

## Tilt sensor N3

The robustly designed N3 tilt sensor has a high impact and vibration resistance so is frequently used for tilt measurement in construction machinery, industrial trucks and adverse industrial environments. The N3 tilt sensor also has a high resolution and repeating accuracy. It can be easily programmed and the neutral position adjusted with the corresponding infrared remote control.

### Product characteristics

- Long service life and reliability thanks to the mechanics-free MEMS technology
- The analogue output signals can be combined with additional switching points
- Tilt range up to  $\pm 60^\circ$
- IP67 protection class
- Operating range from  $-40^\circ\text{C}$  to  $+70^\circ\text{C}$
- Analogue current or voltage output, or volt free switching output via relay
- Depending on the angle, resolution up to  $0.04^\circ$
- Adjustment of the neutral position possible through remote control
- Selectable switch-on and switch-off delay at the switching output

**Technical drawing**

IMAGE 1/6: NOTE: IF MOUNTED HORIZONTALLY, IT IS ONLY POSSIBLE TO MEASURE THE TILT ON THE X-AXIS.

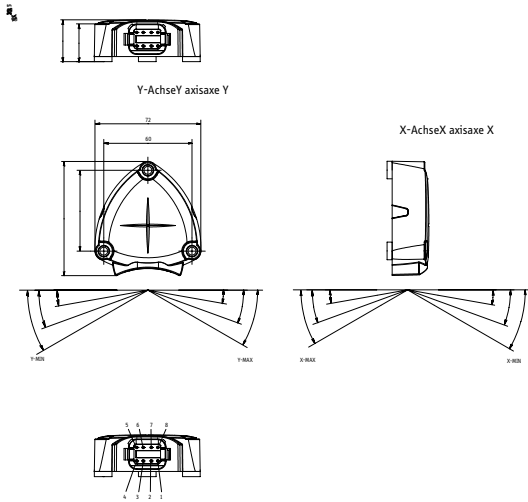


IMAGE 2/6: THE BLOCK CIRCUIT DIAGRAM DEPICTS THE SENSOR WITH THE SWITCHED-ON OPERATING VOLTAGE IN THE ZERO POSITION.

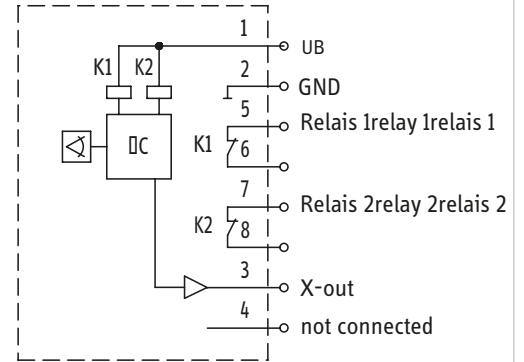


IMAGE 3/6

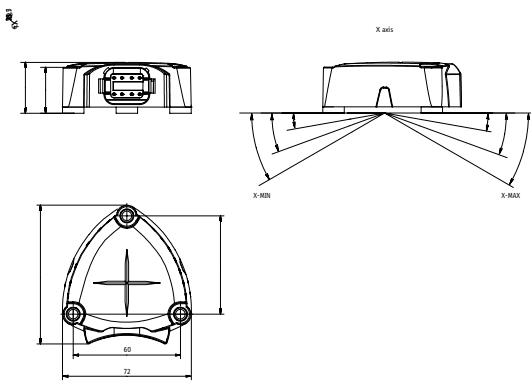


IMAGE 4/6: NOTE: IF MOUNTED VERTICALLY, IT IS POSSIBLE TO MEASURE THE TILT ON EITHER THE X-AXIS OR Y-AXIS.

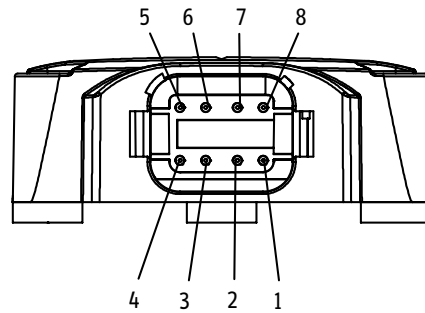


IMAGE 5/6: THE BLOCK CIRCUIT DIAGRAM DEPICTS THE SENSOR WITH THE SWITCHED-ON OPERATING VOLTAGE IN THE ZERO POSITION.

