



# FLUID SENSORS

## OVERVIEW OF THE PRODUCTS

Level sensors, pressure sensors,  
flow sensors, temperature sensors

**SICK**  
Sensor Intelligence.



## FLUID SENSORS AT SICK

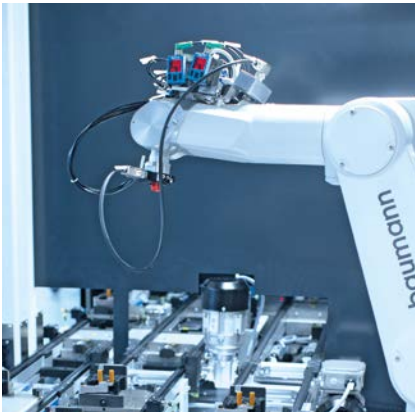
An essential basis for increasing efficiency while saving on resources is the best possible monitoring of the relevant process parameters. Regardless of whether this concerns the pressure, temperature, level or flow – SICK provides a wide range of solutions for process control, stock supply or the monitoring of liquids, gases and bulk materials. In doing so, SICK places an emphasis on rugged sensors which measure as many of the particular variables as possible, regardless of the ambient conditions.

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<b>Level sensors</b> . . . . .	<b>6</b>
LFR SicWave, LBR SicWave, LFC, GRF18S, CFP Cubic, LFP Cubic, LFP Inox, LFH, UP56, UP56 Pure, LFV200, LFV300, LBV300, LBV301	
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TBS, TBT, TCT, TSP, THTS, THTE, THTL	



## Intelligent solutions for level and point level measurement

Whether it is continuous level measurement, point level measurement, or a combination of the two – SICK provides a wide spectrum of solutions for process control, stock supply, or protection. Based on the installation situation, medium properties, and ambient conditions, SICK provides sensors that ensure efficient processes. As the provider of one of the broadest technology portfolios, SICK brings its knowledge to the forefront.



## Universal pressure measurement in liquids and gases

SICK offers a portfolio of electronic pressure measurement transmitters and switches that can be adapted to individual customer requirements because of intelligent and varied configuration options. Typical of all SICK equipment are the use of high-quality materials, robustness and precise measurement technology, easy to operate and install.



## Rugged and exact – flow measurement technology from SICK

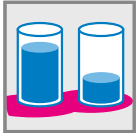
SICK provides innovative sensor solutions for flow measurement technology which combine flexible measuring methods and rugged equipment design with cost-efficient connection concepts for higher-order systems. Whether you need to detect the current flow rate using analog values or find the quantity using pulse detection – SICK's flow sensors are always reliable and safe, with a wide range of media and under difficult process and ambient conditions.



## Universal temperature measurement for liquids and gases

The SICK range of screw-in and insertion thermometers, along with temperature switches provides high-quality solutions for in-contact temperature measurement of fluids and gases. Due to the various installation lengths and the variable mechanical configuration options, the devices can be optimally adapted to individual requirements.

## Level and point level measurement using efficient technology



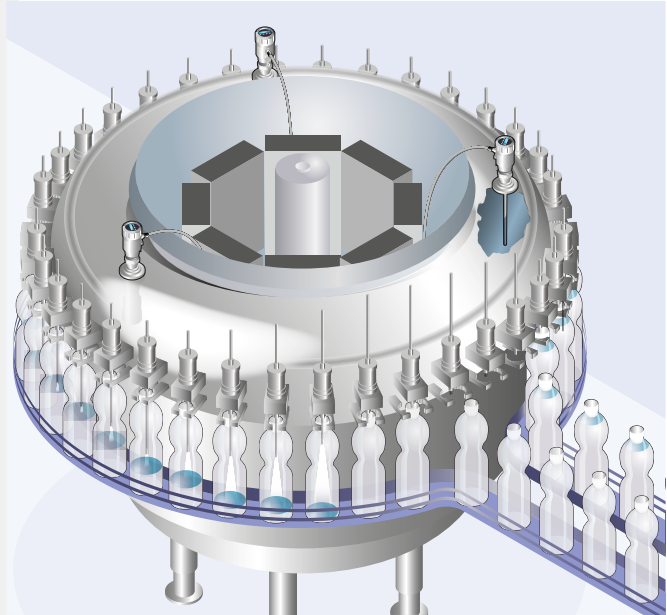
The innovative offer comprises, for example, guided wave radar sensors (TDR), ultrasonic equipment, capacitive sensors, vibrating equipment and various optical technologies. With SICK, the focus is on the optimum solution for your application. To achieve this, we can refer to our broad sensor portfolio.

### Level measurement with LFP Inox

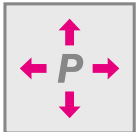
LFP Inox detects the level of storage containers in order to guarantee the supply to the filling machine. Besides the aseptic design, the most important feature of this application is fast, precise measurement.

