Protection rate   IP68 (NEMA 6P)

Environmental Conditions
Operating temperature range   -20°C to +50°C
                                 (-4 to +122°F)
Storage temperature range   -30°C to +60°C
                                 (-22 to +140°F)

Supply Voltage Requirements
5 to 26 VDC (max. 75 mA @ 12 VDC)

Power Consumption   54 mA @ 12 VDC
                         0,65 W @ 12 VDC

Certifications
Sensor   CE

Sensor Cable
Material   Polyurethane jacketed
Length   Standard: 10 m (32.81 ft)
                  Optional: 20 m (65.62 ft), 30 m (98.43 ft)

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