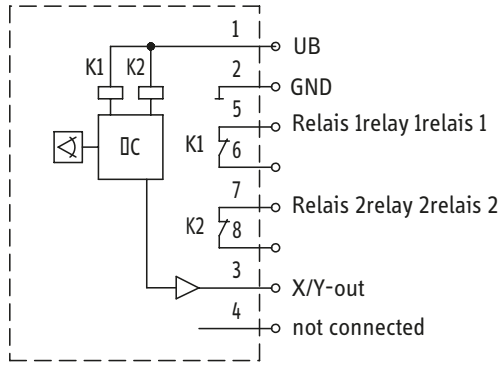


IMAGE 6/6

## Electrical data

Attribute	N3.A1...	N3.A2...	N3.D0....	N3.K1....	N3.K2....
Max. switching voltage	-			48 V DC	
Max. switching current	-			1 A	
Max. switching power	-			30 W	
Polarity reversal protection	yes				
Output signal min.	-	0.5 V DC	-		0.5 V DC
Output signal max.	-	4.5 V DC	-		4.5 V DC
Output signal min.	4 mA	-		4 mA	-
Output signal max.	20 mA	-		20 mA	-
Output signal - centre position/zero position	-	2.5 V DC	-		2.5 V DC
Output signal - centre position/zero position	12 mA	-		12 mA	-
EMC immunity (Norm)	ISO 11452-5:2000 ISO7637-2:2004				
EMC emission (Norm)	DIN EN 55025:2003				
Operating voltage min.	10 V DC				
Operating voltage max.	30 V DC				
Current consumption	24 mA		36 mA		
Load resistance min.	-	10000 Ohm	-		10000 Ohm
Load resistance max.	200 Ohm	-		200 Ohm	-
Short-circuit resistance to GND	no				
Short-circuit resistance to supply	no				
Linearity error	typ. +-1 %				
Repeating accuracy	<= 25°:0,2°, >25°:0,5 °				
Signal update rate	100 Hz				
Technology	MEMS				
Number of measurement axes (Number)	1				

## Electrical data

Attribute	N3.A1...	N3.A2...	N3.D0....	N3.K1....	N3.K2....
Angle measuring range	(wählbar in 5° Schritten) +-5°...+-60 °				
Initialisation time after power on/start-up time	500 ms				
Switching points	-	(wählbar in 0,5° Schritten) +-1,5°...+- 60 °			
Zero justification	±5°				
Vibration filter	40 Hz				
Switching output	-	2x NO			
Connection type (switching output)	-	Selectable			
Outputs	4...20mA	0,5...4,5V	Relay	4...20mA + Relay	0,5...4,5V + Relay
MTTF	29.7 a	29.3 a	29.7 a		29.3 a
Resolution	<= 25°:<=0,04°,>25°:<=0,14 °				
Temperature coefficient	0.008°/K				

## Material information

Attribute	N3.A1...	N3.A2...	N3.D0....	N3.K1....	N3.K2....
Housing material	Gehäuseoberteil:PBT; Gehäusedeckel:PC				

## Environmental conditions

Attribute	N3.A1...	N3.A2...	N3.D0....	N3.K1....	N3.K2....
Protection class	IP67 DIN EN 60529				
Operating temperature min.	-40 °C				
Max. operating temperature	70 °C				
Min. storage temperature	-40 °C				
Max. storage temperature	85 °C				
Min. cable temperature range, moving	-10 °C		-5 °C		-40 °C
Max. cable temperature range, moving	105 °C			80 °C	
Min. cable temperature range, fixed installation	-30 °C			-40 °C	
Max. cable temperature range, fixed installation	105 °C			80 °C	
Shock resistance (Norm)	DIN IEC 68 Teil 2-27				
Vibration resistance (Norm)	DIN IEC 68 Teil 2-6 DIN IEC68-2-64				
Impact resistance (Norm)	max. 20000 g				
ESD insulation resistance (Norm)	ISO 10605:2008				

## Installation

Attribute	N3.A1...	N3.A2...	N3.D0....	N3.K1....	N3.K2....
Torque for fastening screws	6 N m				
Weight	100 g				

## Connection

Attribute	N3.A1...	N3.A2...	N3.D0....	N3.K1....	N3.K2....
Connector type	Deutsch 8 pol.				
Cable length	variabel (1m, 3m, 5m, 10m)				
Connection	Deutsch 8-pol. / Kabelabgang				

## Approvals

Attribute	N3.A1...	N3.A2...	N3.D0....	N3.K1....	N3.K2....
CE label	yes				