**Benefits:**

- Fast response time
- High reproducibility
- Hygienic design
- High enclosure rating IP69
- Simple installation



## Pressure measurement for liquids and gases



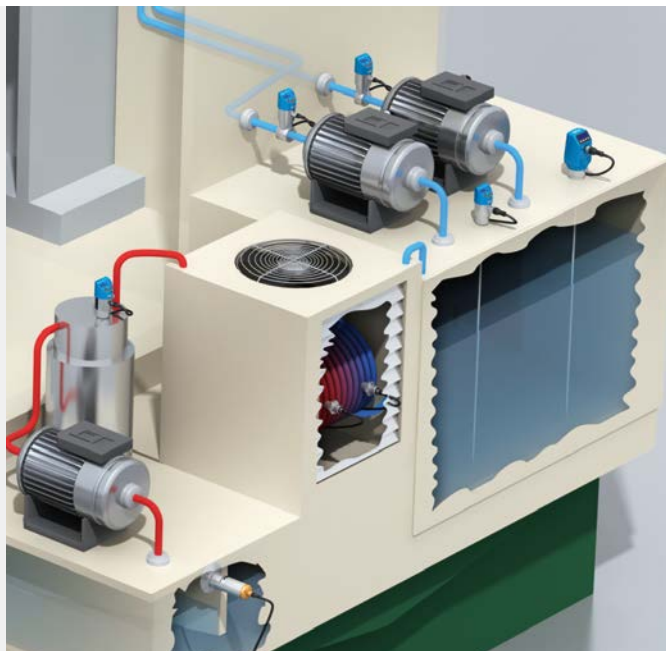
In many branches of machine and plant engineering, the production industry, machine tool construction, process technology, and the manufacture and refinement of foodstuffs and beverages, measurement of variable state pressure plays a central role.

### Monitoring of the workpiece clamping by PBS plus with IO-Link

In CNC machines, the workpieces are often clamped hydraulically. Electronic pressure switches like the PBS make sure that the clamping pressure is correct.

**Benefits:**

- Pressure switch, pressure transmitter and display in one device
- Quick product changes through switching point setting via IO-Link
- Ergonomic: clearly legible display, large push-buttons and rotating housing
- Rugged and reliable
- Wide range of installation variants



## Universal temperature measurement

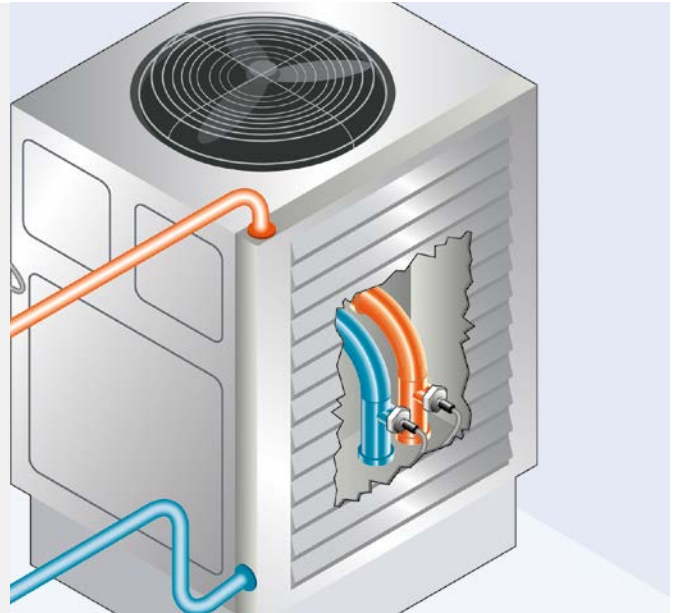


Whether it is the monitoring of operating conditions in machine and plant engineering or the control and regulation of sensitive processes, the reliable and accurate determination of temperature is of fundamental importance in many industries.

### Cooling lubricant temperature control with TSP

Temperature sensors are used in many areas. One example is the machine tool industry. Reliability and long-term stability of the thermometers are indispensable for reliable plant operation. The temperature of the cooling lubricant is regulated in order to guarantee high quality machining of the workpiece

- Reliable
- Small dimensions
- Simple installation
- Inexpensive



## Flow and throughput measurement with modern technologies



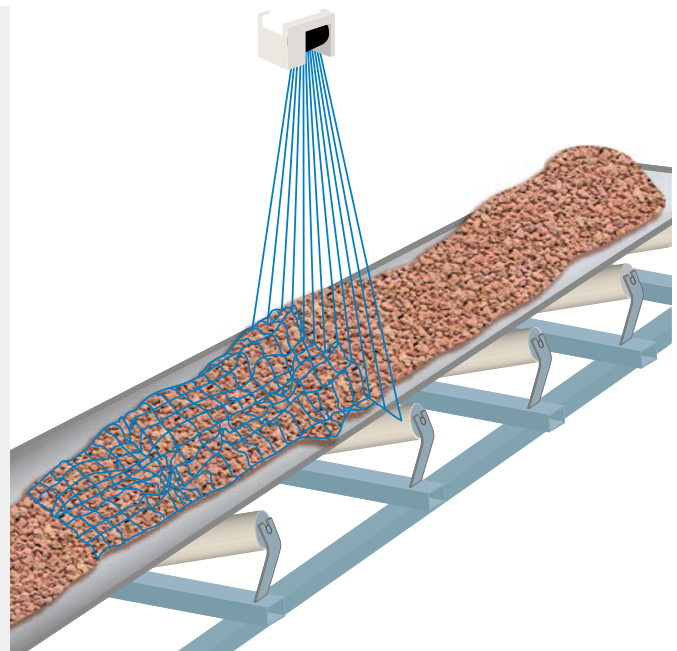
SICK flow rate sensor systems rely on innovative run-time measurement processes based on ultrasonic and laser technology. These non-contact technologies are particularly notable for their flexible fields of application and their great variety.



