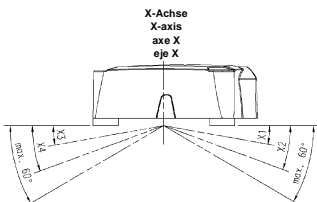
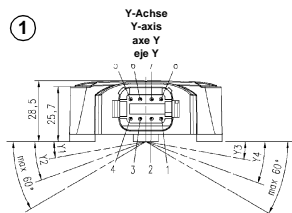


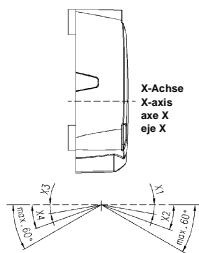
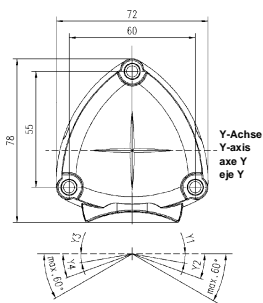


- (D) Betriebsanleitung  
Neigungssensor Typ N3.../N4...**
- (GB) Operating instructions  
Tilt sensor type N3.../N4...**
- (F) Notice d'utilisation  
Détecteur d'inclinaison type N3.../N4...**
- (E) Instrucciones para el servicio  
Sensor de inclinación tipo N3.../N4...**

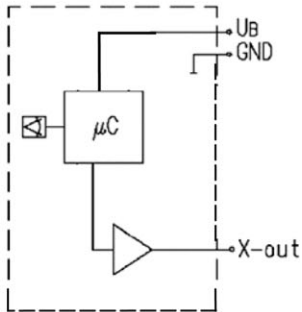
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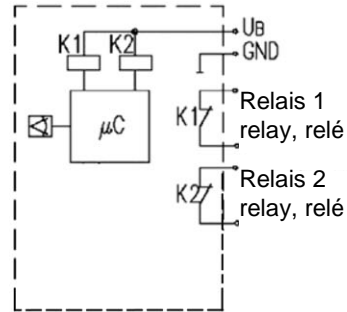
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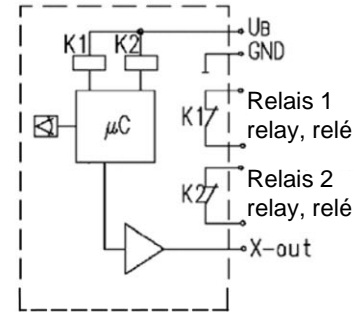
**N3xAxxx**



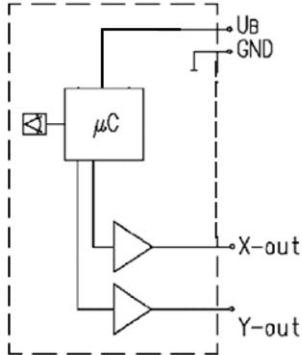
**N3xDxxx**



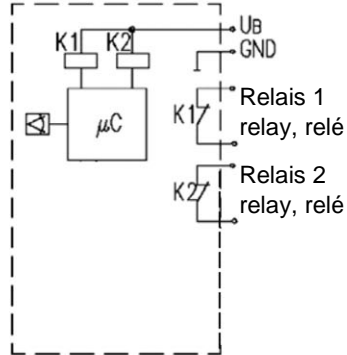
**N3xKxxx**



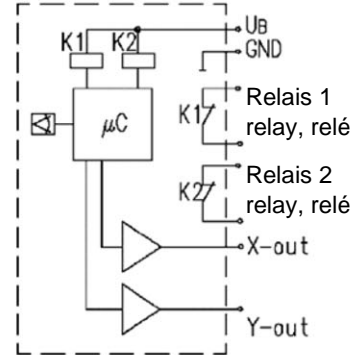
**N4xAxxx**



**N4xDxxx**



**N4xKxxx**



# 1 Technical data

## 1.1 Legend

On the fold-out page, the possible installation variants are depicted in the form of technical drawings.

- 1 Horizontal installation
- 2 Vertical installation

The uniaxial tilt sensor N3... does not have a y-axis.

