



## Sensor de inclinação N5

O sensor de inclinação modelo N5 com interface CAN-Bus está disponível nos protocolos de comunicação CANopen ou SAEJ1939. Este sensor possui elevada resistência à impactos e vibrações, portanto é muito utilizado para medição de inclinação em máquinas agrícolas, máquinas de construção, caminhões fora de estrada entre outras aplicações severas. O sensor de inclinação N5 pode ser facilmente programado e a posição neutra ajustada através de um controle remoto infravermelho.

### Especificação Técnica

- Elevada vida útil e confiabilidade devido à tecnologia MEMS
- Range de medição 360° para um eixo ou 180° para dois eixos
- Até 4 pontos de medição digital programável
- Seleção de delay para funções liga/desliga por sinal de saída
- Ajuste da posição neutra através de controle remoto ou através da rede CAN bus
- Classe de proteção IP67
- Temperatura de trabalho -40 °C to +85 °C
- Conector Deutsch ou plug M12
- Conexão em série: loop através do sinal CAN sem necessidade de conectores T adicionais
- Compacto e robusto, adequado também para ambientes externos
- Redundância para aplicações que exigem nível de segurança mais elevados

## Características do artigo

| Attribute  | N5ACJ...   | N5ACJB...                     | N5ACO...  | N5ACOB...                     | N5ECJ...  | N5ECJB... ▶                    |
|--|------------|-------------------------------|---|-------------------------------|-----------|--------------------------------|
| Max. switching voltage                           | –          | 48 V DC                       | –   | 48 V DC                       | –         | 48 V DC                        |
| Max. switching current                           | –          | 1 A                           | –   | 1 A                           | –         | 1 A                            |
| Max. switching power                             | –          | 30 W                          | –   | 30 W                          | –         | 30 W                           |
| Polarity reversal protection                     | yes        |                               |   |                               |           |                                |
| Resolution                                       | 0.014 °    |                               |   |                               |           |                                |
| Operating voltage min.                           | 9 V DC     |                               |   |                               |           |                                |
| Operating voltage max.                           | 32 V DC    |                               |   |                               |           |                                |
| Current consumption                              | 100 mA     |                               |   |                               |           |                                |
| Short-circuit resistance to GND                  | yes        | no                            | yes   | no                            | yes       | no                             |
| Short-circuit resistance to supply               | yes        | no                            | yes   | no                            | yes       | no                             |
| Repeating accuracy                               | 0,3 °      |                               |   |                               |           |                                |
| Signal update rate                               | 200 Hz     |                               |   |                               |           |                                |
| Technology                                       | MEMS       |                               |   |                               |           |                                |
| Number of measurement axes (Number)              | 2          |                               | 2 (X, Y) Z-axis for signaling the installation position |                               | 2         |                                |
| Angle measuring range                            | 180 °      |                               |   |                               | 360/120 ° |                                |
| Initialisation time after power on/start-up time | 500 ms     |                               |   |                               |           |                                |
| Switching points                                 | –          | Selectable from ±1.5°...±90 ° | –   | Selectable from ±1.5°...±90 ° | –         | Selectable from ±1.5°...±180 ° |
| Zero justification                               | ±60°       |                               |   |                               |           |                                |
| Vibration filter                                 | 25 Hz      |                               |   |                               |           |                                |
| Fieldbus system                                  | CAN        |                               |   |                               |           |                                |
| Protocol   | J1939      |                               | CANopen   |                               | J1939     |                                |
| Node ID / Source Address                         | 0xE2       |                               | 0x20  |                               | 0xE2      |                                |
| Transmitting cycle                               | 10 ms      |                               |   |                               |           |                                |
| Baud rate  | 250 kBit/s |                               |   |                               |           |                                |
| Bus terminating resistor                         | no         |                               |   |                               |           |                                |
| MTTF   | 57.6 a     |                               |   |                               |           |                                |
| Switching output                                 | –          | 2x NO                         | –   | 2x NO                         | –         | 2x NO                          |
| Outputs  | CAN J1939  | CAN J1939 + relay             | CANopen   | CANopen + relay               | CAN J1939 | CAN J1939 + relay              |

