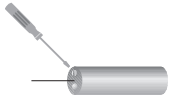


# Capacitive Sensors – calibration

**Important:** when calibrating capacitive sensors, the different material properties of the product being scanned must always be taken into consideration. Capacitive sensors are accordingly fitted with a trimming potentiometer, which can be used to adjust the device's sensitivity. Turning the potentiometer clockwise increases the sensitivity, while turning it anticlockwise reduces the sensitivity.



## Sensor version flush-mounted ...-b-...

Normally, the rectilinear field of flush-mounted sensors scans block material from a distance. In order to ensure that the sensor concerned switches faultlessly, check the maximum sensing distance as described below before putting the device into operation:



**1<sup>st</sup> example:** a ceramic plate is to be scanned by an SK-4-10-b device. Using the sensor amplifier, first set the sensor to the maximum sensing distance S of 4 mm (specified in our catalogue) for metal or for an approximation for your hand (Fig. 1.13). With this preset distance of 4 mm, move the sensor towards the ceramic plate. The sensing distance S for the ceramic plate will then have decreased to approx. 2 mm (Fig. 1.14).

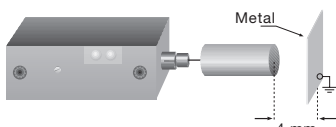


Fig. 1.13

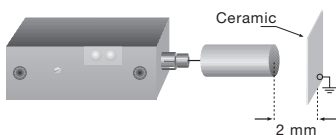


Fig. 1.14

The distance of 2 mm is now the maximum permissible sensing distance for the ceramic plate. You can also adjust for smaller sensing distances than 2 mm.

### Important!

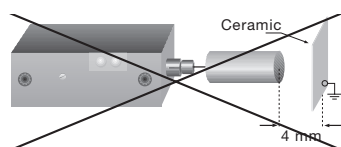


Fig. 1.15

To ensure that our sensors operate reliably within your technical specification, the devices have a larger detection range than the maximum sensing distance S stated in the catalogue. If you now adjust the sensing distance for 4 mm for the ceramic plate described above, the sensor will be working in an impermissible range (Fig. 1.15). This entails a risk that temperature and other environmental factors, plus electrical interference in the mains, may lead to faulty switching by the sensor.



**2<sup>nd</sup> example:** a liquid, e.g. water, is to be scanned through a partition wall by a flush-mounted sensor of the type SK1-20-M30-P-b-S.

This partition wall may only be made of glass or plastic. Basically, to calculate the wall thickness, the thickness in mm will be approx. 10 ... 20 % of the sensor's sensing distance, but max. 4 mm (for standard sensor technology).

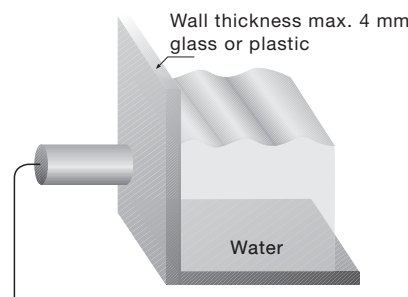


Fig. 1.16

The sensor's face (active surface) is now glued to the glass or plastic wall or mounted on it in a maximally form-fitting configuration. The tank is then filled with water until approx. 30 to 50 % of the sensor's active surface is covered (Fig. 1.16).

When small and ultra-small quantities of liquid are being scanned, particularly, and if the sensor has not been mounted in a form-fitting configuration (flat sensor surface on a tank wall with a small radius), 30% should be selected as the coverage area.

Now turn the sensor's potentiometer anticlockwise (lower sensitivity) until the sensor switches off (with the NO contact versions S „LED OFF“). Now turn the potentiometer clockwise again (higher sensitivity) until the LED, and thus the output signal, just about switch on again. Using the calibration process described here ensures that the sensor does not detect the wall or the media residues on the wall, but only switches when the liquid has again reached the above-described level of 30 to 50 %.

## Sensor version non-flush mounting ...-nb-...

Due to their spherical fields, these capacitive sensors are particularly suitable for applications as fill level sensors for liquids, plastic granules or powder.



**Example:** granules in a tank are to be scanned by a non-flush-mounted sensor of the type SK1-30-M30P-nb-S. The sensor is now installed in the tank with its active surface (free zone at the head as described in the catalogue), in a configuration ensuring that the head is completely covered by the product.

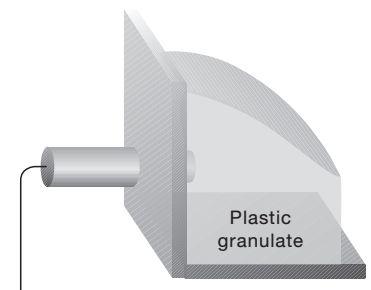


Fig. 1.17

Now turn the sensor's potentiometer anticlockwise (lower sensitivity) until the LED, and thus the output signal, switch off. Then turn the potentiometer clockwise (higher sensitivity) until the LED, and thus the output signal, just about switch on again. To conclude, make an additional ¼ turn (90° turn) in a clockwise direction. This is to compensate for possible temperature fluctuations or changes in the moisture level of the product being scanned.

If a medium has a high  $\epsilon_r$ , especially water, the sensor will react much more sensitively. For this reason, you should perform calibration with about 50 ... 80 % coverage, or use a sensor from the SK1-FSA series.



The SK1-FSA ... Smart Level Sensors are ideal fill level sensors for all aqueous media. They enable you to detect (mostly without calibration) all conductive and also adhering liquids, both when touching the material and also through relatively thick tank walls.