

# LCBS

## Ultrasonic Interface Sensor

LIQUID



## OVERVIEW

### Advantages

- **Reliable:** sensor guarantees accurate and continuous measurement of interface level or range
- **Safe:** real-time interface information ensures quick control of valves and actuators
- **Easy:** simple commissioning thanks to predefined calculation models
- **Cost-saving:** automatic wiper cleaning function enables long-term, maintenance-free operation
- **Smart:** all calibration- and sensor-related data saved in the sensor
- **Flexible:** mounting hardware suits all clarifier designs, ensuring optimum adaptation to the measurement task

### Application

- LCBS is a sensor designed for interface measurement in water and wastewater.
- The sensor is particularly suited for use in the following applications:
- Wastewater treatment: primary clarifier, sludge thickener, secondary clarifier
- Water treatment: sedimentation tank after flocculant dosage, sludge height in contact sludge processes
- Static separation processes: with/without slow stirring and without introduction of air



# FUNCTION AND SYSTEM DESIGN

## Measuring principle

A piezoelectric crystal is enclosed in a flat cylindrical plastic housing. When the crystal is excited by an electrical voltage, it generates a sonar signal. This causes ultrasonic waves to be transmitted at a frequency of approx. 650 kHz and at an angle of 6° to scan the separation zones.

The measured variable is the time the transmitted ultrasonic signal needs to reach the solid particles in the separation zone and return to the receiver. The separation zone is computed after the maximum slope and the maximum signal amplitude.

A sensor version featuring a wiper is available to reliably avoid the buildup of deposit on the sensor membrane.

## Sensor monitoring

The acoustic signals are continuously monitored and analyzed for plausibility. If inconsistencies occur, an error message is output via the transmitter.

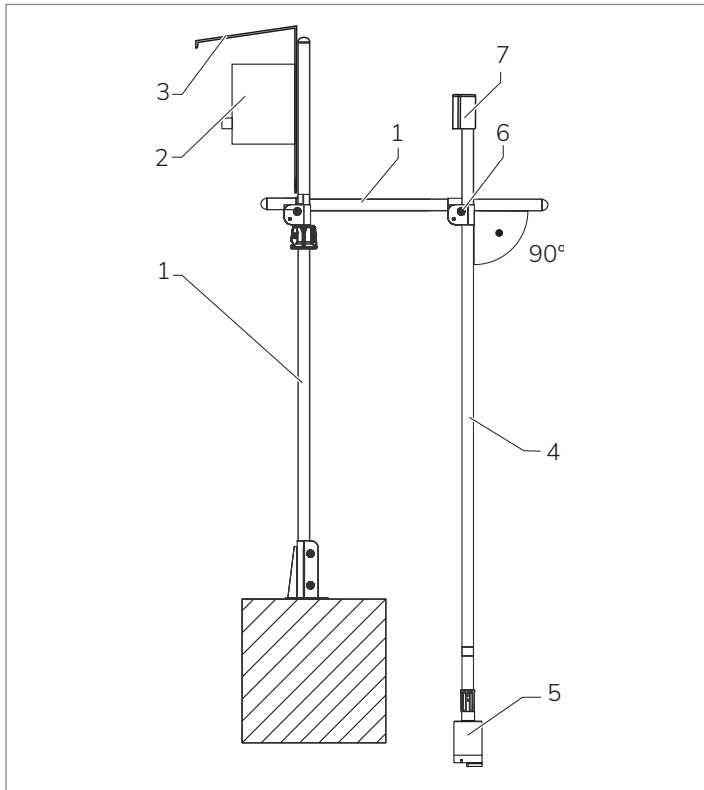
In addition, the following fault conditions are detected by the sensor diagnostics of BMCA:

- Implausibly high or low measured values
- Disturbed regulation due to incorrect measured values

## Measuring system

A complete measuring system comprises:

- Bass LCBS ultrasonic sensor
- BMCA multi-channel transmitter and is optionally delivered with the following accessories:
- A weather protection cover
- A holder
- A fixed or rotatable dip pipe



- 1- Holder
- 2- Liquiline BMCA multi-channel transmitter
- 3- Protective cover
- 4- Assembly
- 5- Bass LULT ultrasonic sensor
- 6- Vertical from all sides
- 7- Splash protection cap

