Data sheet



# AHM36B-BDQC012x12

## AHS/AHM36

**ABSOLUTE ENCODERS**

SICK
Sensor Intelligence.



Illustration may differ

## Ordering information

| Type | part no. |
|---|---|
| AHM36B-BDQC012x12 | 1092007 |

Other models and accessories ➜ www.sick.com/AHS_AHM36

## Detailed technical data

### Safety-related parameters

| | |
|---|---|
| **$MTTF_D$ (mean time to dangerous failure)** | 240 years (EN ISO 13849-1) [1] |

[1] 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.

### Performance

| | |
|---|---|
| **Number of steps per revolution (max. resolution)** | 4,096 (12 bit) |
| **Number of revolutions** | 4,096 (12 bit) |
| **Max. resolution (number of steps per revolution x number of revolutions)** | 12 bit x 12 bit (4,096 x 4,096) |
| **Error limits G** | 0.35° (at 20 °C) [1] |
| **Repeatability standard deviation $\sigma_r$** | 0.25° (at 20 °C) [2] |

[1] 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.
[2] In accordance with DIN ISO 55350-13; 68.3% of the measured values are inside the specified area.

### Interfaces

| | |
|---|---|
| **Communication interface** | IO-Link |
| **Communication Interface detail** | IO-Link V1.1 / COM3 (230,4 kBaud) |
| **Initialization time** | 2 s [1] |
| **Cycle time** | ≤ 3.2 ms |
| **Smart Sensor** | Efficient communication, Enhanced Sensing |
| **Process data** | Position, speed |
| **Parameterising data** | Number of steps per revolution<br>Number of revolutions<br>PRESET |

[1] Valid positional data can be read once this time has elapsed.

| | |
|---|---|
| | Counting direction<br>Sampling rate for speed calculation<br>Unit for output of the speed value |
| **Status information** | Via status LED |

[1] Valid positional data can be read once this time has elapsed.

## Electronics

| | |
|---|---|
| **Connection type** | Male connector, M12, 4-pin, universal |
| **Supply voltage** | 18 ... 30 V |
| **Power consumption** | ≤ 1.5 W |
| **Reverse polarity protection** | ✓ |

## Mechanics

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

[1] Based on devices with male connector.

## Ambient data

| | |
|---|---|
| **EMC** | According to EN 61000-6-2, EN 61000-6-3 and EN 61131-9 |
| **Enclosure rating** | IP65 (IEC 60529) |
| **Permissible relative humidity** | 90 % (Condensation not permitted) |
| **Operating temperature range** | –20 °C ... +70 °C |
| **Storage temperature range** | –40 °C ... +100 °C, without package |
| **Resistance to shocks** | 100 g, 6 ms (EN 60068-2-27) |
| **Resistance to vibration** | 20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

## Classifications

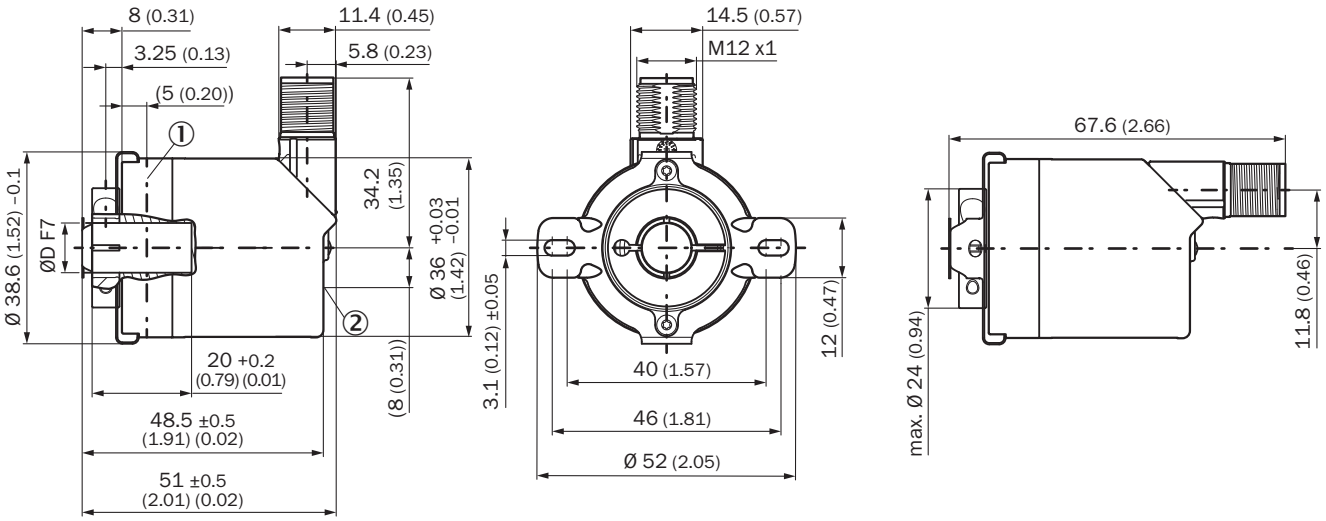
| | |
|---|---|
| **ECLASS 5.0** | 27270502 |
| **ECLASS 5.1.4** | 27270502 |
| **ECLASS 6.0** | 27270590 |
| **ECLASS 6.2** | 27270590 |

