

# AHM36I-BKQC014x12

AHS/AHM36

**ABSOLUTE ENCODERS** 





### Ordering information

| Туре              | Part no. |
|-------------------|----------|
| AHM36I-BKQC014x12 | 1093758  |

Other models and accessories → www.sick.com/AHS\_AHM36

Illustration may differ



#### Detailed technical data

#### Performance

| Number of steps per revolution (max. resolution)   | 16,384 (14 bit)                  |
|--|----------------------------------|
| Number of revolutions  | 4,096 (12 bit)                   |
| $\label{eq:max} \begin{tabular}{ll} \textbf{Max. resolution (number of steps per revolution x number of revolutions)} \end{tabular}$ | 14 bit x 12 bit (16,384 x 4,096) |
| Error limits G   | 0.35° (at 20 °C) <sup>1)</sup>   |
| Repeatability standard deviation $\boldsymbol{\sigma}_{r}$   | 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.

#### Interfaces

| Communication interface        | IO-Link   |  |  |  |
|--------------------------------|---|--|--|--|
| Communication Interface detail | IO-Link V1.1 / COM3 (230,4 kBaud)   |  |  |  |
| Initialization time            | 2 s <sup>1)</sup>   |  |  |  |
| Cycle time                     | ≤ 3.2 ms  |  |  |  |
| Smart Sensor                   | Efficient communication, Enhanced Sensing, diagnosis  |  |  |  |
| Process data                   | Position, speed, electronic cams, limit values, linear position, linear speed, errors and warnings, switching signals on pin 2  |  |  |  |
| Parameterising data            | Number of steps per revolution Number of revolutions PRESET Counting direction Sampling rate for speed calculation Unit for output of the speed value Round axis functionality Electronic cams(2 channels x 8 cams) Limit values Linear measuring length per 360° Pin 2 configuration |  |  |  |
| Available diagnostics data     | Minimum and maximum temperature Maximumspeed Power-on counter   |  |  |  |

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

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

|                                  | Operatinghours counter power-on/motion Counter of direction changes/number of movements cw/number of movements ccw Minimum andmaximum operating voltage Distance covered |
|----------------------------------|--|
| Status information               | Via status LED   |
| Switching input/Switching output | ✓  |
| Pin 2 input frequency            | ≤ 100 Hz   |
| Output frequency pin 2           | ≤ 100 Hz   |

 $<sup>^{1)}\,\</sup>mbox{\sc Valid}$  positional data can be read once this time has elapsed.

#### Electrical data

| Connection type                       | Male connector, M12, 4-pin, universal |  |  |
|---------------------------------------|---------------------------------------|--|--|
| Supply voltage                        | 18 30 V                               |  |  |
| Power consumption                     | ≤ 1.5 W                               |  |  |
| Reverse polarity protection           | ✓                                     |  |  |
| MTTFd: mean time to dangerous failure | 240 years (EN ISO 13849-1)            |  |  |

#### Mechanical data

| Mechanical design              | Blind hollow shaft                           |  |  |
|--------------------------------|--|--|--|
| Shaft diameter                 | 1/4"   |  |  |
| Weight                         | 0.2 kg, Based on devices with male connector |  |  |
| Shaft material                 | Stainless steel 1,4305                       |  |  |
| Flange material                | Stainless steel 1,4305                       |  |  |
| Material, stator coupling      | Stainless steel 1,4305                       |  |  |
| Housing material               | Stainless steel 1,4305                       |  |  |
| Start up torque                | ≤ 1 Ncm <sup>1)</sup>                        |  |  |
| Operating torque               | ≤ 1 Ncm <sup>1)</sup>                        |  |  |
| 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 <sup>-1</sup>                    |  |  |
| Moment of inertia of the rotor | 23 gcm <sup>2</sup>                          |  |  |
| Bearing lifetime               | 2.0 x 10^9 revolutions                       |  |  |
| Angular acceleration           | ≤ 500,000 rad/s²                             |  |  |

<sup>&</sup>lt;sup>1)</sup> At 20 °C.

#### Ambient data

| EMC                           | According to EN 61000-6-2, EN 61000-6-3 and EN 61131-9 |
|-------------------------------|--|
| Enclosure rating              | IP67 (IEC 60529)<br>IP69K (IEC 60529)                  |
| Permissible relative humidity | 90 % (Condensation not permitted)                      |
| Operating temperature range   | -40 °C +85 °C  |

 $<sup>^{1)}</sup>$  With additional mechanical cable mounting.

