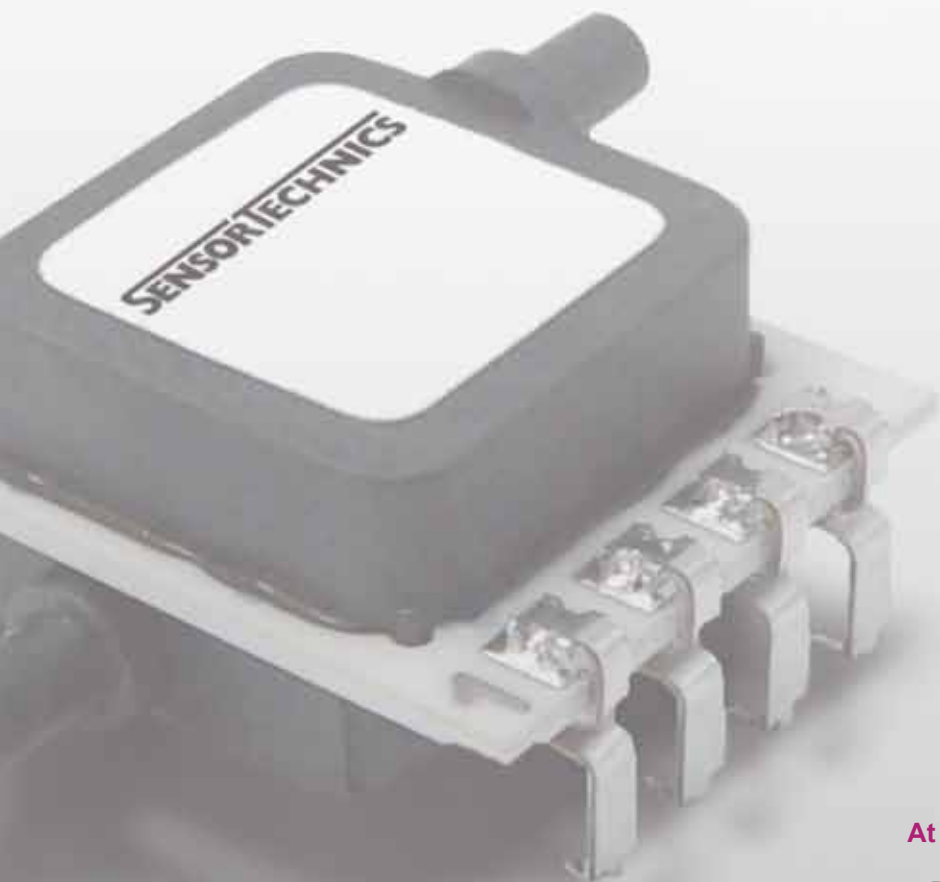


**SENSOR**TECHNICS

Made by  First Sensor



**Products + Services**



#### At a glance

- Decades of experience in developing and manufacturing innovative, high-quality sensor solutions
- Design and manufacture of custom and application specific solutions
- Certified according to ISO 13485:2003 and ISO 9001:2008
- Integration in customers' supply chain management (lot sizes, delivery schedules, kanban, etc.)
- Production, sales, and service locations worldwide
- Long lasting customer relationships with high customer satisfaction levels
- Application areas: medical, industrial, semi-conductors, instrumentation, analytics, HVAC, environmental

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“  
*To enable your systems and industrial equipment to operate efficiently and safely you need reliable and accurate sensors. Our certifications in the medical industry and traceability of individual sensors based on serial numbers, help us demonstrate the high quality standards we keep when designing and manufacturing sensors.*  
 ”

Stefan Klein,  
 Quality Manager

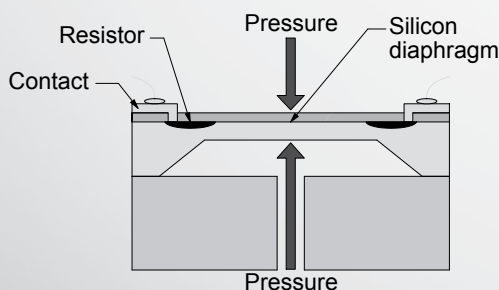
# Pressure sensors

Reliable and highly accurate pressure sensors and transmitters for air, gases, and liquids form the major part of our extensive range of sensors. Whatever you might need, particularly small, particularly accurate or eminently robust and resilient sensors with high media compatibility – we can deliver them.

For many years, we have been one of the leading suppliers of pressure sensors for the broadest range of industrial, measurement, and medical engineering applications. The broad range and high quality of our sensor solutions as well as the diversity of interfaces, process connections, and housing designs are proof of our expertise.

## Air and gases

In our piezoresistive pressure sensors for air and gases four resistors are interconnected to form a measuring bridge on a thin silicon membrane. Minute pressure variations act on the membrane and change the sensor's output signal, which is proportional to pressure. Our piezoresistive sensors cover full scale pressure ranges from 1 mbar to 1,000 bar. Variations featuring unamplified mV outputs, amplified analogue or digital outputs are available. Custom versions supporting self-testing or switching functionality provide for additional safety.



