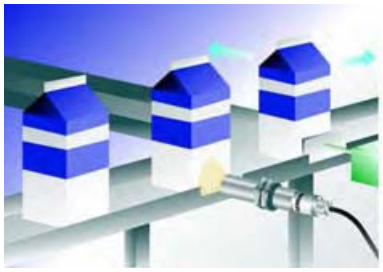
# SIMATIC PXC capacitive proximity switches
## Application examples

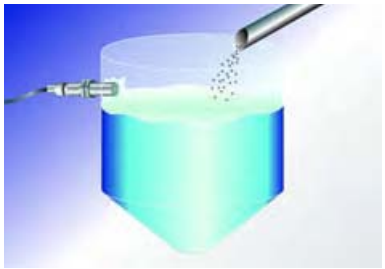
SIMATIC PXC capacitive proximity switches detect any material in solid, powder or liquid state, e.g. glass, ceramics, plastics, wood, oil, water, cardboard and paper. Objects can also be detected through certain non-metallic materials. This multi-talented sensor can be applied virtually everywhere: in metal-working and bottling plants, in automation control and for counting all kinds of consumer goods. The capacitive proximity switches operate without contact and wear and thus have a very long service life.

Typical applications for capacitive proximity switches are:

- Level control in plastic or glass containers
- Level signaling in transparent packaging
- Winding wire breakage signaling
- Tape breakage signaling
- Item counting of any kind



*Detection of milk in cartons*



*Level control for bulk material in vessel*

# Overview of SIMATIC PXC

capacitive proximity switches

## SIMATIC PXC200





| | M18 | M30 | Ø 40 mm | 20 mm x 32 mm | 40 mm x 40 mm |
|---|---|---|---|---|---|
| **Operating distance** | | | | | |
| • 5 mm | ■ | | | ■ | |
| • 10 mm | | ■ | | | |
| • 20 mm | | | ■ | | ■ |
| **Operating voltage** | | | | | |
| • 10 ... 30 VDC | | | | ■ | |
| • 10 ... 65 VDC | ■ | ■ | ■ | | ■ |
| • 20 ... 250 VAC | | ■ | ■ | | ■ |
| **Number of wires** | | | | | |
| • 2-wire | | ■ | ■ | | ■ |
| • 3-wire | ■ | | | ■ | |
| • 4-wire | | ■ | ■ | | ■ |
| **Output** | | | | | |
| • pnp | ■ | ■ | ■ | ■ | ■ |
| • NO contact | ■ | ■ | | ■ | |
| • NC contact | | ■ | | | |
| • NO and NC contact | | ■ | ■ | | ■ |
| • NO or NC contact | | ■ | ■ | | ■ |
| **Mounting** | | | | | |
| • Flush | ■ | ■ | ■ | ■ | ■ |
| **Connection** | | | | | |
| • Connector, Ø 8 mm | | | | ■ | |
| • Cable | ■ | ■ | | ■ | |
| • Terminal compartment | | ■ | ■ | | ■ |
| **Degree of protection** | | | | | |
| • IP 67 | ■ | ■ | ■ | ■ | ■ |
| **Product selection code** | **3RG1613** | **3RG1614** | **3RG1655** | **3RG1673** | **3RG1630** |

Find the right product faster with the product selection code!
In the A&D Mall: enter the product selection code to display a list of relevant products.
In Catalog FS 10: use the product selection code in the order number index in Chapter 6 to find the chapter and page of suitable products.

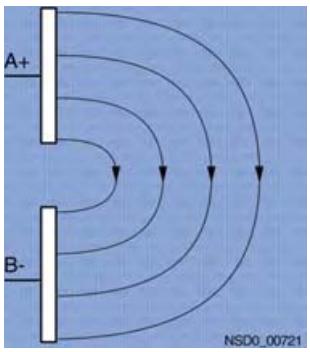
# SIMATIC PXC capacitive proximity switches
## Functionality and highlights

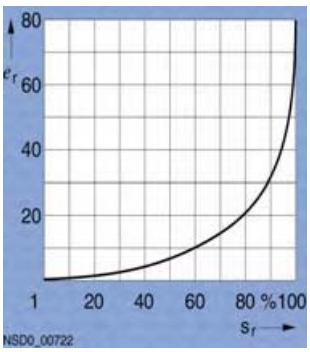
**Function**

The sensing face of a capacitive sensor is formed by two concentrically arranged metal electrodes that are equivalent to the electrodes of an unwound capacitor. The electrode surfaces A and B are connected into the feedback branch of a high-frequency oscillator that is tuned such that it does not oscillate when the surface is free.

When an object approaches the active face of the sensor, it enters the electric field in front of the electrode surfaces and causes a change in the coupling capacitance. The oscillator starts to oscillate; the amplitude is recorded by an evaluation circuit and converted into a switching command.

### Switching frequency




The build-up characteristics specific to other pulse/interval conditions may result in higher switching frequencies than those specified.

### Operating distance

The stated values are applicable to a target of metal which is grounded and whose area corresponds to the sensing face of the proximity switch. The real operating distance sr for non-conductive targets is dependent on the relative dielectric constant er and the characteristic value (see characteristic curve).

## Highlights

- Detection of all materials (e.g. plastics,wood, paper)
- Measurement of liquid through plastic tubes or glass pipes
- Measurement of aggressive chemicals
- Adjustment of the operating distance on the object

### Built-in protection:

- Spurious signal suppression
- Short-circuit and overload protection
- Polarity reversal protection for connections
- Inductive interference protection

**Dielectric constants of various materials:**

- Glass 5
- Paper 2.3
- Vacuum, air 1
- Water 80