### Bulkscan®

The non-contact measuring Bulkscan® device detects the profile of the bulk material on the conveyor belt. The flow rate is calculated using the belt speed and the bulk material profile. This makes it possible to create a feedback control system that provides optimal belt speed and ensures economic belt utilization.




#### Benefit:

- Low-maintenance throughput measurement
- Flexible use
- Optimum belt usage
- Belt monitoring to reduce belt wear (Bulkscan® LMS511)



	 <p><b>LFR SicWave</b></p>	 <p><b>LBR SicWave</b></p>	 <p><b>LFC</b></p>	
	Simply brilliant – level measurement in liquids with 80 GHz radar	Simply brilliant – level measurement in bulk materials with 80 GHz radar	Flexible and straightforward point level measurement – the economic solution	

Technical data overview			
Measurement principle	Radar sensor	Radar sensor	Capacitive level switch
Detection principle	Electro-sensitive	Electro-sensitive	Touching
Medium	Liquids	Solids	Liquids
Detection type	Continuous	Continuous	Point level measurement
Process temperature	-196 °C ... +200 °C	-40 °C ... +200 °C	-20 °C ... +100 °C, +135 °C for max. 1 h
Process pressure	-1 bar ... 25 bar	-1 bar ... 20 bar	-1 bar ... 25 bar
Output signal	-	-	-
Accuracy of the sensor element	≤ 1 mm	≤ 5 mm	approx. 1 mm
Measuring width	up to 30 m	up to 120 m	-

At a glance			
	<ul style="list-style-type: none"> <li>• 80 GHz free-space radar with various antennas</li> <li>• Process connection: thread, flange, clamp</li> <li>• Housing: plastic (IP66 / IP67), aluminum (IP66 / IP68) or stainless steel (IP69)</li> <li>• With or without display and WPAN</li> <li>• Certificates: Ex d, Ex ia, WHG, shipbuilding</li> </ul>	<ul style="list-style-type: none"> <li>• 80 GHz free-space radar with various antennas</li> <li>• Process connection: thread, flange, special brackets</li> <li>• Housing: plastic (IP66 / IP67) or aluminum (IP66 / IP68)</li> <li>• With or without display and WPAN</li> <li>• Certificates: Ex d, Ex ia, Ex ta</li> </ul>	<ul style="list-style-type: none"> <li>• Capacitive level switch based on electrical impedance spectroscopy</li> <li>• Plug and play: preset to watery media</li> <li>• Two digital PNP outputs</li> <li>• Enclosure ratings IP66, IP67 and IP69</li> <li>• Ideal for hygienic applications (easy to clean, EHEDG, 3 A, EG1935/2004, FDA, CIP- and SIP-capable, hygienic adapter available)</li> </ul>
			
Detailed information	→ <a href="http://www.sick.com/LFR_SicWave">www.sick.com/LFR_SicWave</a>	→ <a href="http://www.sick.com/LBR_SicWave">www.sick.com/LBR_SicWave</a>	→ <a href="http://www.sick.com/LFC">www.sick.com/LFC</a>



**GRF18S**

Simple, compact and rugged



**CFP Cubic**

Multifunctional sensor for level and temperature measurement



**LFP Cubic**

Flexible up to the probe tip:



**LFP Inox**

The clean solution

Optical level switch	Capacitive sensor	TDR sensor	TDR sensor
Touching	Touching	Touching	Touching
Liquids	Water and oil-based liquids	Liquids	Liquids
Point level measurement	Limit, continuous	Limit, continuous	Limit, continuous
-25 °C ... +55 °C	-20 °C ... +80 °C	-20 °C ... +100 °C	-20 °C ... +180 °C
-0.5 bar ... 16 bar	-0.5 bar ... 3 bar	-1 bar ... +10 bar	-1 bar ... +16 bar
1 x PNP / 1 x NPN	2 x PNP/NPN/push-pull 2 x PNP/NPN/push-pull + 4 mA ... 20 mA / 0 V ... 10 V 4 x PNP/NPN/push-pull + 2 x 4 mA ... 20 mA / 0 V ... 10 V	1 x PNP + 1 x PNP/NPN + 4 mA ... 20 mA / 0 V ... 10 V / 1 x PNP + 3 x PNP/NPN + 4 mA ... 20 mA / 0 V ... 10 V	1 x PNP + 1 x PNP/NPN + 4 mA ... 20 mA / 0 V ... 10 V
-	± 15 mm	± 5 mm	± 5 mm
-	100 mm ... 1,000 mm	200 mm ... 2,000 mm (rod probe) 1,000, 2,000, 3,000, 4,000 mm (cable probe)	200 mm ... 4,000 mm

- Rugged fill level measurement in fluid media
- Small, compact design; no medium calibration required
- Enclosure rating IP 67 and IP 69
- Process connection G ½
- Highly medium resistant due to stainless steel housing 1.4404, polysulfone apex
- Output available as PNP or NPN transistor
- FDA compliant, UL



→ [www.sick.com/GRF18S](http://www.sick.com/GRF18S)

- Continuous level measurement and temperature measurement as well as level and temperature switches
- Measurement irrespective of container material
- Display and intuitive menu navigation
- No mechanical moving parts
- IP 67 enclosure rating and IO-Link 1.1
- No dead zone along the measuring range



