



FLUID SENSORS

OVERVIEW OF THE PRODUCTS

Level sensors, pressure sensors,
flow sensors, temperature sensors

SICK
Sensor Intelligence.



FLUID SENSORS AT SICK

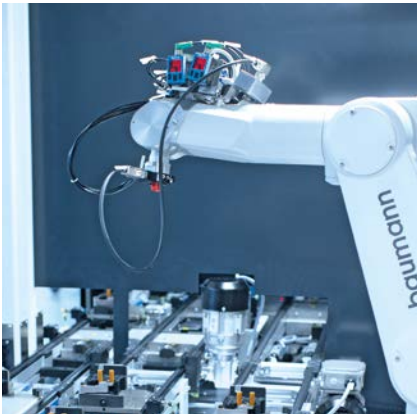
An essential basis for increasing efficiency while saving on resources is the best possible monitoring of the relevant process parameters. Regardless of whether this concerns the pressure, temperature, level or flow – SICK provides a wide range of solutions for process control, stock supply or the monitoring 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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LFR SicWave, LBR SicWave, LFC, GRF18S, CFP Cubic, LFP Cubic, LFP Inox, LFH, UP56, UP56 Pure, LFV200, LFV300, LBV300, LBV301	
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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 devices 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

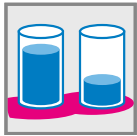
SICK provides innovative sensor solutions for flow measurement technology which combine flexible measurement procedures and rugged equipment design with cost-efficient connection concepts for higher-order systems. Whether you need to detect the current flow rate using analog values or find the quantity using pulse detection – flow sensors from SICK 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



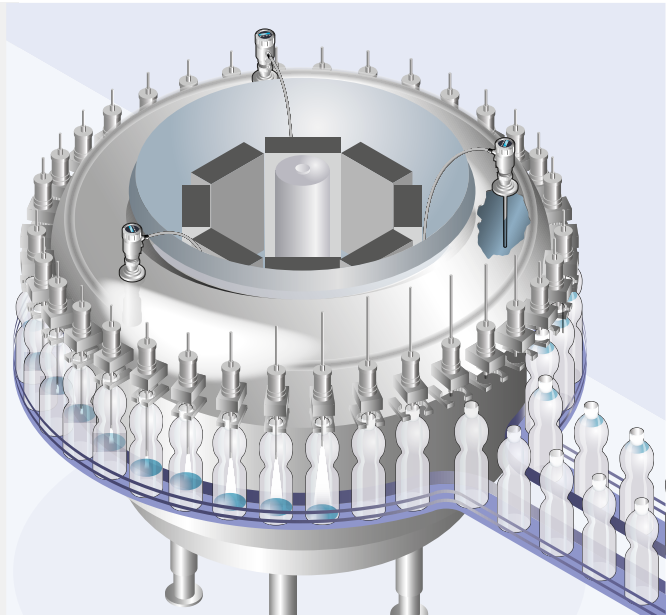
The innovative offer comprises, for example, guided wave radar sensors (TDR), ultrasonic equipment, capacitive sensors, vibrating devices and various optical technologies. With SICK, the focus is on the optimum solution for your application. To achieve this, we can refer to our broad sensor portfolio.

Level measurement with LFP Inox

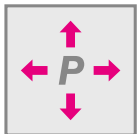
LFP Inox detects the level of storage containers in order to guarantee the supply to the filling machine. Besides the aseptic design, the most important feature of this application is fast, precise measurement.

Advantages:

