The air bubble detector **SONOCHECK ABD06** is used to detect air and gas bubbles in tubes made of synthetic material. However, it can also be used as a wet/dry sensor in tubes.

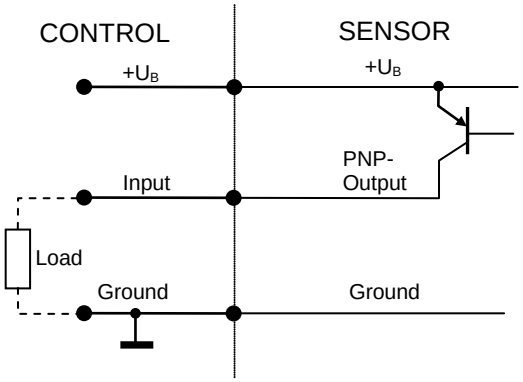
The sensor has no contact with the liquid and is suitable for applications in medical and food technology. But the sensor is also suitable for industrial applications such as the bubble detection at tubes filled with glue or paint.

The air bubble detector is designed as a component for fixed installation in machines.

Technical Data

SONOCHECK, Type ABD06.xx **Air Bubble Detector**		
Measuring method	Ultrasound	
Bubble sensitivity	Bubbles larger than 1/3 of internal tube diameter are detected	
Measuring cycle	200 µs	
Response time	Can be adjusted, minimum < 0.5 ms	
Holding time	Can be set in order to increase the duration of the output signal.	
Operating temperature	+5 °C to +60 °C	
Storage temperature	-20 °C to +70 °C	
Materials	Housing and Cover: Plastics / POM; Measuring cell: Plastics / PMMA; Potting: PUR; (other materials on request)	
Dimensions of tube	**Model**	**Outer diameter**
	The selection of the right sensor depends on the tube properties. If possible, provide us with a tube sample!	
	S	3.0 ... approx. 8.5 mm
	L	8.0 ... approx. 17.0 mm
Requirements for tube	**Parameter**	**Property**
	Material	Plastics, 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

* For industrial applications with high-viscosity liquids (e.g. fats/special paints) screening tests must be made.

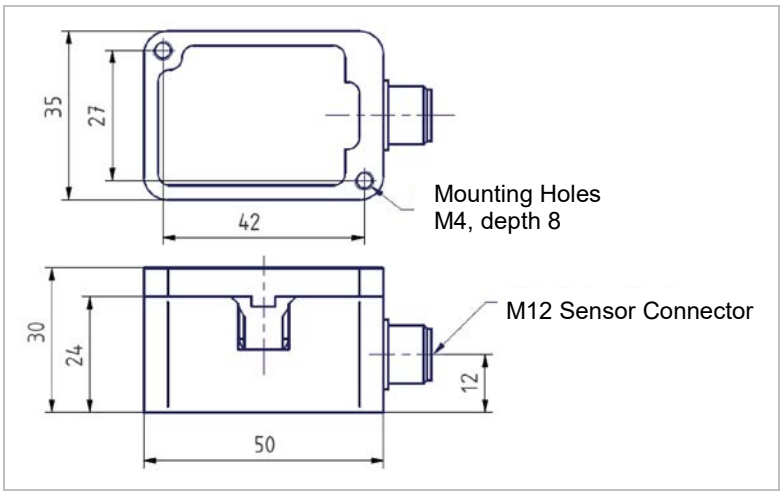
Liquid requirements	Low-viscosity liquids containing no or few solids*	
Mounting	2 x recessed M4 threaded holes on rear of sensor	
	Tube is inserted into sensor dry	
Protection	IP67	
Operating voltage	+12 ... 30 VDC; Ripple max. 10 %; Protection against reverse polarity	
Current consumption	Max. 50 mA (without switching current)	
Connecting cable	M12 sensor cable, 3 poles	
Switching output	PNP, max. switching current 150 mA  *No internal fuse! Pay attention to maximum switching current!*	
Output specification (Default)	**State**	**Level of PNP-Output**
	Air / Bubble	+24 V
	Liquid	Ground
	Internal error (Self-test)	+24 V
	The state of output can be configured according to the application by means of the ABD Monitor.	
Directives/standards	Compliance with DIN EN 61326-1: 2006 EN 61000-4-3 EMC, Radiated radio-frequency - Electromagnetic field immunity, Test Result A, Test with 10 V/m (0.15 ... 1000 MHz) EN 61000-4-4 EMC, Electrical fast transient/burst immunity test, Test Result A (see restrictions below) EN 61000-4-6 EMC, Immunity to conducted disturbances, induced by radio-frequency fields, Test Result A, Test with 10 V/m EN 55011 Electromagnetic disturbance characteristics, Limit 30 dBµV/m *For testing typical settings for bubble detection have been applied. The interference immunity depends on a reasonable configuration. Operating with very high bubble sensitivity combined with a very short response time can cause disturbances of the system, induced by electromagnetic disturbing, pressure changing, mechanical vibration, etc.*	

Functional safety	Reliability, test according to IEC 61508 by using SN 29500 MTTF (mean time to failure): 239 [years] PFD (probability of failure on demand): $5.212*10^{-4}$ *These specifications depend on the ambient conditions as well as on the operating conditions of the sensor. Note, that a proof test interval of T_1 = 1 year is given. The MTTF value corresponds to the MTBF value, because the sensor is a non-repairable device.*
Scope of delivery	Bubble detector type ABD06, Cover with screws, dimensions adjusted to sensor and tube Operating Manual
Accessories	M12 sensor cable, 3 poles, length 2 m / 5 m / 10 m ABD Monitor, consisting of: • USB Data Converter • M12 cable, 5 poles, length 2 m • USB cable, type A-B, length 1.5 m • CD with software ABD Monitor
Options	Snap-in cover, dimensions adjusted to sensor and tube (cannot be retrofitted)

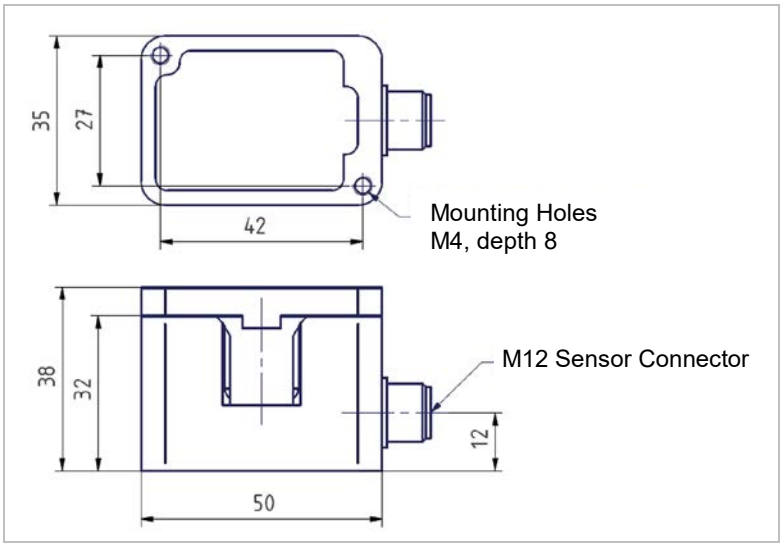
Table 1: Technical data for SONOCHECK sensor type ABD06.xx

Technical Drawings

Model S (outer tube diameter of 3.0 ... approx. 8.5 mm)



Model L (outer tube diameter of 8.0 ... approx. 17 mm)



Information is subject to change without notice!

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