

# GCA5 - SAE J1939 to 4.7 m

Interface SAE J1939

Measuring length absolute 2.3 m and 4.7 m

Preliminary

## Overview

- Interface SAE J1939
- Redundant version
- Magnetic sensing method
- Operating temperature -40...+85 °C
- Protection IP 67
- Flange connector M12 or cable
- Measuring length 2.3 m and 4.7 m
- Designed for harsh environmental conditions
- Removable rubber plugs for drainage
- Load dump protection
- Integrated inclination sensor



## Technical data

### Technical data - electrical ratings

|                             |  |
|-----------------------------|--|
| Voltage supply              | 8...36 VDC   |
| Reverse polarity protection | Yes  |
| Short-circuit proof         | Yes  |
| Consumption typ.            | 30 mA (24 VDC, w/o load)<br>60 mA (24 VDC, w/o load, redundant)  |
| Initializing time typ.      | ≤ 0.5 s after power on   |
| Interface                   | SAE J1939  |
| Function                    | Linear position feedback<br>Angular position feedback  |
| Measuring range             | Up to 4.7 m (linear position)<br>0...360° (inclination angle)  |
| Resolution                  | 0.1 mm (linear position)<br>0.1° (inclination angle)   |
| Temperature coefficient     | 0.04 °/K (inclination angle)   |
| Linearity                   | ±0.5 % FS (linear position)<br>±0.2° (inclination angle)   |
| Absolute accuracy           | ±0.8 % FS (+25 °C / linear position)<br>±1.4 % FS (-40...+85 °C / linear position)<br>±0.3° (+25 °C / inclination angle) |
| Sensing method              | Magnetic   |
| Code sequence               | Programmable   |
| Load dump protection        | ISO 16750-2<br>Test Level 4, 12 V/24 V systems   |
| Interference immunity       | EN 61000-6-2   |
| Emitted interference        | EN 61000-6-4   |
| Programmable parameters     | Operating modes<br>Rotating direction<br>Scaling<br>Zero position  |

### Technical data - mechanical design

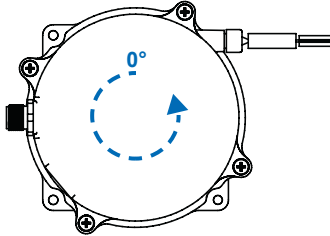
|                       |   |
|-----------------------|---|
| Protection EN 60529   | IP 67 (housing, drainage holes closed)<br>IP 54 (cable inlet)                       |
| Material              | Cable: stainless steel cable AISI 304<br>coated with nylon PA12<br>Housing: plastic |
| Operating temperature | -40...+85 °C  |
| Measuring length      | 2.3 m<br>4.7 m  |
| Cable acceleration    | ≤10 m/s <sup>2</sup>  |
| Cable speed           | ≤1 m/s  |
| Cable diameter        | 0.9 mm  |
| Cable fastening       | Eyelet<br>Height: 5 mm<br>Internal diameter: 8 mm<br>Outer diameter: 15 mm          |
| Pull-in force         | >1.5 N (pull-in force reduced at low temperatures)                                  |
| Pull-out force        | ≤8 N  |
| Relative humidity     | 95 % non-condensing   |
| Resistance            | EN 60068-2-6<br>Vibration 10 g, 10-2000 Hz<br>EN 60068-2-27<br>Shock 50 g, 11 ms    |
| Weight approx.        | 625 g   |
| Connection            | Cable 2 m, radial<br>Flange connector M12, 5-pin                                    |
| Instruction           | Please consider the assembly instructions   |

## Optional

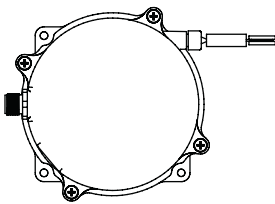
- With integrated inclination sensor

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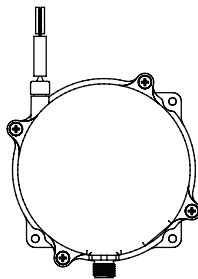
**Installation position**