## 1.2 Terminal assignment

Pin	Assignment
1	Operating voltage ( $U_B$ )
2	GND
5, 6	Relay 1
7, 8	Relay 2
3	X-OUT
4	Y-OUT

The terminal assignments of the models with cable connection can be found in the corresponding datasheet. The datasheets can be requested from elobau or downloaded at [www.elobau.com](http://www.elobau.com).

### 1.3 Type denomination

The following example and table are given to explain the type denomination of the tilt sensors.

Example:

N4AK1 E1CC 0001

Nabcd efgH xxxx

Placeholder	Characteristic		Meaning
Na	Number of axes	3	One axis
		4	Two axes
b	Housing/installation	A	Horizontal (8-pin)
		B	Vertical (8-pin)
		C	Horizontal (cable)
		D	Vertical (cable)
		E	Vertical (8-pin / Y-axis / N3)
		F	Vertical (cable / Y-axis / N3)
c	Outputs	A	Analogue
		D	Digital
		K	Combined (analogue and digital)
d	Output signal (analogue)	0	No signal
		1	4-20 mA
		2	0.5-4.5 V
e (*)	Relay (digital)	A	1 x 24 V (contact breaker)
		B	2 x 24 V (contact breakers)
		C	1 x 24 V (contact maker)
		D	2 x 24 V (contact makers)
		E	1 x 12 V (contact breaker)
		F	2 x 12 V (contact breakers)
		G	1 x 12 V (contact maker)
		H	2 x 12 V (contact makers)

Placeholder	Characteristic		Meaning
f (*)	Connection type (digital)	1	1 output = X1/X3 / Y1/Y3
		2	1 output = X1/X3 1 output = Y1/Y3
		3	1 output = X1/X3 / Y1/Y3 1 output = X2/X4 / Y2/Y4
		4	1 output = X1/X3 1 output = X2/X4
		5	1 output = X1/X3
		6	1 output = X1 1 output = X3
g (*)	Switch-on delay (digital)	A	No delay
		B	0.5 s
		C	1 s
		D	1.5 s
		E	2 s
h (*)	Turn-off delay (digital)	A	No delay
		B	0.5 s
		C	1 s
		D	1.5 s
		E	2 s
x	Sequence numbers		Assigned by elobau

(\*) Not applicable with selection of analogue outputs (i. e. placeholder c = A).

## 1.4 Electrical data

On the circuit diagrams of the fold-out page, the tilt sensors are depicted in neutral position with the operating voltage applied.

Operating voltage	10-30 V DC (analogue signal only)
	12 V DC $\pm$ 15 % (12 V relay)
	24 V DC $\pm$ 15 % (24 V relay)
Power consumption	Typ. 22 mA
	Typ. 8 mA per relay

Analogue output signals	Uout: 0.5-4.5 V
	Iout: 4-20 mA
Load resistance at Uout	Min. 10 k $\Omega$ (Ri = 100 $\Omega$ )
Load resistance at Iout	Max. 500 $\Omega$ (UB > 15 V)
	Max. 250 $\Omega$ (UB < 15 V)
Digital output signals	Relay: 12 V / 24 V
	Switching voltage: max. 48 V DC
	Switching current: max. 1 A / 30 W / 30 VA
Delay time	Switch-on delay (neutral position to the switching point): selectable
	Turn-off delay (switching point to the neutral position): selectable
Resolution	Inclination angle $\leq 25^\circ$ : $\leq 0.04^\circ$
	Inclination angle $> 25^\circ$ : $\leq 0.14^\circ$
Linearity error	Inclination angle $\leq 25^\circ$ : 1 %
	Inclination angle $> 25^\circ$ : 2 %
Temperature drift	1.3 %
Repeat accuracy	Inclination angle $\leq 25^\circ$ : 0.2°
	Inclination angle $> 25^\circ$ : 0.5°
Vibration filter	Limiting frequency selectable (typ. 40 Hz)
Signal refresh rate	Approx. 100 Hz
Start-up time	$\leq 1000$ ms

## 1.5 Mechanical data

Housing material	Housing upper part	PBT GF35
	Housing cover	PC
Installation sockets	$\varnothing$ 5.3 mm	
Temperature range	-40 °C .... +70 °C	
International protection	IP 67	

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## **2 Appropriate use**

### **2.1 Field of application**

The tilt sensor is designed for measuring the inclination (angle from a horizontal line) in different devices, machines etc.

