

Tilt switches

N3 / N4.....

MEMS technology, one or two axis

- + long lifetime and highly reliability due to mechanism-free MEMS technology
- + combinable output signals
- + one or two axis measurement
- + tilt range up to $\pm 60^\circ$
- + high protection class IP67
- + operating temperature range -40°C to $+70^\circ\text{C}$
(-40°F to $+158^\circ\text{F}$)
- + current or voltage output, or switching output via relay
- + depending on the angle, resolution up to $\leq 0.04^\circ$
- + with versions with switching output, switch-on and turn-off delay selectable



Use

Typical applications are on window cleaning platforms, aerial platforms, lifting platforms and firefighter ladders. Due to high protection class IP67, the sensor is perfectly suited for use under damp or polluted conditions. The functioning principle is based on a micro-electromagnetic system (MEMS), whereby the sensor has a very compact and flat design and is therefore particularly well-suited for tight installation spaces.

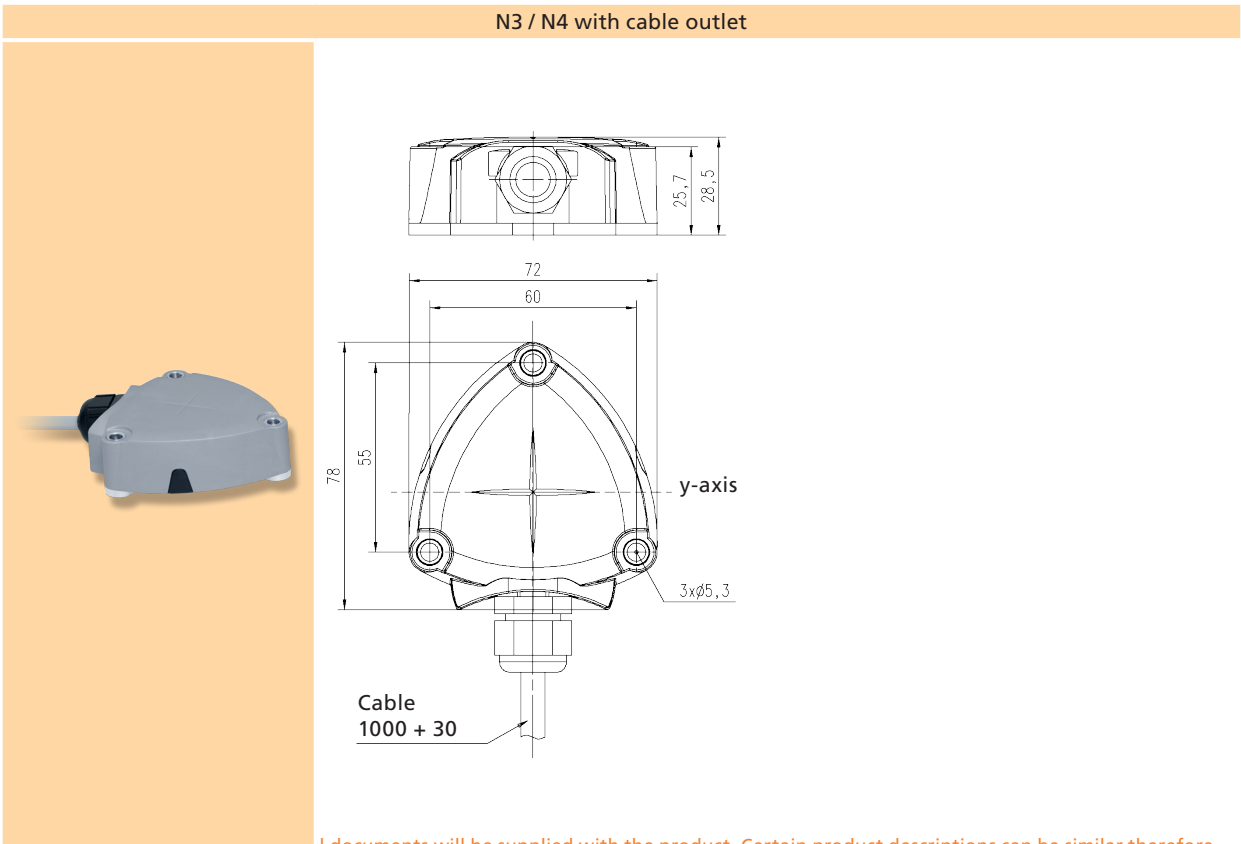
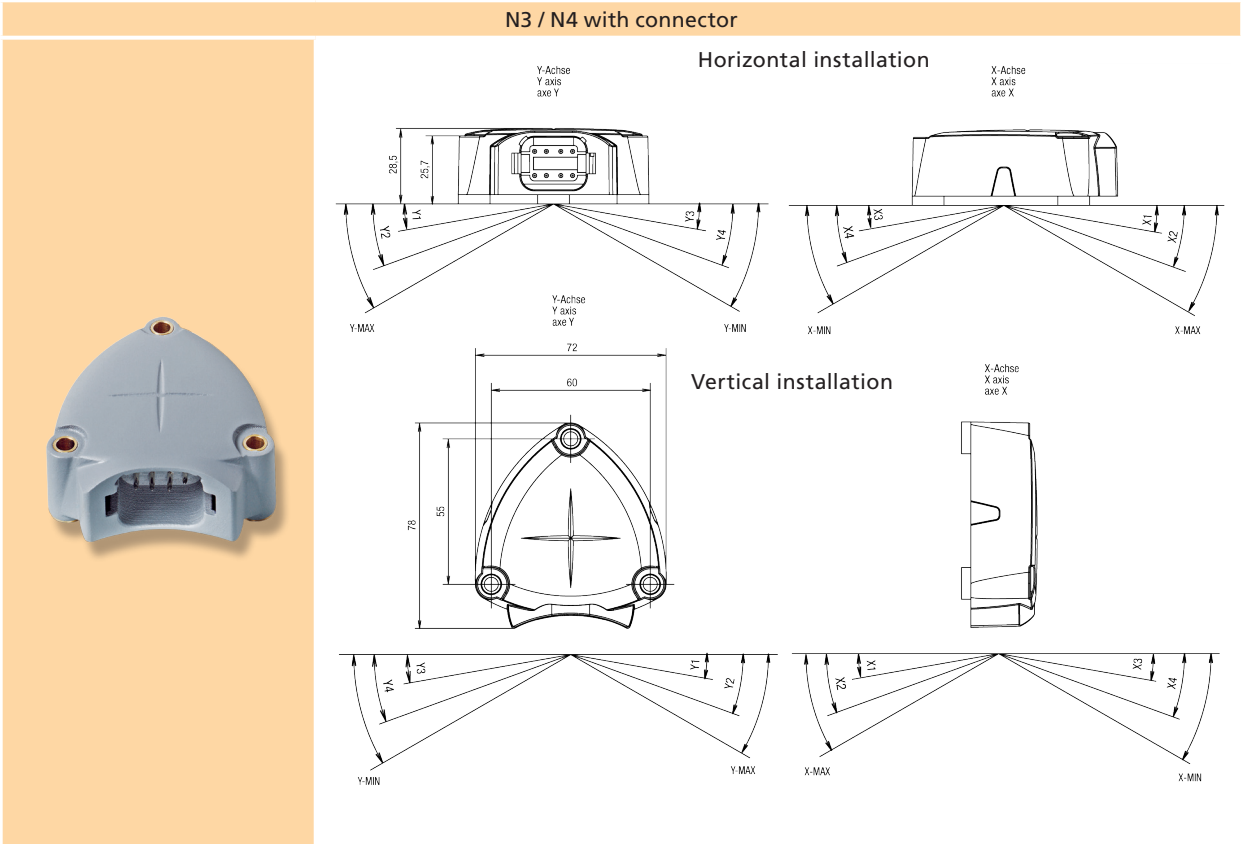
Options

Sensor type N3 is designed for a one-axis measurement, type N4 for a two-axis measurement. Both tilt switches can be specified for a variety of applications, meaning, for example, that the choice between an analog output signal (current and voltage) or switching outputs (relay) exists. In addition, the two output types can be combined. Depending on the requirements, a turn-on and turn-off delay can be defined at the switching output. The electrical connection is done by cable or with a Deutsch connector plug.



