

**ATM60-D4H13x13**

ATM60

**ABSOLUTE ENCODERS**

**SICK**  
Sensor Intelligence.



Illustration may differ

## Ordering information

Type	Part no.
ATM60-D4H13x13	1030017

Bus adapter not included with delivery

Other models and accessories → [www.sick.com/ATM60](http://www.sick.com/ATM60)

## Detailed technical data

### Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	150 years (EN ISO 13849-1) <sup>1)</sup>
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<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.

### Performance

<b>Number of steps per revolution (max. resolution)</b>	8,192 (13 bit)
<b>Number of revolutions</b>	8,192 (13 bit)
<b>Max. resolution (number of steps per revolution x number of revolutions)</b>	13 bit x 13 bit (8,192 x 8,192)
<b>Measuring step</b>	0.043 °
<b>Error limits G</b>	± 0.25 ° <sup>1)</sup>
<b>Repeatability standard deviation σ<sub>r</sub></b>	0.1 ° <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>	DeviceNet™
<b>Data protocol</b>	DeviceNet Specification Release 2.0
<b>Address setting</b>	0 ... 63, DIP switches or protocol
<b>Data transmission rate (baud rate)</b>	125 kBaud, 250 kBaud, 500 kBaud, DIP switches or protocol
<b>Initialization time</b>	1,250 ms <sup>1)</sup>
<b>Position forming time</b>	0.25 ms
<b>Status information</b>	Network status LED, 2-colours
<b>Bus termination</b>	DIP switch <sup>2)</sup>
<b>Set (electronic adjustment)</b>	Via PRESET push button or protocol

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

<sup>2)</sup> Should only be connected in the final device.

## Electronics

<b>Connection type</b>	Bus adapter <sup>1)</sup>
<b>Supply voltage</b>	10 ... 32 V
<b>Power consumption</b>	≤ 2 W (without load)
<b>Reverse polarity protection</b>	✓

<sup>1)</sup> Order bus adapter separately.

## Mechanics

<b>Mechanical design</b>	Solid shaft, face mount flange
<b>Shaft diameter</b>	10 mm
<b>Shaft length</b>	19 mm
<b>Weight</b>	0.59 kg <sup>1)</sup>
<b>Shaft material</b>	Stainless steel
<b>Flange material</b>	Aluminum
<b>Start up torque</b>	2.5 Ncm (+20 °C), with shaft seal 0.5 Ncm (+20 °C), without shaft seal <sup>2)</sup>
<b>Operating torque</b>	1.8 Ncm (+20 °C), with shaft seal 0.3 Ncm (+20 °C), without shaft seal <sup>2)</sup>
<b>Permissible shaft loading</b>	300 N (radial) 50 N (axial)
<b>Operating speed</b>	≤ 6,000 min <sup>-1</sup> <sup>3)</sup>
<b>Moment of inertia of the rotor</b>	35 gcm <sup>2</sup>
<b>Bearing lifetime</b>	3.6 x 10 <sup>9</sup> revolutions
<b>Angular acceleration</b>	≤ 500,000 rad/s <sup>2</sup>

<sup>1)</sup> Based on encoder with male connector.

<sup>2)</sup> If the shaft seal has been removed by the customer.

<sup>3)</sup> Allow for self-heating of 3.3 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, with shaft seal (IEC 60529) <sup>1)</sup> IP43, without shaft seal, on encoder flange not sealed (IEC 60529) <sup>1)</sup> IP66, without shaft seal, on encoder flange sealed (IEC 60529) <sup>1)</sup>
<b>Permissible relative humidity</b>	98 %
<b>Operating temperature range</b>	-20 °C ... +85 °C
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package
<b>Resistance to shocks</b>	100 g, 6 ms (EN 60068-2-27)
<b>Resistance to vibration</b>	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