Ultrasonic sensor with basin holder system and multi-channel transmitter

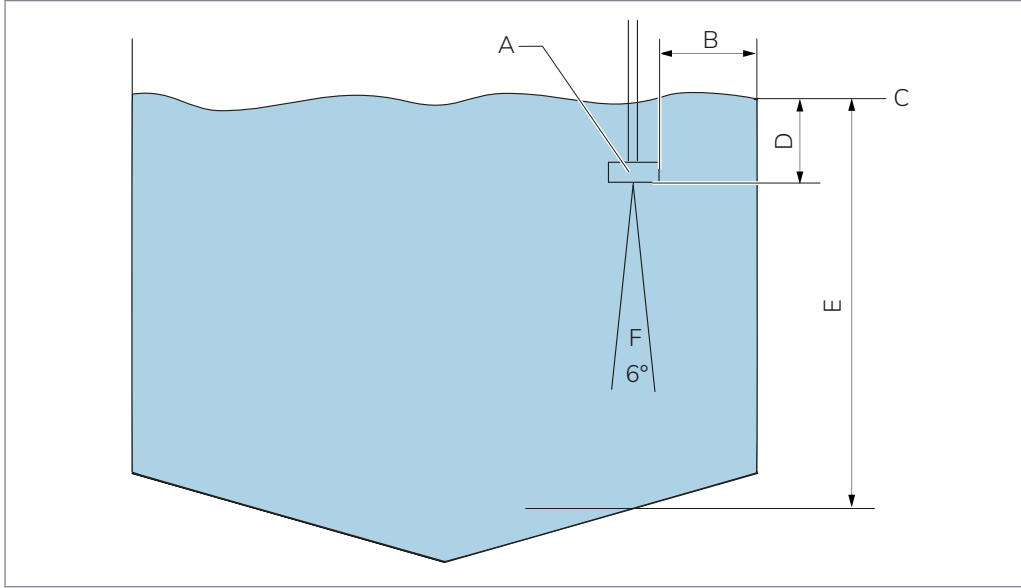


## INPUT

<b>Measured variable</b>	Interface
<b>Measuring range</b>	0.3 to 10 m (1 to 32 ft)
<b>ATEX</b>	II 1G Ex ib IIA T4/T5/T6 Ga

## INSTALLATION

### Installation instructions



Basin configuration

- A- Sensor
- B- 50 cm (1.64 ft) Minimum distance between sensor and basin rim
- C- Fixed reference point, e.g. surface of water, basin rim, bridge/walkway etc.
- D- Sensor offset
- E- Basin depth
- F- Opening angle of ultrasonic cone 6°

