



# AHM36B-S4QC012x12

AHS/AHM36 IO-Link

**ABSOLUTE ENCODERS**

**SICK**  
Sensor Intelligence.



### Ordering information

| Type              | Part no. |
|-------------------|----------|
| AHM36B-S4QC012x12 | 1092017  |

Other models and accessories → [www.sick.com/AHS\\_AHM36\\_IO-Link](http://www.sick.com/AHS_AHM36_IO-Link)

Illustration may differ



### Detailed technical data

#### Performance

|                                                               |                                |
|---------------------------------------------------------------|--------------------------------|
| <b>Number of steps per revolution</b>                         | 4,096 (max.)                   |
| <b>Number of revolutions</b>                                  | 4,096 (max.)                   |
| <b>Max. resolution (singleturn, multiturn)</b>                | 4,096 (12 bit), 4,096 (12 bit) |
| <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>        | IO-Link                                                                                                                                                              |
| <b>Communication Interface detail</b> | V1.1, COM3 (230,4 kBaud)                                                                                                                                             |
| <b>Process data</b>                   | Position, speed                                                                                                                                                      |
| <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 |
| <b>Status information</b>             | Via status LED                                                                                                                                                       |
| <b>Initialization time</b>            | 2 s <sup>1)</sup>                                                                                                                                                    |
| <b>Cycle time</b>                     | ≤ 3.2 ms                                                                                                                                                             |

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

## Electrical data

|                                              |                                          |
|----------------------------------------------|------------------------------------------|
| <b>Connection type</b>                       | Male connector, M12, 4-pin, universal    |
| <b>Supply voltage range</b>                  | 18 V ... 30 V                            |
| <b>Power consumption</b>                     | ≤ 1.5 W                                  |
| <b>Reverse polarity protection</b>           | ✓                                        |
| <b>MTTFd: mean time to dangerous failure</b> | 240 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>                  | Solid shaft, face mount flange    |
| <b>Shaft diameter</b>                     | 10 mm x 12 mm                     |
| <b>Shaft length</b>                       | 12 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                         |
| <b>Operating torque</b>                   | < 0.5 Ncm                         |
| <b>Permissible Load capacity of shaft</b> | 40 N / radial<br>20 N / axial     |
| <b>Moment of inertia of the rotor</b>     | 2.5 gcm <sup>2</sup>              |
| <b>Bearing lifetime</b>                   | 3.6 x 10 <sup>8</sup> revolutions |
| <b>Angular acceleration</b>               | ≤ 500,000 rad/s <sup>2</sup>      |
| <b>Operating speed</b>                    | ≤ 6,000 min <sup>-1</sup>         |

<sup>1)</sup> Relates to devices with male connector connection.

## 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                                   |
| <b>Resistance to shocks</b>          | 100 g, 6 ms (according to EN 60068-2-27)             |
| <b>Resistance to vibration</b>       | 20 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6) |