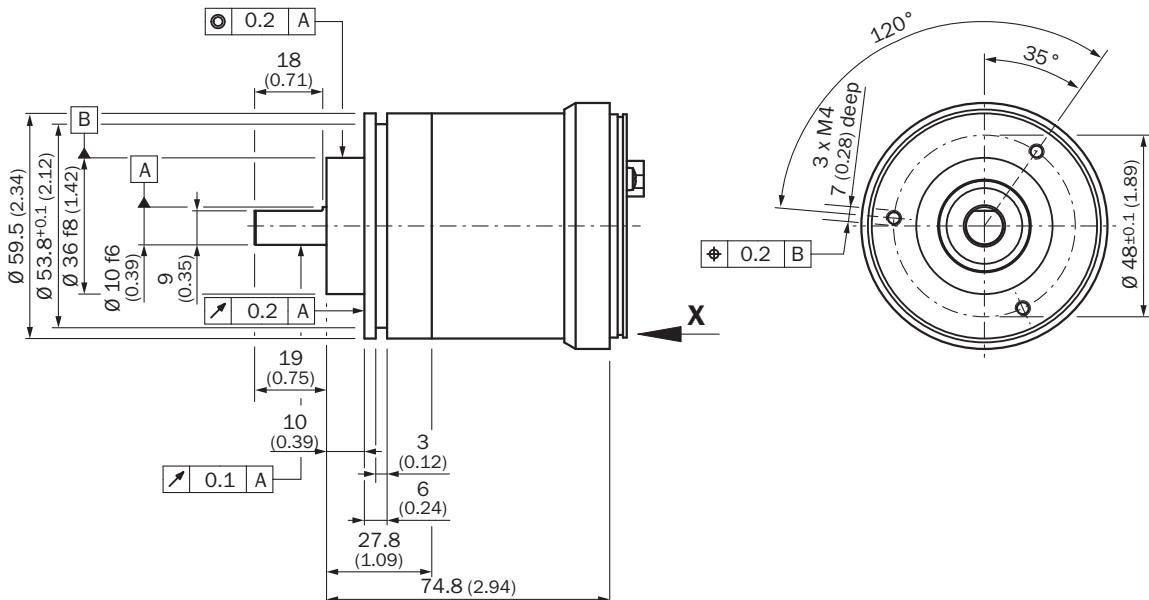
<sup>1)</sup> With mating connector fitted.

## Classifications

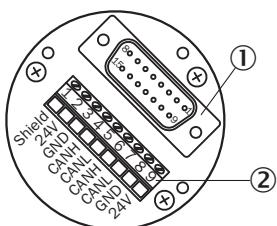
<b>ECLASS 5.0</b>	27270502
<b>ECLASS 5.1.4</b>	27270502
<b>ECLASS 6.0</b>	27270590
<b>ECLASS 6.2</b>	27270590

<b>ECLASS 7.0</b>	27270502
<b>ECLASS 8.0</b>	27270502
<b>ECLASS 8.1</b>	27270502
<b>ECLASS 9.0</b>	27270502
<b>ECLASS 10.0</b>	27270502
<b>ECLASS 11.0</b>	27270502
<b>ECLASS 12.0</b>	27270502
<b>ETIM 5.0</b>	EC001486
<b>ETIM 6.0</b>	EC001486
<b>ETIM 7.0</b>	EC001486
<b>ETIM 8.0</b>	EC001486
<b>UNSPSC 16.0901</b>	41112113

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



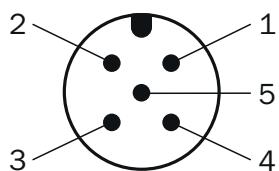
### PIN assignment



- ① Internal plug connector to encoder
- ② External connection to the bus

Terminal strip	Male device connector	Signal	Explanation
1	1	shield	Screen
2	2	$U_S$ (24 V)	Operating voltage 10 ... 32 V
3	3	GND (COM)	0 V (GND)
4	4	$CAN_H$	CAN Bus Signal high
5	5	$CAN_L$	CAN Bus Signal low
6	-	$CAN_H$	CAN Bus Signal high
7	-	$CAN_L$	CAN Bus Signal low
8	-	GND (COM)	0 V (GND)
9	-	$U_S$ (24 V)	Operating voltage 10 ... 32 V