→ [www.sick.com/CFP\\_Cubic](http://www.sick.com/CFP_Cubic)

- Level sensor for liquids
- No mechanical moving parts
- Exchangeable and cuttable probe and cable probe
- Resistant to deposit formation
- 3 in 1: combines display, analog output (according to NAMUR NE 43), and binary output
- High enclosure rating IP67, rotating housing, remote electronics and IO-Link






→ [www.sick.com/LFP\\_Cubic](http://www.sick.com/LFP_Cubic)

- Level measurement in hygienic applications
- Manually cuttable rod probe length with Ra ≤ 0.8 µm
- CIP/SIP-resistant
- High enclosure rating: IP67 and IP69, autoclavable
- Interchangeable hygienic process connections
- 3 in 1: combines display, analog output, and binary output
- Remote amplifier with process connection, IO-Link






→ [www.sick.com/LFP\\_Inox](http://www.sick.com/LFP_Inox)

		
<b>LFH</b>	<b>UP56</b>	<b>UP56 Pure</b>
At a high level	Rugged, non-contact and pressure-resistant	Pure reliability

Technical data overview			
Measurement principle	Level probe	Ultrasonic sensor	Ultrasonic sensor
Detection principle	Touching	Electro-sensitive	Electro-sensitive
Medium	Liquids	Liquids	Liquids
Detection type	Continuous	Limit, continuous	Limit, continuous
Process temperature	-10 °C ... +50 °C -10 °C ... +85 °C with FEP cable	-25 °C ... +70 °C	-25 °C ... +85 °C
Process pressure	-	0 bar ... 6 bar, overpressure	0 bar ... 6 bar, overpressure, overpressure for Mini
Output signal	Analog	1 x PNP + 4 mA ... 20 mA / 0 V ... 10 V 2 x PNP 2 x NPN	1 x PNP + 4 mA ... 20 mA / 0 V ... 10 V / 4 mA ... 20 mA
Accuracy of the sensor element	≤ ± 0.25% of the span for Enhanced variant p ≥ 0.25 bar ≤ ± 0.5% of the span for Standard variant and Enhanced variant p < 0.25 bar	-	-
Measuring width		≤ 3.4 m	≤ 1,500 mm

**At a glance**

<ul style="list-style-type: none"> <li>• Immersion depth up to 100 m</li> <li>• Available with various lengths of cable</li> <li>• Measurement ranges from 0 bar to 0.1 bar up to 0 bar to 25 bar</li> <li>• Stainless steel membrane</li> <li>• Hermetically sealed stainless steel housing with PA protective cap</li> <li>• Cable material PUR, FEP cable for aggressive media optionally available</li> <li>• Optional temperature measurement with integrated Pt-100 element</li> <li>• Optional surge protection</li> </ul>	<ul style="list-style-type: none"> <li>• Non-contact level measurement up to 3.4 m operating distance / 8.0 m scanning distance limit</li> <li>• Pressure resistant up to 6 bar</li> <li>• Converter protected by PVDF cover for increased resistance</li> <li>• 3-in-1: continuous measurement, switching signal and display</li> <li>• Analog output selectable between 4 mA to 20 mA and 0 V to 10 V</li> <li>• Process connections G 1 and G 2</li> <li>• IP 67 enclosure rating</li> <li>• Simple operation, also via Connect+</li> </ul>	<ul style="list-style-type: none"> <li>• Ultrasonic level sensor with very high chemical resistance</li> <li>• Non-contact measurement in immersion pipe of up to 1,500 mm</li> <li>• PTFE-coated membrane and GF D40 process connection made of PTFE</li> <li>• Pressure resistant up to 6 bar, temperature resistant up to 85 °C</li> <li>• Different sizes available</li> <li>• Analog output selectable between 4 mA to 20 mA and 0 V to 10 V</li> <li>• Switching output for monitoring the maximum and minimum limit</li> </ul>
		

Detailed information	→ <a href="http://www.sick.com/LFH">www.sick.com/LFH</a>	→ <a href="http://www.sick.com/UP56">www.sick.com/UP56</a>	→ <a href="http://www.sick.com/UP56_Pure">www.sick.com/UP56_Pure</a>
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<b>LFV200</b>	<b>LFV300</b>	<b>LBV300</b>	<b>LBV301</b>
The intelligent limit switch for all kinds of liquids	Flexible and rugged – vibrating level switch for liquids	Reliable and rugged in bulk materials	Rugged, flexible and cleanable
Vibrating level switch	Vibrating level switch	Vibrating level switch	Vibrating level switch
Touching	Touching	Touching	Touching
Liquids	Liquids	Bulk materials	Bulk materials
Point level measurement	Point level measurement	Point level measurement	Point level measurement
-40 °C ... +150 °C	-50 °C ... +250 °C	-50 °C ... +250 °C	-50 °C ... +250 °C
-1 bar ... +64 bar	-1 bar ... +64 bar	-1 bar ... +25 bar	-1 bar ... +16 bar
Non-contact switch 1 x PNP	Non-contact switch Double relay (DPDT) 1 x PNP/NPN NAMUR signal	Non-contact switch Double relay (DPDT) NAMUR signal 1 x PNP/NPN	Non-contact switch Double relay (DPDT) 1 x PNP/NPN NAMUR signal
± 2 mm	± 2 mm	± 10 mm	± 10 mm

