



NM1-2L-420-ATEX

■ Single axis industrial tilt measuring system for explosion hazardous areas with ATEX inspection document TÜV 99 ATEX 1469 / II 2G Ex ib IIB T4 Gb

- Measuring range $\pm 3^\circ$ up to $\pm 60^\circ$ or 0 ... 90°
- Accuracy $\pm 0,1^\circ$ (up to $\pm 10^\circ$), $\pm 0,2^\circ$ (up to $\pm 30^\circ$), $\pm 0,25^\circ$ (up to $\pm 60^\circ$)
- Analogue output 4 ... 20 mA (2-wire-technology)
- Supply voltage 18 ... 28 VDC



■ Description

The single axis industrial tilt measuring system NM1-2L-420-ATEX is the combination of a non-contact inclination sensor and sensor adapted electronics. The measuring system is designed for precise tilt measurement in one axis. It is applicable for the use in defined explosion hazardous areas according to the attached EU type examination certificate. The system is intended for side assembly. Available tilt measuring ranges are $\pm 3^\circ$ to $\pm 60^\circ$ or 0 ... 10° to 0 ... 90° . The analogue output signal of 4 ... 20mA in 2-wire-technology is a standard signal and therefore a further analysis is easily feasible.

The tilt measuring system is built into a robust EMC-safe die-cast aluminium enclosure with external mounting holes (IP68, test condition 1h, 1m water depth), which is well suited for applications in rough and industrial environments. Furthermore, the built-in electronics are protected against humidity and vibrations.

■ Specifications

| | |
|-----------------------------------|---|
| Number of measuring axis: | 1 |
| Supply voltage: | 18 ... 28 VDC, electronic is protected against voltage reversal |
| Power consumption: | < 1 W |
| Analogue output / burden: | 4 ... 20 mA (2-wire), max. 500 Ω burden at supply voltage of 24VDC |
| Frequency range (-3dB): | 0,5 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 ... $10^\circ, 0 ... 30^\circ, 0 ... 45^\circ, 0 ... 60^\circ, 0 ... 90^\circ$ other measuring ranges on request |
| Accuracy at 23°C: | Up to $\pm 10^\circ$: $\pm 0,1^\circ$ Up to $\pm 30^\circ$: $\pm 0,2^\circ$ Up to $\pm 60^\circ$: $\pm 0,25^\circ$ |
| Electrical connection: | Connection cable FD CP plus 2 x 0,25 mm ² , outer sheath PUR mixture, cable length according to customer requirements |
| Cross-sensitivity: | < 1,5% at 30° cross slope |
| Temperature drift of sensitivity: | < -0,25 %/K |
| Temperature drift of zero point: | < $\pm 0,1$ mV/K |
| Enclosure: | EMC-safe aluminium die-cast enclosure |
| Protection class: | IP68 according to DIN EN 60529 (VDE 0470), test condition: 1 h, 1 m water depth An additional mechanical protection against jet water is recommended. |
| Dimensions (W x H x D): | 115 x 64 x 35 mm (without EMV cable glands and external earth connection) |
| Weight: | Ca. 800g with 10m connection cable |
| Temperature, storage: | -25 ... +60 °C |
| Temperature, operating: | -25 ... +60 °C |

Note to supply and signal circuit:

Ignition protection type intrinsic safety Ex ib IIB only for connection to a certified intrinsically safe circuit with following maximum values:

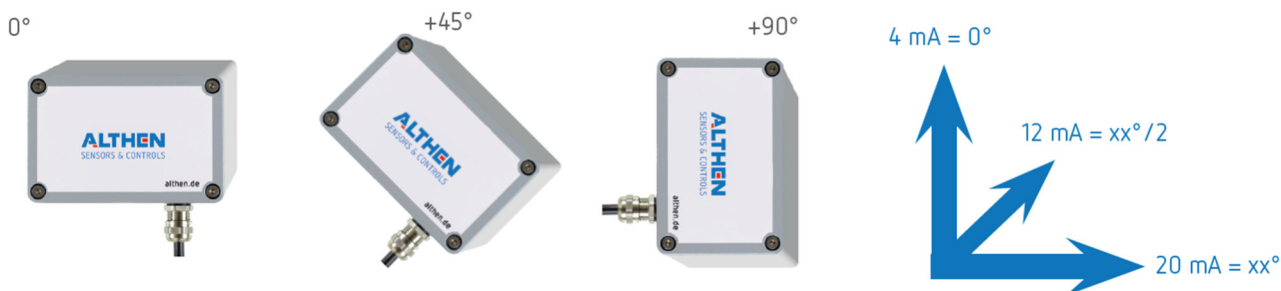
$U_i = 28 \text{ VDC}$ $C_i = \text{negligible small}$
 $I_i = 110 \text{ mA}$ $L_i = \text{negligible small}$
 $P_i = 770 \text{ mW}$

Terminal wiring

Electrical connections are made via a connecting cable (FD CP plus, 2x0,25 mm², outer sheath PUR mixture), which can be ordered in different length according to customer requirements. The cable screen is connected to the enclosure.

