



**AHS36I-S3AC000720**

AHS/AHM36

**ABSOLUTE ENCODERS**

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

| Type              | Part no. |
|-------------------|----------|
| AHS36I-S3AC000720 | 1099391  |

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>       | 720                            |
| <b>Error limits G</b>                                         | 0.35° (at 20 °C) <sup>1)</sup> |
| <b>Repeatability standard deviation <math>\sigma_r</math></b> | 0.2° (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>          | SSI                                                |
| <b>Process data</b>                     | Position                                           |
| <b>Initialization time</b>              | 100 ms <sup>1)</sup>                               |
| <b>Position forming time</b>            | 125 µs                                             |
| <b>SSI</b>                              |                                                    |
| Code type                               | Gray                                               |
| Code sequence parameter adjustable      | CW/CCW (V/R) configurable via cable                |
| Clock frequency                         | 2 MHz <sup>2)</sup>                                |
| Set (electronic adjustment)             | H-active (L = 0 - 3 V, H = 4,0 - U <sub>s</sub> V) |
| CW/CCW (counting sequence when turning) | L-active (L = 0 - 1 V, H = 2,0 - U <sub>s</sub> V) |

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

<sup>2)</sup> Minimum, LOW level (Clock +): 250 ns.

#### Electrical data

|                          |                                       |
|--------------------------|---------------------------------------|
| <b>Connection type</b>   | Male connector, M12, 8-pin, universal |
| <b>Supply voltage</b>    | 4.5 ... 32 V DC                       |
| <b>Power consumption</b> | ≤ 1.5 W (without load)                |

<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.

|                                              |                                          |
|----------------------------------------------|------------------------------------------|
| <b>Reverse polarity protection</b>           | ✓                                        |
| <b>MTTFd: mean time to dangerous failure</b> | 230 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>                     | 6 mm                                    |
| <b>Shaft length</b>                       | 12 mm                                   |
| <b>Weight</b>                             | 0.2 kg <sup>1)</sup>                    |
| <b>Shaft material</b>                     | Stainless steel 1,4305                  |
| <b>Flange material</b>                    | Stainless steel 1,4305                  |
| <b>Housing material</b>                   | Stainless steel 1,4305                  |
| <b>Material, cable</b>                    | PUR                                     |
| <b>Start up torque</b>                    | 1 Ncm                                   |
| <b>Operating torque</b>                   | < 1 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>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>              | IP67 (according to IEC 60529)<br>IP69K (according to IEC 60529) |
| <b>Permissible relative humidity</b> | 90 % (Condensation not permitted)                               |
| <b>Operating temperature range</b>   | -40 °C ... +100 °C                                              |
| <b>Storage temperature range</b>     | -40 °C ... +100 °C, without package                             |
| <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)            |

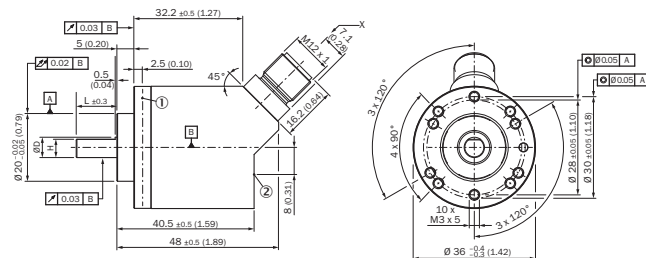
## Classifications

|                     |          |
|---------------------|----------|
| <b>ECI@ss 5.0</b>   | 27270502 |
| <b>ECI@ss 5.1.4</b> | 27270502 |
| <b>ECI@ss 6.0</b>   | 27270590 |
| <b>ECI@ss 6.2</b>   | 27270590 |
| <b>ECI@ss 7.0</b>   | 27270502 |
| <b>ECI@ss 8.0</b>   | 27270502 |
| <b>ECI@ss 8.1</b>   | 27270502 |
| <b>ECI@ss 9.0</b>   | 27270502 |

|                       |          |
|-----------------------|----------|
| <b>ECI@ss 10.0</b>    | 27270502 |
| <b>ECI@ss 11.0</b>    | 27270502 |
| <b>ETIM 5.0</b>       | EC001486 |
| <b>ETIM 6.0</b>       | EC001486 |
| <b>ETIM 7.0</b>       | EC001486 |
| <b>UNSPSC 16.0901</b> | 41112113 |

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

Solid shaft, face mount flange, male connector

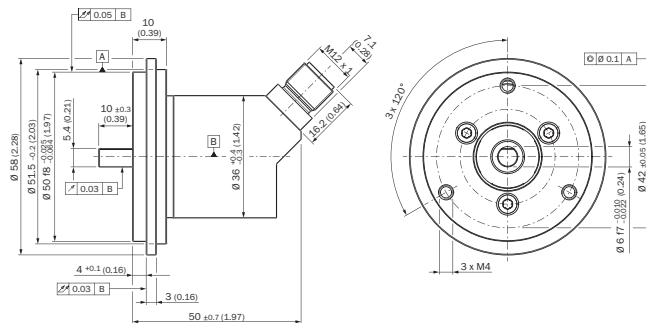


Non-tolerated dimensions according to DIN-ISO 2768-mk

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

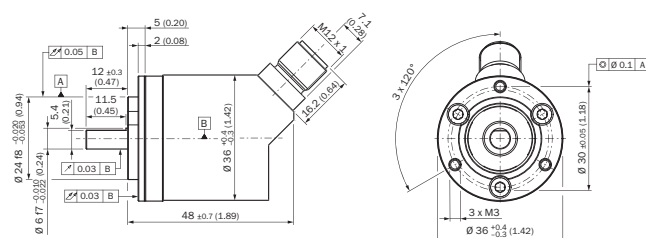
### Attachment specifications

Solid shaft, face mount flange with flange adapter, centering collar D20 on D50 (BEF-FA-020-050-I, 2103985)



