

**NM1-IP-4L****Single axis tilt measuring system**

- Measuring range  $\pm 3^\circ$  up to  $\pm 60^\circ$  or 0 ...  $90^\circ$
- Accuracy  $\pm 0,1^\circ$  (up to  $\pm 15^\circ$ ), 0,5% of measuring range (up to  $\pm 60^\circ$ )
- Analogue output 0 ... ( $\pm$ )10 V or 0(4) ... 20 mA (4-wire-technology)
- Supply voltage 10 ... 18 VDC or 18 ... 30 VDC

**Description**

The single axis industrial tilt measuring system NM1-IP-4L is the combination of a non-contact inclination sensor AccuStar®-EA and sensor adapted electronics. The measuring system is designed for precise tilt measurement in one axis and intended for side assembly. Available tilt measuring ranges are  $\pm 3^\circ$  to  $\pm 60^\circ$  or 0 ...  $10^\circ$  to 0 ...  $90^\circ$ . The electrical wiring is realised in 4-wire-technology. For further evaluation of the measured inclination there are different standard analogue output signals available, depending on the ordered type.

The tilt measuring system is built into a robust EMC-safe die-cast aluminium enclosure (IP66), which is well suited for applications in rough and industrial environments.

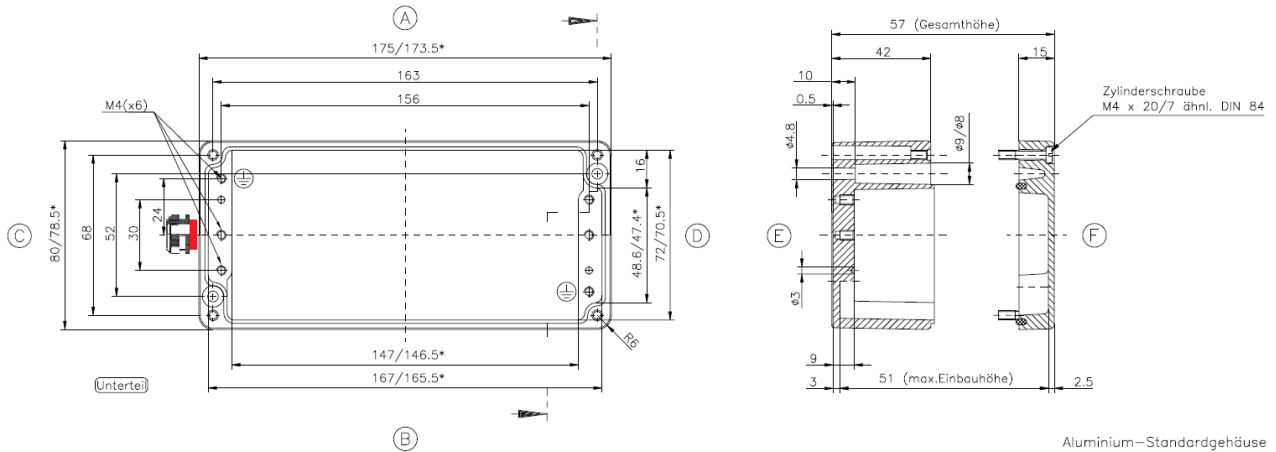
**Specifications**

Number of measuring axis:	1
Supply voltage:	10 ... 18 VDC*, 18 ... 30 VDC*, electronic is protected against voltage reversal
Voltage insulation between supply voltage and analogue output:	Galvanic isolation between supply voltage and analogue output, 200 V, higher voltage insulation on request
Power consumption:	ca. 3 W
Analogue output / burden:	0 ... 10 V / $\pm 10$ V, max. 1 mA (short-time short-circuit proof) 0 ... 20 mA, 4 ... 20 mA, max. 500 $\Omega$
Frequency range (-3 dB):	2 Hz
Preferred measuring range:	$\pm 3^\circ, \pm 5^\circ, \pm 10^\circ, \pm 15^\circ, \pm 20^\circ, \pm 30^\circ, \pm 45^\circ, \pm 60^\circ$ 0 ... $10^\circ, 0 \dots 30^\circ, 0 \dots 45^\circ, 0 \dots 60^\circ, 0 \dots 90^\circ$ other measuring ranges on request
Accuracy at 23°C:	Up to $\pm 15^\circ$ : $\pm 0,1^\circ$ Up to $\pm 60^\circ$ : 0,5% of measuring range Up to $\pm 65^\circ$ : on request
Cross-sensitivity:	< 1% up to $\pm 60^\circ$
Electrical connection:	M16 x 1,5 EMC cable glands on internal spring-cage terminal blocks
Enclosure:	EMC-safe aluminium die-cast enclosure
Protection class:	IP66
Dimensions (W x H x D):	175 x 80 x 57 mm (without EMC cable glands)
Weight:	1.000 g
Temperature, storage:	-20 ... +60 °C
Temperature, operating:	-20 ... +60 °C

**\*Note:** A internal self-restoring „Polyswitch-Resetable®“- fuse, according to the supply voltage, is used to protect the electronics. It is recommended to use a power supply with at least 10 Watt and a slow current limit.

**For further specifications see datasheet AccuStar®-EA**

## ■ Dimensions of enclosure



Aluminium-Standardgehäuse

## ■ Terminal wiring

Electrical connections are made via the EMC-cable glands to the internal spring-cage terminal blocks. The maximal connection cross section is 2,5 mm<sup>2</sup>. Although this system is designed with a high degree of immunity to electromagnetic interferences (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application.

Terminal	Description
1	Supply voltage
2	Ground supply voltage

Terminal	Description
3	Analogue output
4	Ground analogue output

## ■ Ordering information

<b>NM1-IP-4L...</b>	Single axis tilt measuring system in 4-wire-technology	
<b>...-12E-...</b>	Supply voltage: 10 ... 18 VDC	
<b>...-24E-...</b>	Supply voltage: 18 ... 30 VDC	
<b>...-010-...</b>	Analogue output: 0 ... 10 V,	zero point at 5 V
<b>...-B10-...</b>	Analogue output: ±10 V,	zero point at 0 V
<b>...-020-...</b>	Analogue output: 0 ... 20 mA,	zero point at 10 mA
<b>...-420-...</b>	Analogue output: 4 ... 20 mA,	zero point at 12 mA
<b>...-xx-...</b>	Measuring range (see note below)	
<b>...-V</b>	Electronic is potted and protected against humidity and vibrations	

**Note:** When placing an order, please fill in placeholder „xx“ with the wanted tilt measuring range.

### Example:

Measuring range ±45°, Analogue output ±10 V, Supply voltage 18 ... 30 VDC → NM1-IP-4L-24E-B10-B45  
 Measuring range 0 ... 60°, Analogue output 0 ... 10 V, Supply voltage 10 ... 18 VDC → NM1-IP-4L-12E-010-060

## ■ Customized Requirements

Technical modifications according to customer requirements are available on request. Moreover, we deliver customized special solutions for a lot of measuring tasks in the section pressure, force, position and tilt measuring using our measuring transducers. Do not hesitate to contact us.

We reserve the right to do technical changes without prior notice.

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Version 06.2018  
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