



## Product Description

The sks sensor offers a non-contact measurement of the distance to an object which must be positioned within the sensor's detection zone. The switched output is set in dependence of the adjusted detect distance.

Via the push-button, the detect distance and operating mode can be adjusted (teach-in). Two LEDs indicate operation and the state of the switched output.

The output function is changeable from NOC to NCC.

## Operating Instructions

sks-15/D sks-15/E  
sks-15/CD sks-15/CE

## Ultrasonic proximity switch with one switched output

## Safety Notes

- Read the operating instructions prior to start-up.
- Connection, installation and adjustment works may only be carried out by expert personnel.
- No safety component in accordance with the EU Machine Directive

## Proper use

sks ultrasonic sensors are used for non-contact detection of objects.

## Installation

- Mount the sensor at the installation site.  
Maximum torque: 0,5 Nm
- Connect a connection cable to the M8 device plug.

## 3-pin initiator plug

|   |                 |        |
|---|-----------------|--------|
|   |                 | colour |
| 1 | +U <sub>B</sub> | brown  |
| 3 | -U <sub>B</sub> | blue   |
| 4 | D               | black  |

## 4-pin initiator plug

|   |                 |        |
|---|-----------------|--------|
|   |                 | colour |
| 1 | +U <sub>B</sub> | brown  |
| 3 | -U <sub>B</sub> | blue   |
| 4 | D               | black  |
| 2 | Com             | white  |

Fig. 2: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cable

## Start-Up

- Connect the power supply.
- Carry out the adjustment in accordance with the diagram.

## Factory Setting

- Operation with one detect point
- Switched output on NOC
- Detect points at operating range

## Operating modes

Three operating modes are available for the switched output:

- Operation with one detect point  
The switched output is set if the object falls below the set detect point.
- Window mode  
The switched output is set if the object is within the set window margins.
- Two-way reflective barrier  
The switched output is set if the object is between sensor and reflector.

## Checking operation mode

- In normal mode shortly press the push-button.

The green LED stops shining for one second, then it will show the current operation mode:

- 1 x flashing = operation with one switching point
- 2 x flashing = window mode
- 3 x flashing = reflective barrier

After a break of 3 s the green LED shows the **output function**:

- 1 x flashing = NOC
- 2 x flashing = NCC

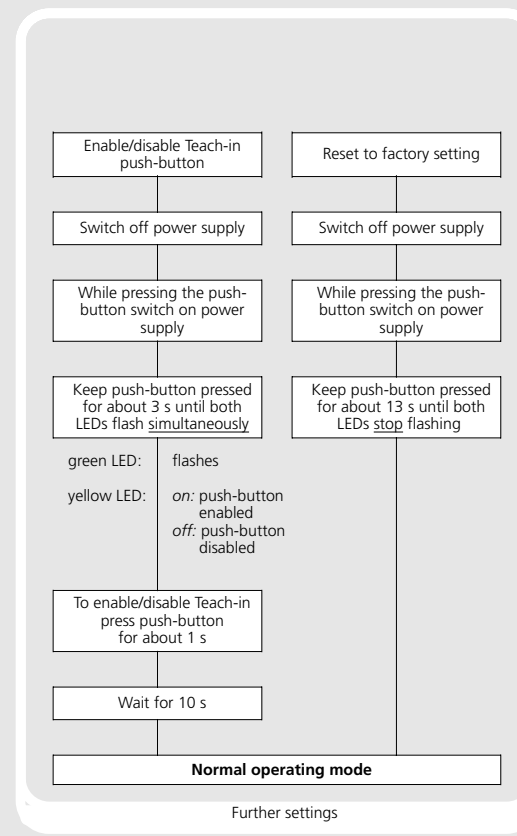
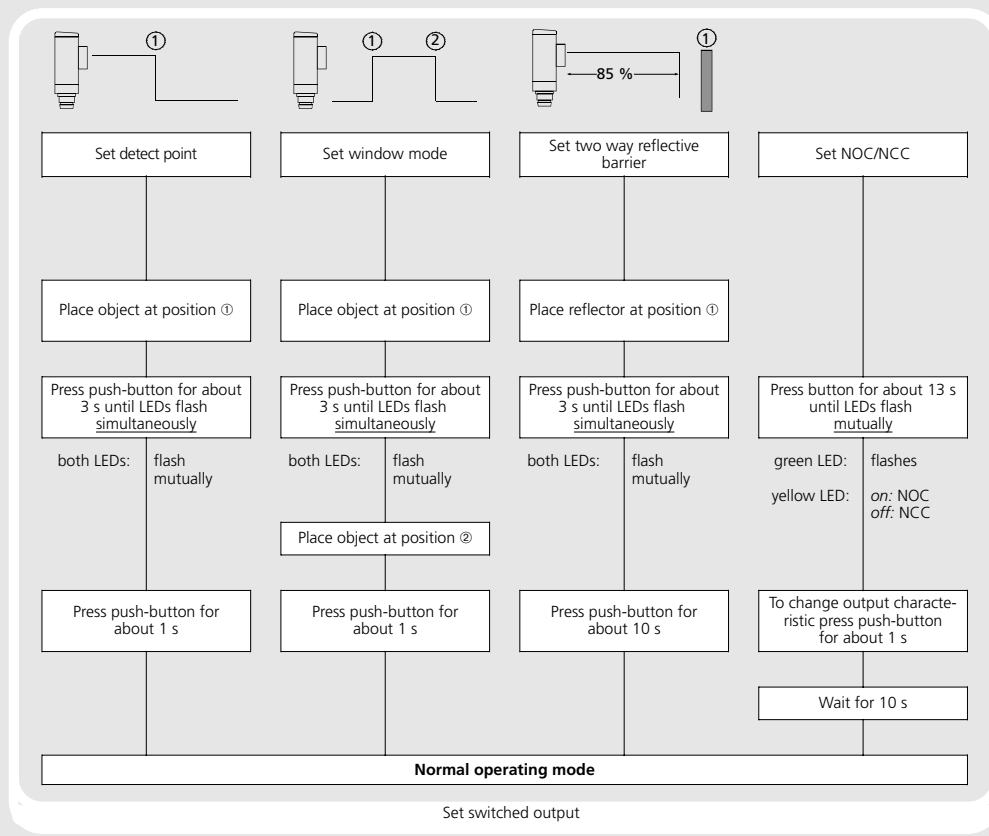
## Maintenance

microsonic sensors are maintenance-free. In case of excess caked-on dirt we recommend cleaning the white sensor surface

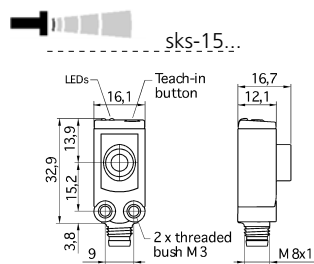
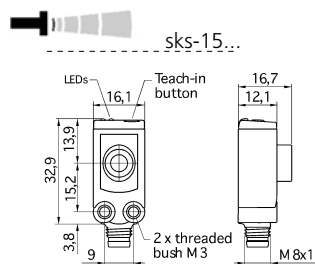
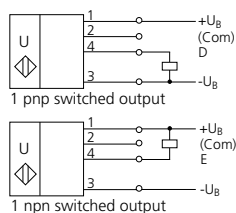
## Notes

- sks-15/CD and sks-15/CE sensors have internal temperature compensation. Because the sensors heat up on their own, the temperature compensation reaches its optimum working point after approximately 30 minutes of operation.  
The sensors sks-15/D and sks-15/E have no temperature compensation.
- The sks sensor has a blind zone, within which distance measurements are not possible.
- In the normal operating mode, an illuminated yellow LED signals the switched output is switched through.
- If the object to be sensed moves into the detection area from the side, the switching distance should be set 8-10 % further than the desired switch point to obtain a reliable object detection.  
If the object moves towards the sensor (e.g. level control) the detect point can be taught to the actual distance at which the sensor has to switch the output.