The ambient conditions must be checked by the user before using the tilt sensor.

### **2.2 Norms and guidelines**

The tilt sensor complies with the following European guideline:  
2004/108/EC (EMC guideline)

### **2.3 Safety/Dangers**

- Only operate the tilt sensor in a completely closed and undamaged housing.
- Only replace components with original spare parts which are approved for the defined application.
- Operate the tilt sensors only in accordance with their intended use. Failure to comply with these conditions will invalidate any warranty claims or any liability on the part of the manufacturer.
- Ensure that all safety requirements applying to the individual machines are observed.
- Ensure that the international and national regulations are observed.

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## 3 Function

### 3.1 Mode of operation

The tilt sensors of series N3/N4 employ the capacitive measuring method.

The sensors supply a linearised output voltage or an output current depending on the inclination (see Electrical data).

In addition, different switching points can be defined which activate one or several relays.

The configuration of the sensors is defined in the type denomination.

### 3.2 Neutral position adjustment (optional with IR remote control)

All tilt sensors are preprogrammed with a neutral position (see the fold-out page).

The user can adjust the neutral position using the infrared remote control "IR-NGS01" (not included in the scope of delivery), if required.

During this adjustment, the current inclination angle is defined as the neutral position.

**NOTE** The neutral position can only be adjusted within a minute after the operating voltage has been applied.

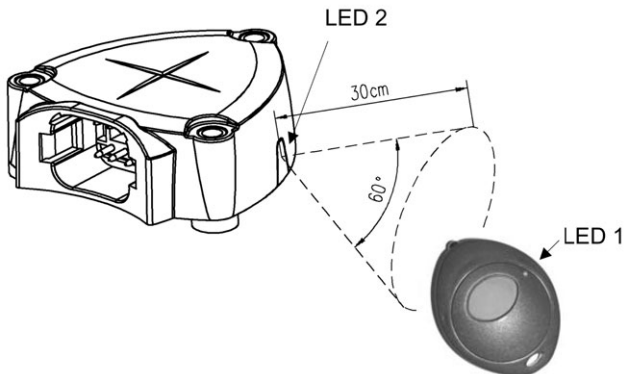
#### Defining the neutral position:

- Shortly press the button on the IR remote control. The remote control is activated. LED 1 lights up briefly to indicate readiness for operation.
- Press the button for longer than 2 seconds. A data signal is transmitted to the tilt sensor. LED 1 on the IR remote control flashes rapidly to indicate that the transmission is in progress.

If the button is not pressed within 8 seconds, the remote control is deactivated and will have to be reactivated by pressing the button again.

LED 2 on the tilt sensor flashes briefly three times to confirm the correct receipt of the data signal.

Point the IR remote control towards the sensor as shown in the figure.



## 4 Installation

- Ensure that the tilt sensor is only installed by specially-trained authorised personnel.
- Install the tilt sensor on a level surface (mechanically unstressed).
- The tilt sensor must not be modified.
- Connect tilt sensor, see Technical data.

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## 5 Putting into operation

- Ensure that the tilt sensor is only put into operation by specially-trained authorised personnel.
- Ensure that the electrical data is adhered to.
- Observe the operating instructions and notes provided by the manufacturer of the device.
- Apply operating voltage and check the proper functioning of the tilt sensor according to application.

## 6 Maintenance

### 6.1 Measures

The tilt sensor is maintenance-free.

### 6.2 Disposal

Dispose of used parts and unwanted packaging in accordance with the regulations of the country in which the device is installed.

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Artikelnummer / Article Number / Référence / N° de artículo: 900591

Version / Version / Version / Versión: 1.1

Datum / Date / Date / Fecha: 31.08.2007

Seiten / Pages / Pages / Páginas: 36

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