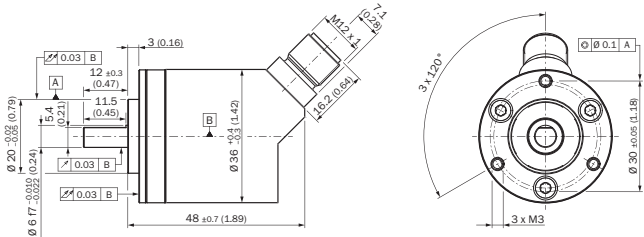
Order example for 6 mm shaft diameter: AHx36I-S3xx0xxxxx + BEF-FA-020-050-I (adapter is not pre-assembled)

Solid shaft, face mount flange with flange adapter, centering collar D20 on D24 (BEF-FA-020-024-I, 2103982)



Order example for 6 mm shaft diameter: AHx36I-S3xx0xxxxx + BEF-FA-020-024-I (adapter is not pre-assembled)

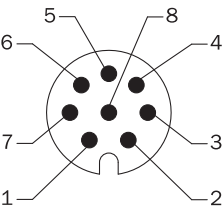
Solid shaft, face mount flange with flange adapter, centering collar D20 on D36, 2 mm high (BEF-FA-020-036-2-I, 2103984)



Order example for 6 mm shaft diameter: AHx36I-S3xx0xxxxx + BEF-FA-020-036-2-I (adapter is not pre-assembled)

PIN assignment

M12 male connector, 8-pin and cable, 8-wire, SSI/Gray



View of M12 male device connector on encoder

| PIN | Wire colors (cable connection) | Signal         | Explanation                                                                                 |
|-----|--------------------------------|----------------|---------------------------------------------------------------------------------------------|
| 1   | Brown                          | Data -         | Interface signals                                                                           |
| 2   | White                          | Data +         | Interface signals                                                                           |
| 3   | Black                          | V/R            | Sequence in direction of rotation                                                           |
| 4   | Pink                           | SET            | Electronic adjustment<br>Interface signals                                                  |
| 5   | Yellow                         | Clock +        | Interface signals                                                                           |
| 6   | Purple                         | Clock -        | Interface signals                                                                           |
| 7   | Blue                           | GND            | Ground connection                                                                           |
| 8   | Red                            | U <sub>S</sub> | Operating voltage                                                                           |
|     |                                | Screen         | Screen connected to hous-<br>ing on encoder side. Connect-<br>ed to ground on control side. |

### Recommended accessories

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

|                                                                                     | Brief description                                                                                                                                                                                                                                                                                                                  | Type               | Part no. |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|
| Shaft adaptation                                                                    |                                                                                                                                                                                                                                                                                                                                    |                    |          |
|    | Bellows coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial $\pm 0.25$ mm, axial $\pm 0.4$ mm, angular $\pm 4^\circ$ ; max. speed 10,000 rpm, $-30^\circ\text{C}$ to $+120^\circ\text{C}$ , max. torque 80 Ncm; material: stainless steel bellows, aluminum hub                                                     | KUP-0606-B         | 5312981  |
|                                                                                     | Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial $\pm 0.25$ mm, axial $\pm 0.4$ mm, angular $\pm 4^\circ$ ; max. speed 10,000 rpm, $-30^\circ\text{C}$ to $+120^\circ\text{C}$ , 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 $\pm 2.5$ mm, axially $\pm 3$ mm, angle $\pm 10$ 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 $\pm 0.3$ mm, axial $\pm 0.4$ mm, angular $\pm 2.5^\circ$ ; max. speed 12,000 rpm, $-10^\circ$ to $+80^\circ\text{C}$ , max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin | KUP-0610-F         | 5312985  |
| Plug connectors and cables                                                          |                                                                                                                                                                                                                                                                                                                                    |                    |          |
|    | Head A: female connector, M12, 8-pin, straight<br>Head B: Flying leads<br>Cable: Incremental, SSI, PUR, halogen-free, shielded, 2 m                                                                                                                                                                                                | DOL-1208-G02MAC1   | 6032866  |
|                                                                                     | Head A: female connector, M12, 8-pin, straight<br>Head B: Flying leads<br>Cable: Incremental, SSI, PUR, halogen-free, shielded, 5 m                                                                                                                                                                                                | DOL-1208-G05MAC1   | 6032867  |
|                                                                                     | Head A: female connector, M12, 8-pin, straight<br>Head B: Flying leads<br>Cable: Incremental, SSI, PUR, halogen-free, shielded, 10 m                                                                                                                                                                                               | DOL-1208-G10MAC1   | 6032868  |
|                                                                                     | Head A: female connector, M12, 8-pin, straight<br>Head B: Flying leads<br>Cable: Incremental, SSI, PUR, halogen-free, shielded, 20 m                                                                                                                                                                                               | DOL-1208-G20MAC1   | 6032869  |
|  | Head A: female connector, M12, 8-pin, straight, A-coded<br>Head B: -<br>Cable: shielded                                                                                                                                                                                                                                            | YF12ES8-0050S5586A | 2097334  |
|  | Head A: male connector, M12, 8-pin, straight, A-coded<br>Head B: -<br>Cable: shielded                                                                                                                                                                                                                                              | YM12ES8-0050S5586A | 2097337  |

## 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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