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MICRO-EPSILON

More Precision.

optoNCDT 1402SC

IP69K Laser Displacement Sensor for the Food Processing Industry

	Eight models with measuring ranges from 5mm to 600mm
	Ideal for OEM applications
	Compact sensor with stainless steel housing
312Hz 375Hz 1000Hz	**Adjustable measuring rate up to 1.5kHz**
*A*nalog *D*igital	**Analogue (U/I) and digital output**
*T*rigger	**Trigger input**
*F*ilter inside	**Adjustable filter functions Peak selection (firmware)**
	Telemetry qualified by low power consumption
IP69K	**Protection class IP69K for harsh environments**
//www.	**Configuration via software www.micro-epsilon.com/download**

The optoNCDT 1402SC sensor is protected to IP69K and is available with measurement ranges between 5mm and 600mm. Due to its robust design, the sensor is ideally suited to applications in the food and beverage processing industry, either in outdoor use or within the demanding process manufacturing environment. The sensor housing is made from corrosion-resistant V4A steel and meets all food industry regulations and standards. Despite more challenging environmental conditions, the optoNCDT 1402SC offers very reliable measurement results. The sensor is resistant to high pressures, including jet washing, abrasive cleaning agents and disinfectants such as hydrogen peroxide and other alkaline and chlorine-based cleaning agents.

Protection Class: IP69K

Topic of the new protection class IP69K is mainly the resistance of electronic devices to jet washing and abrasive cleaning agents. At the IP Rating test, the sensor is mounted on a rotary disc, rotating at 5 revolutions per minute. At a water temperature of 80°C and over a period of 8 hours, the sensor is treated using a flat-spray nozzle at 0°, 30°, 60° and 90°. The distance from the nozzle to the sensor is between 100mm and 150mm. The jet has a pressure of 80 to 100bar.

Although these tests are standard for the food processing sector, the sensor is not normally subjected to such extreme conditions. Sensors in these types of applications are expected to offer reliable measurement results over a long period of time. Therefore, the sensors must not be susceptible to damage by cleaning processes. An extremely robust stainless steel housing avoids normal marking issues and custom-designed electronics ensure the characteristics of the optoNCDT 1402SC.

Very Low Current Consumption

As the sensor has a very low current consumption of just 50mA, it can also be applied in telemetry applications. In a specific customer application, the sensor rotates around a belt without being connected to the power supply. The data transmission works in the same way.

Special features:

Waterproof

The optoNCDT 1402SC is waterproof and so is suitable for use in production plants in which the sensor will be exposed to high-pressure cleaning. Contrary to conventional sensor housings, applications in seawater are also possible.


Resistant to Cleaning Agents

Due to its robust stainless steel housing, the sensor can also be cleaned using abrasive cleaning agents, which are commonly used in the food processing industry.

Food-Safe

As the entire housing of the sensor is made from V4A stainless steel, the sensor is ideally suited to the food and beverage processing industry. Labels or markings cannot work loose.
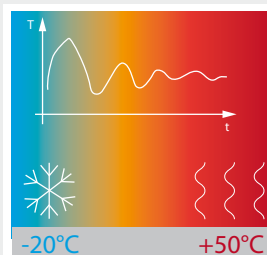

Temperature Resistant

Frequent rapid fluctuations in temperature will not affect the sensor. This is guaranteed by the special design of the sensor design and the optics, which are made from mineral glass.

-20°C   +50°C

Beverage Filling:

When it comes to beverage filling processes, the position of the screw or crown cap is a critical factor that affects the durability. This leads to the reliable closure of the bottle and so prevents any ingress of containments. We would there-fore recommend monitoring this process. As the optoNCDT 1402SC sensor has a very high measuring rate and can also be triggered, it is ideal for these types of application.

Shaping of Pastries:
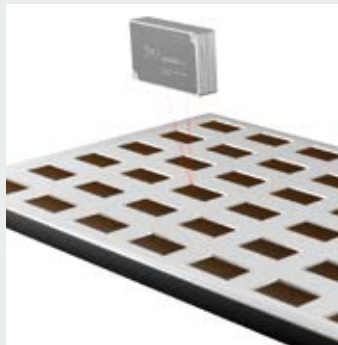
In order to ensure consistent quality of pastries, the baking process must be harmonised with the target size of the pastry product, which means the same volume is required for each one. Monitoring the profile of the pastry during this process provides important information and guarantees a consistent shape. Pastries that show unsatisfactory results can be separated afterwards. This can either be carried out at the beginning of production or even at the end of the baking process.