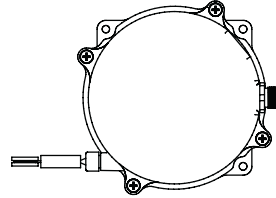
Position 1  
0/360°



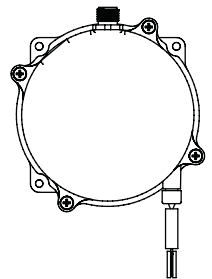
Position 2  
+90°



Position 3  
+180°



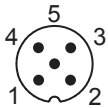
Position 4  
+270°



**Terminal assignment**

**Flange connector M12, male, 5-pin, A-coded**

| Pin | Signals | Description                       |
|-----|---------|-----------------------------------|
| 1   | CAN_GND | Ground connection relating to CAN |
| 2   | +Vs     | Voltage supply                    |
| 3   | GND     | Ground connection relating to +Vs |
| 4   | CAN_H   | CAN Bus Signal (dominant High)    |
| 5   | CAN_L   | CAN Bus Signal (dominant Low)     |



**Cable**

| Core colour | Signals | Description                       |
|-------------|---------|-----------------------------------|
| white       | GND     | Ground connection relating to +Vs |
| brown       | +Vs     | Voltage supply                    |
| green       | CAN_H   | CAN Bus Signal (dominant High)    |
| yellow      | CAN_L   | CAN Bus Signal (dominant Low)     |
| grey        | CAN_GND | Ground connection relating to CAN |

Cable data: 5 x 0.5 mm<sup>2</sup>, 2 m

Terminals GND and CAN\_GND are internally connected and identical in their functions.

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## SAE J1939 features

|                         |   |
|-------------------------|---|
| Programmable parameters | Rotating direction<br>Scaling<br>Zero position  |
| Default                 | Baud rate 250 kbit/s<br>Channel A: ECU address 4 (04h)<br>Channel A: ECU address 5 (05h)<br>Time-driven: 100 ms |

## Data transfer

### ECU address 4

#### PGN65363 – cyclic message (PDU2 format)

| LSB  | ... | ... | MSB         | ... | ...    | ... | ... |
|--|-----|-----|-------------|-----|--------|-----|-----|
| Byte 0   | 1   | 2   | 3           | 4   | 5      | 6   | 7   |
| linear position<br>0 → 23000\47000 <sub>dec</sub><br>in steps of 0.1 mm<br>position increasing in size and value |     |     | Speed value |     | Status |     |     |

#### PGN65364 – cyclic message (PDU2 format)

| LSB  | ... | ... | MSB | ... | ... | ... | ... |
|--|-----|-----|-----|-----|-----|-----|-----|
| Byte 0   | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
| inclination angle<br>0 → 3600 <sub>dec</sub><br>in steps of 0.1°<br>angle increasing in size and value |     |     |     |     |     |     |     |

### ECU address 5

#### PGN65363 – cyclic message (PDU2 format)

| LSB  | ... | ... | MSB         | ... | ...    | ... | ... |
|--|-----|-----|-------------|-----|--------|-----|-----|
| Byte 0   | 1   | 2   | 3           | 4   | 5      | 6   | 7   |
| linear position<br>0 → 23000\47000 <sub>dec</sub><br>in steps of 0.1 mm<br>position increasing in size and value |     |     | Speed value |     | Status |     |     |

#### PGN65364 – cyclic message (PDU2 format)

| LSB  | ... | ... | MSB | ... | ... | ... | ... |
|--|-----|-----|-----|-----|-----|-----|-----|
| Byte 0   | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
| inclination angle<br>0 → 3600 <sub>dec</sub><br>in steps of 0.1°<br>angle increasing in size and value |     |     |     |     |     |     |     |