| | |
|---|---|
| **ECLASS 7.0** | 27270502 |
| **ECLASS 8.0** | 27270502 |
| **ECLASS 8.1** | 27270502 |
| **ECLASS 9.0** | 27270502 |
| **ECLASS 10.0** | 27270502 |
| **ECLASS 11.0** | 27270502 |
| **ECLASS 12.0** | 27270502 |
| **ETIM 5.0** | EC001486 |
| **ETIM 6.0** | EC001486 |
| **ETIM 7.0** | EC001486 |
| **ETIM 8.0** | EC001486 |
| **UNSPSC 16.0901** | 41112113 |

## Certificates

| | |
|---|---|
| **EU declaration of conformity** | ✓ |
| **UK declaration of conformity** | ✓ |
| **ACMA declaration of conformity** | ✓ |
| **Moroccan declaration of conformity** | ✓ |
| **China-RoHS** | ✓ |
| **cTUVus certificate** | ✓ |
| **Information according to Art. 3 of Data Act (Regulation EU 2023/2854)** | ✓ |

## Dimensional drawing Blind hollow shaft, male connector

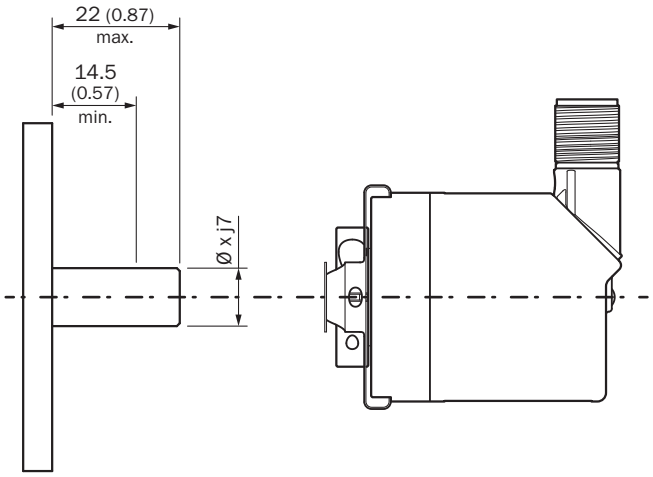



Dimensions in mm (inch)
① Measuring point for operating temperature
② measuring point for vibrations