Thickness Measurement of Pasta Dough:
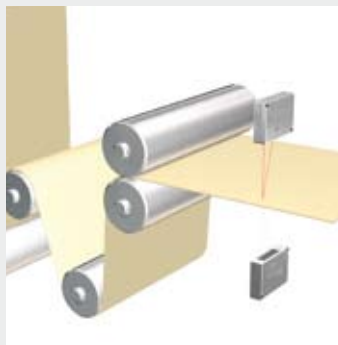
The thickness of permanent lines such as pasta dough or biscuit is a vital factor in the production process. Pastry that is too thin or thick will result in quality problems and raw material wastage. Random sampling and inspection does not offer reliable results, as defective goods are often detected too late. By applying two optoNCDT140SC sensors, the thickness can be measured easily and continuously. The signals are directly used for controlling the production line.
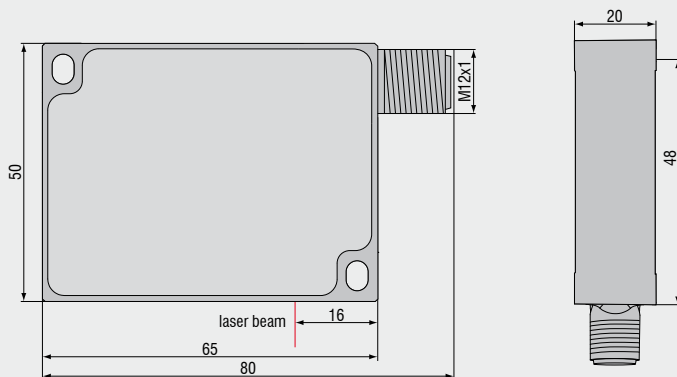
Volume Determination during Portioning:

If meat, cheese or bread is portioned, the thickness is less important than the weight of the slices. In order to ensure this, two optoNCDT140SC sensors are applied in automatic portioning machines, which scan the meat before being portioned. Therefore, the sensors rotate around the meat. The target is to achieve a constant weight for each packed unit. By using this volume information, the thickness of the slices required is controlled dynamically so that irregularities in the volume are compensated for.

Model	ILD 1402-5SC	ILD 1402-10SC	ILD 1402-20SC	ILD 1402-50SC	ILD 1402-100SC	ILD 1402-200SC	ILD 1402-250SC	ILD 1402-600SC
Measuring range	5mm	10mm	20mm	50mm	100mm	200mm	250mm	600mm
Start of measuring range SMR	20mm	20mm	30mm	45mm	50mm	60mm	100mm	200mm
Midrange MMR	22.5mm	25mm	40mm	70mm	100mm	160mm	225mm	500mm
End of measuring range EMR	25mm	30mm	50mm	95mm	150mm	260mm	350mm	800mm
Linearity	5...9µm	5...18µm	7...36µm	12...90µm	20...180µm	40...360µm	50...1200µm	120...3000µm
	≤0.18% FSO						≤0.5% FSO	
Resolution [1] averaged with averaging factor 64	0.6µm	1µm	2µm	5µm	10µm	13µm	32µm	80µm
	0.01% FSO							
Resolution [1] dynamic 1.5 kHz	1...3µm	2...5µm	5...10µm	6...25µm	12...50µm	13...100µm	32...300µm	80...600µm
	0.02...0.05% FSO						0.02...0.12% FSO	
Measuring rate, programmable	1.5kHz; 1kHz; 750Hz; 375Hz; 50Hz							
Exposure rate, programmable [2]	0.6ms; 1ms; 1.3ms; 2.6ms; 20ms							
Light source	semiconductor laser <1mW, 670nm (red)							
Laser safety class	class 2 IEC 60825-1 : 2001-11							
Spot diameter SMR	110µm	110µm	210µm	1100µm	1400µm	2300µm	5000µm	2.6 x 5mm
Spot diameter MMR	380µm	650µm	530µm	110µm	130µm	2200µm	5000µm	2.6 x 5mm
Spot diameter EMR	650µm	1200µm	830µm	1100µm	1400µm	2100µm	5000µm	2.6 x 5mm
Protection class	IP 69 K							
Vibration	15g / 10Hz … 1kHz						20g / 10Hz…1kHz	
Shock	15g / 6ms (IEC 68-2-29)							
Weight (without cable)	appr. 173g							
Temperature stability	0.03 % FSO/°C				0.08 % FSO/°C			
Operation temperature	0 …+50°C							
Storage temperature	-20 ... +70°C							
Output analogue	4 ... 20mA (1 ... 5V with cable PC 1402-3/U); free scalable within the nominal range							
Output digital	RS422 / 14bit							
Control I/O	1x open collector output (switching output, switch, error); 1x input (trigger)							
Supply	11 ... 30VDC, 24VDC / 50mA							
Controller	integrated signal processor							
Software	free setup and aquisition tool + SDK (software development kit)							
Electromagnetic compatibility (EMC)	EN 61326-1:2006 / EN 55011 Class B (Interface emission) EN 61326-1:2006 / EN 61000-4-2:1995 + A1:1998 + A2:2001 (Interference resistance)							

FSO = Full scale output   All specifications apply for a diffusely reflecting matt white ceramic target
[1] resolution digital output 14bit   [2] tide to measurement rate
SMR = Start of measuring range   MMR = Midrange   EMR = End of measuring range

(Dimensions in mm, not to scale)