## Sensor adjustment with Teach-in procedure



# Technical data



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                    |                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Blind zone</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20 mm                                                                              | 20 mm                                                                              |
| <b>Operating range</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 150 mm                                                                             | 150 mm                                                                             |
| <b>Maximum range</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 250 mm                                                                             | 250 mm                                                                             |
| <b>Angle of beam spread</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | See detection zone                                                                 | See detection zone                                                                 |
| <b>Transducer frequency</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 380 kHz                                                                            | 380 kHz                                                                            |
| <b>Resolution, sampling rate</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0,10 mm                                                                            | 0,10 mm                                                                            |
| <b>Reproducibility</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ± 0,15 %                                                                           | ± 0,15 %                                                                           |
| <b>Detection zones</b><br>for different objects:<br>The dark grey areas are determined with a thin round bar (10 mm dia.) and indicate the typical operating range of a sensor. In order to obtain the light grey areas, a plate (100 x 100 mm) is introduced into the beam spread from the side. In doing so, the optimum angle between plate and sensor is always employed. This therefore indicates the maximum detection zone of the sensor. It is not possible to evaluate ultrasonic reflections outside this area. |                                                                                    |                                                                                    |
| <b>Accuracy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Temperature drift 0,17 % / °C                                                      | Temperature drift internal compensated, ≤ 2 %                                      |
| <b>Operating voltage UB</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20 - 30 V DC, reverse polarity protection                                          | 20 - 30 V DC, reverse polarity protection                                          |
| <b>Voltage ripple</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ±10 %                                                                              | ±10 %                                                                              |
| <b>No-load current consumption</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | < 30 mA                                                                            | < 30 mA                                                                            |
| <b>Housing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ABS<br>ultrasonic transducer: polyurethane foam, epoxy resin with glass content    | ABS<br>ultrasonic transducer: polyurethane foam, epoxy resin with glass content    |
| <b>Class of protection to EN 60 529</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | IP 67                                                                              | IP 67                                                                              |
| <b>Type of connection</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3-pin M8 initiator plug                                                            | 4-pin M8 initiator plug                                                            |
| <b>Controls</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Yes, Teach-in push-button                                                          | Yes, Teach-in push-button                                                          |
| <b>Indicators</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LED green (operation)<br>LED yellow (state of output)                              | LED green (operation)<br>LED yellow (state of output)                              |
| <b>Programmable</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | No                                                                                 | No                                                                                 |
| <b>Operating temperature</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -25°C to +70°C                                                                     | -25°C to +70°C                                                                     |
| <b>Storage temperature</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -40°C to +85°C                                                                     | -40°C to +85°C                                                                     |
| <b>Weight</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8 g                                                                                | 8 g                                                                                |
| <b>Switching hysteresis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2 mm                                                                               | 2 mm                                                                               |
| <b>Switching frequency</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 25 Hz                                                                              | 25 Hz                                                                              |
| <b>Response time</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 32 ms                                                                              | 32 ms                                                                              |
| <b>Time delay before availability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | < 300 ms                                                                           | < 300 ms                                                                           |
| <b>Norm conformity</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | EN 60947-5-2                                                                       | EN 60947-5-2                                                                       |
| <b>Order no.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>sks-15/D</b>                                                                    | <b>sks-15/CD</b>                                                                   |
| <b>Switched output</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | pnp, UB-2 V, I <sub>max</sub> = 200 mA<br>switchable NOC/NCC, short-circuit-proof  | pnp, UB-2 V, I <sub>max</sub> = 200 mA<br>switchable NOC/NCC, short-circuit-proof  |
| <b>Order no.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>sks-15/E</b>                                                                    | <b>sks-15/CE</b>                                                                   |
| <b>Switched output</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | npn, -UB+2 V, I <sub>max</sub> = 200 mA<br>switchable NOC/NCC, short-circuit-proof | npn, -UB+2 V, I <sub>max</sub> = 200 mA<br>switchable NOC/NCC, short-circuit-proof |

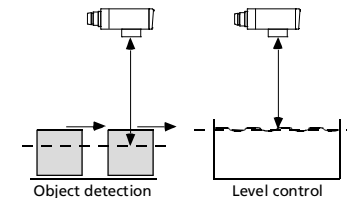


Fig. 4: Set the detect point for different directions of movement of the object

- In the »Two-way reflective barrier« operating mode, the object has to be within the range of 0-85 % of the set distance.
- If the push-button is not pressed for 10 minutes during the teach-in setting, the settings made hitherto are deleted.
- The sensor can be reset to its factory setting.



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MV-DO-074785-187014