

# AHM36I-BBQL014x12

AHS/AHM36

**ABSOLUTE ENCODERS** 





## Ordering information

Туре	Part no.
AHM36I-BBQL014x12	1093775

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 $\sigma_{\text{r}}$	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

 $<sup>^{1)}\,\</sup>mathrm{Valid}$  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.

	Maximumspeed Power-on counter 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> Valid positional data can be read once this time has elapsed.

#### Electrical data

Connection type	Cable, 4-wire, universal, 3 m
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	8 mm
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
Material, cable	PUR
Start up torque	≤ 1 Ncm <sup>1)</sup>
Operating torque	≤ 1 Ncm <sup>1)</sup>
Permissible movement static	$\pm$ 0.3 mm, $\pm$ 0.3 mm (radial, axial)
Permissible movement dynamic	± 0.1 mm (radial) ± 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) IP69K (IEC 60529)

 $<sup>^{1)}</sup>$  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.

Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	-40 °C +85 °C
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>

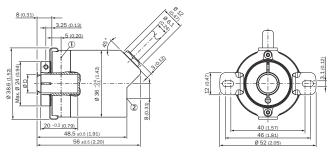
<sup>1)</sup> With additional mechanical cable mounting.

#### 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, cable



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

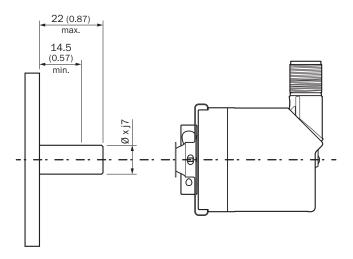
- Measuring point for operating temperature
- ② Measuring point for vibrations

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

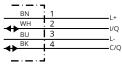
<sup>&</sup>lt;sup>3)</sup> For side-mounted encoders (horizontal encoder shaft, vertical stator coupling), additional damping measures may be required in some cases as resonances can arise. Furthermore, the cable must be fastened with the shortest possible distance to the encoder.

Туре	Shaft diameter Ø 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	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	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						
	<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: 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-G02MNI	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			
	<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, 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-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			
	<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: 10 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-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
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: 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 13	<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
6 3	<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
	<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: 2 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 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>	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 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-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 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>	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
	<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: 10 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 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>	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
100	<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
	<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, 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-B02MRN	6058502
6	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
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: 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- 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.

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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