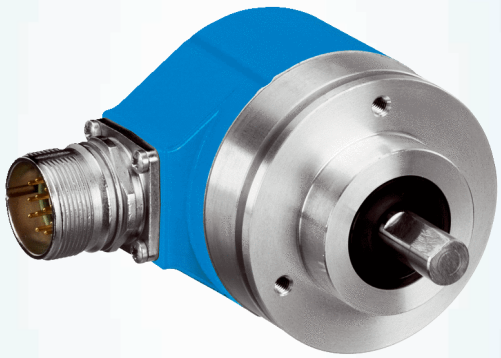
Online data sheet



ATM60-A4A12X12

ATM60 SSI

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.

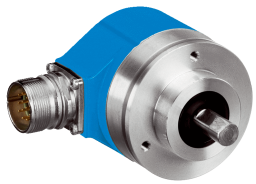


Illustration may differ

Ordering information

Type	Part no.
ATM60-A4A12X12	1030001

Other models and accessories ➜ www.sick.com/ATM60_SSI

Detailed technical data

Performance

Max. number of steps per revolution	8,192, maximum permissible resolution: 25 bit (12 bit singleturn x 13 bit multiturn or 13 bit singleturn x 12 bit multiturn).
Max. number of revolutions	8,192, maximum permissible resolution: 25 bit (12 bit singleturn x 13 bit multiturn or 13 bit singleturn x 12 bit multiturn).
Resolution power	8,192 x 8,192 x maximum permissible resolution: 25 bit (12 bit singleturn x 13 bit multiturn or 13 bit singleturn x 12 bit multiturn).
Resolution	13 bit x 13 bit x maximum permissible resolution: 25 bit (12 bit singleturn x 13 bit multiturn or 13 bit singleturn x 12 bit multiturn).
Error limits	± 0.25°
Repeat accuracy	0.1°
Measuring step	0.043°
Initialization time	1,050 ms [1]
Position forming time	0.15 ms

[1] Valid positional data can be read once this time has elapsed.

Interfaces

Electrical interface	SSI
Signal wire	Potential-free with a 12-pin M23 male connector for the housing or a 12-wire cable
Interface signals	Clock +, Clock -, Data +, Data- [1] Programming interface: RS-422
Clock frequency	1 MHz [2]
Set (electronic adjustment)	H-active (L = 0 - 4,7 V, H = 10 - Us V)
CW/CCW (counting sequence when turning)	L-active (L = 0 - 1,5 V, H = 2,0 - Us V)
Parameterising data	Number of steps per revolution Number of revolutions Code type Electronic adjustment

[1] For higher clock frequencies, choose synchronous SSI.
[2] Minimum, LOW level (Clock +): 500 ns.

Electrical data

Connection type	Male connector, radial
Operating voltage range	10 V ... 32 V
Power consumption max. without load	≤ 0.8 W
Code type	Gray, binary
Reverse polarity protection	✓
MTTFd: mean time to dangerous failure	150 years (EN ISO 13849-1) [1]

[1] 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

Mechanical interface	Solid shaft, Face mount flange
Shaft diameter	10 mm
Shaft length	19 mm
Weight	0.5 kg
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum die cast
Start up torque with shaft seal	2.5 Ncm
Start up torque without shaft seal	0.5 Ncm
Operating torque with shaft seal	1.8 Ncm
Operating torque without shaft seal	0.3 Ncm [1]
Permissible Load capacity of shaft	300 N / radial 50 N / axial
Moment of inertia of the rotor	35 gcm²
Bearing lifetime	3.6 x 10^9 revolutions
Max. angular acceleration	≤ 500,000 rad/s²
Operating speed	6,000 /min [2]

[1] If the shaft seal has been removed by the customer.

[2] Self warming of 3.3 K per 1000 revolutions/min when applying note working temperature range.

