

# AHM36B-BDCC012x12

AHS/AHM36

**ABSOLUTE ENCODERS**

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

| Type              | Part no. |
|-------------------|----------|
| AHM36B-BDCC012x12 | 1069386  |

Other models and accessories → [www.sick.com/AHS\\_AHM36](http://www.sick.com/AHS_AHM36)

### Detailed technical data

#### Performance

|   |                                 |
|---|---------------------------------|
| <b>Number of steps per revolution (max. resolution)</b>                         | 4,096 (12 bit)                  |
| <b>Number of revolutions</b>  | 4,096 (12 bit)                  |
| <b>Max. resolution (number of steps per revolution x number of revolutions)</b> | 12 bit x 12 bit (4,096 x 4,096) |
| <b>Error limits G</b>   | 0.35° (at 20 °C) <sup>1)</sup>  |
| <b>Repeatability standard deviation <math>\sigma_r</math></b>                   | 0.25° (at 20 °C) <sup>2)</sup>  |

<sup>1)</sup> In accordance with DIN ISO 1319-1, position of the upper and lower error limit depends on the installation situation, specified value refers to a symmetrical position, i.e. deviation in upper and lower direction is the same.

<sup>2)</sup> In accordance with DIN ISO 55350-13; 68.3% of the measured values are inside the specified area.

#### Interfaces

|   |  |
|---|--|
| <b>Communication interface</b>            | CANopen  |
| <b>Data protocol</b>                      | CANopen CiA DS-301 V4.02, CiA DSP-305 LSS, Encoder Profile: - CiA DS-406, V3.2. - Class C2   |
| <b>Address setting</b>                    | 0 ... 127, default: 5  |
| <b>Data transmission rate (baud rate)</b> | 20 kbit/s ... 1,000 kbit/s, default: 125 kbit/s  |
| <b>Initialization time</b>                | 2 s <sup>1)</sup>  |
| <b>Process data</b>                       | Position, speed, Temperature   |
| <b>Parameterising data</b>                | Number of steps per revolution<br>Number of revolutions<br>PRESET<br>Counting direction<br>Sampling rate for speed calculation<br>Unit for output of the speed value<br>Round axis functionality |
| <b>Status information</b>                 | CANopen status via status LED  |
| <b>Bus termination</b>                    | Via external terminator <sup>2)</sup>  |

<sup>1)</sup> Valid positional data can be read once this time has elapsed.

<sup>2)</sup> See accessories.

## Electrical data

|  |  |
|--|--|
| <b>Connection type</b>                       | Male connector, M12, 5-pin, universal    |
| <b>Supply voltage</b>                        | 10 ... 30 V                              |
| <b>Power consumption</b>                     | ≤ 1.5 W (without load)                   |
| <b>Reverse polarity protection</b>           | ✓  |
| <b>MTTFd: mean time to dangerous failure</b> | 270 years (EN ISO 13849-1) <sup>1)</sup> |

<sup>1)</sup> This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

## Mechanical data

|                                       |   |
|---------------------------------------|---|
| <b>Mechanical design</b>              | Blind hollow shaft                      |
| <b>Shaft diameter</b>                 | 10 mm                                   |
| <b>Weight</b>                         | 0.12 kg <sup>1)</sup>                   |
| <b>Shaft material</b>                 | Stainless steel                         |
| <b>Flange material</b>                | Aluminum                                |
| <b>Housing material</b>               | Zinc                                    |
| <b>Start up torque</b>                | 0.5 Ncm (+20 °C)                        |
| <b>Operating torque</b>               | < 0.5 Ncm (+20 °C)                      |
| <b>Permissible movement static</b>    | ± 0.3 mm, ± 0.3 mm (radial, axial)      |
| <b>Permissible movement dynamic</b>   | ± 0.1 mm (radial)<br>± 0.1 mm (axial)   |
| <b>Operating speed</b>                | ≤ 6,000 min <sup>-1</sup> <sup>2)</sup> |
| <b>Moment of inertia of the rotor</b> | 15 gcm <sup>2</sup>                     |
| <b>Bearing lifetime</b>               | 2.0 x 10 <sup>9</sup> revolutions       |
| <b>Angular acceleration</b>           | ≤ 500,000 rad/s <sup>2</sup>            |

<sup>1)</sup> Based on devices with male connector.