- Commissioning without container filling or medium calibration
- Immune to deposit formation
- Two electrical output versions and IO-Link available
- Pipe extension up to 1,200 mm
- Hygienic designs with polished surface, CIP- and SIP-capable
- Housing made of 316L stainless steel
- Very high repeatability



→ [www.sick.com/LFBV200](http://www.sick.com/LFBV200)

- Choice of various housing materials and electrical output signals
- Commissioning without filling
- Immune to deposit formation
- Very high repeatability
- Hygienic designs according to EHEDG and FDA, CIP and SIP-capable
- ATEX certification available
- Pipe extension up to 6 m long



→ [www.sick.com/LFBV300](http://www.sick.com/LFBV300)

- Rugged device design
- Choice of various housing materials and electrical output signals
- Immune to deposit formation
- Commissioning without filling
- Very high repeatability
- ATEX certifications (1D / 2D / 1G / 2G) available
- Tube extension model (LBV330) up to 6 m and cable extension model (LBV320) up to 80 m available for vertical mounting






→ [www.sick.com/LBV300](http://www.sick.com/LBV300)




- Compact sensor from 1" thread onward
- Rod design prevents bulk materials from sticking or jamming
- Polished monoprobe for food applications
- Commissioning without filling and medium calibration
- ATEX certifications (1D / 2D / 1G / 2G) available
- Tube extension model (LBV331) up to 6 m and cable extension model (LBV321) up to 80 m available for vertical mounting



→ [www.sick.com/LBV301](http://www.sick.com/LBV301)

		
<b>PBS plus</b>	<b>PBS Hygienic</b>	<b>PAC50</b>
Multifunctional IO-Link sensor for pressure measurement, control and monitoring	The compact pressure switch for hygienic applications	Turns pressure into colors

Technical data overview			
<b>Device type</b>	Pressure switch	Pressure switch	Pressure switch
<b>Measuring ranges</b>			
Gauge pressure	0 bar ... 0.4 bar (0 psi ... 6 psi) up to 0 bar ... 1,000 bar (0 psi ... 14,504 psi)	0 bar ... 1 bar up to 0 bar ... 25 bar	0 bar ... 6 bar; 0 bar ... 10 bar
Absolute pressure	0 bar ... 0.4 bar (0 psi ... 6 psi) up to 0 bar ... 25 bar (0 psi ... 363 psi)	0 bar ... 1 bar up to 0 bar ... 25 bar	-
Vacuum and ± measuring ranges	-1 bar ... 0 bar (-14.5 psi ... 0 psi) up to -1 bar ... +24 bar (-14.5 psi ... +348 psi)	-1 bar ... 0 bar up to -1 bar ... +24 bar	-1 bar ... 0 bar; -1 bar ... +1 bar; 0 bar ... 6 bar; 0 bar ... 10 bar; -1 bar ... +10 bar
<b>Pressure unit</b>	bar (can be switched to psi, MPa, kPa, kg/cm <sup>2</sup> )	bar, MPa, psi and kg/cm <sup>2</sup>	-
<b>Accuracy</b>	≤ ± 0.5% of the range	≤ ± 1% of the range	≤ ± 1.5% of the range ≤ ± 2% of the range incl. temperature error
<b>Output signal</b>	Output 1: PNP/IO-Link, output 2 (optional): PNP/NPN selectable, analog output (optional): 4 ... 20 mA / 0 ... 10 V selectable	Switching outputs PNP or NPN, analog output as well as optional IO-Link	Configurable switching outputs PNP, NPN or push-pull, analog output and optional IO-Link
<b>Electrical connection</b>	Round connector M12 x 1	Round connector M12 x 1	Round connector M12 x 1

At a glance			
	<ul style="list-style-type: none"> <li>• Switchable switching outputs (PNP/NPN) and analog output (current/voltage)</li> <li>• Scalable analog output (5:1 turn down)</li> <li>• High measurement accuracy</li> <li>• IO-Link for transmitting process data to the control as measured values in bar</li> <li>• Housing can be twisted in two places (process connection/display) and display can be rotated by 180°</li> </ul>	<ul style="list-style-type: none"> <li>• Hygienically-graded pressure switch with display for the food and beverage industry</li> <li>• Wetted parts are made from stainless steel 1.4435</li> <li>• Pressure values indicated on display</li> <li>• Unit of pressure value in the display can be switched</li> <li>• Output states are indicated separately via wide-angle LEDs</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic pressure switch for pneumatic applications</li> <li>• Large display shows system pressure, output states and set switching points</li> <li>• Three large function keys and intuitive menu navigation</li> <li>• Installation on a mounting rail, wall or in a control panel</li> </ul>
			

Detailed information	→ <a href="http://www.sick.com/PBS_plus">www.sick.com/PBS_plus</a>	→ <a href="http://www.sick.com/PBS_Hygienic">www.sick.com/PBS_Hygienic</a>	→ <a href="http://www.sick.com/PAC50">www.sick.com/PAC50</a>
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**PBT**