Ambient data

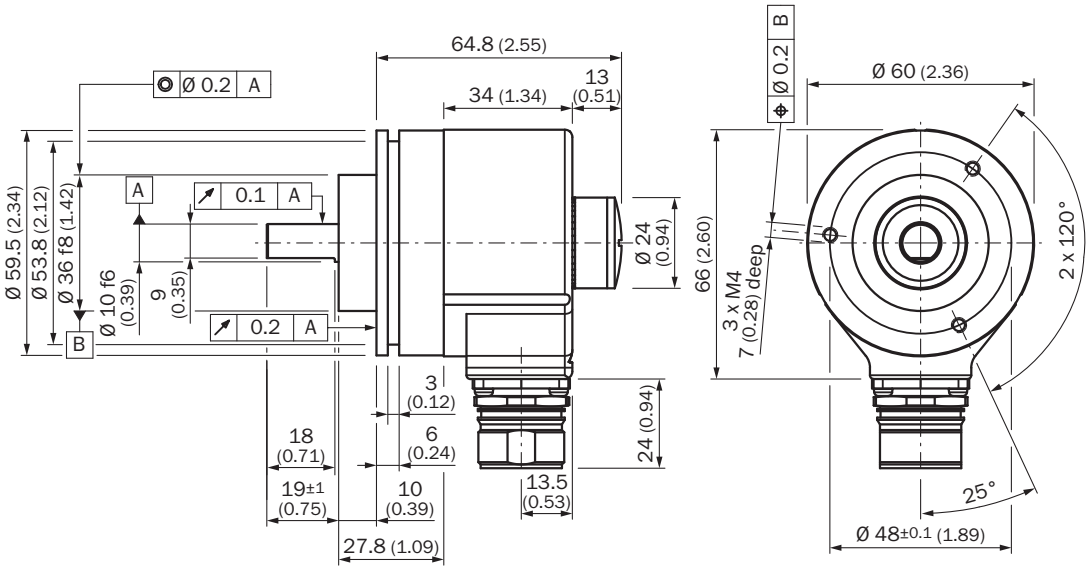
EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP 67, with shaft seal (according to IEC 60529) [1] IP43, without shaft seal, on encoder flange not sealed (according to IEC 60529) [1] IP 65, without shaft seal, on encoder flange sealed (according to IEC 60529) [1]
Permissible relative humidity	98 %
Working temperature range	–20 °C ... +85 °C
Storage temperature range	–40 °C ... +100 °C, without package
Resistance to shocks	100 g, 6 ms (according to EN 60068-2-27)
Resistance to vibration	20 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)

[1] With mating connector inserted.

Classifications

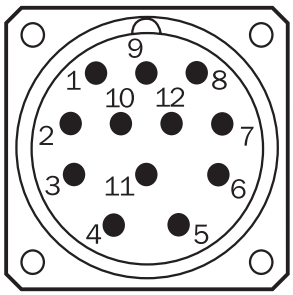
ECl@ss 5.0	27270502
ECl@ss 5.1.4	27270502
ECl@ss 6.0	27270590
ECl@ss 6.2	27270590
ECl@ss 7.0	27270502
ECl@ss 8.0	27270502
ECl@ss 8.1	27270502
ECl@ss 9.0	27270502
ETIM 5.0	EC001486
ETIM 6.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing (Dimensions in mm (inch))



