

Properties:

- ✓ 2-wire tilt protection switch¹⁾
- ✓ Measuring range +/-180° rotationally symmetric around the Z-axis.
- ✓ Median resolution and precision
- ✓ Connection compatible for applications that previously implemented with mechanical switches (e.g. mercury, pendulum or reed switches).
- ✓ Suitable for industrial use
 - IP rating: IP65/67
 - CE mark

**Areas of application:**

- ✓ Industrial automation
- ✓ Agricultural and forestry machinery
- ✓ Commercial vehicles, tail lifts
- ✓ Crane and lifting technology

^{*)} Patent protected by EP3564980

Function: The tilt switch HNSC-B-...-KS-DC monitors rotationally symmetric tilt deviations from the vertical (Z-axis). If a tilt deviation from the Z-axis occurs that is greater than the defined OFF monitoring range, the switch transitions to a low-resistance operating state (NORMALLY CLOSE). The indicator LED of the switch signals the respective switching state. The tilt switch will only return to the high-resistance operating state when the tilt deviation falls below the defined switching point again. The switching point is set according to customer specifications within a range of 30° tilt to 150° tilt (see order key). The switching hysteresis between the ON and OFF points is approximately 2° tilt. The measurement limit frequency is approximately 5 Hz.

Special advantages: Special advantages: The HNSC-B tilt switch is particularly suitable for retrofitting in existing applications for which a 1:1 replacement is required due to increased requirements (robustness, accuracy, RoHS directive, etc.). In many cases, the switch offers a simple solution for this.

Example: The replacement of a mechanical tilt switch with the HNSC-B at a PLC input can be implemented without further measures due to the very low power consumption.

Customer-specific variants: Switching hysteresis and cut-off frequency of the switch are based on many years of experience but can be customized according to the respective application.

Mechanical data:

Housing material: Plastic
Dimensions: 40 x 20 x 20 mm

Measuring range:

Measuring range X-axis: -90°...+90°
Switching angle X-axis: according to customer preference between 2° and 45°

Connections:

Connection: Cable, 2-wire, length as per customer request (max. 3m)

Alternatively: Cable with M12 connector, 4-pole, A-coded, see connection diagram.

Output/interface:

Switch type: normally open (NO) contact

Operating condition:

Ambient temperature: -25° C ... 70° C
Protection class: DIN IP 67

Accuracy¹⁾:

| | | | | |
|-------------------------------|-----------|------|------|-------|
| Accuracy: | +/- 2° | | | |
| Hysteresis: | 2° +/- 1° | | | |
| Limit frequency: | 1 Hz | | | |
| Measuring principle: | MEMS | | | |
| | Min. | Typ. | Max. | |
| Temp. coefficient (relative): | 0.02 | 0.06 | 0.12 | [°/K] |
| Temp. coefficient at 0° C: | 0.50 | 1.50 | 3.00 | [°] |
| Temp. coefficient at 50° C: | 0.50 | 1.50 | 3.00 | [°] |
| Temp. coefficient at -25° C: | 1.00 | 3.00 | 6.00 | [°] |
| Temp. coefficient at 70° C: | 0.95 | 2.70 | 5.40 | [°] |

¹⁾ All properties have been determined at a tilt of 8°. Different switching angles may lead to slightly deviating results.

Electrical data:

Operating voltage U_B : 9-30 VDC
Rated voltage: 24 VDC
Ripple voltage: < 15 %
Rated current: 100 mA
Residual current consumption: ca. 500 µA
Switching output: polarized NO contact
Voltage drop, static: 5 V, max.

Function displays:

LED, yellow: contact closed

EMV:

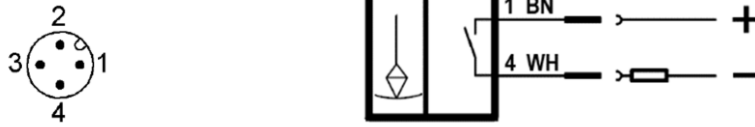
EU-Directive: 2014/30/EU EMV Directive, 2011/65/EU RoHS Directive
Applied standards: EN 61000-6-3:2007 + A1:2011/AC:2012 (emitted interference for residential, commercial and small businesses), EN 61000-6-2:2005 + AC:2005-09 (Interference immunity for industrial areas)