A genuine all-round talent



**PFT**

The flexible solution



**PHT**

A clean solution



**PET**

For that little bit extra

Pressure transmitters	Pressure transmitters	Pressure transmitters	Pressure transmitters
0 bar ... 1 bar up to 0 bar ... 600 bar	0 bar ... 0.1 bar up to 0 bar ... 600 bar	0 bar ... 0.25 bar up to 0 bar ... 25 bar	0 bar ... 6 bar up to 0 bar ... 600 bar
0 bar ... 1 bar up to 0 bar ... 25 bar	0 bar ... 0.25 bar up to 0 bar ... 25 bar	0 bar ... 0.25 bar up to 0 bar ... 16 bar	-
-1 bar ... 0 bar up to -1 bar ... +24 bar	-1 bar ... 0 bar up to -1 bar ... +30 bar	-1 bar ... 0 bar up to -1 bar ... +15 bar	-1 bar ... +5 bar up to -1 bar ... +59 bar
bar, MPa, psi and kg/cm <sup>2</sup>	bar, MPa, psi and kg/cm <sup>2</sup>	bar, MPa, psi and kg/cm <sup>2</sup>	bar, psi, kg/cm <sup>2</sup> , kPa and MPa
≤ ± 1% of the range ≤ ± 0.5% of the range ≤ ± 0.6% of the range	≤ ± 0.5% of the range ≤ ± 0.25% of the range	≤ ± 0.5% of the range ≤ ± 0.25% of the range	≤ ± 1.2% of the range (at room temperature) ≤ ± 1.2% of the range
Analog	Analog	Analog	Analog
Round plug connector M12 x 1, angled plug, cable connection	Round plug connector M12 x 1, angled plug, cable connection	Round plug connector M12 x 1, angled plug, cable connection, field housing	Round connector M12 x 1, 4-pin, for angled plug according to DIN EN 175301-803 A

- A large variety of process connections available
- No mechanical moving parts – Hence no wear, fatigue or maintenance
- Circularly welded, hermetically sealed stainless steel membrane
- Electrical connection M12 x 1, angled plug (DIN 175301-803 A) or cable connection



→ [www.sick.com/PBT](http://www.sick.com/PBT)

- Also with flush-mounted membrane
- Media temperature up to 150 °C (optional)
- Large number of common process connections
- Particularly shock and vibration resistant
- Accuracy 0.5% or 0.25%
- Zero point and range adjustable
- Round connector M12 x 1, angled plug (DIN 175301-803 A) or cable connection



→ [www.sick.com/PFT](http://www.sick.com/PFT)

- Rugged and precise pressure measuring technology
- Flush-mounted, hermetically sealed stainless steel membrane with roughness Ra < 0.4 µm
- Parts in contact with media made of stainless steel 1.4435, housing made of stainless steel 1.4571
- Suitable for CIP and SIP
- Large number of hygienic process connections can be supplied
- Stainless-steel housing with enclosure rating up to IP 68
- Can also supplied with field housing IP67



→ [www.sick.com/PHT](http://www.sick.com/PHT)



- Various output signals and electrical connections can be supplied
- Common process connections available
- High overload resistance. Pressure peak damping available on request for selected process connections
- Circularly welded, hermetically sealed stainless steel membrane
- Stainless steel housing with enclosure rating up to IP67



→ [www.sick.com/PET](http://www.sick.com/PET)

	 <p style="text-align: center;"><b>Bulkscan®</b></p>	 <p style="text-align: center;"><b>FTMg</b></p>	
	Non-contact and maintenance-free volume flow measurement	Flow sensor with leakage detection	

Technical data overview			
Measurement principle	Time-of-flight laser technology	Calorimetric (flow, temperature), piezoresistive (pressure)	
Medium	Bulk materials	Compressed air (air quality ISO 8573-1:2010 [3:4:4]), helium, argon, nitrogen, carbon dioxide	
Output signal	Ethernet Digital inputs and digital outputs USB auxiliary interface RS-232 / RS-422	1 analog output 4 mA ... 20 mA + 1 digital/analog output (PNP, NPN, push-pull, 4 mA ... 20 mA / switchable) + 1 digital output (PNP, NPN, push-pull switchable), IO-Link V1.1 (COM3 / 230K4 baud) Ethernet TCP/IP, OPC UA, MQTT, integrated web server	
Max. belt speed	30 m/s / ≤ 20 m/s	-	
Measuring tube nominal width	-	DN 15 DN 20 DN 25	
Max. adjustable measuring range	-	5.3 l/min ... 4,417.9 l/min (according to DIN 1343)	

At a glance			
	<ul style="list-style-type: none"> <li>• Efficient and cost-effective non-contact measurement of volume and mass flow of bulk materials</li> <li>• Laser pulses with high angular resolution ensure outstanding image resolution</li> <li>• Multi-echo pulse evaluation produces highly reliable measurements</li> <li>• Integrated function for determining the center-of-gravity of the bulk material</li> <li>• Rugged design for harsh ambient conditions</li> <li>• Integrated heater allows measurement even at low temperatures</li> <li>• Compact IP67 rated housing</li> </ul>		
	<ul style="list-style-type: none"> <li>• Measures compressed air and non-corrosive gases such as argon, helium, carbon dioxide and nitrogen</li> <li>• Calorimetric measurement principle with a measurement accuracy of ± 3% M.V. and ± 0.3% M.E.V.</li> <li>• Measurement of gas flow and temperature as well as process pressure and energy consumption with only one sensor</li> <li>• Low pressure loss</li> <li>• High measurement dynamics for cylinder and leakage monitoring</li> </ul>		