 $<sup>^{2)}\,\</sup>mbox{The cable must also be fastened with the shortest possible distance to the encoder.}$ 

<sup>&</sup>lt;sup>3)</sup> For side-mounted encoders (horizontal encoder shaft, vertical stator coupling), additional damping measures may be required in some cases as resonances can arise. Furthermore, the cable must be fastened with the shortest possible distance to the encoder.

| Storage temperature range | -40 °C +100 °C, Without packaging                    |  |  |
|---------------------------|--|--|--|
| Resistance to shocks      | 100 g, 6 ms (EN 60068-2-27) <sup>1) 2)</sup>         |  |  |
| Resistance to vibration   | 20 g, 10 Hz 2,000 Hz (EN 60068-2-6) <sup>1) 3)</sup> |  |  |

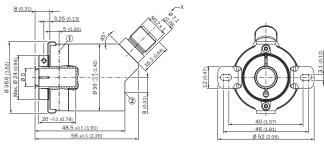
 $<sup>^{1)}</sup>$  With additional mechanical cable mounting.

#### 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 |

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

Blind hollow shaft, male connector



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

- Measuring point for operating temperature
- Measuring point for vibrations

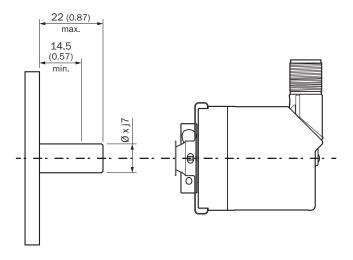
| Туре              | Shaft diameter<br>Ø D F7 |
|-------------------|--------------------------|
| AHx36x-BAxxxxxxxx | 6 mm                     |
| AHx36x-BBxxxxxxxx | 8 mm                     |

 $<sup>^{2)}\,\</sup>mbox{The cable must also be fastened with the shortest possible distance to the encoder.}$ 

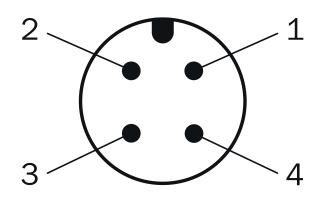
<sup>&</sup>lt;sup>3)</sup> For side-mounted encoders (horizontal encoder shaft, vertical stator coupling), additional damping measures may be required in some cases as resonances can arise. Furthermore, the cable must be fastened with the shortest possible distance to the encoder.

| Туре              | Shaft diameter<br>Ø D F7 |
|-------------------|--------------------------|
| 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<br>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       | Ŀ      | 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   | Туре            | Part no. |
|---------|---|-----------------|----------|
| Flanges |   |                 |          |
|         | Standard stator coupling, AHS/AHM36   | BEF-DS16-AHX    | 2108615  |
| Others  |   |                 |          |
|         | Connection type head A: Female connector, M12, 4-pin, straight Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 2 m, 4-wire, PVC Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid hydrogen peroxide (H2O2) Application: Hygienic and washdown zones  | DOL-1204-GO2MNI | 6052613  |
| B       | <ul> <li>Connection type head A: Female connector, M12, 4-pin, angled</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 2 m, 4-wire, PVC</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Connection systems: Flying leads</li> <li>Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>Application: Hygienic and washdown zones</li> </ul> | DOL-1204-W02MNI | 6052614  |
|         | Connection type head A: Female connector, M12, 4-pin, straight Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 5 m, 4-wire, PVC Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid & hydrogen peroxide (H2O2) Application: Hygienic and washdown zones  | DOL-1204-G05MNI | 6052615  |
| 3       | Connection type head A: Female connector, M12, 4-pin, angled Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 5 m, 4-wire, PVC Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid & hydrogen peroxide (H2O2) Application: Hygienic and washdown zones  | DOL-1204-W05MNI | 6052616  |
|         | Connection type head A: Female connector, M12, 4-pin, straight Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 10 m, 4-wire, PVC Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid & hydrogen peroxide (H2O2) Application: Hygienic and washdown zones   | DOL-1204-G10MNI | 6052617  |

|   | Brief description  | Туре            | Part no. |
|---|--|-----------------|----------|
| 3 | Connection type head A: Female connector, M12, 4-pin, angled Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 10 m, 4-wire, PVC Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid & hydrogen peroxide (H2O2) Application: Hygienic and washdown zones  | DOL-1204-W10MNI | 6052618  |
|   | <ul> <li>Connection type head A: Female connector, M12, 4-pin, straight</li> <li>Connection type head B: Male connector, M12, 4-pin, straight</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 2 m, 4-wire, PVC</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>Application: Hygienic and washdown zones</li> </ul>  | DSL-1204-G02MNI | 6052630  |
| 6 | <ul> <li>Connection type head A: Female connector, M12, 4-pin, straight</li> <li>Connection type head B: Male connector, M12, 4-pin, straight</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 5 m, 4-wire, PVC</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>Application: Hygienic and washdown zones</li> </ul>  | DSL-1204-G05MNI | 6052631  |
| 6 | <ul> <li>Connection type head A: Female connector, M12, 4-pin, angled</li> <li>Connection type head B: Male connector, M12, 4-pin, straight</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 2 m, 4-wire, PVC</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>Application: Hygienic and washdown zones</li> </ul>  | DSL-1204-B02MNI | 6052633  |
|   | <ul> <li>Connection type head A: Female connector, M12, 4-pin, angled</li> <li>Connection type head B: Male connector, M12, 4-pin, straight</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 5 m, 4-wire, PVC</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Note: This product is generally resistant to chemical cleaning agents (see ECOLAB). Please do not use cleaning agents of any other Kind., Not resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>Application: Hygienic and washdown zones</li> </ul>  | DSL-1204-B05MNI | 6052634  |
|   | Connection type head A: Female connector, M12, 4-pin, straight Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 2 m, 4-wire, PP Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid & hydrogen peroxide (H2O2) Application: Hygienic and washdown zones, Drag chain operation | DOL-1204-G02MRN | 6058291  |

