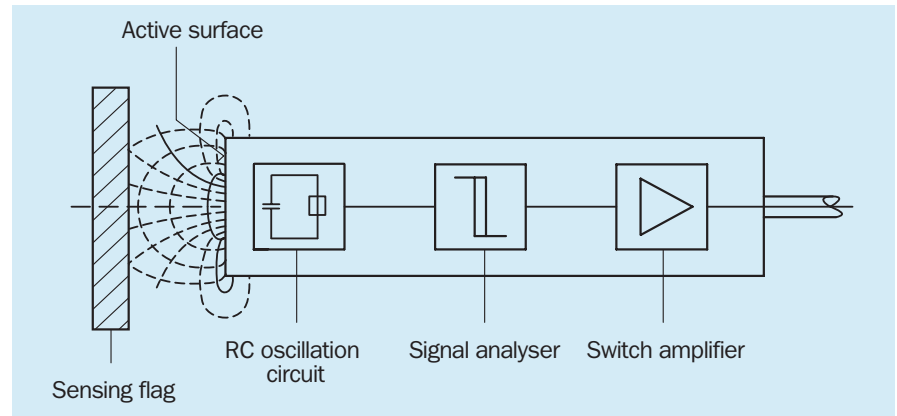
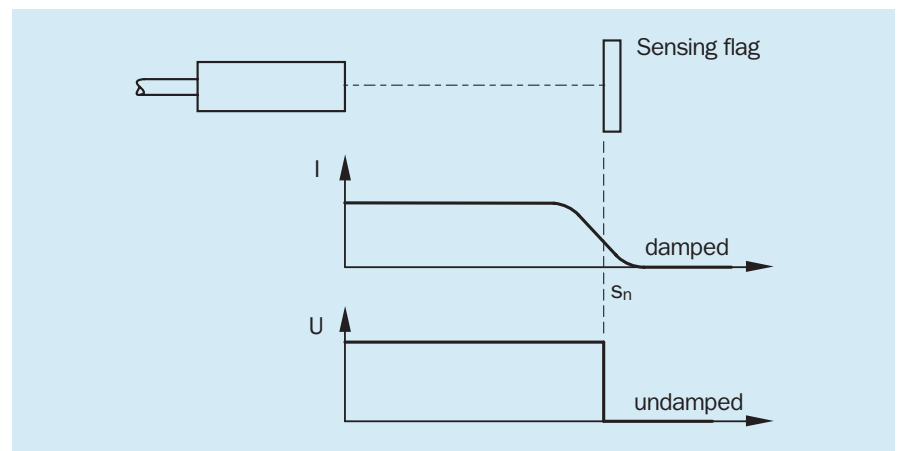


## Operating principle

The active element in a capacitive proximity sensor consists of a sensor electrode and shielding. Together, these two electrodes form the capacitor.



On the approach of a sensing flag (metallic or non-metallic object), a change in capacity takes place in the electrical field of this capacitor, i.e. the capacitor of the RC oscillation circuit is arranged in such a way that its capacity increases when an object approaches. The oscillator is set in such a way that it only becomes capable of oscillation through this increase in capacity. The start in oscillation when an object approaches is detected by the signal analyser and output via the signal amplifier.



### Reduction factor R

As with the inductive proximity sensors, the reduction factor depends on the material. It describes the factor by which the sensing range  $s$  is reduced by a certain material, with reference to the nominal sensing range  $s_n$ , which results from the use of an earthed ST37 metal plate as sensing flag.

The most important reduction factors for capacitive proximity sensors are:

Iron, earthed	1.0	Oil	0.2
Water	1.0	PVC	0.4
Wheat	0.3 ... 0.6	PE	0.37
Wood	0.2 ... 0.9	Ceramic material	0.3
Glass	0.3 ... 0.7		

The reduction factor heavily depends on the moisture content of the material.

Test	Standard	Product Standard EN 60497-5-2	General interference immunity Generic Standard EN 50082-2	SICK Capacitive Sensors
Electrostatic Discharge ESD	EN 61000-4-2 (IEC 1000-4-2)	4 kV cd <sup>1)</sup> / 8 kV ad <sup>2)</sup>	4 kV cd <sup>1)</sup> /8 kV ad <sup>2)</sup>	17 kV cd <sup>1)</sup> /ad <sup>2)</sup>
HF radiated	EN 61000-4-3 (IEC 1000-4-3)	3 V/m 80 ... 1000 MHz	10 V 80 ... 1000 MHz	> 15 V/m 80 ... 1000 MHz
HF wire conducted	EN 61000-4-6 (IEC 1000-4-6)	–	10 V 0.15 ... 80 MHz	> 10 V/m
Burst	EN 61000-4-4 (IEC 1000-4-4)	1 kV	2 kV	4 kV
Surge	IEC 255-5	1 kV, 500 Ohm	–	2.5 kV, 500 Ohm

<sup>1)</sup> cd = Contact discharge

<sup>2)</sup> ad = Air discharge

The same installation notes apply as for the inductive proximity sensors (see p. 210).

**Selection table**

Housing Design, size in mm, material	Sensing range S <sub>n</sub> in mm		Switching output P <sup>1)</sup>	Output function Com. <sup>2)</sup>	Connection C <sup>3)</sup> Co. <sup>4)</sup>		Electr. config.	From page
	Flush	Non-flush						
<b>with thread</b>								
M18, Plastic	8	12					DC	362
M18, PTFE	8						DC	364
M30, Plastic	16	25					DC	366
M30, Plastic	16	25					AC	368
<b>Cuboid</b>								
35x55x15, Plastic	16	25					DC	372

<sup>1)</sup> P = PNP

<sup>3)</sup> C = Cable

<sup>2)</sup> Com. = Complementary

<sup>4)</sup> Co. = Connector

**Type code**

	CM	18	–	08B	N	P	–	K	W	O	
<b>Sensor technology</b>											<b>Other codes</b>
Capacitive	C									O	–
<b>Design</b>											<b>Cables and connectors</b>
Cylinder with thread		M							W		Cable, PVC
Cuboid		Q							C		Connector M12 x 1
<b>Housing shape</b>											<b>Housing material</b>
Metric external thread 18			18					K			Plastic
Metric external thread 30			30					T			PTFE (Teflon®)
Edge length of sensing face 35			35								<b>Output</b>
<b>Sensing range/installation</b>										P	Complementary
Flush				B							<b>Interface</b>
Non flush				N	P						PNP, 4-wire, 10 ... 40 V DC
8 mm, flush				08B	N						NPN, 4-wire, 10 ... 40 V DC
25 mm, non flush				25N	A						2-wire, 20 ... 265 V AC