Detailed information	→ <a href="http://www.sick.com/Bulkscan" style="color: white;">www.sick.com/Bulkscan</a>		→ <a href="http://www.sick.com/FTMg" style="color: white;">www.sick.com/FTMg</a>
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**FFU**

Non-contact flow measurement



**DOSIC®**

The compact stainless-steel sensor for flexible flow measurement



**T-Easic® FTS**

Clever dry-run protection in pumps

Ultrasonic sensor	Ultrasonic sensor	Calorimetric measurement process
Liquids	Conductive and non-conductive liquids	Water and oil-based liquids
Analog output 4 mA ... 20 mA, 0 mA ... 20 mA, 1 pulse/status output Analog output: 4 mA ... 20 mA, 0 mA ... 20 mA, 2 pulse/status outputs, 1 switching input	1 x analog output: 4 mA ... 20 mA, 2 x digital outputs or inputs (configurable) 2 x analog output: 4 mA ... 20 mA, 2 x digital outputs or inputs (configurable)	2 x push-pull digital outputs for flow and temperature (Q2 can be selected as digital input)
-	IO-Link 1.1	IO-Link 1.1
-	-	-
DN 10 DN 15 DN 20 DN 25 DN 32 DN 40 DN 50	DN 15 / DN 25	≥ DN25
0 l/min ... 900 l/min	0 l/min ... 250 l/min	0.03 ... 1.5 m/s (water) 0.03 ... 3 m/s (oil)

- Flow sensor for conductive and non-conductive liquids
- Compact design with no moving parts
- Process temperature up to 80 °C, process pressure up to 16 bar
- High chemical resistance due to seal-free sensor design
- Large display with membrane key-board
- Integrated empty tube detection



→ [www.sick.com/FFU](http://www.sick.com/FFU)

- Flow measurement for water and oil-based liquids
- Seal-free stainless-steel 316L sensor with Ra ≤ 0.8
- Straight, self-draining measuring tube
- Compact design with short installation lengths
- Configurable digital outputs
- Temperature measurement
- IP 67/69 enclosure rating, CIP/SIP-compatible, IO-Link version 1.1


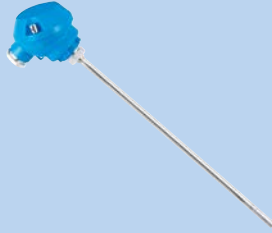



→ [www.sick.com/DOSIC](http://www.sick.com/DOSIC)

- Flow monitoring and temperature measurement in one sensor
- Optimized for water and oil; teach-in option of other liquids
- IP 67/IP 69 enclosure rating and IO-Link 1.1
- Industrial design in VISTAL® housing with 180°-rotatable OLED display
- Stainless steel hygienic variant, completely CIP-/SIP-capable, process temperatures up to 150 °C






→ [www.sick.com/T-Easic\\_FTS](http://www.sick.com/T-Easic_FTS)




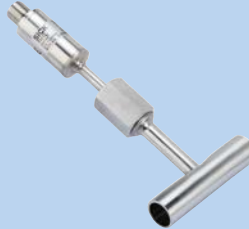
		
<b>TBS</b>	<b>TBT</b>	<b>TCT</b>
Temperature monitoring made easy	The proven temperature measurement	Compact, tough, precise

Technical data overview			
Measuring range	-20 °C ... +80 °C	-50 °C ... +150 °C -50 °C ... +250 °C	-50 °C ... +150 °C -50 °C ... +250 °C
Accuracy of the sensor element	$\leq \pm (0.15 \text{ °C} + 0.002  t )$	Class A acc. to IEC 60751	Class A acc. to IEC 60751
Accuracy of the opt. measuring transducer	-	$\leq \pm 0.1\%$ of the range	$\leq \pm 0.2\%$ of the range
Output signals and maximum permissible load resistance $R_A$	Transistor outputs PNP/NPN (1x IO-Link 1.1), optional analog output 4 mA ... 20 mA or 0 V ... 10 V	Pt100, 4-wire, 4 mA ... 20 mA, 2-wire ( $R_A \leq (U^* - 10 \text{ V}) / 0.028 \text{ A [ohm]}$ )	Pt100, 4-wire, 4 mA ... 20 mA, 2-wire ( $R_A \leq (U^* - 9 \text{ V}) / 0.023 \text{ A [ohm]}$ )
Electrical connection	M12 x 1 round connector, 4-pin M12 x 1 round connector, 5-pin	Cable gland M16 x 1.5, IP65 Cable gland M16 x 1.5, IP67	Round connector M12 x 1, 4-pin, IP 67, angled plug (DIN EN 175301-803 A), 4-pin, IP65