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



Pressure measurement for liquids and gases



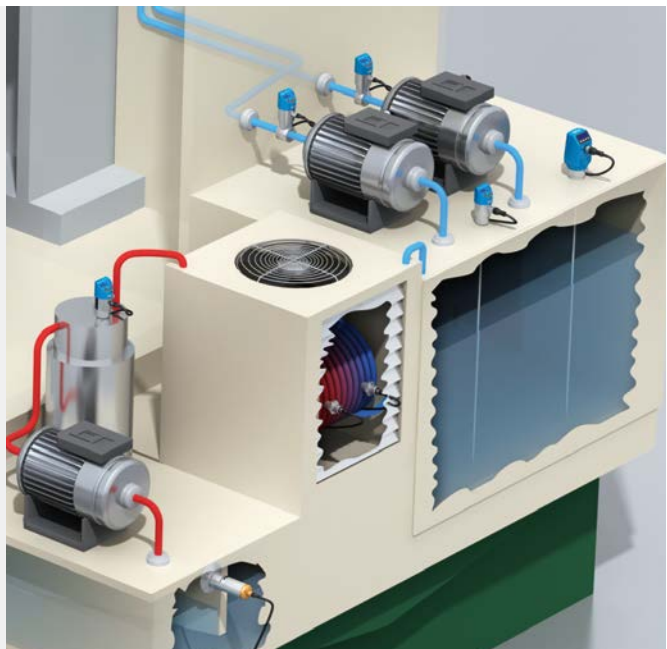
In many branches of machine and plant engineering, the production industry, machine tool construction, process technology, and the manufacture and refinement of foodstuffs and beverages, measurement of variable state pressure plays a central role.

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

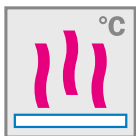
In CNC machines, the workpieces are often clamped hydraulically. Electronic pressure switches like the PBS make sure that the clamping pressure is correct.

Advantages:

- 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

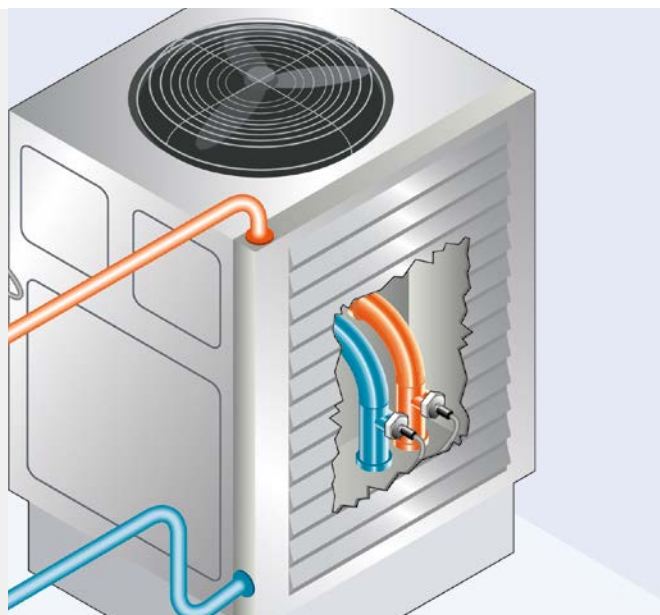


Whether it is the monitoring of operational statuses in machine and plant engineering or the control and regulation of sensitive processes, the reliable and accurate determination of temperature is of fundamental importance in many industries.

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



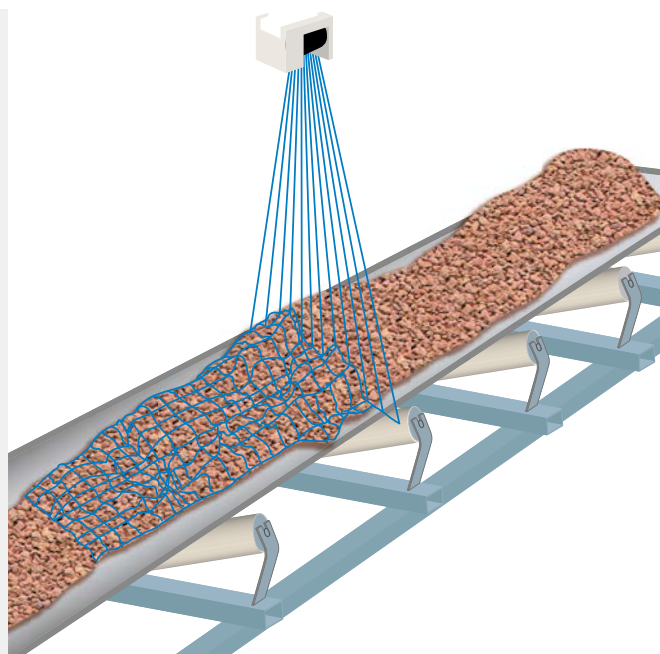
SICK flow rate sensor systems rely on innovative run-time measurement processes based on ultrasonic and laser technology. These non-contact technologies are particularly notable for their flexible fields of application and their great variety.