| Brief description   | Туре            | Part no. |
|---|-----------------|----------|
| Connection type head A: Female connector, M12, 4-pin, angled Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 2 m, 4-wire, PP Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H202 and CH202. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid & hydrogen peroxide (H202) Application: Hygienic and washdown zones, Drag chain operation  | DOL-1204-W02MRN | 6058474  |
| <ul> <li>Connection type head A: Female connector, M12, 4-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 5 m, 4-wire, PP</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Connection systems: Flying leads</li> <li>Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H202 and CH202. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H202)</li> <li>Application: Hygienic and washdown zones, Drag chain operation</li> </ul> | DOL-1204-G05MRN | 6058476  |
| Connection type head A: Female connector, M12, 4-pin, angled Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 5 m, 4-wire, PP Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H202 and CH202. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid & hydrogen peroxide (H202) Application: Hygienic and washdown zones, Drag chain operation  | DOL-1204-W05MRN | 6058477  |
| Connection type head A: Female connector, M12, 4-pin, straight Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 10 m, 4-wire, PP Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H202 and CH202. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid & hydrogen peroxide (H202) Application: Hygienic and washdown zones, Drag chain operation   | DOL-1204-G10MRN | 6058478  |
| Connection type head A: Female connector, M12, 4-pin, angled Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 10 m, 4-wire, PP Description: Sensor/actuator cable, unshielded Connection systems: Flying leads Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid & hydrogen peroxide (H2O2) Application: Hygienic and washdown zones, Drag chain operation   | DOL-1204-W10MRN | 6058479  |

|      | Brief description  | Туре                   | Part no. |
|------|--|------------------------|----------|
| 60   | Connection type head A: Female connector, M12, 4-pin, straight Connection type head B: Male connector, M12, 4-pin, straight Signal type: Sensor/actuator cable Cable: 2 m, 4-wire, PP Description: Sensor/actuator cable, unshielded Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid & hydrogen peroxide (H2O2) Application: Hygienic and washdown zones, Drag chain operation  | DSL-1204-G02MRN        | 6058499  |
| 10 C | <ul> <li>Connection type head A: Female connector, M12, 4-pin, straight</li> <li>Connection type head B: Male connector, M12, 4-pin, straight</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 5 m, 4-wire, PP</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>Application: Hygienic and washdown zones, Drag chain operation</li> </ul>  | DSL-1204-G05MRN        | 6058500  |
|      | Connection type head A: Female connector, M12, 4-pin, angled Connection type head B: Male connector, M12, 4-pin, straight Signal type: Sensor/actuator cable Cable: 2 m, 4-wire, PP Description: Sensor/actuator cable, unshielded Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H202 and CH202. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid & hydrogen peroxide (H202) Application: Hygienic and washdown zones, Drag chain operation  | DSL-1204-B02MRN        | 6058502  |
|      | Connection type head A: Female connector, M12, 4-pin, angled Connection type head B: Male connector, M12, 4-pin, straight Signal type: Sensor/actuator cable Cable: 5 m, 4-wire, PP Description: Sensor/actuator cable, unshielded Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H202 and CH202. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid & hydrogen peroxide (H202) Application: Hygienic and washdown zones, Drag chain operation  | DSL-1204-B05MRN        | 6058503  |
| 8    | <ul> <li>Connection type head A: Female connector, M12, 4-pin, straight</li> <li>Connection type head B: Male connector, M12, 4-pin, straight</li> <li>Signal type: Sensor/actuator cable</li> <li>Cable: 20 m, 4-wire, PP</li> <li>Description: Sensor/actuator cable, unshielded</li> <li>Note: This product is generally resistant to chemical cleaning agents (see ECOLAB) and other chemical compounds such as H2O2 and CH2O2. Before permanent installation is carried out, the material's resistance to the cleaning agent being used must be checked., Resistant against lactic acid &amp; hydrogen peroxide (H2O2)</li> <li>Application: Hygienic and washdown zones, Drag chain operation</li> </ul> | YF2AP4-<br>020PA2M2AP4 | 2143765  |

## 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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