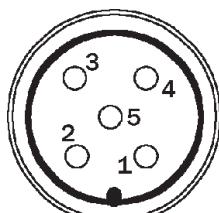
M12 male connector (bus adapter)



IN/US

Terminal strip	Male device connector	Signal	Explanation
1	1	shield	Screen
2	2	$U_S$ (24 V)	Operating voltage 10 ... 32 V
3	3	GND (COM)	0 V (GND)
4	4	$CAN_H$	CAN Bus Signal high
5	5	$CAN_L$	CAN Bus Signal low
6	-	$CAN_H$	CAN Bus Signal high
7	-	$CAN_L$	CAN Bus Signal low
8	-	GND (COM)	0 V (GND)
9	-	$U_S$ (24 V)	Operating voltage 10 ... 32 V

M12 female connector (bus adapter)



OUT/US (female contact)

Terminal strip	Male device connector	Signal	Explanation
1	1	shield	Screen
2	2	$U_S$ (24 V)	Operating voltage 10 ... 32 V
3	3	GND (COM)	0 V (GND)
4	4	$CAN_H$	CAN Bus Signal high
5	5	$CAN_L$	CAN Bus Signal low

Terminal strip	Male device connector	Signal	Explanation
6	-	CAN <sub>H</sub>	CAN Bus Signal high
7	-	CAN <sub>L</sub>	CAN Bus Signal low
8	-	GND (COM)	0 V (GND)
9	-	U <sub>S</sub> (24 V)	Operating voltage 10 ... 32 V

## Recommended accessories

Other models and accessories → [www.sick.com/ATM60](http://www.sick.com/ATM60)

	Brief description	Type	Part no.
Mounting brackets and plates			
	<ul style="list-style-type: none"> <li><b>Description:</b> Mounting bracket for encoder with spigot 36 mm for face mount flange</li> <li><b>Items supplied:</b> Mounting kit included</li> </ul>	BEF-WF-36	2029164
Others			
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Male connector, M12, 5-pin, straight, A-coded</li> <li><b>Signal type:</b> Fieldbus, CANopen, DeviceNet™</li> <li><b>Cable:</b> 6 m, 5-wire, PUR, halogen-free</li> <li><b>Description:</b> Fieldbus, unshielded, Head A: female connector, M12, 5-pin, straight Head B: male connector, M12, 5-pin, straight Cable: drop cable, PUR, halogen-free, unshielded, 2 x 0.34 mm<sup>2</sup>, Ø 6.9 mm CANopenDeviceNet™</li> </ul>	DSL-1205-G06MK	6028327
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Flying leads</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> CANopen, DeviceNet™</li> <li><b>Items supplied:</b> By the meter</li> <li><b>Cable:</b> 4-wire, twisted pair</li> <li><b>Description:</b> CANopen, shieldedDeviceNet™</li> <li><b>Note:</b> Wire shield Al-Pt film, overall shield C-screen tin-plated</li> </ul>	LTG-2804-MW	6028328
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 5-pin, straight, A-coded</li> <li><b>Signal type:</b> CANopen, DeviceNet™</li> <li><b>Description:</b> CANopen, shielded, Head A: female connector, M12, 5-pin, straight, shielded, for cable diameter 4.5 mm ... 7 mm Head B: -DeviceNet™</li> <li><b>Connection systems:</b> Screw-type terminals</li> <li><b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>	DOS-1205-GA	6027534
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M12, 5-pin, straight, A-coded</li> <li><b>Signal type:</b> CANopen, DeviceNet™</li> <li><b>Description:</b> CANopen, shielded, Head A: male connector, M12, 5-pin, straight, A coded, shielded, for cable diameter 4 mm ... 8 mm Head B: -DeviceNet™</li> <li><b>Connection systems:</b> Screw-type terminals</li> <li><b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>	STE-1205-GA	6027533
	<ul style="list-style-type: none"> <li><b>Description:</b> Flange adapter, adaptation of face mount flange with 36 mm centering hub to 50 mm servo flange, aluminum, including 3 flat head screws M4 x 10</li> <li><b>Material:</b> Aluminum</li> <li><b>Details:</b> Aluminum</li> <li><b>Items supplied:</b> Including 3 countersunk screws M3 x 10</li> </ul>	BEF-FA-036-050	2029160
	<ul style="list-style-type: none"> <li><b>Description:</b> Flange adapter, adaptation of face mount flange with 36 mm centering hub to 100 mm servo flange with 60 mm centering hub, aluminum</li> <li><b>Material:</b> Aluminum</li> <li><b>Details:</b> Aluminum</li> </ul>	BEF-FA-036-100	2029161