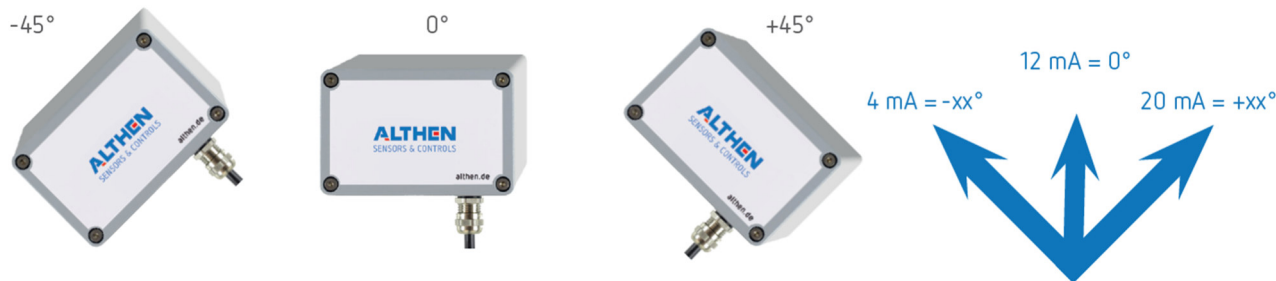
| Terminal | Description | Wire colour |
|----------|-----------------------|-------------|
| 1 | Supply voltage | white |
| 2 | Signal / Current loop | brown |

Schematic representation of measuring axis



Version 0 ... Rxx°

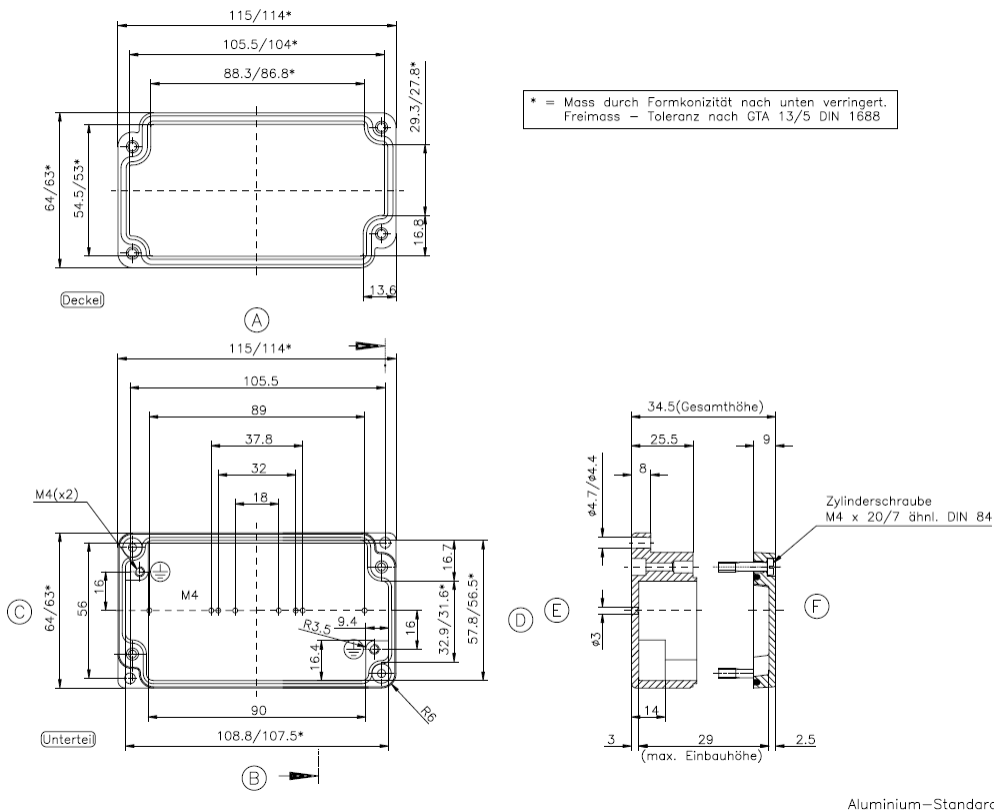
(Note: Example shows an inclination of 0 ... 90°)



Version 0 ... Bxx°

(Note: Example shows an inclination of 0 ... ±45°)

■ Dimensions of enclosure



■ Ordering information

| | |
|---------------------------|---|
| NM1-2L-420-ATEX... | Single axis tilt measuring system for defined explosion hazardous areas acc. to examination certificate |
| ...-Bxx-... | Bidirectional, xx=tilt measuring range, fe. B45 = $\pm 45^\circ$ |
| ...-Lxx-... | Left-turning, xx= tilt measuring range, fe. L30 = 0 ... -30° |
| ...-Rxx-... | Right-turning, xx= tilt measuring range, fe. R30 = 0 ... 30° |
| ...-y m | Cable length (1-100m) according to customer requirements |

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

Example: Tilt measuring range $\pm 45^\circ$ with 20m connection cable → NM1-2L-420-ATEX-B45-20m

■ Alignment/Calibration

A calibration with a traceable factory calibration certificate (with 3 measuring points) is included in the scope of supply.

■ 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.



Translation
(1) **EU-Type Examination Certificate**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 2014/34/EU**

(3) **Certificate Number** TÜV 99 ATEX 1469 **issue:** 01
 (4) for the product: Tilt measuring system type NM1-2L-420-ATEX-xxxx
 (5) of the manufacturer: ALTHEN GmbH Mess- und Sensortechnik
 (6) Address: Dieselstrasse 2
 65779 Kelkheim
 Germany
 Order number: 8000476207
 Date of issue: 2018-10-26

(7) The design of this product and any acceptable variation thereto are specified in the schedule to this EU-Type Examination Certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH, Notified Body No. 0044, in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
 The examination and test results are recorded in the confidential ATEX Assessment Report No. 17 203 207583.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012 + A11:2013 **EN 60079-11:2012**

except in respect of those requirements listed at item 18 of the schedule.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions for Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design, and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the product shall include the following:

II 2G Ex ib IIB T4 Gb

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body

Roder

Hanover office, Am TÜV 1, 30519 Hannover, Tel. +49 511 998-61455, Fax +49 511 998-61590

This certificate may only be reproduced without any change, schedule included.
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