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)







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

			
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	Point level measurement, continuous	Point level measurement, continuous	Point level measurement, 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

<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 • Enclosure rating IP 67 and IO-Link 1.1 • No dead zone along the measuring range 	<ul style="list-style-type: none"> • 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 amplifier and IO-Link 	<ul style="list-style-type: none"> • 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/GRF18S	→ www.sick.com/CFP_Cubic	→ www.sick.com/LFP_Cubic	→ www.sick.com/LFP_Inox

				
	LFH	UP56	UP56 Pure	
	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	Non-contact	Non-contact	
Medium	Liquids	Liquids	Liquids	
Detection type	Continuous	Point level measurement, continuous	Point level measurement, 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	$\leq \pm 0.25\%$ of the span for Enhanced variant $p \geq 0.25$ bar $\leq \pm 0.5\%$ of the span for Standard variant and Enhanced variant $p < 0.25$ bar	-	-	
Measuring width		≤ 3.4 m	$\leq 1,500$ mm	

At a glance

- Immersion depth up to 100 m
- Available with various lengths of cable
- Measuring ranges from 0 bar to 0.1 bar up to 0 bar to 25 bar
- Stainless steel membrane
- Hermetically sealed stainless-steel housing with PA protective cap
- Cable material PUR, FEP cable for aggressive media optionally available
- Optional temperature measurement with integrated Pt-100 element
- Optional surge protection



- Non-contact measurement up to 3.4 m operating distance / 8.0 m scanning distance limit
- Pressure resistant up to 6 bar
- Transducer protected by PVDF cover for increased resistance
- 3-in-1: continuous measurement, switching signal and display
- Analog output selectable between 4 mA to 20 mA and 0 V to 10 V
- Process connections G 1 and G 2
- Enclosure rating IP 67
- Simple operation, also via Connect+



- Ultrasonic level sensor with very high chemical resistance
- Non-contact measurement in immersion pipe of up to 1,500 mm
- PTFE-coated membrane and GF D40 process connection made of PTFE
- Pressure resistant up to 6 bar, temperature resistant up to 85 °C
- Different sizes available
- Analog output selectable between 4 mA to 20 mA and 0 V to 10 V
- Switching output for monitoring the maximum and minimum limit




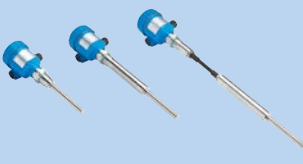









Detailed information

→ www.sick.com/LFH




→ www.sick.com/UP56





→ www.sick.com/UP56_Pure

 <p>LFV200</p>	 <p>LFV300</p>	 <p>LBV300</p>	 <p>LBV301</p>
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
<p>Vibrating level switch Touching Liquids Point level measurement</p> <p>–40 °C ... +150 °C</p> <p>–1 bar ... +64 bar</p> <p>Non-contact switch 1 x PNP</p> <p>± 2 mm</p>	<p>Vibrating level switch Touching Liquids Point level measurement</p> <p>–50 °C ... +250 °C</p> <p>–1 bar ... +64 bar</p> <p>Non-contact switch Double relay (DPDT) 1 x PNP/NPN NAMUR signal</p> <p>± 2 mm</p>	<p>Vibrating level switch Touching Bulk materials Point level measurement</p> <p>–50 °C ... +250 °C</p> <p>–1 bar ... 25 bar</p> <p>Non-contact switch Double relay (DPDT) NAMUR signal 1 x PNP/NPN</p> <p>± 10 mm</p>	<p>Vibrating level switch Touching Bulk materials Point level measurement</p> <p>–50 °C ... +250 °C</p> <p>–1 bar ... +16 bar</p> <p>Non-contact switch Double relay (DPDT) 1 x PNP/NPN NAMUR signal</p> <p>± 10 mm</p>
<ul style="list-style-type: none"> 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  <p>→ www.sick.com/LFV200</p>	<ul style="list-style-type: none"> 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  <p>→ www.sick.com/LFV300</p>	<ul style="list-style-type: none"> 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 variant (LBV330) up to 6 m and cable extension variant (LBV320) up to 80 m available for vertical mounting  <p>→ www.sick.com/LBV300</p>	<ul style="list-style-type: none"> 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 variant (LBV331) up to 6 m and cable extension variant (LBV321) up to 80 m available for vertical mounting  <p>→ www.sick.com/LBV301</p>