<sup>2)</sup> Allow for self-heating of 3.5 K per 1,000 rpm when designing the operating temperature range.

## Ambient data

|                                      |  |
|--------------------------------------|--|
| <b>EMC</b>                           | According to EN 61000-6-2 and EN 61000-6-3 |
| <b>Enclosure rating</b>              | IP65 (IEC 60529)                           |
| <b>Permissible relative humidity</b> | 90 % (Condensation not permitted)          |
| <b>Operating temperature range</b>   | -20 °C ... +70 °C                          |
| <b>Storage temperature range</b>     | -40 °C ... +100 °C, without package        |
| <b>Resistance to shocks</b>          | 100 g, 6 ms (EN 60068-2-27)                |
| <b>Resistance to vibration</b>       | 20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)    |

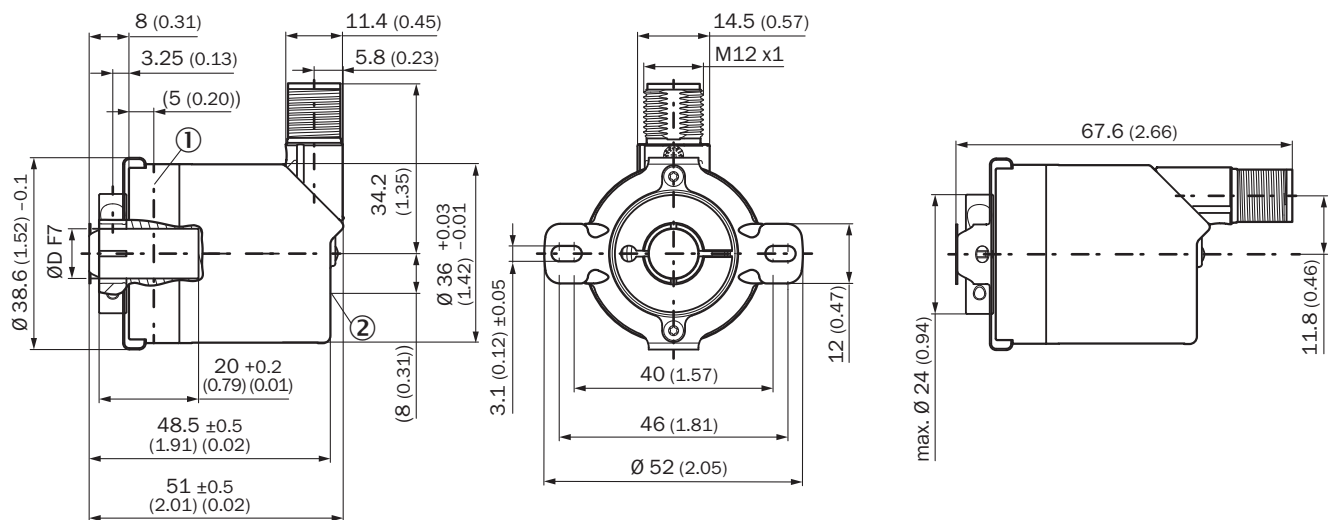
## Classifications

|                     |          |
|---------------------|----------|
| <b>ECLASS 5.0</b>   | 27270502 |
| <b>ECLASS 5.1.4</b> | 27270502 |
| <b>ECLASS 6.0</b>   | 27270590 |
| <b>ECLASS 6.2</b>   | 27270590 |
| <b>ECLASS 7.0</b>   | 27270502 |
| <b>ECLASS 8.0</b>   | 27270502 |

|                       |          |
|-----------------------|----------|
| <b>ECLASS 8.1</b>     | 27270502 |
| <b>ECLASS 9.0</b>     | 27270502 |
| <b>ECLASS 10.0</b>    | 27270502 |
| <b>ECLASS 11.0</b>    | 27270502 |
| <b>ECLASS 12.0</b>    | 27270502 |
| <b>ETIM 5.0</b>       | EC001486 |
| <b>ETIM 6.0</b>       | EC001486 |
| <b>ETIM 7.0</b>       | EC001486 |
| <b>ETIM 8.0</b>       | EC001486 |
| <b>UNSPSC 16.0901</b> | 41112113 |