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product family:</b> Shaft couplings</li> <li><b>Description:</b> Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial <math>\pm 0.25</math> mm, axial <math>\pm 0.4</math> mm, angular <math>\pm 4^\circ</math>; max. speed 10,000 rpm, <math>-30^\circ\text{C}</math> to <math>+120^\circ\text{C}</math>, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub</li> </ul>	KUP-0610-B	5312982
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product family:</b> Shaft couplings</li> <li><b>Description:</b> Bellows coupling, shaft diameter 10 mm/10 mm; maximum shaft offset: radial <math>\pm 0.25</math> mm, axial <math>\pm 0.4</math> mm, angular <math>\pm 4^\circ</math>; max. revolutions 10,000 rpm, <math>-30^\circ</math> to <math>+120^\circ\text{C}</math>, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs</li> </ul>	KUP-1010-B	5312983
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product family:</b> Shaft couplings</li> <li><b>Description:</b> 10 mm / 12 mm; maximum shaft offset: radial <math>\pm 0.25</math> mm, axial <math>\pm 0.4</math> mm, angular <math>\pm 4^\circ</math>; max. revolutions 10,000 rpm, <math>-30^\circ</math> to <math>+120^\circ\text{C}</math>, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs</li> </ul>	KUP-1012-B	5312984
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product family:</b> Shaft couplings</li> <li><b>Description:</b> Spring washer coupling, shaft diameter 6 mm / 10 mm, Maximum shaft offset: radial <math>\pm 0.3</math> mm, axial <math>\pm 0.4</math> mm, angular <math>\pm 2.5^\circ</math>; max. speed 12,000 rpm, <math>-10^\circ</math> to <math>+80^\circ\text{C}</math>, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin</li> </ul>	KUP-0610-F	5312985
	<ul style="list-style-type: none"> <li><b>Description:</b> Flange adapter, adaptation of face mount flange with 36 mm centering hub to 60 mm square mounting plate, aluminum, including 3 flat head screws M4 x 8</li> <li><b>Material:</b> Aluminum</li> <li><b>Details:</b> Aluminum</li> <li><b>Items supplied:</b> Including 3 countersunk screws M4 x 8</li> </ul>	BEF-FA-036-060REC	2029162
	<ul style="list-style-type: none"> <li><b>Description:</b> Flange adapter, adaptation of face mount flange with 36 mm centering hub to 58 mm square mounting plate with shock absorbers, aluminum</li> <li><b>Material:</b> Aluminum</li> <li><b>Details:</b> Aluminum</li> </ul>	BEF-FA-036-060RSA	2029163
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product family:</b> Shaft couplings</li> <li><b>Description:</b> Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset, radial <math>\pm 0.3</math> mm, axial <math>\pm 0.4</math> mm, angle <math>\pm 2.5^\circ</math>, torsion spring stiffness 30 Nm/rad; material: aluminum flange, glass-fiber reinforced polyamide membrane and hardened steel coupling pin</li> </ul>	KUP-1010-F	5312986

## 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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