

CSM Correlation Sensor

Ultrasonic sensors for flow measurement

ELECTRONICS

ACOUSTIC

WEIGHT

OVERLOADING
SAFETY SYSTEMS

VALVES

TEMPERATURE

DETECT
A FIRE®**FLOW**

DENSITY

INTERFACE

PRESSURE

LEVEL



Ultrasonic sensors for flow measurement with very high accuracy in slight to heavily polluted media. For installation on channel wall or channel bottom.

Measurements starting at flow levels of 3 cm.

For high-accurate flow measurement by means of ultrasonic cross correlation method:

- Infiltration measurement (extraneous water)
- Influent control
- Billing measurement places
- Discharge constructions
- Precipitation discharge measurements

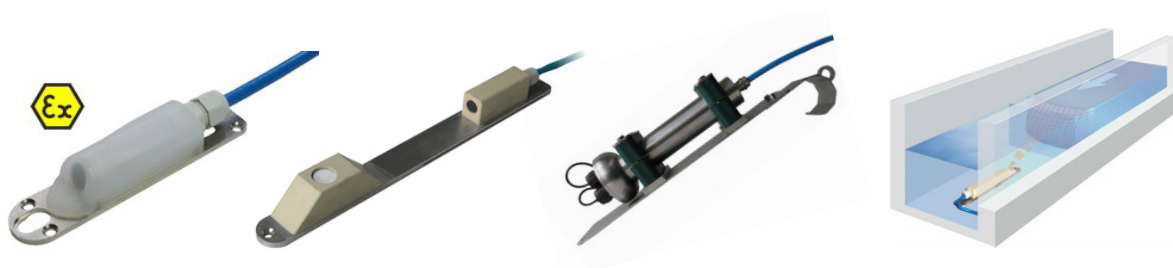
The Mini sensor family provides the best possible sensors to detect lowest flow levels e.g. for infiltration measurement (extraneous water) or indirect discharge measurement.

The sensors use the proven ultrasonic cross correlation method patented by NIVUS. This method allows to detect and to indicate flow profiles starting at flow levels as low as a few centimeters.

Due to their shape the sensors are particularly suitable for small geometries and help to avoid backwater effects, the risk of build-up and clogging.

Typical applications

- Measurement campaigns in channel networks
- Small WWTPs: intake and discharge
- Industrial wastewater networks
- Particularly suitable for channels featuring low flow levels



Technical Specifications

Measurement principle	Correlation with measurement of the real flow profile
Measurement frequency	1MHz
Protection	IP68
Ex approval	II 2G Ex ib IIB T4 Gb (ATEX) / Ex ib IIB T4 Gb (IECEX)
Operating temperature	Wedge sensor without hydrostatic level measurement • 20 °C up to +70 °C for up to 15 min operating time • 20 °C up to +65 °C when used continuously • 40 °C up to +80 °C when used in Ex Zone 1 Wedge sensor without hydrostatic level measurement • 20 °C up to +50 °C • 40 °C up to +80 °C when used in Ex Zone 1
Storage temperature	-30 °C to +70 °C
Operating pressure	max. 4 bar (combi sensor with pressure cell max. 1 bar)
Medium-contacting materials	Polyurethane, stainless steel 1.4571, PPO GF30, PA Pressure compensation element: POM-C, PMMA, PA, stainless steel 1.4571 (CSM-D only)
Flow velocity measurement	
Measurement range	-350 cm/s to +600 cm/s
Max. Measuring span	Δ 700 cm/s
Quantity of scan layers recorded and computed	max. 32
Zero point drift	absolutely stable zero point
Error limits (per scan layer)	• < 1 % of measurement value ($v > 1$ m/s) • < 0.5 % of measurement value +5 mm/s ($v < 1$ m/s)
Beam angle	±5 degrees
Level measurement – Pressure	
Measurement range	0 to 500 cm
Zero point drift	max. 0.75 % of final value (0 – 50 °C)
Measurement uncertainty	≤ 0.5 % of final value
Temperature measurement	
Measurement range	-40 °C to +80 °C
Measurement uncertainty	±0.5 K

Specifications subject to change