### Dimensional drawing (Dimensions in mm (inch))

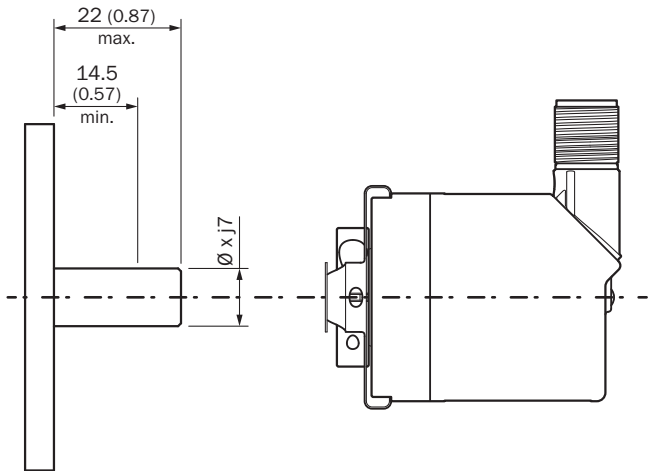
Blind hollow shaft, male connector



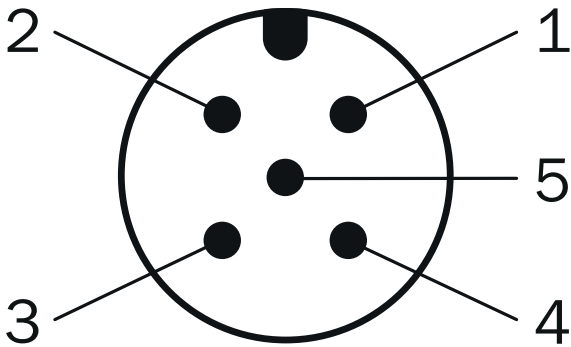
- ① Measuring point for operating temperature
- ② Measuring point for vibrations

| Type              | Shaft diameter<br>$\varnothing D F7$ |
|-------------------|--------------------------------------|
| AHx36x-BAxxxxxxxx | 6 mm                                 |
| AHx36x-BBxxxxxxxx | 8 mm                                 |
| AHx36x-BCxxxxxxxx | 1/4"                                 |
| AHx36x-BDxxxxxxxx | 10 mm                                |
| AHx36x-BKxxxxxxxx | 3/8"                                 |

Attachment specifications



PIN assignment









| PIN     | Signal      | Wire colors (cable connection) | Function   |
|---------|-------------|--------------------------------|--|
| 1       | CAN Shield  | White                          | Screen   |
| 2       | VDC         | Red                            | Supply voltage<br>Encoder<br>10 V DC ... 30 V DC |
| 3       | GND/CAN GND | Blue                           | 0 V (GND)  |
| 4       | CAN high    | Black                          | CAN signal                                       |
| 5       | CAN low     | Pink                           | CAN signal                                       |
| Housing | -           | -                              | Screen   |

### Recommended accessories

Other models and accessories → [www.sick.com/AHS\\_AHM36](http://www.sick.com/AHS_AHM36)