## Características do artigo

| Attribute   | N5ACJ...  | N5ACJB...                               | N5ACO... | N5ACOB...                               | N5ECJ... | N5ECJB... ▶                             |
|---|---|---|----------|---|----------|---|
| Turn-on delay   | –   | Selectable (0...2 s in 0.5s increments) | –        | Selectable (0...2 s in 0.5s increments) | –        | Selectable (0...2 s in 0.5s increments) |
| Turn-off delay  | –   | Selectable (0...2 s in 0.5s increments) | –        | Selectable (0...2 s in 0.5s increments) | –        | Selectable (0...2 s in 0.5s increments) |
| Connection type (switching output)                          | –   | Selectable                              | –        | Selectable                              | –        | Selectable                              |
| Temperature coefficient                                     | ± 0,02°/K   |   |          |   |          |   |
| Linearity error   | ± 0,4°  |   |          |   |          |   |
| Protection class  | IP67 DIN EN 60529   |   |          |   |          |   |
| Operating temperature min.                                  | -40 °C  |   |          |   |          |   |
| Max. operating temperature                                  | 85 °C   |   |          |   |          |   |
| Min. storage temperature                                    | -40 °C  |   |          |   |          |   |
| Max. storage temperature                                    | 105 °C  |   |          |   |          |   |
| Shock resistance (Norm)                                     | 500 m/s²; 100 shocks per axis, DIN EN 60068-2-27  |   |          |   |          |   |
| Vibration resistance (Norm)                                 | Sine Vibration: 100 m/s²; 19h, DIN EN 60068-2-6 Random Vibration: 80,1 m/s²; 24h, DIN EN 60068-2-64 |   |          |   |          |   |
| Impact resistance (Norm)                                    | max. 50 g   |   |          |   |          |   |
| EMC Agricultural and forestry machines (Norm)               | DIN EN ISO 14982<br>pulse 5b: max. voltage 65 V (absolute), functional status C for pulse 1 and 4   |   |          |   |          |   |
| EMC Earth-moving and building construction machinery (Norm) | DIN EN ISO 13766-1<br>pulse "load dump": max. voltage 65 V (absolute)                               |   |          |   |          |   |
| EMC Industrial trucks (Norm)                                | DIN EN 12895  |   |          |   |          |   |
| Torque for fastening screws                                 | 6 N m   |   |          |   |          |   |
| Weight  | 100 g   |   |          |   |          |   |
| Connection  | Deutsch 8-pol.  |   |          |   |          |   |
| CE label  | yes   |   |          |   |          |   |