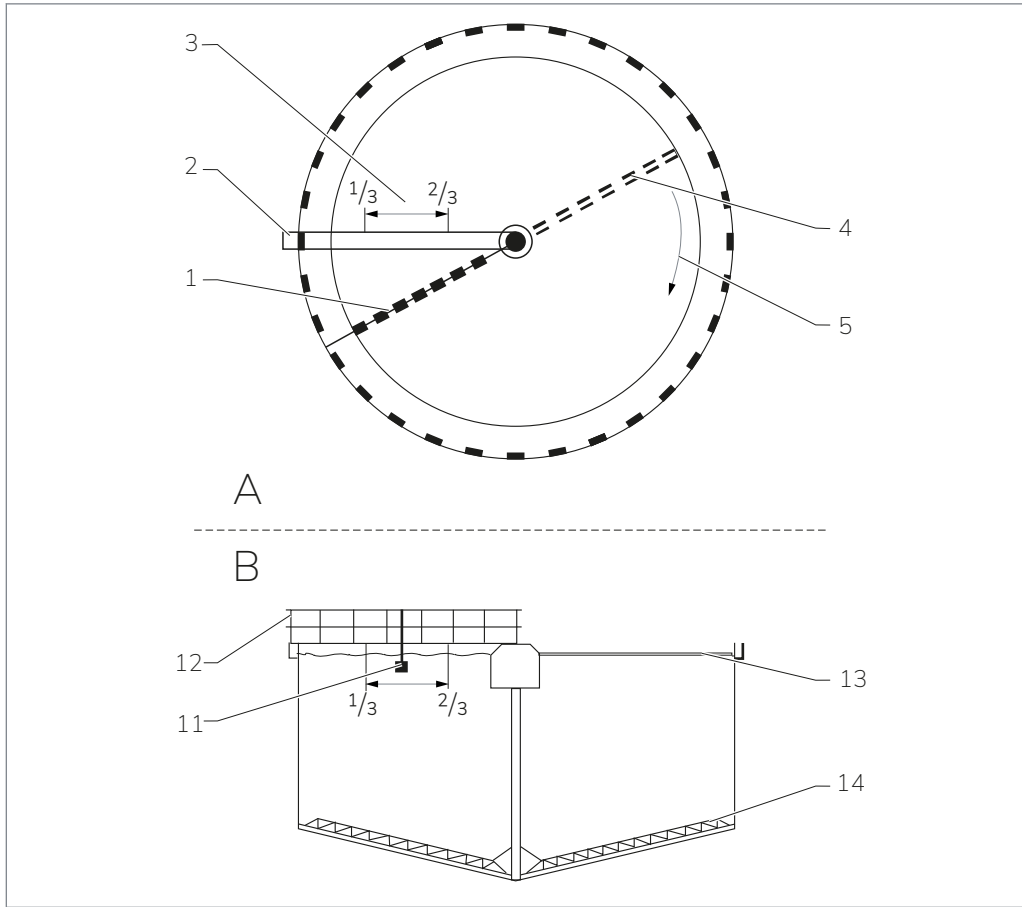
### Installation instructions

Find a suitable installation position for the sensor in the basin. Take the following points into consideration when selecting the installation position:

1. Ensure the distance from the basin rim is at least 50 cm (1.64 ft) (the sensor emits ultrasonic waves in a conical pattern).
  - There should not be any conduits or basin wall protrusions in the measuring range below the sensor. Scraper units that are only temporarily in this area are permitted.
2. Mount the sensor so that it is straight and parallel to the basin wall (measured value offset).
  - Do not install the sensor in zones where air bubbles, turbulence, high concentrations of turbid material and suspended matter, or foam formation occur (e.g. inlet).
3. Using a dip pipe, install the sensor at least 20 cm (0.66 ft) beneath the surface of the water.



## Circular clarifier



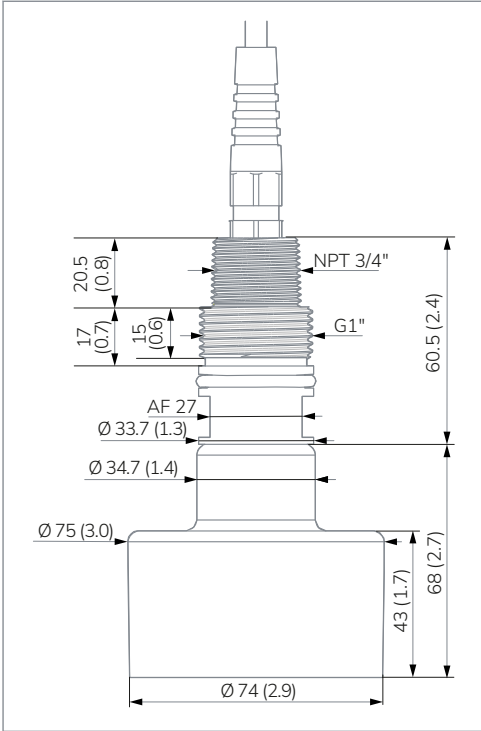
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Basin configuration in circular clarifiers

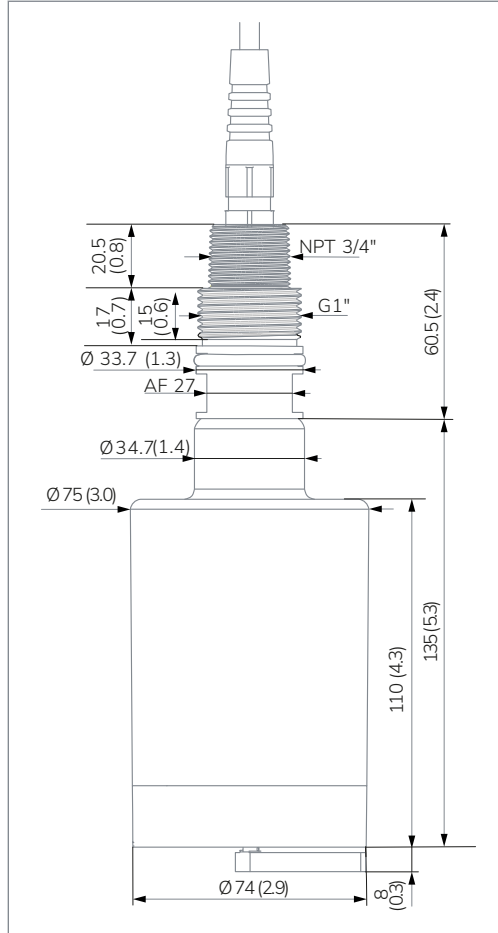
A	View from above	B	Cross-section
1	Surface skimmer	11	Sensor
2	Bridge/walkway	12	Rail
3	Sensor position range	13	Surface skimmer
4	Floor rake	14	Floor rake
5	Direction of rake movement		



# DIMENSION



Dimensions for standard sensor.  
Dimensions: mm (in)



Dimensions for sensor with wiper.  
Dimensions: mm (in)