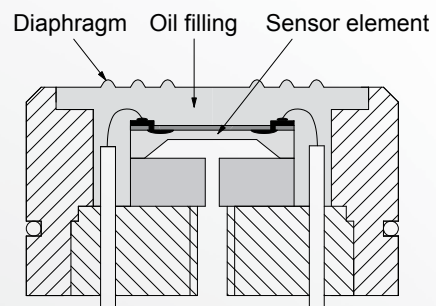
Principle of function  
Pressure sensors for air and gases

## Ultra-low differential pressure sensors

With full scale pressure ranges starting at 25 Pa (0.25 mbar) our LBA/LDE series differential pressure sensors for air and gases open up completely new application areas. These sensors employ an innovative technology based on thermal flow measurement through a micro-flow channel to combine extremely high sensitivity and resolution with high immunity to dust contamination and condensation.

## Liquids



For liquids, Sensortech industrial pressure transmitters are fitted with media compatible ceramic or stainless steel type pressure sensors. The actual sensor elements are always isolated from the process media, ensuring usability and a long life span in corrosive and aggressive media. You can choose from a wide range of threaded fittings, a variety of output signals and standard or custom housings to adapt transmitters to your application requirements.



Principle of function  
Pressure sensors for liquids

## Uncompensated pressure sensors

Cost-effective piezoresistive pressure sensors for air and gases with pressure ranges up to 10 bar. The uncalibrated and uncompensated basic sensors feature analogue mV output signals and almost unlimited resolution. They offer very small housings with pressure ports for tubing or manifold connection and custom pressure ranges.

	HDU	HMU
Pressure ranges	100 mbar to 5 bar 1 to 70 psi	100 mbar to 10 bar 1 to 150 psi
Pressure type	Absolute, gage, differential	Absolute, gage, differential
Output signal	typ. 100 mV (FSO)	typ. 100 mV (FSO)
Thermal effects		
- Offset	typ. $\pm 0,02$ %FSS/°C	typ. $\pm 0,02$ %FSS/°C
- Span	typ. $-0,2$ %FSS/°C	typ. $-0,2$ %FSS/°C
- Bridge impedance	typ. 0,26 %/°C	typ. 0,26 %/°C
Temperature range		
- Operating	-40...85 °C (-40...185 °F)	-40...85 °C (-40...185 °F)
Dimensions without connections (approx.)	12 x 15 x 7 mm (0.47 x 0.59 x 0.28 inch)	10 x 13 x 6 mm (0.39 x 0.51 x 0.24 inch)
Features	<ul style="list-style-type: none"> <li>• Analogue sensor with nearly unlimited resolution</li> <li>• Cost-effective basic pressure sensor</li> </ul>	<ul style="list-style-type: none"> <li>• Analogue sensor with nearly unlimited resolution</li> <li>• Cost-effective basic pressure sensor</li> <li>• Increased media compatibility</li> </ul>
Datasheet download: <a href="http://www.sensortektechnics.com">www.sensortektechnics.com</a>	/hdu	/hmu
Housing options (other housings available)		

## Temperature compensated pressure sensors

Highly accurate piezoresistive pressure sensors for air and gases with full scale pressure ranges from 5 mbar. The sensors feature calibrated and temperature compensated analogue mV output signals and almost unlimited resolution. They are available in many different housing options and with custom pressure ranges.

	HCL	HDO	HRO
Pressure ranges	5 to 75 mbar (2 to 30 inH <sub>2</sub> O)	10 mbar to 5 bar (4 inH <sub>2</sub> O to 70 psi)	10 mbar to 10 bar 4 inH <sub>2</sub> O to 150 psi
Pressure type	Gage, differential	Absolute, gage, differential	Gage, differential
Output signal	typ. 20 mV (FSO)	typ. 90 mV (FSO)	typ. 90 mV (FSO)
Accuracy (non-linearity and hysteresis)	typ. ±0.05 %FSO	typ. ±0.1 %FSO (P-grade) typ. ±0.2 %FSO (H-grade)	typ. ±0.25 %FSS
Temperature range			
- Compensated	0...70 °C (32...158 °F)	0...50 °C (32...122 °F)	0...70 °C (32...158 °F)
- Operating	-25...85 °C (-13...185 °F)	-40...85 °C (-40...185 °F)	-25...85 °C (-13...185 °F)
Dimensions without connections (approx.)	13 x 16 x 7 mm (0.51 x 0.63 x 0.28 inch)	12 x 15 x 7 mm (0.47 x 0.59 x 0.28 inch)	29 x 18 x 11 mm (1.14 x 0.71 x 0.43 inch)
Features	<ul style="list-style-type: none"> <li>• Analogue sensor with nearly unlimited resolution</li> <li>• For very low pressures</li> <li>• Excellent offset stability</li> <li>• Virtually no position sensitivity</li> </ul>	<ul style="list-style-type: none"> <li>• Analogue sensor with nearly unlimited resolution</li> <li>• Different accuracy classes available</li> </ul>	<ul style="list-style-type: none"> <li>• Analogue sensor with nearly unlimited resolution</li> <li>• Different accuracy classes available</li> </ul>
Datasheet download: www.sensorteknics.com	/hcl	/hdo	/hro
Housing options (other housings available)			

## Pressure sensors with integrated signal conditioning



Digital piezoresistive miniature pressure sensors with amplified output signals for air and gases with full scale pressure ranges from 2.5 mbar, a broad range of housing options and custom pressure ranges. High resolution digital signal conditioning provides for a very high level of overall accuracy within large operating temperature ranges.