				
	PBS plus	PBS Hygienic	PAC50	
	Multifunctional IO-Link sensor for pressure measurement, control and monitoring	The compact pressure switch for hygienic applications	Monitors pressure visibly better	

Technical data overview				
Device type	Pressure switch	Pressure switch	Pressure switch	
Measuring range				
Gauge pressure	0 bar ... 0.4 bar (0 psi ... 6 psi) to 0 bar ... 1,000 bar (0 psi ... 14,504 psi)	0 bar ... 1 bar to 0 bar ... 25 bar	0 bar ... 6 bar; 0 bar ... 10 bar	
Absolute pressure	0 bar ... 0.4 bar (0 psi ... 6 psi) 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) to –1 bar ... +24 bar (–14.5 psi ... +348 psi)	–1 bar ... 0 bar 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	
Pressure unit	bar (can be switched to psi, MPa, kPa, kg/cm²)	bar, MPa, psi and kg/cm²	–	
Accuracy	≤ ± 0.5% of the range	≤ ± 1% of the range	≤ ± 1.5% of the range ≤ ± 2% of the range incl. temperature error	
Output signal	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	
Electrical connection	Round connector M12 x 1	Round connector M12 x 1	Round connector M12 x 1	

At a glance				
	<ul style="list-style-type: none"> • Switchable switching outputs (PNP/NPN) and analog output (current/voltage) • Scalable analog output (5:1 turn down) • High measurement accuracy • IO-Link for transmitting process data to the control as measured values in bar • Housing can be twisted in two places (process connection/display) and display can be rotated by 180° 	<ul style="list-style-type: none"> • Hygienically-graded pressure switch with display for the food and beverage industry • Wetted parts are made from stainless steel 1.4435 • Pressure values indicated on display • Unit of pressure value in the display can be switched • Output states are indicated separately via wide-angle LEDs 	<ul style="list-style-type: none"> • Electronic pressure switch for pneumatic applications • Large display shows system pressure, output states and set switching points • Three large pushbuttons and intuitive menu navigation • Installation on a mounting rail, wall or in a control panel • Variant for leak detection field available (pressure loss over time) 	
				
Detailed information	→ www.sick.com/PBS_plus	→ www.sick.com/PBS_Hygienic	→ www.sick.com/PAC50	

			
PBT	PFT	PHT	PET
A genuine all-round talent	The flexible solution	A clean solution	For that little bit extra

Pressure transmitters	Pressure transmitters	Pressure transmitters	Pressure transmitters
0 bar ... 1 bar to 0 bar ... 600 bar	0 bar ... 0.1 bar to 0 bar ... 600 bar	0 bar ... 0.25 bar to 0 bar ... 25 bar	0 bar ... 6 bar to 0 bar ... 600 bar
0 bar ... 1 bar to 0 bar ... 25 bar	0 bar ... 0.25 bar to 0 bar ... 25 bar	0 bar ... 0.25 bar to 0 bar ... 16 bar	–
–1 bar ... 0 bar to –1 bar ... +24 bar	–1 bar ... 0 bar to –1 bar ... +30 bar	–1 bar ... 0 bar to –1 bar ... +15 bar	–1 bar ... +5 bar to –1 bar ... +59 bar
bar, MPa, psi and kg/cm ²	bar, MPa, psi and kg/cm ²	bar, MPa, psi and kg/cm ²	bar, psi, kg/cm ² , 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 connector M12 x 1, angled plug, cable connection	Round connector M12 x 1, angled plug, cable connection	Round 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