Tilt switch with cable outlet

Mechanical assembly



Installation dimensions

Installation size	78 x 72 x 28.5 mm
Mounting	screw connection 3x Ø 5.3 mm holes

Key mechanical data

Technology	MEMS*
Ambient temperature	-40°C to +70 °C (-40°F to +158°F)
Storage temperature	-40°C to +85°C (-40°F to +185°F)
Protection class	IP67 DIN EN 60529
Material	upper housing part: PBT; housing lid: PC
Connection	cable or Deutsch connector

* The MEMS technology is a micro-mechanical, capacitive sensor element made from two adjacent plate capacitors. The middle plate is used by both plate capacitors at once and is designed as a micro-mechanical spring-loaded pendulum. The movement of the pendulum changes the capacitance ratio of two plate capacitors.

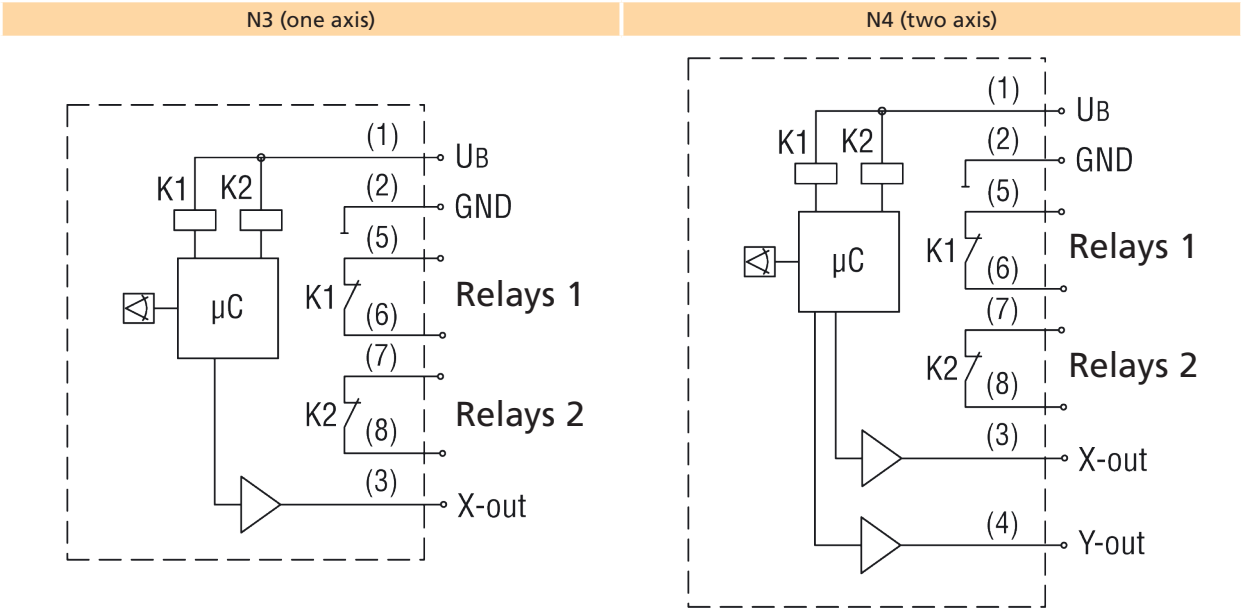
Key electrical data

	Analog	Switching output
Tilt range	± 5° ... ± 60°	± 1.5° ... ± 60°
Operating voltage	10 ... 30 VDC	10...30 VDC
Operating current	32 mA typical	16mA typical; 12mA/relay typical
Output signal	$U_{out} = 0.5 \dots 4.5 \text{ V}$	relay
	$I_{out} = 4 \dots 20 \text{ mA}$	relay
Load resistance	$U_{out} = \text{min. } 10 \text{ k}\Omega$ ($R_i = 100 \Omega$)	---
	$I_{out} = U_B > 15 \text{ V: max. } 500 \Omega$	---
	$U_B < 15 \text{ V: max. } 200 \Omega$	---
Switching voltage	---	max. 48 VDC
Switching current / power	---	max. 1 A / 30 W/VA
Delay time (on/off)	---	selectable (0 ... 2000 ms)
Switching points	---	selectable
Zero justification	max. ± 5°	
Resolution, angle ≤25°	≤ 0.04°	
Resolution, angle >25°	≤ 0.14°	
Linearity error, angle ≤25°	± 1% from angle rate typical	
Linearity error, angle >25°	± 1% from angle rate typical	
Repeating accuracy, ≤25°	0.2°	
Repeating accuracy, >25°	0.5°	
Sensor offset temperature drift	0.008°/K	