	HCLA	HCE	HDI
Pressure ranges	2.5 to 75 mbar (1 to 30 inH <sub>2</sub> O)	10 mbar to 5 bar (4 inH <sub>2</sub> O to 70 psi) & barometric pressure ranges	10 mbar to 5 bar (4 inH <sub>2</sub> O to 70 psi) & barometric pressure ranges
Pressure type	Gage, differential	Absolute, gage, differential	Absolute, gage, differential
Output signal	0.25...4.25 V, I <sup>2</sup> C bus	0.25...4.25 V, SPI bus	0.5...4.5 V, I <sup>2</sup> C bus
Accuracy - Non-linearity - Total accuracy incl. temperature effects (0...85° C, 32... 185 °F)	typ. ±0.05 %FSS	typ. ±0.1 %FSS max. ±0.5 %FSS	typ. ±0.1 %FSS max. ±0.5 %FSS (P-grade) max. ±1.5 %FSS (H-grade)
Operating temperature range	-25...85 °C (-13...185 °F)	-25...85°C (-13...185 °F)	-20...85 °C (-4...185 °F)
Dimensions without connections (approx.)	13 x 16 x 7 mm (0.51 x 0.63 x 0.28 inch)	13 x 16 x 7 mm (0.51 x 0.63 x 0.28 inch)	12 x 15 x 7 mm (0.47 x 0.59 x 0.28 inch)
Features	<ul style="list-style-type: none"> <li>• Digital signal conditioning</li> <li>• For very low pressures</li> <li>• Excellent offset stability and virtually no position sensitivity</li> <li>• I<sup>2</sup>C bus interface and analogue output at the same time</li> </ul>	<ul style="list-style-type: none"> <li>• Digital signal conditioning</li> <li>• Very high total accuracy</li> <li>• SPI bus interface and analogue output at the same time</li> </ul>	<ul style="list-style-type: none"> <li>• Digital signal conditioning</li> <li>• Very high total accuracy</li> <li>• I<sup>2</sup>C bus interface and analogue output at the same time</li> <li>• Different accuracy classes available</li> </ul>
Datasheet download: www.sensortektechnics.com	/hcla	/hce	/hdi
Housing options (other housings available)			



## Pressure sensors based on flow measurement

Ultra-low differential pressure sensors for air and gases based on thermal flow measurement through a micro-flow channel integrated within the sensor chip. The extremely low flow through the sensor ensures high immunity to dust contamination and condensation. The sensors feature high sensitivity and offset stability.

	LBA	LDE
Pressure ranges	25 to 500 Pa (0.1 to 2 inH <sub>2</sub> O)	25 to 500 Pa (0.1 to 2 inH <sub>2</sub> O)
Pressure type	Gage, differential	Gage, differential
Output signal	0.5...4.5 V	0.5...4.5 V, SPI bus
Offset stability	typ. 0.3 % p.a.	max. 0.1 % p.a. (from 50 Pa)
Total accuracy incl. temperature effects (5...55 °C, 41...131 °F)	max. ±(1.5 % of reading +1.5 %FSS) (for 250 Pa and 500 Pa)	max. ±(1.5 % of reading +1.5 %FSS) (for all pressure ranges)
Dimensions without connections (approx.)	13 x 18 x 8 mm (0.51 x 0.71 x 0.32 inch)	13 x 18 x 8 mm (0.51 x 0.71 x 0.32 inch)
Features	<ul style="list-style-type: none"> <li>• Unmatched sensitivity and resolution</li> <li>• Analogue signal conditioning</li> <li>• Micro-flow channel integrated within sensor chip</li> <li>• High immunity to dust, humidity and long tubing</li> <li>• Miniature housing</li> </ul>	<ul style="list-style-type: none"> <li>• Unmatched offset stability, linearity, sensitivity and resolution</li> <li>• Digital signal conditioning with SPI bus interface and analogue output at the same time</li> <li>• Micro-flow channel integrated within sensor chip</li> <li>• High immunity to dust, humidity and long tubing</li> <li>• Miniature housing</li> </ul>
Datasheet download: <a href="http://www.sensortektechnics.com">www.sensortektechnics.com</a>	/lba	/lde
Housing		




## Pressure sensors with increased media compatibility

Miniature pressure sensors with digital signal conditioning and pressure ranges up to 10 bar. Increased media compatibility for gases and liquids. Very small housings with a selection of pressure ports for tubing connection or manifold mounting. Custom pressure ranges and modifications are available.