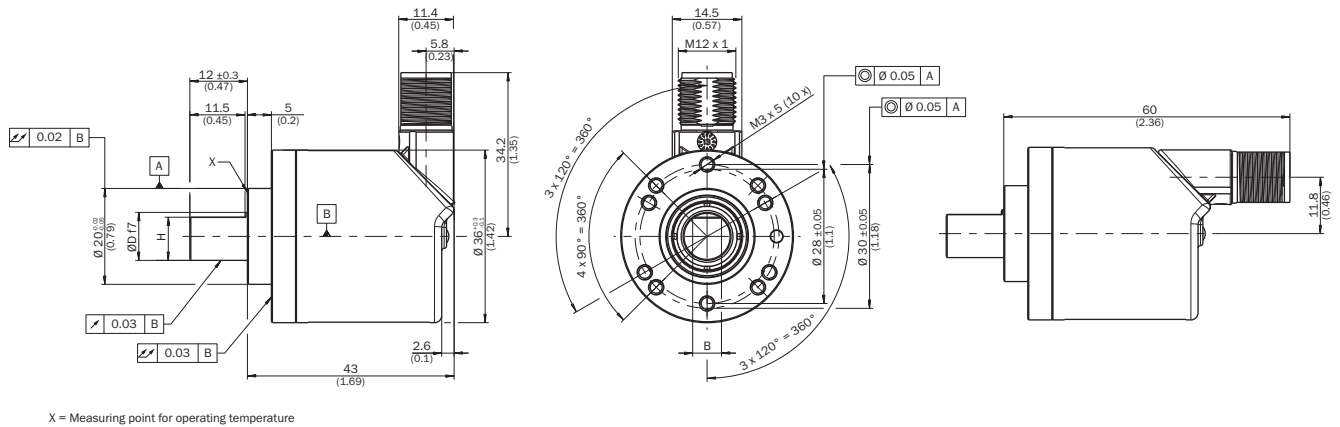
## Classifications

|                     |          |
|---------------------|----------|
| <b>ECl@ss 5.0</b>   | 27270502 |
| <b>ECl@ss 5.1.4</b> | 27270502 |
| <b>ECl@ss 6.0</b>   | 27270590 |
| <b>ECl@ss 6.2</b>   | 27270590 |
| <b>ECl@ss 7.0</b>   | 27270502 |
| <b>ECl@ss 8.0</b>   | 27270502 |

|                       |          |
|-----------------------|----------|
| <b>ECl@ss 8.1</b>     | 27270502 |
| <b>ECl@ss 9.0</b>     | 27270502 |
| <b>ETIM 5.0</b>       | EC001486 |
| <b>ETIM 6.0</b>       | EC001486 |
| <b>UNSPSC 16.0901</b> | 41112113 |

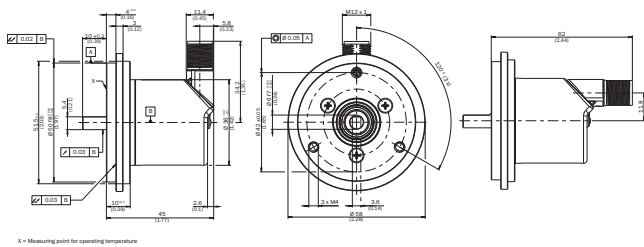
### Dimensional drawing (Dimensions in mm (inch))

Solid shaft, face mount flange, connector outlet



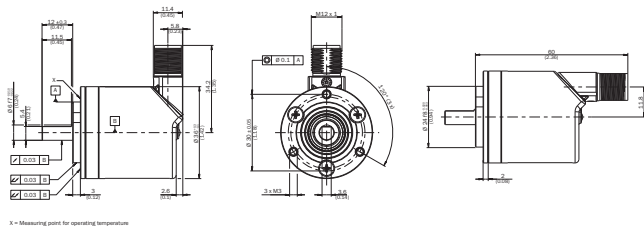
### Proposed fitting

Solid shaft, face mount flange with flange adapter, centering collar D20 on D50 (BEF-FA-020-050, 2072297)



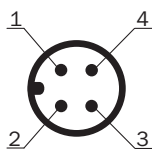
Order example for 6 mm shaft diameter: AHx36x-S3xx0xxxx + BEF-FA-020-050 (adapter is not pre-assembled)

Solid shaft, face mount flange with flange adapter, centering collar D20 on D24 (BEF-FA-020-024, 2072294)



Order example for 6 mm shaft diameter: AHx36x-S3xx0xxxx + BEF-FA-020-024 (adapter is not pre-assembled)

PIN assignment








| PIN | Wire color | Signal | Function                             |
|-----|------------|--------|--------------------------------------|
| 1   | Brown      | L+     | Encoder supply voltage 18-30 V (+Us) |
| 2   | White      | I/Q    | Not connected - no function          |
| 3   | Blue       | L-     | Encoder supply voltage 0 V (GND)     |
| 4   | Black      | C/Q    | IO-Link communication                |