Current step offset temperature drift	± 1% typical	
Voltage step offset temperature drift	± 0.25% typical	
Vibration filter	limit frequency typically 40 Hz (can be changed on request)	
Signal update rate	approx. 100 Hz	
Startup time	≤ 500 ms	

The relevant corresponding technical documents will be supplied with the product. Certain product descriptions can be similar therefore please ensure that you have the latest version of documentation for your specific product prior to any use.

elobau reserves the right to change technical data and documentation without notice.

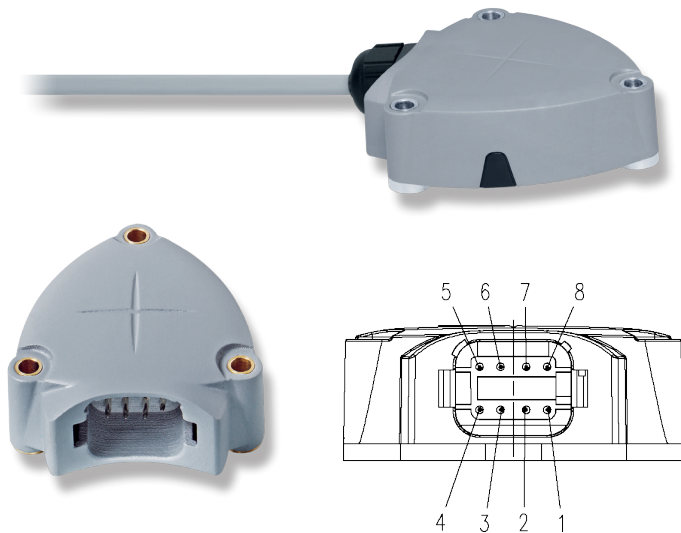
Wiring



Contact form is selectable (N.O.(normally open) or N.C.(normally close)).
Block circuit diagram is depicted with switched-on operating voltage in the zero position

Connection type

Cable	consisting of 8x Ø 0.5 mm² wire, 1000 ± 30 mm length
Connector	8-pin Deutsch DT06-8S
Compatible elobau cable sets	
8-pin Deutsch connector	part no.: L1HC00.B



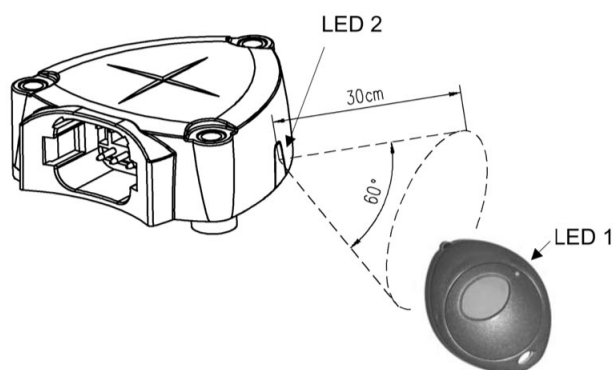
Neutral position adjustment

All tilt sensors are preprogrammed with a neutral position. The user can adjust the neutral position using an infrared remote control, if required. During this adjustment, the current inclination angle is defined as the neutral position.

Defining the neutral position:

Shortly press the button on the infrared remote control to activate the IR-control. LED 1 lights up briefly to indicate readiness of operation. Then press the button for longer than two seconds to transmit a data signal to the tilt sensor. LED 1 flashes rapidly to indicate that the transmission is in progress. (If the button is not pressed within eight 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 that the correct receipt of the data signal.