	HMA	HMI	HME
Pressure ranges	100 mbar to 10 bar 1 to 150 psi	100 mbar to 10 bar 1 to 150 psi	100 mbar to 10 bar 1 to 150 psi
Pressure type	Gage, differential	Gage, differential	Gage, differential
Output signal	0.5...4.5 V, 0.3...2.7 V	I <sup>2</sup> C bus	SPI bus
Accuracy - Non-linearity - Total accuracy incl. temperature effects	max. ±0.25 %FSS max. ±1.5 %FSS	max. ±0.25 %FSS max. ±1.5 %FSS	max. ±0.25 %FSS max. ±1.5 %FSS
Compensated temperature range	-20...85 °C (-4...185 °F)	-20...85 °C (-4...185 °F)	-20...85 °C (-4...185 °F)
Dimensions without connections (approx.)	10 x 13 x 6 mm (0.39 x 0.51 x 0.24 inch)	10 x 13 x 6 mm (0.39 x 0.51 x 0.24 inch)	10 x 13 x 6 mm (0.39 x 0.51 x 0.24 inch)
Features	<ul style="list-style-type: none"> <li>• Increased media compatibility for gases and liquids</li> <li>• Digital signal conditioning</li> <li>• Analogue output signal</li> <li>• Very small housings</li> </ul>	<ul style="list-style-type: none"> <li>• Increased media compatibility for gases and liquids</li> <li>• Digital signal conditioning</li> <li>• I<sup>2</sup>C bus interface</li> <li>• Very small housings</li> </ul>	<ul style="list-style-type: none"> <li>• Increased media compatibility for gases and liquids</li> <li>• Digital signal conditioning</li> <li>• SPI bus interface</li> <li>• Very small housings</li> </ul>
Datasheet download: <a href="http://www.sensortektechnics.com">www.sensortektechnics.com</a>	/hma	/hmi	/hme
Housing options (other housings available)			



## Pressure sensors for corrosive liquids and gases

Pressure sensors suitable even for corrosive liquids and gases. Small housings for space-saving integration into demanding OEM applications. These sensors stand out through their excellent price/performance ratio as well as very good stability and repeatability. Customised options are available.

	SSO	SSI	KMA
Pressure ranges	200 mbar to 35 bar (3 to 500 psi)	200 mbar to 35 bar 3 to 500 psi	500 mbar to 100 bar (7 to 1500 psi)
Pressure type	Absolute, gage	Absolute, gage	Gage
Output signal	typ. 100 mV (FSO)	0.5...4.5 V, I <sup>2</sup> C bus	0.5...4.5 V
Accuracy - Non-linearity - Total accuracy incl. temperature effects	typ. ±0.1 %FSS	typ. ±0.1 %FSS max. ±1.5 %FSS (-20...85 °C, -4... 185 °F)	max. ±0.4 %FSO
Temperature range - Compensated - Operating	0...50 °C (32...122 °F) -40...125 °C (-40...257 °F)	-20...85 °C (-4...185 °F) -40...120 °C (-40...248 °F)	0...85 °C (32...185 °F) -20...85 °C (-4...185 °F)
Dimensions without connections (approx.)	Ø 19 mm (Ø 0.75 inch)	Ø 19 mm (Ø 0.75 inch)	Ø 22 x 27 mm (Ø 0.87 x 1.06 inch)
Features	<ul style="list-style-type: none"> <li>• High media compatibility</li> <li>• Fully welded stainless steel construction</li> </ul>	<ul style="list-style-type: none"> <li>• High media compatibility</li> <li>• Fully welded stainless steel construction</li> <li>• Very high total accuracy</li> <li>• I<sup>2</sup>C bus interface and analogue output at the same time</li> </ul>	<ul style="list-style-type: none"> <li>• High media compatibility</li> <li>• Ceramic pressure sensor element in stainless steel housing</li> <li>• Digital signal conditioning</li> </ul>
Datasheet download: www.sensorteknics.com	/sso	/ssi	/kma
Housing options			

## Low pressure transmitters

Pressure transmitters with amplified output signals for air and gases with full scale pressure ranges from 1 mbar. Options include a broad range of pressure and electrical connections as well as fast and flexible customisation to specific requirements.

	CTE7000	BTE5000
Pressure ranges	10 mbar to 7 bar 0.15 to 100 psi	1 mbar to 10 bar 1 inH <sub>2</sub> O to 150 psi
Pressure type	Absolute, gage	Gage, differential
Output signal	0...5 V, 0...10 V, 0.5...4.5 V, 4...20 mA	1...6 V, 4...20 mA
Accuracy (non-linearity and hysteresis)	typ. ±0.2 %FSO	typ. ±0.1 %FSO
Temperature range		
- Compensated	0...50 °C (32...122 °F)	0...70 °C (32...158 °F)
- Operating	-40...85 °C (-40...185 °F)	-40...85 °C (-40...185 °F)
Dimensions without connections (approx.)	Ø 22 x 52 mm (Ø 0.87 x 2.05 inch)	Ø 40 x 72 mm (Ø 1.58 x 2.84 inch)
Features	<ul style="list-style-type: none"> <li>• Rugged stainless steel housing</li> <li>• Small size</li> </ul>	<ul style="list-style-type: none"> <li>• Two pressure ports for differential pressure measurement (e.g. for volumetric flow measurement, filter control etc.)</li> <li>• Rugged aluminium housing</li> </ul>
Datasheet download: <a href="http://www.sensorteknics.com">www.sensorteknics.com</a>	/cte7000	/bte5000
Housing		



## Pressure transmitters for corrosive liquids and gases

Pressure transmitters with amplified output signals even for corrosive liquids and gases. These transmitters use ceramic or stainless steel pressure sensor elements to ensure high media compatibility. The transmitters are available with a choice of different pressure and electrical connections and as custom versions.

