

The air bubble detector **SONOCHECK ABD07/xx-1** is used to detect air or gas bubbles in flexible plastic tubes and is intended to prevent air infusions. The sensor has no contact with the liquid and is suitable for applications particularly in medical devices. Designed as a component for fixed installation in machines and equipment it can be mechanically and electrically integrated.

The sensor sensitivity can be adapted to the requirements of individual operating conditions on request.

Technical data

SONOCHECK type ABD07/xx-1 Air Bubble Detector		
Measuring method	Ultrasound	
Bubble sensitivity	Depends on sensor version and tube diameter, adjustment of the bubble sensitivity on request	
Measuring cycle	200 μ s	
Response time, Holding time	Minimum < 1 ms, typical 2 ms On request: Delays or holding times for bubble events	
Operating temperature	+5 °C to +60 °C	
Materials	Transducer and electronics potted in plastic housing	
Version/designs	The sensor version depends on the tube diameter, the hardness of the tube and its wall thickness.	
Requirements for tube	Parameter	Property
	Outer diameter	3.2 to 9.6 mm, according to specification of the sensor
	Wall thickness	Optimum: 10 to 20 % of outer diameter
	Material	Plastic, e.g. PVC, PE, silicone, PUR Other materials on request or after test only
	Special Features	Tube must be smooth on outside, no fabric tube
	Elasticity	Tube must be able to adjust flexibly
	Tube is inserted into sensor in dry condition	
Liquid requirements	Water, blood, solutions or other low-viscosity liquids containing no or few solids	

Mounting	Via 2 recessed holes on rear side of sensor (see technical drawings); self-tapping screws for plastics, Ø 3 mm, screw-in depth: min. 4 mm, max. 6 mm		
	Plane mounting with complete surface required. Maximum torque: 0.6 Nm		
Protection	IP67		
Cleaning	<p>Caution! Incorrect cleaning of the ABD07/xx-1 sensor and its components can present a hazard for the user. Cleaning is prohibited</p> <ul style="list-style-type: none"> • in a steam sterilizer or with hot steam in general • with white spirit or acetone • by immersion in solvents or other liquids 		
Operating voltage	+5 ± 0.2 VDC		
Current consumption	≤ 30 mA		
Connecting cable	4 x single wires; firmly connected to the sensor; length: 50 ± 2 cm		
Inputs and outputs	Color	Connection	
	Red	Operating voltage	
	Yellow	ABD-IN, Bubble test input (5 V logic, TTL) Test of the sensor by simulating a bubble, L-active	
	White	ABD-OUT, Output (5 V logic, TTL)	
	Blue	Ground (GND)	
ABD-OUT	Default configuration		
	Condition	Signal at output ABD-OUT (H/L: TTL output)	LED
	Air/Bubble	H	red
	Liquid	L	green
	Internal error (self-test)	H	---
	Alternative configurations		
	Switching output: the specification of the output levels can be adjusted		
	<ul style="list-style-type: none"> • Serial interface • Pulse-width-modulation, width of pulse depends on bubble size 		

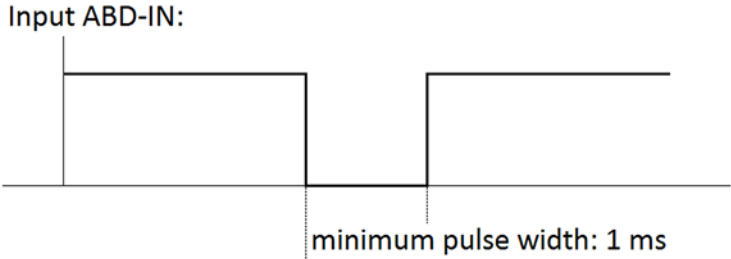
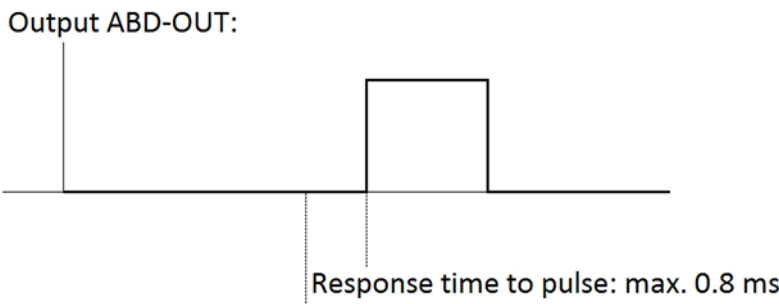
ABD-IN, Bubble test input	<p>The bubble test input triggers the sensor to simulate bubbles.</p> <p>Please note: At high flow rates (flow speed > 500 mm/s) the sensor might miss real bubbles during this period!</p> <p>In default configuration the signal is low active. The minimum pulse width is 1 ms. During this period the transmitted ultrasonic pulses are decreased. This reduced signal is processed by the sensor in the same way as a real bubble would be processed. That means, the sensor does not differentiate between a real bubble and the test, the output ABD-OUT is set to 'Air/Bubble' (H), and the LED is set to red.</p> <p>To ensure, that the sensor is working properly, the machine which controls the sensor should trigger this bubble test periodically. The machine should check, whether the sensor output is set to 'Air/Bubble' as reaction on the input pulse.</p> <p>Input ABD-IN:</p>  <p>Output ABD-OUT:</p>  <p>Timing diagram of bubble test</p>
Directives/standards	<p>The sensors were developed to be tested with respect to the following standards:</p> <ul style="list-style-type: none"> • Safety Requirements: IEC 60601-1:2005 (3rd edition) • EMC: EN 60601-1-2:2007 (3rd edition) • Acoustic Output (Ultrasonic): IEC 61157:2007
Scope of delivery	<ul style="list-style-type: none"> • SONOCHECK air bubble detector, type ABD07/xx-1 • Technical data sheet
Accessories/options	<p>ABD Monitor for configuration and diagnostics, consisting of:</p> <ul style="list-style-type: none"> • USB data converter (Type 007) • USB cable, type A-B, length 1.5 m • CD with ABD Monitor software