<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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/PBT	→ www.sick.com/PFT	→ www.sick.com/PHT	→ www.sick.com/PET







			
	Bulkscan®	FTMg	
	Non-contact and maintenance-free volume flow measurement	Flow sensor with leak detection	


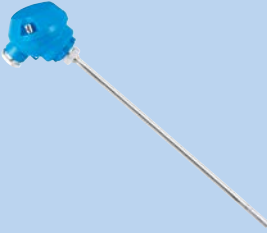

Technical data overview

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) OPC UA, MQTT, integrated web server	
Max. belt speed	30 m/s / ≤ 20 m/s	–	
Measuring pipe nominal width	–	DN 15 DN 20 DN 25 DN 40 DN 50	
Max. adjustable measuring range	–	5.3 l/min ... 17,671.5 l/min (according to DIN 1343)	




At a glance



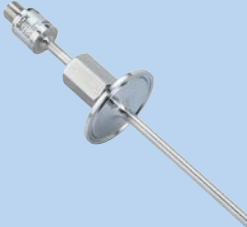
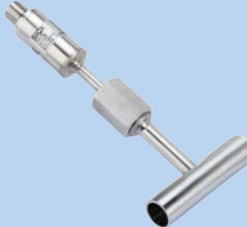




	<ul style="list-style-type: none"> • Efficient and cost-effective non-contact measurement of volume and mass flow of bulk materials • Laser pulses with high angular resolution ensure outstanding image resolution • Multi-echo pulse evaluation produces highly reliable measurements • Integrated function for determining the center-of-gravity of the bulk material • Rugged design for harsh ambient conditions • Integrated heater allows measurement even at low temperatures • Compact housing with enclosure rating IP67 	<ul style="list-style-type: none"> • Measures compressed air and non-corrosive gases such as argon, helium, carbon dioxide and nitrogen • Visualization of compressed air consumption via the FTMg Monitoring Box from SICK • Measurement of gas flow and temperature as well as process pressure and energy consumption with only one sensor • Low pressure loss • High measurement dynamics for cylinder and leakage monitoring 	
Detailed information	→ www.sick.com/Bulkscan	→ www.sick.com/FTMg	

		
FFU	DOSIC®	T-Easic® FTS
Non-contact flow measurement	The compact stainless-steel sensor for flexible flow measurement	Clever dry-run protection in pumps
Ultrasonic sensor Liquids	Ultrasonic sensor Conductive and non-conductive liquids	Calorimetric measurement procedure 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) IO-Link 1.1	2 x push-pull digital outputs (Q2 configu- rable as pulse output / digital input) for flow and temperature IO-Link 1.1 Optional: Q1 configurable as analog output 4 mA ... 20 mA
– 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 m/s ... 3 m/s (water and oil) 0.03 m/s ... 6 m/s (taught-in media)
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Flow measurement for water and oil-based liquids Seal-free stainless-steel 316L sensor with $Ra \leq 0.8$ Straight, self-draining measuring tube Compact design with short installation lengths Configurable digital outputs Temperature measurement Enclosure rating IP 67/69, CIP/SIP-compatible, IO-Link version 1.1 	<ul style="list-style-type: none"> Flow monitoring and temperature measurement in one sensor Optimized for water and oil; teach-in option of other liquids Industrial design in VISTAL® housing with 180°-rotatable OLED display Stainless steel hygienic variant, completely CIP-/SIP-capable, process temperatures up to 150 °C Optimal pump protection thanks to empty pipe detection Automated measurement system via analog output or IO-Link Enclosure rating IP 67 / IP 69 
→ www.sick.com/FFU	→ www.sick.com/DOSIC	→ www.sick.com/T-Easic_FTS

				
	TBS	TBT	TCT	
	Temperature monitoring made easy	The proven temperature measurement	Compact, rugged, 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	$\pm (0.15 \text{ °C} + 0.002 t)$	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 ($R_A \leq (L^+ - 10 \text{ V}) / 0.028 \text{ A [ohm]}$)	Pt100, 4-wire, 4 mA ... 20 mA, 2-wire ($R_A \leq (L^+ - 9 \text{ V}) / 0.023 \text{ A [ohm]}$)	
Electrical connection	Round connector M12 x 1, 4-pin Round connector M12 x 1, 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, 4-pin, IP65	