	<b>CTE8000</b>	<b>CTE9000</b>	<b>KTE6000</b>
Pressure ranges	250 mbar to 100 bar 5 to 1500 psi	100 mbar to 35 bar 1.5 to 500 psi	250 mbar to 400 bar 5 to 6000 psi
Pressure type	Absolute, gage	Absolute, gage	Absolute, gage
Output signal	0...5 V, 0...10 V, 0.5...4.5 V, 1...6 V, 4...20 mA	0...5 V, 0...10 V, 0.5...4.5 V, 1...6 V, 4...20 mA	0...5 V, 0...10 V, 0.5...4.5 V, 1...6 V, 4...20 mA
Accuracy (non-linearity and hysteresis)	typ. $\pm 0.1$ %FSO	typ. $\pm 0.2$ %FSO	typ. $\pm 0.1$ %FSO
Temperature range			
- Compensated	0...70 °C (32...158 °F)	0...50 °C (32...122 °F)	0...70 °C (32...158 °F)
- Operating	-25...85 °C (-13...185 °F)	-40...85 °C (-40...185 °F)	-25...85 °C (-13...185 °F)
Dimensions without connections (approx.)	Ø 22 x 52 mm (Ø 0.87 x 2.05 inch)	Ø 22 x 65 mm (Ø 0.87 x 2.56 inch)	Ø 27 x 68 mm (Ø 1.06 x 2.68 inch)
Features	<ul style="list-style-type: none"> <li>• High media compatibility</li> <li>• Ceramic pressure sensor element</li> <li>• Small size</li> </ul>	<ul style="list-style-type: none"> <li>• High media compatibility</li> <li>• Fully welded stainless steel pressure sensor element, without sealing</li> </ul>	<ul style="list-style-type: none"> <li>• High media compatibility</li> <li>• Ceramic pressure sensor element</li> <li>• Flush mount versions</li> <li>• Rugged stainless steel housing</li> </ul>
Datasheet download: <a href="http://www.sensorteknics.com">www.sensorteknics.com</a>	/cte8000	/cte9000	/kte6000
Housing options			



“  
Our innovative level sensors using a capacitive measuring method have set a new standard in the industry. More and more of our customers are discovering the potentials of these contact-free, highly sensitive sensors. Our engineers and product managers support you with in-depth, practical advice. These sensors not only form a new technological standard, but are inexpensive as well.  
”

Dr. Adriano Pittarelli,  
Product Manager

# Level sensors

We cover not only all standard applications with a comprehensive offering of hydrostatic and optical sensors – continuous or point level measurement – but will also customise our sensors' housings and interfaces to meet your special requirements. Our latest sensor innovations using capacitive measuring technology set new level control standards.

Fluid level control sounds quite easy but can turn into a demanding sensor application problem if movement, foaming, or media and container issues come into play.

## The classics: hydrostatic and optical

For this reason, we offer a broad range of both classic submersible level sensors using hydrostatic pressure measurement and optical level switches. While you work on the details of your optimal solution, it will be a pleasure for our sales and development engineers to serve you as trusted and experienced advisors and fill you in on the many types of housings and interfaces.

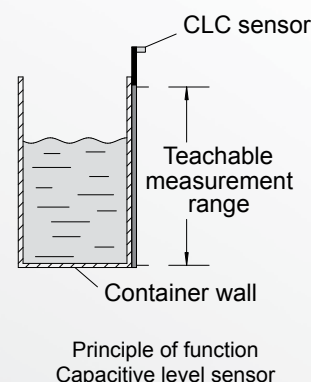
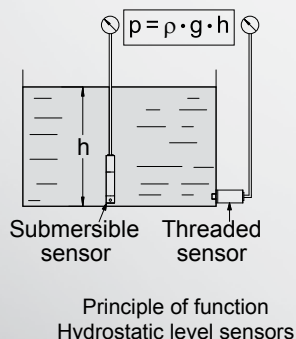
## Highly flexible: capacitive sensors

Our latest sensor generation for measuring low levels continuously and contact-free is based on a new sensor technology. These innovative sensors use an electrode that forms a capacitance across the respective surrounding medium. Capacitive sensors

have a great advantage: flexibility of use. Liquids and bulk materials can be measured, continuous or point level measurements can be made and the measurement is performed from the outside, through non-metallic container walls. The electrode is simply attached to the outer side of the wall. Our capacitive sensors can very easily be calibrated to smallest amounts and level control within a few millimetres. Foams can be ignored and even two-phase mixtures – water and oil, for instance – can be detected reliably. What about disturbances caused by temperature and condensation? These are compensated with the help of a reference electrode.

## Many economic benefits

Capacitive sensors are small, inexpensive and measure contact-free. Talk to us about these innovative level sensors and about how we can assist you technically and commercially with your design.



## Hydrostatic liquid level sensors


Submersible hydrostatic level sensors with amplified output signals. These transmitters use ceramic or stainless steel pressure sensor elements to ensure high media compatibility. Fast and flexible modifications based on custom specific requirements are available for all hydrostatic liquid level sensors.