PIN assignment

View of M23 male device connector on encoder



View of M23 male device connector on encoder

PIN	Signal	Colour of wires (cable outlet)	Explanation
1	GND	Blue	Ground connection
2	Data +	White	Interface signals
3	Clock +	Yellow	Interface signals
4	R x D +	Gray	RS-422 programming lines
5	R x D -	Green	RS-422 programming lines RS-422 programming lines
6	T x D +	Pink	RS-422 programming lines
7	T x D -	Black	RS-422 programming lines
8	U_S	Red	Operating voltage
9	SET 1)	Orange	Electronic adjustment
10	Data -	Brown	Interface signals
11	Clock -	Purple	Interface signals
12	2)	Orange-black	Sequence in direction of rotation
	Screen		Housing potential
SET = This input activates the electronic zero set. If the SET cable is set to U_S for more than 100 ms, the mechanical position corresponds to the 0 value, i.e., the predetermined SET value.			
V/R = Forwards/Reverse: This input programs the counting direction for the encoder. When it is not connected, this input is set to HIGH. If the encoder shaft is rotat-ed clockwise (to the right) as viewed when facing the shaft, it counts in ascending order. If it should count in ascending order when the shaft is rotated counterclock-wise (to the left), then this connection must be permanently set to LOW level (GND).			

Recommended accessories

Other models and accessories ➜ www.sick.com/ATM60_SSI

	Brief description	Type	Part no.
Flanges			
	Flange adapter, adaption of 36 mm spigot face mount flange to 50 mm servo flange, Aluminum, including 3 countersunk screws M4 x 10	BEF-FA-036-050	2029160
	Flange adapter, adaption of 36 mm spigot face mount flange to 60 mm square installation plate, Aluminum, including 3 countersunk screws M4 x 10	BEF-FA-036-060REC	2029162
	Flange adapter, adaption of 36 mm spigot face mount flange to 58 mm square installation plate with shock-absorber, Aluminum	BEF-FA-036-060RSA	2029163
	Flange adapter, adaption of 36 mm spigot face mount flange to 100 mm servo flange with 60 mm spigot, Aluminum	BEF-FA-036-100	2029161
Mounting brackets and mounting plates			
	Mounting bracket for encoder with spigot 36 mm for face mount flange, mounting kit included	BEF-WF-36	2029164
Shaft adaptation			

	Brief description	Type	Part no.
	Bellows coupling, shaft diameter 6 mm / 10 mm	KUP-0610-B	5312982
	Spring washer coupling, shaft diameter 6 mm / 10 mm	KUP-0610-F	5312985
	Bellows coupling, shaft diameter 10 mm / 10 mm	KUP-1010-B	5312983
	Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset, radial ± 0.3 mm, axial ± 0.4 mm, angle ± 2.5°, torsion spring stiffness 30 Nm/rad; material: aluminum flange, glass-fiber reinforced polyamide membrane and hardened steel coupling pin	KUP-1010-F	5312986
	Bellows coupling, shaft diameter 10 mm / 12 mm	KUP-1012-B	5312984
Plug connectors and cables			
	Head A: female connector, M23, 12-pin, straight Head B: cable Cable: SSI, RS-422, drag chain use, PUR, shielded, 3 m	DOL-2312-G03MMA1	2029201
	Head A: female connector, M23, 12-pin, straight Head B: cable Cable: SSI, RS-422, drag chain use, PUR, shielded, 5 m	DOL-2312-G05MMA1	2029202
	Head A: female connector, M23, 12-pin, straight Head B: cable Cable: SSI, RS-422, drag chain use, PUR, shielded, 10 m	DOL-2312-G10MMA1	2029203
	Head A: female connector, M23, 12-pin, straight Head B: cable Cable: SSI, RS-422, drag chain use, PUR, shielded, 1.5 m	DOL-2312-G1M5MA1	2029200
	Head A: female connector, M23, 12-pin, straight Head B: cable Cable: SSI, RS-422, drag chain use, PUR, shielded, 20 m	DOL-2312-G20MMA1	2029204
	Head A: female connector, M23, 12-pin, straight Head B: cable Cable: SSI, RS-422, drag chain use, PUR, shielded, 30 m	DOL-2312-G30MMA1	2029205
	Head A: female connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded	DOS-2312-G	6027538
	Head A: female connector, M23, 12-pin, angled Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded	DOS-2312-W01	2072580
	Head A: male connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, RS-422, shielded	STE-2312-G	6027537
Programming and configuration tools			
	Programming tool for ATM60, ATM90, and KH53	PGT-01-S	1030111

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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