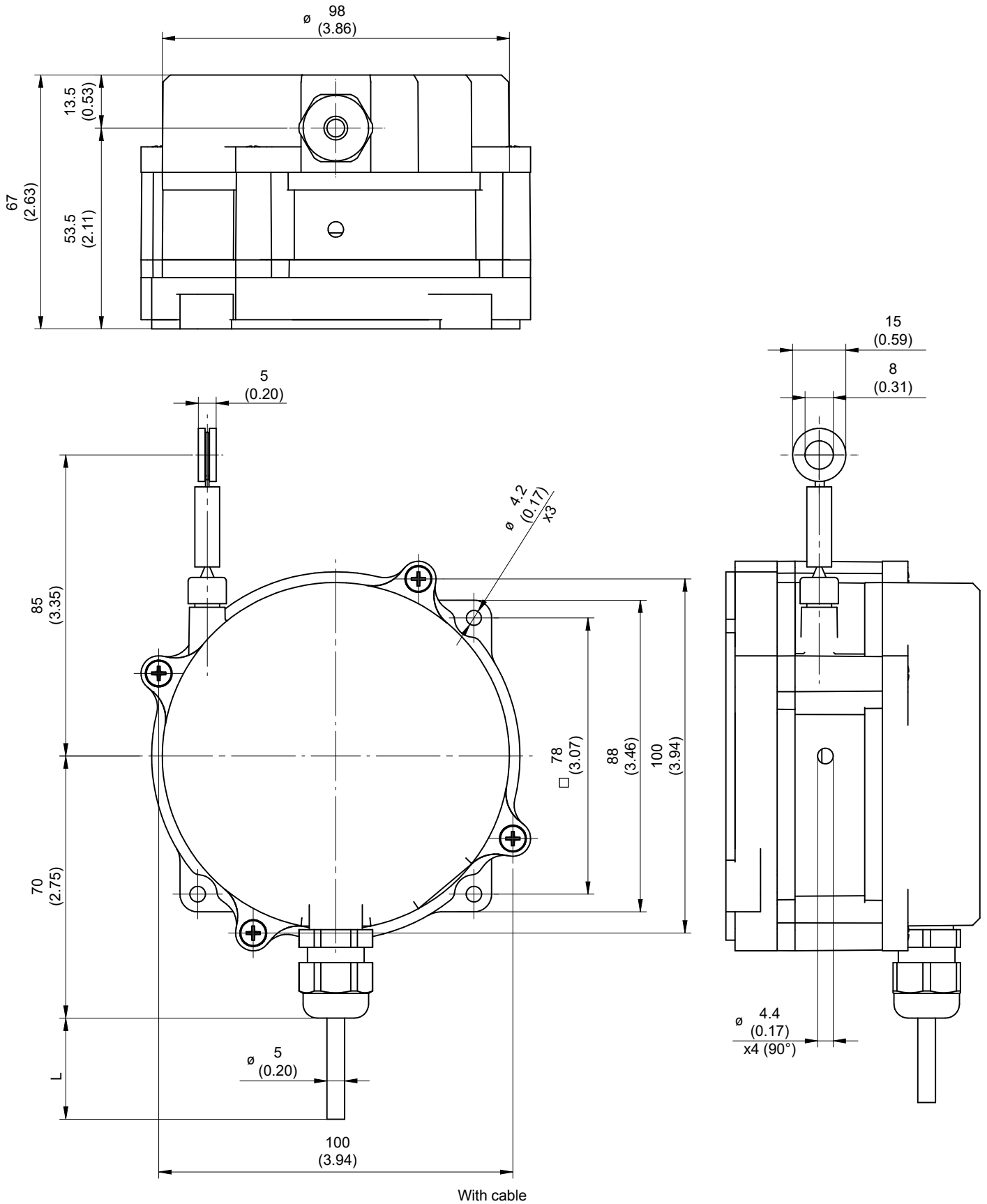
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## Dimensions