	CTE8000...CS	CTE9000...CS	KTE8000...CS
Pressure / level ranges	from 250 mbar from 2.5 mH <sub>2</sub> O from 5 psi (from 12 ftH <sub>2</sub> O)	from 100 mbar from 1 mH <sub>2</sub> O from 1.5 psi (from 3.5 ftH <sub>2</sub> O)	from 250 mbar from 2.5 mH <sub>2</sub> O from 5 psi (from 12 ftH <sub>2</sub> O)
Pressure type	Gage	Gage	Gage
Output signal	0...10 V, 4...20 mA	0...10 V, 4...20 mA	0...10 V, 4...20 mA
Accuracy (non-linearity and hysteresis)	typ. ±0.1 %FSO	typ. ±0.2 %FSO	typ. ±0.1 %FSO
Temperature range			
- Compensated	0...70 °C (32...158 °F)	0...50 °C (32...122 °F)	0...70 °C (32...158 °F)
- Operating	-10...70 °C (14...158 °F)	-10...70 °C (14...158 °F)	-10...70 °C (14...158 °F)
Dimensions (approx.)	Ø 22 x 130 mm (Ø 0.87 x 5.12 inch)	Ø 22 x 130 mm (Ø 0.87 x 5.12 inch)	Ø 24 x 123 mm (Ø 0.95 x 4.84 inch)
Features	<ul style="list-style-type: none"> <li>• High media compatibility</li> <li>• Ceramic pressure sensor element</li> <li>• Small outside diameter</li> </ul>	<ul style="list-style-type: none"> <li>• High media compatibility</li> <li>• Fully welded stainless steel pressure sensor element</li> <li>• Small outside diameter</li> </ul>	<ul style="list-style-type: none"> <li>• High media compatibility</li> <li>• Ceramic pressure sensor element</li> <li>• Chemically resistant PPS plastic housing especially suited for salty, spring and waste waters etc.</li> </ul>
Datasheet download: www.sensorteknics.com	/cte8000cs	/cte9000cs	/kte8000cs
Housing			




## Capacitive level sensors

Continuous contact-free level sensors based on a new capacitive sensor technology. High flexibility to measure desired levels and media, also including application set-up by two-point calibration.

	CLC
	Ranges 0...100 mm (0...4 inch)
Output signal	0.5...4.5 V, 1-wire
Resolution	typ. 6 bit
Temperature range	
- Compensated	±20 °C (±36 °F) (relative to calibration temperature)
- Operating	-20...85 °C (-4...185 °F)
Dimensions without connections (approx.)	125 x 25 x 3 mm (4.92 x 0.98 x 0.12 inch)
Features	<ul style="list-style-type: none"> <li>• Continuous level sensing</li> <li>• Contact-free and sterile use</li> <li>• Easy installation</li> <li>• Small size</li> <li>• For liquids and bulk materials</li> </ul>
Datasheet download: <a href="http://www.sensorteknics.com">www.sensorteknics.com</a>	/clc
Housing	

## Level switches

Level switches based on capacitive or optical measurements. Both technologies operate reliably and accurately without any moving parts.

CLW (capacitive)	OLP, OLT, OLM (optical)
Hysteresis <25 mm (<1 inch)	In the area of optical level switches for liquid media, we offer models with microprocessor compatible TTL signals as well as high performance products with transistor outputs. They are available in miniature Polysulfone or TROGAMID® plastic housings or in stainless steel housings.
low = 0 V, high = 5 V (switching output)	
-	
Temperature range	
±20 °C (±36 °F) (relative to calibration temperature)	
-20...85 °C (-4...185 °F)	
Dimensions without connections (approx.)	
30 x 25 x 3 mm (1.18 x 0.98 x 0.12 inch)	
Features	<ul style="list-style-type: none"> <li>• Maximum accuracy and reliability</li> <li>• Excellent media compatibility</li> <li>• Very small form factors, easy installable</li> <li>• Many housing options</li> </ul>
• Point level sensing, two switch points	
• Adjustable hysteresis up to 25 mm (1 inch)	
• Contact-free and sterile use	
• Easy installation	
• Small size	
• For liquids and bulk materials	
Datasheet download: <a href="http://www.sensorteknics.com">www.sensorteknics.com</a>	/clw
Housing	





“  
Our broad range of sensors for flow measurement offer perfect solutions for unusual and especially demanding problems – whatever they may be, specific flow ranges, highest resolutions or custom housing requirements.  
”

Markus Schwan,  
Director R&D

# Flow sensors

We rank developing and manufacturing state-of-the-art mass and volumetric flow sensors among our core competencies. Be it in medical devices or for industrial applications – we provide highly accurate and reliable flow sensors even for particularly small volumes and masses.

Depending on the application – mass flow or volumetric flow measurement – the broad range of sensors from our company use different measurement principles, each of them highly accurate.

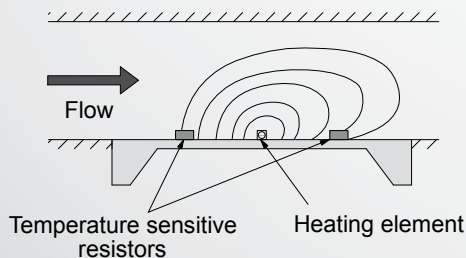
## Thermal mass flow measurement

Our mass flow sensors use a thermal measurement method to enable extremely good response characteristics and accurate measurement even of low flows. For this purpose, the sensors contain a heating element placed between temperature sensitive resistors. If a mass flow shifts the temperature profile within the medium, a voltage signal proportional to the flow is generated as a result of the temperature difference between the resistors. The output is transmitted via a large variety of electrical interfaces. This measurement principle proves superior to

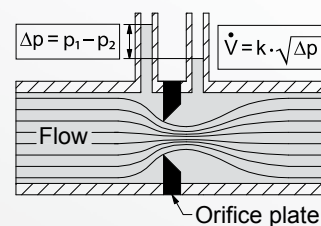
other methods for many applications. Specifically, it also allows bidirectional measurements and short response times for flow changes.