## Características do artigo

| Attribute  | N5ECO...   | N5ECOB...                      | N5GCJ...  | N5GCO...  | N5ICJ...  | N5ICO... ▶ |
|--|------------|--------------------------------|-----------|---|-----------|------------|
| Max. switching voltage                           | –          | 48 V DC                        | –         |   |           |            |
| Max. switching current                           | –          | 1 A                            | –         |   |           |            |
| Max. switching power                             | –          | 30 W                           | –         |   |           |            |
| Polarity reversal protection                     | yes        |                                |           |   |           |            |
| Resolution                                       | 0.014 °    |                                |           |   |           |            |
| Operating voltage min.                           | 9 V DC     |                                |           |   |           |            |
| Operating voltage max.                           | 32 V DC    |                                |           |   |           |            |
| Current consumption                              | 100 mA     |                                |           |   |           |            |
| Short-circuit resistance to GND                  | yes        | no                             | yes       |   |           |            |
| Short-circuit resistance to supply               | yes        | no                             | yes       |   |           |            |
| Repeating accuracy                               | 0,3 °      |                                |           |   |           |            |
| Signal update rate                               | 200 Hz     |                                |           |   |           |            |
| Technology                                       | MEMS       |                                |           |   |           |            |
| Number of measurement axes (Number)              | 2          |                                |           | 2 (X, Y) Z-axis for signaling the installation position | 2         |            |
| Angle measuring range                            | 360/120 °  |                                | 180 °     |   | 360/120 ° |            |
| Initialisation time after power on/start-up time | 500 ms     |                                |           |   |           |            |
| Switching points                                 | –          | Selectable from ±1.5°...±180 ° | –         |   |           |            |
| Zero justification                               | ±60°       |                                |           |   |           |            |
| Vibration filter                                 | 25 Hz      |                                |           |   |           |            |
| Fieldbus system                                  | CAN        |                                |           |   |           |            |
| Protocol   | CANopen    |                                | J1939     | CANopen   | J1939     | CANopen    |
| Node ID / Source Address                         | 0x20       |                                | 0xE2      | 0x20  | 0xE2      | 0x20       |
| Transmitting cycle                               | 10 ms      |                                |           |   |           |            |
| Baud rate  | 250 kBit/s |                                |           |   |           |            |
| Bus terminating resistor                         | no         |                                |           |   |           |            |
| MTTF   | 57.6 a     |                                |           |   |           |            |
| Switching output                                 | –          | 2x NO                          | –         |   |           |            |
| Outputs  | CANopen    | CANopen + relay                | CAN J1939 | CANopen   | CAN J1939 | CANopen    |

## Características do artigo

| Attribute   | N5ECO...  | N5ECOB...                               | N5GCJ...     | N5GCO... | N5ICJ... | N5ICO... ▶ |
|---|---|---|--------------|----------|----------|------------|
| Turn-on delay   | –   | Selectable (0...2 s in 0.5s increments) | –            |          |          |            |
| Turn-off delay  | –   | Selectable (0...2 s in 0.5s increments) | –            |          |          |            |
| Connection type (switching output)                          | –   | Selectable                              | –            |          |          |            |
| Temperature coefficient                                     | ± 0,02°/K   |   |              |          |          |            |
| Linearity error   | ± 0,4°  |   |              |          |          |            |
| Protection class  | IP67 DIN EN 60529   |   |              |          |          |            |
| Operating temperature min.                                  | -40 °C  |   |              |          |          |            |
| Max. operating temperature                                  | 85 °C   |   |              |          |          |            |
| Min. storage temperature                                    | -40 °C  |   |              |          |          |            |
| Max. storage temperature                                    | 105 °C  |   |              |          |          |            |
| Shock resistance (Norm)                                     | 500 m/s²; 100 shocks per axis, DIN EN 60068-2-27  |   |              |          |          |            |
| Vibration resistance (Norm)                                 | Sine Vibration: 100 m/s², 19h, DIN EN 60068-2-6 Random Vibration: 80,1 m/s², 24h, DIN EN 60068-2-64 |   |              |          |          |            |
| Impact resistance (Norm)                                    | max. 50 g   |   |              |          |          |            |
| EMC Agricultural and forestry machines (Norm)               | DIN EN ISO 14982<br>pulse 5b: max. voltage 65 V (absolute), functional status C for pulse 1 and 4   |   |              |          |          |            |
| EMC Earth-moving and building construction machinery (Norm) | DIN EN ISO 13766-1<br>pulse "load dump": max. voltage 65 V (absolute)                               |   |              |          |          |            |
| EMC Industrial trucks (Norm)                                | DIN EN 12895  |   |              |          |          |            |
| Torque for fastening screws                                 | 6 N m   |   |              |          |          |            |
| Weight  | 100 g   |   |              |          |          |            |
| Connection  | Deutsch 8-pol.  |   | M12x1 5-pol. |          |          |            |
| CE label  | yes   |   |              |          |          |            |