Functional safety:

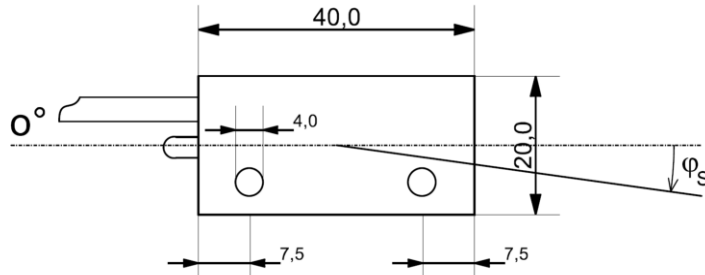
MTTFd: 1691 years
Service life: 20 years

The MTTF/service life values do not constitute binding quality and/or service life commitments; they are merely empirical values without binding character. These values do not extend the limitation period for claims for defects or otherwise affect them in any way.

Connection diagram

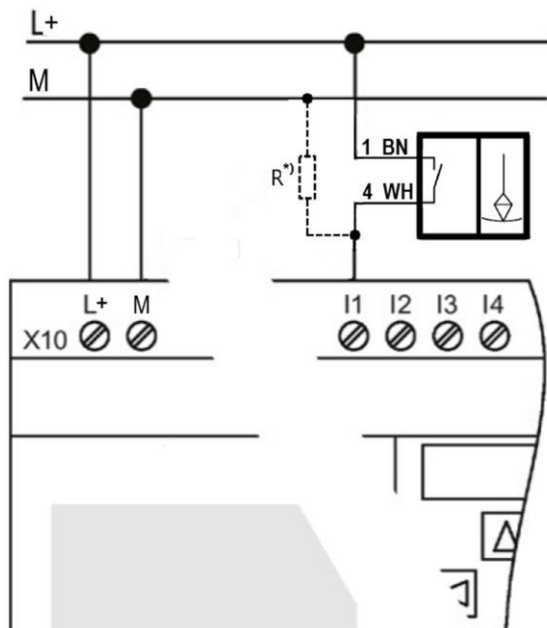


Mounting dimensions



The reference plane for the specified switching angle is the bottom of the housing.

Use with a PLC

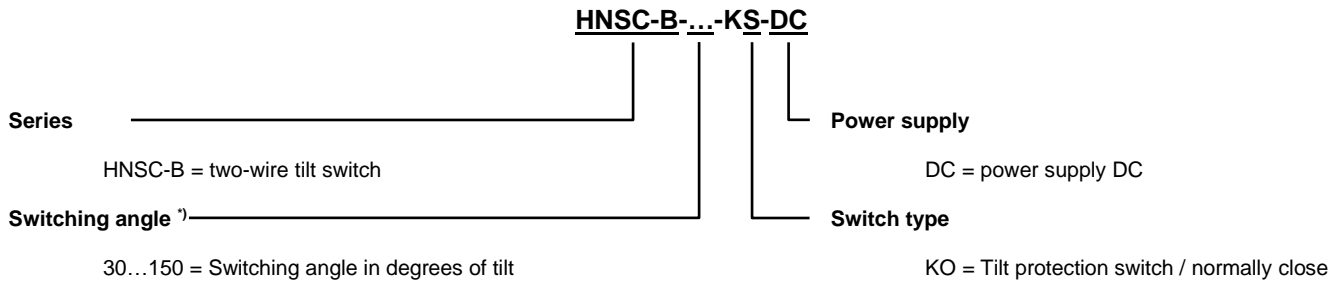


Example: Wiring of the tilt switch HNSC-B to the digital input of a PLC

Please note: When using the tilt switch HNSC-B as a signal transmitter on a digital input of a PLC, the control system must tolerate a residual current of approx. 600 µA when detecting signal 0. Please observe the specifications in the technical data of the control system used.

R*): Alternatively, when using very sensitive digital inputs, a 2k resistor can be connected between the input used and ground.

Order Code:



***) Please specify the desired characteristics of the switch when ordering:**

Example: HNSC-B-08-KS-DC, order designation for a tilt protection switch normally open with a switching angle of 8° tilt.

Please include the desired cable length (max. 3 m) when ordering.

If you wish to have the version with M12 connector, please specify it when placing your order.