|   | Brief description  | Type               | Part no. |
|---|--|--------------------|----------|
| Programming and configuration tools   |  |                    |          |
|    | Hand-held programming device for the programmable SICK AHS/AHM36 CANopen encoders, TMS/TMM61 CANopen inclination sensors, TMS/TMM88 CANopen, TMS/TMM88 Analog, and wire draw encoders with AHS/AHM36 CANopen. Compact dimensions, low weight, and intuitive operation.   | PGT-12-Pro         | 1076313  |
| Flanges   |  |                    |          |
|    | Stator coupling on hole circle 63 mm   | BEF-DS08           | 2072206  |
|    | Standard stator coupling, AHS/AHM36  | BEF-DS16-AHX       | 2108615  |
| Others  |  |                    |          |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Flying leads</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> CANopen, DeviceNet™</li> <li>• <b>Cable:</b> 4-wire, twisted pair</li> <li>• <b>Description:</b> CANopen, DeviceNet™, shielded</li> <li>• <b>Note:</b> Wire shield Al-Pt film, overall shield C-screen tin-plated</li> </ul>  | LTG-2804-MW        | 6028328  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, X-coded</li> <li>• <b>Signal type:</b> CANopen, DeviceNet™</li> <li>• <b>Description:</b> CANopen, DeviceNet™, shielded, Head A: female connector, M12, 5-pin, straight, shielded, for cable diameter 4.5 mm ... 7 mm Head B: -</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> ≤ 0.75 mm²</li> </ul>          | DOS-1205-GA        | 6027534  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Signal type:</b> CANopen, DeviceNet™</li> <li>• <b>Description:</b> CANopen, DeviceNet™, shielded, Head A: male connector, M12, 5-pin, straight, A coded, shielded, for cable diameter 4 mm ... 8 mm Head B: -</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> ≤ 0.75 mm²</li> </ul>       | STE-1205-GA        | 6027533  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 5-pin, straight</li> <li>• <b>Signal type:</b> CANopen</li> <li>• <b>Description:</b> CANopen, unshielded, CAN male connector, with terminating resistor</li> </ul>   | CAN male connector | 6021167  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, A-coded</li> <li>• <b>Connection type head B:</b> Male connector, M12, 5-pin, A-coded</li> <li>• <b>Connection type head C:</b> Female connector, M12, 5-pin, A-coded</li> <li>• <b>Description:</b> T-piece for simultaneous connection to sender and receiver, splits the cable from the control cabinet to the sender and receiver</li> <li>• <b>Note:</b> 5-pin</li> </ul> | DSC-1205T000025KMO | 6030664  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Signal type:</b> CAN, Power</li> <li>• <b>Cable:</b> 0.5 m, 5-wire</li> <li>• <b>Description:</b> CAN, Power, Y-CAN cable</li> </ul>   | Y-CAN cable        | 6027647  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, CANopen, DeviceNet™</li> <li>• <b>Cable:</b> 2 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, CANopen, DeviceNet™, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>            | YF2A15-020C1BXLEAX | 2106283  |

|   | Brief description   | Type               | Part no. |
|---|---|--------------------|----------|
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, CANopen, DeviceNet™</li> <li>• <b>Cable:</b> 5 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, CANopen, DeviceNet™, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>                                   | YF2A15-050C1BXLEAX | 2106284  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, CANopen, DeviceNet™</li> <li>• <b>Cable:</b> 10 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, CANopen, DeviceNet™, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>                                  | YF2A15-100C1BXLEAX | 2106286  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Male connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Signal type:</b> Fieldbus, CANopen, DeviceNet™</li> <li>• <b>Cable:</b> 2 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, CANopen, DeviceNet™, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>  | YF2A15-020C1BM2A15 | 2106279  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Male connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Signal type:</b> Fieldbus, CANopen, DeviceNet™</li> <li>• <b>Cable:</b> 5 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, CANopen, DeviceNet™, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>  | YF2A15-050C1BM2A15 | 2106281  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Male connector, M12, 5-pin, straight, A-coded</li> <li>• <b>Signal type:</b> Fieldbus, CANopen, DeviceNet™</li> <li>• <b>Cable:</b> 10 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, CANopen, DeviceNet™, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul> | YF2A15-100C1BM2A15 | 2106282  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight</li> <li>• <b>Connection type head B:</b> Female connector, D-Sub, 9-pin, straight</li> <li>• <b>Signal type:</b> CANopen</li> <li>• <b>Description:</b> CANopen, shielded, Adapter cable for encoders and inclination sensors with CANopen interface and M12</li> <li>• <b>Note:</b> Programming adapter cable for programming tool PGT-12-Pro</li> </ul>                                   | DDL-2D05-G0M5BC9   | 2083805  |

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

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