At a glance

<ul style="list-style-type: none"> <li>• Large display, IO-Link 1.1</li> <li>• Individually programmable transistor outputs PNP or NPN, optional analog output 4 mA ... 20 mA or 0 V ... 10 V</li> <li>• Round connector M12 x 1</li> <li>• Measuring ranges from -20 °C ... +120 °C</li> <li>• Pt1000 element, accuracy class A (IEC 60751)</li> <li>• Various installation lengths and connection threads</li> <li>• Parts in contact with media made from corrosion-resistant stainless steel 1.4571</li> <li>• Enclosure rating IP 65 and IP 67</li> </ul> <div style="text-align: center;"></div>	<ul style="list-style-type: none"> <li>• Pt100 resistance, accuracy class A according to IEC 60751</li> <li>• Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C</li> <li>• Parts in contact with media made from corrosion-resistant stainless steel 1.4571</li> <li>• Various mechanical adaptations and installation lengths</li> <li>• Pt100 (4-wire) or 4 mA ... 20 mA (2-wire)</li> <li>• Cable gland M16 x 1.5</li> </ul> <div style="text-align: center;"></div>	<ul style="list-style-type: none"> <li>• Pt100 resistance, accuracy class A according to IEC 60751</li> <li>• Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C</li> <li>• Parts in contact with media made from corrosion-resistant stainless steel 1.4571</li> <li>• Various mechanical adaptations and insertion lengths, also available with protective tube</li> <li>• Pt100 (4-wire) or 4 mA ... 20 mA (2-wire)</li> <li>• Round connector M12 x 1 (IP 67) or angled plug according to DIN EN 175301-803 A (IP 65)</li> </ul> <div style="text-align: center;"></div>
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Detailed information	<a href="http://www.sick.com/TBS">→ www.sick.com/TBS</a>	<a href="http://www.sick.com/TBT">→ www.sick.com/TBT</a>	<a href="http://www.sick.com/TCT">→ www.sick.com/TCT</a>
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<b>TSP</b>	<b>THTS</b>	<b>THTE</b>	<b>THTL</b>
Efficient and space saving temperature measurement	Simple, hygienic temperature measurement	Hygienic and flexible: temperature sensor with protective pipe	Perfectly fitted: hygienic temperature measurement in pipelines

-30 °C ... +130 °C	-50 °C ... +150 °C -50 °C ... +250 °C	-50 °C ... +150 °C -50 °C ... +250 °C	-50 °C ... +150 °C
Class B acc. to IEC 60751	Class A acc. to IEC 60751	Class A acc. to IEC 60751	Class A acc. to IEC 60751
-	≤ ± 0.2% of the range	≤ ± 0.2% of the range	≤ ± 0.2% of the range
Pt100, 2-wire or Pt1000, 2-wire Pt100, 3-wire or Pt1000, 3-wire	Pt100, 4-wire, 4 mA ... 20 mA, 2-wire ( $R_A \leq (L^+ - 10 V) / 0.023 A$ [ohm])	Pt100, 4-wire, 4 mA ... 20 mA, 2-wire ( $R_A \leq (L^+ - 10 V) / 0.023 A$ [ohm])	Pt100, 4-wire, 4 mA ... 20 mA, 2-wire ( $R_A \leq (L^+ - 10 V) / 0.023 A$ [ohm])
Round connector M12 x 1, 4-pin, IP67	M12 x 1 round connector, 4-pin	M12 x 1 round connector, 4-pin	M12 x 1 round connector, 4-pin

<ul style="list-style-type: none"> <li>• Platinum resistor (Pt100 or Pt1000, 2-wire or 3-wire), accuracy class B according to IEC 60751</li> <li>• Measuring range -30 °C ... +130 °C</li> <li>• Various connection threads and insertion lengths</li> <li>• Parts in contact with media made from stainless steel 1.4305</li> <li>• Round connector M12 x 1 (IP 67)</li> </ul>	<ul style="list-style-type: none"> <li>• Pt100 resistor, accuracy class A (IEC 60751)</li> <li>• Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C</li> <li>• Parts in contact with media: corrosion-resistant stainless steel 316L / 1.4435, <math>R_a \leq 0.8 \mu m</math></li> <li>• Various hygienic process connections and installation lengths</li> <li>• Pt100 (4-wire) or 4 mA ... 20 mA (2-wire)</li> <li>• Round connector M12 x 1</li> </ul>	<ul style="list-style-type: none"> <li>• Pt100, accuracy class A (IEC 60751)</li> <li>• Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C</li> <li>• Measurement probe press-fitted into protective pipe under spring load</li> <li>• In contact with media: corrosion-resistant stainless steel 316L / 1.4435, <math>R_a \leq 0.8 \mu m</math></li> <li>• Hygienic process connections</li> <li>• Pt100 (4-wire) or 4 mA ... 20 mA (2-wire)</li> <li>• Round connector M12 x 1</li> </ul>	<ul style="list-style-type: none"> <li>• Pt100, accuracy class A (IEC 60751)</li> <li>• Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C</li> <li>• Through housing for orbital welding into pipeline</li> <li>• Measurement probe press-fitted into protective pipe under spring load</li> <li>• In contact with media: corrosion-resistant stainless steel 316L / 1.4435, <math>R_a \leq 0.8 \mu m</math></li> <li>• Pt100 (4-wire) or 4 mA ... 20 mA (2-wire)</li> <li>• Round connector M12 x 1</li> </ul>
			

→ [www.sick.com/TSP](http://www.sick.com/TSP)

→ [www.sick.com/THTS](http://www.sick.com/THTS)

→ [www.sick.com/THTE](http://www.sick.com/THTE)

→ [www.sick.com/THTL](http://www.sick.com/THTL)

## SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 9,700 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the customers need. In application centers in Europe, Asia, and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes SICK a reliable supplier and development partner.

Comprehensive services round out the offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**That is “Sensor Intelligence.”**

### **Worldwide presence:**

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → [www.sick.com](http://www.sick.com)