## Sensors for volumetric flow measurement

Sensortech's differential pressure sensors lend themselves to measure volume flows of gases using the differential pressure method. This is done by constricting the cross section of a flow line, using a baffle or a nozzle, for instance. When the flow speed is raised, the static pressure drops. The differential pressure  $\Delta p$ , which is a measure for the volumetric flow, can be measured by a low differential pressure sensor. This is another area where we are noted for our robust and extremely accurate sensors, with full scale pressure ranges starting at  $\pm 25$  Pa ( $\pm 0.25$  mbar).




Principle of function  
Mass flow sensors



Principle of function  
Volumetric flow measurement

## Thermal mass flow sensors

Mass flow sensors for air and gases based on a highly sensitive thermal measuring principle. Due to stable MEMS silicon chip technology the sensors feature fast response times and low power consumption.

	<b>WBA, WBI</b>	<b>WTA, WTR</b>
Flow ranges	200 sccm to 1 slpm	1 to 50 slpm
Output signal	1...5 V (WBA), I <sup>2</sup> C bus (WBI)	0.5...4.5 V (WTA), RS-485 (WTR)
Accuracy (repeatability and hysteresis)	max. ±0,25 % of reading	max. ±0,25 % of reading
Temperature range		
- Compensated	-25...85 °C (-13...185 °F) (WBA) 0...50 °C (32...122 °F) (WBI)	0...50 °C (32...122 °F)
- Operating	-25...85 °C (-13...185 °F)	-25...85 °C (-13...185 °F)
Dimensions without connections (approx.)	31 x 32 x 16 mm (1.22 x 1.26 x 0.63 inch)	70 x 34 x 20 mm (2.76 x 1.34 x 0.79 inch)
Features	<ul style="list-style-type: none"> <li>• Fast response time</li> <li>• High sensitivity</li> <li>• Bidirectional flow sensing</li> <li>• Low power consumption</li> </ul>	<ul style="list-style-type: none"> <li>• Fast response time</li> <li>• High sensitivity</li> <li>• Low power consumption</li> </ul>
Datasheet download: www.sensortechcnics.com	/wba /wbi	/wta /wtr
Housing		

## Sensors for volumetric flow measurement

Differential pressure sensors and robust differential pressure transmitters for volumetric flow measurement.

For a large choice of suitable products please refer to the pressure sensor section, e. g., HCL, HCLA, LBA/ LDE and BTE5000 series.



## Custom flow sensor examples

### Poured out perfectly

Swedish  
Bar Systems



**Volumetric flow sensor  
for an inventory control system  
in catering**

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### A highly accurate life saver



**Highly accurate flow sensor  
for controlling  
respiratory equipment**

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### Extra requirement: sterilisable



**Sterilisable  
flow sensor**



Technical equipment and systems combine more and more functionality in smaller and smaller space. In many cases, standard components cannot live up to this. As your strategic partner, we not only develop custom sensor solutions but also support you across the entire life cycle of the product – from specification on to design, prototyping, volume production, maintenance, spare parts delivery, and next product generation.

Dr. Jochen Müller,  
Technical Director

# Custom sensors

As large as the diversity of standard sensors may be, many customers still need custom solutions. And this is exactly where we score for you. Working closely with you, we design and manufacture custom sensor solutions, which incorporate complex and multifunctional capabilities in many cases. Discover us as your professional project partner.

For many years, our sensor technology, development, and manufacturing know-how has been helping us to establish strategic partnerships with many customers, contributing significantly to the market success of many products.

Many of these projects and partnerships start off with customising mechanical and electrical interfaces, housing shapes, or the like. This is where our teams first show flexibility – often at no additional cost.

And in the process, too:

## The customer reigns supreme

In our development projects for custom solutions, we will adapt to your wishes in every way: What are the particular technical specifications and commercial constraints? Should our development teams only design the sensor core? Or are they responsible for integrating multi-sensor modules into complete systems including evaluation unit, transmission protocol, and actuators as well? Who accounts for tests, documentation, and design optimisation for manufacturing?

In many strategic partnerships, our experts will assume responsibility for the entire life cycle of your custom solution. Once the development project is completed, we synchronise production lots, product support, and services with your needs.

## It's economic

Here is a tip: You might want to speak to our development and sales engineers before investing time and effort to adapt your solution's specifications, design, and functionality to existing standard sensors. Our laboratories and state-of-the-art production facilities enable us to develop and manufacture custom solutions cost-effectively even in small quantities.

Experience shows that it pays. Significantly shorter development times, lower integration and quality assurance costs and – not least – greater market success of your products and your organisation will all pay back costs of individual sensor solutions several times.



# Custom sensors

We provide you with tailor-made solutions, sensors, and systems, designed and manufactured to meet your requirements. This extends from modifying a standard product to developing a specific solution from start to finish comprising multiple components such as sensors, valves, pumps, and microcontrollers. In brief: Simply tell us what you need.

## Small modification, great benefit



### Example: Pressure transmitter tailored to your needs

We optimise standard sensors according to your requirements – for example, in calibration or with new pressure connector variations and electrical connections. You can use this to realise significant competitive advantages: Our team delivers precise sensor customisation, shortening the design phase of your own products while cutting down on your design and construction costs.