Table 1: Technical data for SONOCHECK sensor type ABD07/xx-1

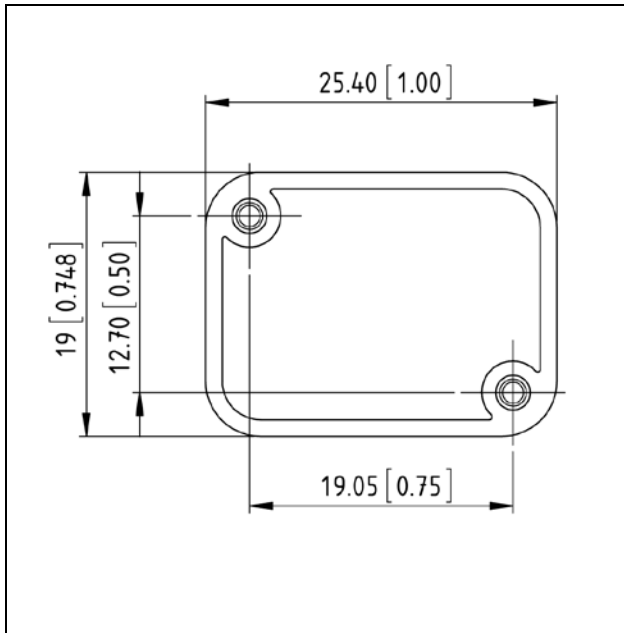
Technical drawings

Fig. 1: Sensor dimensions in mm [inch]
(The drawings are not to scale)

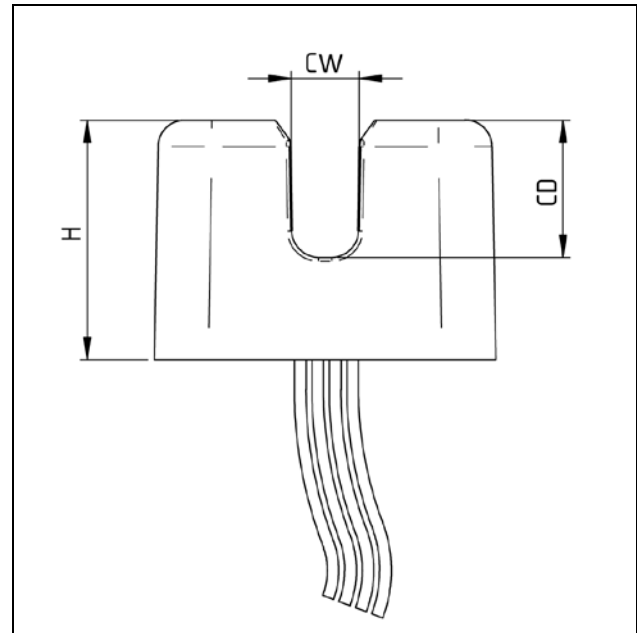


Fig. 2: Channel dimensions and sensor height

Information for ordering

Specification	ABD07/25-1		ABD07/30-1		ABD07/50-1		ABD07/80-1	
	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
Outer diameter of tube	3.2	1/8	4.0	0.157	6.4	1/4	9.6	3/8
CW: Channel width	2.5	0.1	3.2	0.125	5.1	0.2	7.9	0.31
CD: Channel depth	8.25	0.325	8.9	0.35	10.2	0.4	13.3	0.524
H: Sensor height	15.75	0.62	16.5	0.65	17.8	0.7	21	0.827
Order number	200 02 0087		200 02 0088		200 02 0089		200 02 0090	

Table 2: Specifications for SONOCHECK sensor type ABD07/xx-1

HEADQUARTERS GERMANY

SONOTEC
Ultraschallsensorik Halle GmbH
Nauendorfer Str. 2
06112 Halle (Saale), Germany

Tel.: +49 (0)345 / 133 17- 0
sales_eu@sonotec.de
www.sonotec.eu

AMERICAS

SONOTEC US Inc.
190 Blydenburgh rd
Suite 8 2nd floor
Islandia, New York 11749, USA

Phone: +1 631 / 415 4758
sales@sonotecusa.com
www.sonotecusa.com