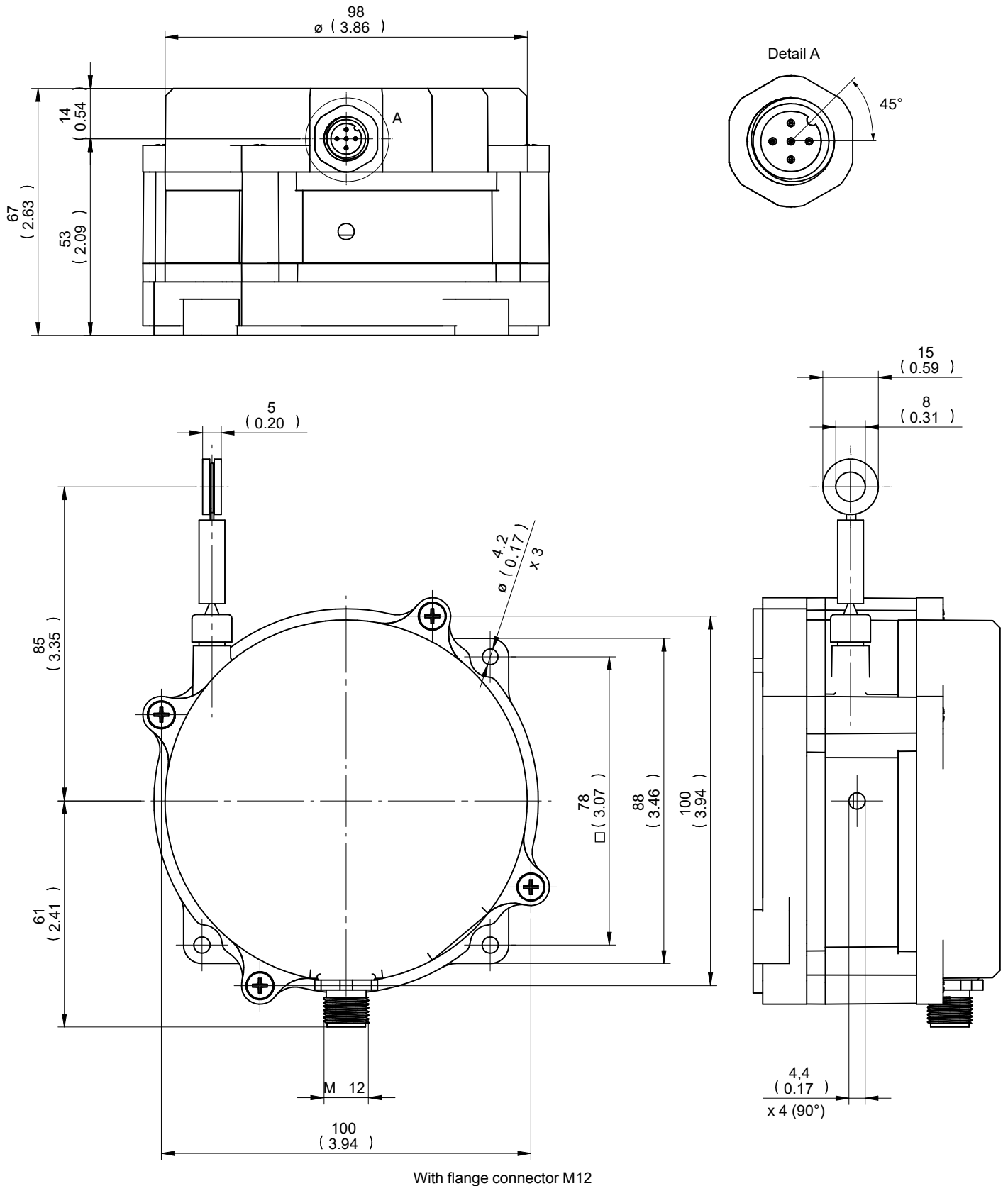
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## Dimensions



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**Ordering reference**

|  | GCA5- | P | M | ### | . | R | A | # | . | ## | 0 | . | A | ### | #### |      |
|--|-------|---|---|-----|---|---|---|---|---|----|---|---|---|-----|------|------|
| <b>Product</b>                                       | GCA5- |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| <b>Type</b>  |       | P |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| Plastic  |       | P |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| <b>Technology</b>                                    |       |   | M |     |   |   |   |   |   |    |   |   |   |     |      |      |
| Magnetic   |       |   | M |     |   |   |   |   |   |    |   |   |   |     |      |      |
| <b>Measuring range</b>                               |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| 2.3 m  |       |   |   | 023 |   |   |   |   |   |    |   |   |   |     |      |      |
| 4.7 m  |       |   |   | 047 |   |   |   |   |   |    |   |   |   |     |      |      |
| <b>Measuring wire fixation</b>                       |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| Ring   |       |   |   |     |   | R |   |   |   |    |   |   |   |     |      |      |
| <b>Measuring wire diameter</b>                       |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| 0.90 mm  |       |   |   |     |   |   | A |   |   |    |   |   |   |     |      |      |
| <b>Connection</b>                                    |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| Cable radial, 2 m                                    |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      | L    |
| Flange socket radial, M12, 5-pin, male contacts, CCW |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      | N    |
| <b>Voltage supply / output</b>                       |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| 8...36 VDC, SAE J1939                                |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      | CD   |
| 8...36 VDC, SAE J1939 redundant (2-channel design)   |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      | CR   |
| <b>Resolution supplement</b>                         |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| No option  |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      | 0    |
| <b>Operating temperature</b>                         |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| -40...+85 °C   |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      | A    |
| <b>Option inclinometer</b>                           |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| 1-dimensional / 0...360°                             |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      | 136  |
| No option  |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| <b>Option terminating resistor</b>                   |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |
| With integrated terminating resistor                 |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      | 4816 |
| No option  |       |   |   |     |   |   |   |   |   |    |   |   |   |     |      |      |