At a glance				
	<ul style="list-style-type: none"> • Large display, IO-Link 1.1 • Individually programmable transistor outputs PNP or NPN, optional analog output 4 mA ... 20 mA or 0 V ... 10 V • Round connector M12 x 1 • Measuring ranges from -20 °C ... +120 °C • Pt1000 element, accuracy class A (IEC 60751) • Various installation lengths and connection threads • Parts in contact with media made from corrosion-resistant stainless steel 1.4571 • Enclosure rating IP 65 and IP 67 	<ul style="list-style-type: none"> • Pt100 resistance, accuracy class A according to IEC 60751 • Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C • Parts in contact with media made from corrosion-resistant stainless steel 1.4571 • Various mechanical adaptations and installation lengths • Pt100 (4-wire) or 4 mA ... 20 mA (2-wire) • Cable gland M16 x 1.5 	<ul style="list-style-type: none"> • Pt100 resistance, accuracy class A according to IEC 60751 • Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C • Parts in contact with media made from corrosion-resistant stainless steel 1.4571 • Various mechanical adaptations and insertion lengths, also available with protective pipe • Pt100 (4-wire) or 4 mA ... 20 mA (2-wire) • Round connector M12 x 1 (IP 67) 	
Detailed information	→ www.sick.com/TBS	→ www.sick.com/TBT	→ www.sick.com/TCT	

			
TSP Efficient and space saving temperature measurement	THTS Simple, hygienic temperature measurement	THTE Hygienic and flexible: temperature sensor with protective pipe	THTL 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
-	$\leq \pm 0.2\%$ of the range	$\leq \pm 0.2\%$ of the range	$\leq \pm 0.2\%$ 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 ($R_A \leq (L^+ - 10 \text{ V}) / 0.023 \text{ A}$ [ohm])	Pt100, 4-wire, 4 mA ... 20 mA, 2-wire ($R_A \leq (L^+ - 10 \text{ V}) / 0.023 \text{ A}$ [ohm])	Pt100, 4-wire, 4 mA ... 20 mA, 2-wire ($R_A \leq (L^+ - 10 \text{ V}) / 0.023 \text{ A}$ [ohm])
Round connector M12 x 1, 4-pin, IP67	Round connector M12 x 1, 4-pin	Round connector M12 x 1, 4-pin	Round connector M12 x 1, 4-pin
<ul style="list-style-type: none"> Platinum resistor (Pt100 or Pt1000, 2-wire or 3-wire), accuracy class B according to IEC 60751 Measuring range -30 °C ... +130 °C Various connection threads and insertion lengths Parts in contact with media made from stainless steel 1.4305 Round connector M12 x 1 (IP 67) 	<ul style="list-style-type: none"> Pt100 resistor, accuracy class A (IEC 60751) Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C Parts in contact with media: corrosion-resistant stainless steel 316L / 1.4435, $R_a \leq 0.8 \mu\text{m}$ Various hygienic process connections and installation lengths Pt100 (4-wire) or 4 mA ... 20 mA (2-wire) Round connector M12 x 1 	<ul style="list-style-type: none"> Pt100, accuracy class A (IEC 60751) Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C Measurement probe press-fitted into protective pipe under spring load In contact with media: corrosion-resistant stainless steel 316L / 1.4435, $R_a \leq 0.8 \mu\text{m}$ Hygienic process connections Pt100 (4-wire) or 4 mA ... 20 mA (2-wire) Round connector M12 x 1 	<ul style="list-style-type: none"> Pt100, accuracy class A (IEC 60751) Measuring ranges -50 °C ... +150 °C and -50 °C ... +250 °C Through housing for orbital welding into pipeline Measurement probe press-fitted into protective pipe under spring load In contact with media: corrosion-resistant stainless steel 316L / 1.4435, $R_a \leq 0.8 \mu\text{m}$ Pt100 (4-wire) or 4 mA ... 20 mA (2-wire) Round connector M12 x 1 
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SICK AT A GLANCE

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