Recommended accessories

Other models and accessories → [www.sick.com/AHS\\_AHM36\\_IO-Link](http://www.sick.com/AHS_AHM36_IO-Link)

|                         | Brief description                                                                                                                                                                                                                                                                                 | Type       | Part no. |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|
| <b>Shaft adaptation</b> |                                                                                                                                                                                                                                                                                                   |            |          |
|                         | Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, -30 °C to +120 °C, max. torque 80 Ncm; material: stainless steel bellows, aluminum hub                                                              | KUP-0610-B | 5312982  |
|                         | Double loop coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radially +/- 2,5 mm, axially +/- 3 mm, angle +/- 10 degrees; max. speed 3.000 rpm, -30 to +80 degrees Celsius, torsional spring stiffness of 25 Nm/rad                                                                      | KUP-0610-D | 5326697  |
|                         | Spring washer coupling, shaft diameter 6 mm / 10 mm, Maximum shaft offset: radial +/- 0.3 mm, axial +/- 0.4 mm, angular +/- 2.5°; max. speed 12,000 rpm, -10° to +80 °C, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin | KUP-0610-F | 5312985  |
|                         | Double loop coupling, shaft diameter 8 mm / 10 mm, max. shaft offset: radially +/- 0,25 mm, axially +/- 0,4 mm, angle +/- 4 degrees; max. speed 10.000 rpm, -30 to +120 degrees Celsius, torsional spring stiffness of 150 Nm/rad                                                                 | KUP-0810-D | 5326704  |
|                         | Bellows coupling, shaft diameter 10 mm/10 mm; maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4°; max. revolutions 10,000 rpm, -30° to +120 °C, max. torque 80 Ncm; material: stainless steel bellows, aluminum clamping hubs                                             | KUP-1010-B | 5312983  |
|                         | Double loop coupling, shaft diameter 10 mm / 10 mm, Maximum shaft offset: radial +/- 2.5 mm, axial +/- 3 mm, angular +/- 10°; max. speed 3,000 rpm, -30° to +80 °C, max. torque 1.5 Nm; material: polyurethane, galvanized steel flange                                                           | KUP-1010-D | 5326703  |
|                         | 10 mm / 12 mm; maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4°; max. revolutions 10,000 rpm, -30° to +120 °C, max. torque 80 Ncm; material: stainless steel bellows, aluminum clamping hubs                                                                            | KUP-1012-B | 5312984  |
|                         | Double loop coupling, shaft diameter 10 mm / 12 mm, Maximum shaft offset: radial +/- 2.5 mm, axial +/- 3 mm, angular +/- 10°; max. speed 3,000 rpm, -30° to +80 °C, max. torque 1.5 Nm; material: polyurethane, galvanized steel flange                                                           | KUP-1012-D | 5326702  |

|                                                                                   | Brief description                                                                                                                                                                     | Type               | Part no. |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|
| Plug connectors and cables                                                        |                                                                                                                                                                                       |                    |          |
|  | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2 m                                   | YF2A14-020UB3XLEAX | 2095607  |
|                                                                                   | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 5 m                                   | YF2A14-050UB3XLEAX | 2095608  |
|                                                                                   | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 10 m                                  | YF2A14-100UB3XLEAX | 2095609  |
|  | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: male connector, M12, 4-pin, straight, A-coded<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2 m  | YF2A14-020UB3M2A14 | 2096000  |
|  | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: male connector, M12, 4-pin, straight, A-coded<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 5 m  | YF2A14-050UB3M2A14 | 2096001  |
|  | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: male connector, M12, 4-pin, straight, A-coded<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 10 m | YF2A14-100UB3M2A14 | 2096002  |
|  | Head A: female connector, M12, 4-pin, straight<br>Head B: -<br>Cable: unshielded                                                                                                      | DOS-1204-G         | 6007302  |

## 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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