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



Infrared remote control:
article number: IR-NGS01

The infrared remote control has to be pressed in the space of the detection range of the tilt sensor as shown in the figure.

Page 6 of 8

Two axis:

N4

K

Angle rate analog

angle rate: _____°

(±5° ... ±60°)

Digital switching points

switching points (±1.5° ... ±60°)

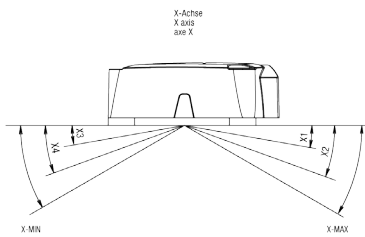
+X1 _____° +Y1 _____°

+X2 _____° +Y2 _____°

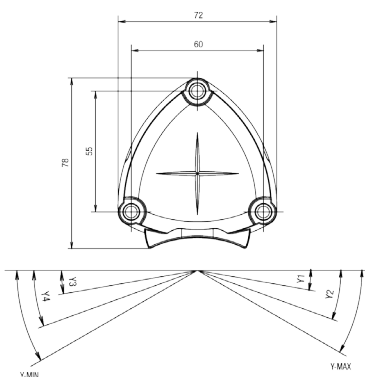
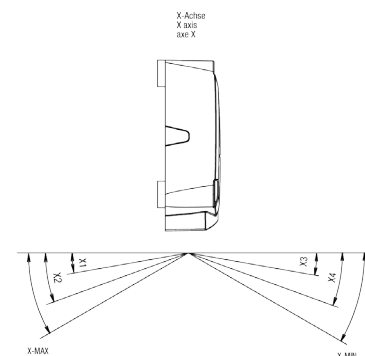
- X3 _____° - Y3 _____°

- X4 _____° - Y4 _____°

Horizontal installation



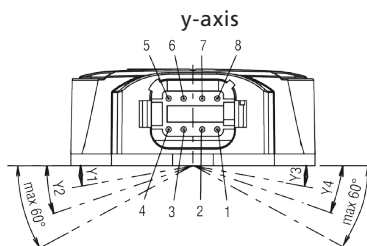
Vertical installation



Infrared remote control (IR-NGS01)

☐ yes quantity: _____

☐ no



Numbers

assigned by elobau

Switch-off delay*

- ☐ A = without ☐ B = 0.5 s
☐ C = 1 s ☐ D = 1.5 s
☐ E = 2 s

Switch-on delay*

- ☐ A = without ☐ B = 0.5 s
☐ C = 1 s ☐ D = 1.5 s
☐ E = 2 s

Interconnection type*

- ☐ 1 = relay 1 : X1/X3 Y1/Y3
☐ 2 = relay 1 : X1/X3
relay 2 : Y1/Y3
☐ 3 = relay 1 : X1/X3 Y1/Y3
relay 2 : X2/X4 Y2/Y4
☐ 4 = relay 1 : X1/X3
relay 2 : X2/X4

Relay*

- ☐ A = 1x relay (N.C.(normally close))
☐ B = 2x relays (N.C.(normally close))
☐ C = 1x relay (N.O.(normally open))
☐ D = 2x relays (N.O.(normally open))

x-axis output signal

- ☐ 0 = no signal
☐ 1 = 4...20 mA
☐ 2 = 0.5...4.5 V

Outputs

- ☐ A = analog
☐ D = switching output
☐ K = combined

Housing / installation / connection

- ☐ A = horizontal (Deutsch)
☐ B = vertical (Deutsch)
☐ C = horizontal (cable)
☐ D = vertical (cable)

Compatible cable set

- ☐ Deutsch DT06-8S part no.: L1HC00.B
_____ m (1 - 10m in 1m steps)

* not included in
"Outputs A = analog"
version

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N3/N4 - Ver. 1.2

Page 7 of 8

Your product enquiry

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Country	
☎	
📧	
E-mail	

Notes, questions, other

This image shows a full page of blank graph paper. The background is a solid light beige or cream color. Overlaid on this background is a precise grid of thin, dark brown lines. The grid consists of small, equal-sized squares that cover the entire area of the page, leaving no margins or unlined spaces. There are approximately 20 columns and 20 rows of squares visible.