## Características do artigo

| Attribute  | N5KCJ...   | N5KCO...  | N5LCJ...  | N5LCO... |
|--|------------|---|-----------|----------|
| Max. switching voltage                           | -          |   |           |          |
| Max. switching current                           | -          |   |           |          |
| Max. switching power                             | -          |   |           |          |
| Polarity reversal protection                     | yes        |   |           |          |
| Resolution                                       | 0.014 °    |   |           |          |
| Operating voltage min.                           | 9 V DC     |   |           |          |
| Operating voltage max.                           | 32 V DC    |   |           |          |
| Current consumption                              | 100 mA     |   |           |          |
| Short-circuit resistance to GND                  | yes        |   |           |          |
| Short-circuit resistance to supply               | yes        |   |           |          |
| Repeating accuracy                               | 0,3 °      |   |           |          |
| Signal update rate                               | 200 Hz     |   |           |          |
| Technology                                       | MEMS       |   |           |          |
| Number of measurement axes (Number)              | 2          | 2 (X, Y) Z-axis for signaling the installation position | 2         |          |
| Angle measuring range                            | 180 °      |   | 360/120 ° |          |
| Initialisation time after power on/start-up time | 500 ms     |   |           |          |
| Switching points                                 | -          |   |           |          |
| Zero justification                               | ±60°       |   |           |          |
| Vibration filter                                 | 25 Hz      |   |           |          |
| Fieldbus system                                  | CAN        |   |           |          |
| Protocol   | J1939      | CANopen   | J1939     | CANopen  |
| Node ID / Source Address                         | 0xE2       | 0x20  | 0xE2      | 0x20     |
| Transmitting cycle                               | 10 ms      |   |           |          |
| Baud rate  | 250 kBit/s |   |           |          |
| Bus terminating resistor                         | no         |   |           |          |
| MTTF   | 57.6 a     |   |           |          |
| Switching output                                 | -          |   |           |          |
| Outputs  | CAN J1939  | CANopen   | CAN J1939 | CANopen  |
| Turn-on delay                                    | -          |   |           |          |
| Turn-off delay                                   | -          |   |           |          |

## Características do artigo

| Attribute   | N5KCJ...  | N5KCO... | N5LCJ... | N5LCO... |
|---|---|----------|----------|----------|
| Connection type (switching output)                          | -   |          |          |          |
| Temperature coefficient                                     | ± 0,02°/K   |          |          |          |
| Linearity error   | ± 0,4°  |          |          |          |
| Protection class  | IP67 DIN EN 60529   |          |          |          |
| Operating temperature min.                                  | -40 °C  |          |          |          |
| Max. operating temperature                                  | 85 °C   |          |          |          |
| Min. storage temperature                                    | -40 °C  |          |          |          |
| Max. storage temperature                                    | 105 °C  |          |          |          |
| Shock resistance (Norm)                                     | 500 m/s²;, 100 shocks per axis, DIN EN 60068-2-27   |          |          |          |
| Vibration resistance (Norm)                                 | Sine Vibration: 100 m/s²;, 19h, DIN EN 60068-2-6 Random Vibration: 80,1 m/s²;, 24h, DIN EN 60068-2-64 |          |          |          |
| Impact resistance (Norm)                                    | max. 50 g   | max. 50g |          |          |
| EMC Agricultural and forestry machines (Norm)               | DIN EN ISO 14982<br>pulse 5b: max. voltage 65 V (absolute), functional status C for pulse 1 and 4     |          |          |          |
| EMC Earth-moving and building construction machinery (Norm) | DIN EN ISO 13766-1<br>pulse "load dump": max. voltage 65 V (absolute)                                 |          |          |          |
| EMC Industrial trucks (Norm)                                | DIN EN 12895  |          |          |          |
| Torque for fastening screws                                 | 6 N m   |          |          |          |
| Weight  | 100 g   |          |          |          |
| Connection  | 2 x M12x1 5pol.   |          |          |          |
| CE label  | yes   |          |          |          |