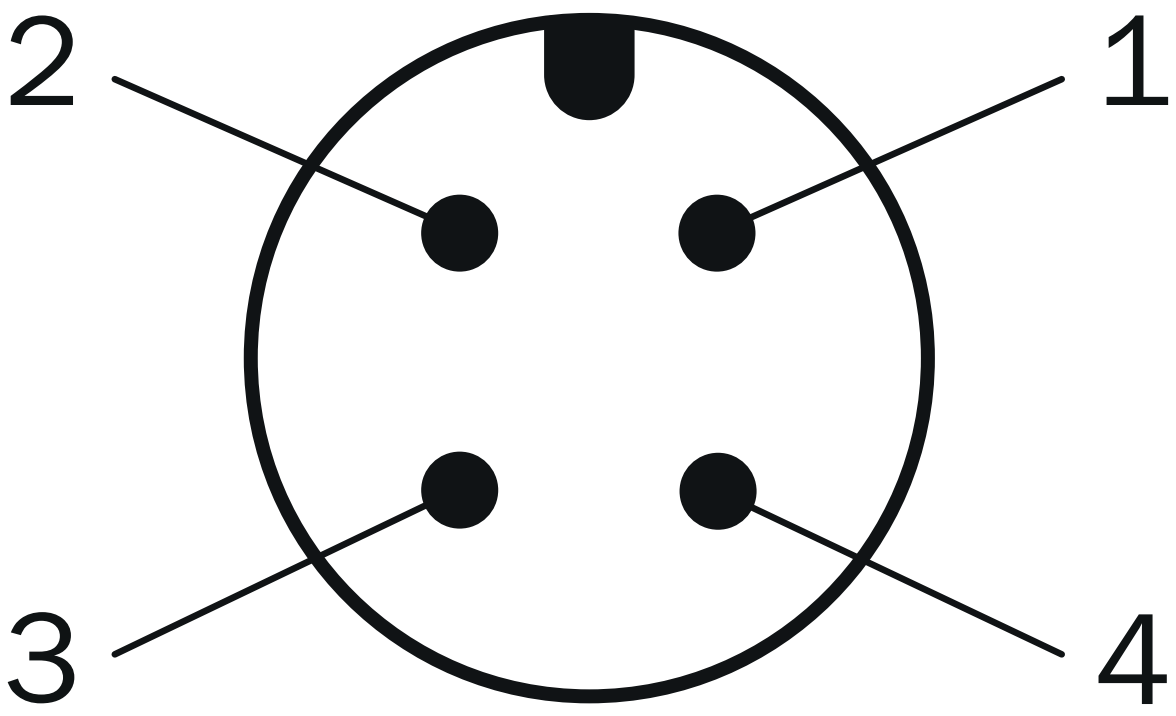
| Type | Shaft diameterØ D F7 |
|---|---|
| AHx36x-BAxxxxxxxx | 6 mm |

| Type | Shaft diameterØ D F7 |
|---|---|
| AHx36x-BBxxxxxxxx | 8 mm |
| AHx36x-BCxxxxxxxx | 1/4″ |
| AHx36x-BDxxxxxxxx | 10 mm |
| AHx36x-BKxxxxxxxx | 3/8″ |

## Attachment specifications



## PIN assignment




| PIN | Wire color | Signal | Function | | |
|---|---|---|---|---|---|
| – | – | – | Basic | Advanced | Advanced Smart Task |
| 1 | Brown | L+ | Encoder supply voltage 18-30 V (+Us) | | |
| 2 | White | I/Q | Not connected - no function | Multifunctional pin (configurable as switching input or switching output) | |
| 3 | Blue | L- | Encoder supply voltage 0 V (GND) | | |
| 4 | Black | C/Q | IO-Link communication | | |
| | | – | - | | Switching output (SIO mode) |

## Recommended accessories

Other models and accessories ➜ www.sick.com/AHS_AHM36

| | Brief description | Type | part no. |
|---|---|---|---|
| connectors and cables | | | |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Description:** Unshielded<br>• **Connection systems:** Screw-type terminals<br>• **Permitted cross-section:** ≤ 0.75 mm² | DOS-1204-G | 6007302 |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Male connector, M12, 4-pin, straight, A-coded<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 2 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-020UB3M2A14 | 2096000 |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Male connector, M12, 4-pin, straight, A-coded<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 5 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-050UB3M2A14 | 2096001 |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Male connector, M12, 4-pin, straight, A-coded<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 10 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-100UB3M2A14 | 2096002 |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 2 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-020UB3XLEAX | 2095607 |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 5 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-050UB3XLEAX | 2095608 |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 10 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-100UB3XLEAX | 2095609 |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 0.6 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-C60UB3XLEAX | 2145654 |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 1 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-010UB3XLEAX | 2145655 |
|  | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 3 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-030UB3XLEAX | 2145656 |

| | Brief description | Type | part no. |
|---|---|---|---|
| Mounting systems | | | |
|  | • **Product family:** Stator couplings<br>• **Description:** Standard stator coupling, AHS/AHM36 | BEF-DS16-AHX | 2108615 |

# 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.

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**For us, that is “Sensor Intelligence.”**

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