	Standard product CTE9001GY4	Custom pressure transmitter
Pressure range	0...1 bar gage	0...35 ft H <sub>2</sub> O gage
Pressure connector	G1/8	Quick-fit pressure fitting
Electric connection	M12 x 1 Hirschmann plug	Shielded cable



## Ensuring your sustainable competitive edge: Examples of custom developments

### The Swiss army knife of pressure sensors



Custom pressure transmitter  
with four calibrated pressure ranges

**The challenge:** A robust sensor system was needed for an automotive diagnostic unit that could be used for multiple measuring tasks in a flexible way, to measure air, oil, fuel, and cooling fluid pressures, and at the same time was suitable for rough shop floor environments.

**The solution:** A newly developed sensor that can be connected to the various applications using a quick-fit pressure fitting, so enabling service staff to handle it in an easy and user-friendly way. Four calibrated partial pressure ranges were defined within a standard pressure range of -15...500 psi to be selected separately depending on the measurement task. For each pressure range, a microcontroller calculates an error corrected signal/pressure characteristic, depending on the accuracy requirements of the particular measurement task.

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### Small sensor, great in accuracy



Custom  
digital pressure sensor  
with 0.1 % overall accuracy

**The challenge:** A pressure sensor was needed as a key component of a high-quality patient monitor, capable of resolving and accurately recording pressures down to fractions of one millibar, laying the base for optimal monitoring and control of the patient's breathing.

**The solution:** Mechanically stable assemblies are achieved by placing a piezoresistive sensor element on a ceramic substrate with the help of highly advanced chip-on-board technology. A high-quality, low-noise amplifier is used to amplify the measuring bridge's analogue mV output signal, which is then digitised using a 24 bit A/D converter with a sample interval of 250  $\mu$ s. This produces high resolution digital signals with a very high signal-to-noise ratio comparable with analogue signals. A microcontroller adjusts the digitised sensor output signal using sensor specific calibration coefficients. The result is a custom solution featuring an extremely high overall accuracy of typically 0.1 %FSO (max. 0.25 %FSO) over a 0...70 °C temperature range.



*A one stop shop for sensor technology expertise – that is what many of our customers view as their benefit from partnering with us. Apart from our comprehensive sensor and actuator portfolio, our service includes in-depth advice based on practical experience, flexibility, reliability, and expertise in technical customisation.*

”

Richard Bell,  
Sales Director

# Other sensors

In many other sensor technology fields, customers benefit from our expertise and years of experience. All from one source, our sensors and miniaturised pumps and valves do their jobs reliably in millions of industrial, environmental, measuring, and medical device products.

Do you have other sensor technology requirements? When advising our customers, our experts can choose from a wide range of additional sensor types for the most diverse values to be measured.

## Miniature force sensors

Piezoresistive measurement technology helps our force sensors to ensure high sensitivity for the measurement of small forces as well as low power consumption that you ask for.

## Oxygen sensors

Easy calibration as well as high stability and accuracy are key requirements of oxygen measuring applications. Moreover, our zirconium dioxide technology sensors are non-consumptive and distinguish themselves through a very long life cycle.

## Air bubble detectors

Our air bubble detectors operate contact-free and find their use everywhere in the manufacturing and medical industries where liquids in tube or metal pipes need to be monitored.

## Humidity sensors

Our humidity sensors are well suited for battery powered, mobile devices. Ideal for high-volume applications, they stand out through both accurate measuring and low power consumption.

## Pumps and valves – miniaturised actuators

Our portfolio of special miniature pumps and valves for many different application purposes rounds off our broad range of solutions. Precision control of gas and liquids are a common feature.



**First Sensor AG****Location Munich**

Boschstraße 10  
82178 Puchheim  
Germany  
Phone: +49 89 80083-0  
Fax: +49 89 80083-33  
E-Mail: FSM@first-sensor.com

**Sales office Benelux**

Christinadal 16  
5551 BH Valkenswaard  
Netherlands  
Phone: +31 40 2011546  
Fax: +31 40 2013105  
E-mail: Benelux.FSM@first-sensor.com

**Sales office France (North)**

61 Rue de Rosselmont  
57600 Forbach  
France  
Phone: +33 3 87886587  
Fax: +33 3 87887693  
E-mail: F-Nord.FSM@first-sensor.com

**Sales office France (South)**

115 Route de Paris  
69260 Charbonnières  
France  
Phone: +33 4 37415974  
Fax: +33 4 78344557  
E-mail: F-Sud.FSM@first-sensor.com

**Sensortechncs, Inc.**

905 South Main Street, Suite 201  
Mansfield, MA 02048  
USA  
Phone: +1 508 339-2955  
Fax: +1 508 339-2991  
E-Mail: salesNA@sensortechncs.com

**Sensortechncs Ltd. (UK & Ireland)**

McGowan House  
66C Somers Road  
Rugby, Warwickshire CV22 7DH  
United Kingdom  
Phone: +44 1788 560426  
Fax: +44 1788 561228  
E-mail: uk@sensortechncs.com

**Sensortechncs AB (Sweden)**

Jägerhorns väg 10  
141 75 Kungens Kurva  
Sweden  
Phone: +46 8 4495642  
Fax: +46 8 4495649  
E-mail: se@sensortechncs.com

**Sensortechncs AB (Denmark)**

Vermundsgade 38A, 2 sal. Th.  
2100 København Ø  
Denmark  
Phone: +45 45561377  
Fax: +45 45566477  
E-mail: dk@sensortechncs.com