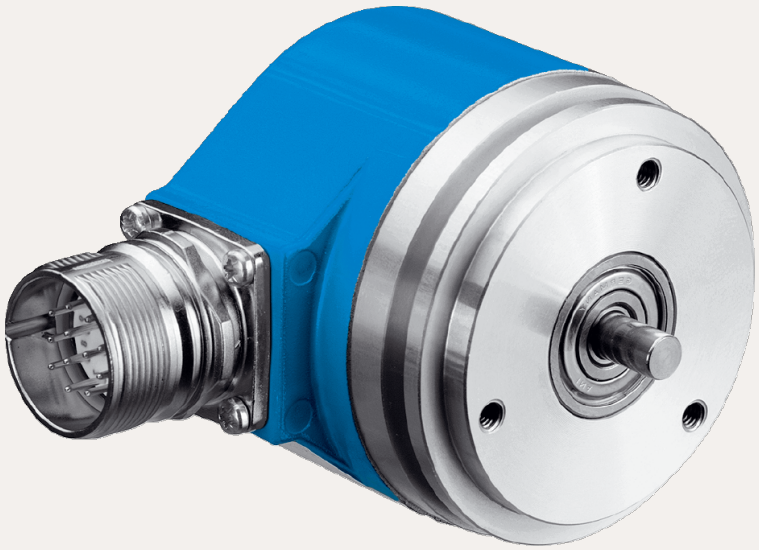
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DATA SHEET

ATM60-A1A0-K19

ATM60
Absolute encoders

SICK Sensor Intelligence



Illustration may differ

ABSOLUTE ENCODERS

ATM60-A1A0-K19

ORDERING INFORMATION

Type	part no.
ATM60-A1A0-K19	1034294

Further device versions and accessories at www.sick.com/ATM60

DETAILED TECHNICAL DATA

FEATURES

Special device	✓
Standard reference device	ATM60-A1A12X12, 1030005

SAFETY-RELATED PARAMETERS

$MTTF_D$ (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.

PERFORMANCE

Number of steps per revolution (max. resolution)	6,680
Number of revolutions	4,096 (12 bit)
Max. resolution (number of steps per revolution x number of revolutions)	12 bit (6,680 x 4,096)
Resolution	Maximum permissible resolution: 25 bit (12 bit singleturn x 13 bit multiturn or 13 bit singleturn x 12 bit multiturn).
Measuring step	0.043°
Error limits G	± 0.25° [1]
Repeatability standard deviation σ_r	0.1° [2]

[1] 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.

[2] In accordance with DIN ISO 55350-13; 68.3% of the measured values are inside the specified area.

INTERFACES

Communication interface	SSI
Initialization time	1,050 ms [1]
Position forming time	0.15 ms
Parameterising data	Number of steps per revolution Number of revolutions Code type Electronic adjustment
Code type	Gray
Code sequence parameter adjustable	CW/CCW (V/R)
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)

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

[2] Minimum, LOW level (Clock +): 500 ns.

ELECTRONICS

Connection type	Male connector, M23, 12-pin, radial
Supply voltage	10 ... 32 V
Power consumption	≤ 0.8 W (without load)
Reverse polarity protection	✓

MECHANICS

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

[1] Based on encoder with male connector.

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

[3] Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

AMBIENT DATA

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP67, with shaft seal (IEC 60529) [1] IP43, without shaft seal, on encoder flange not sealed (IEC 60529) [1]

[1] With mating connector fitted.

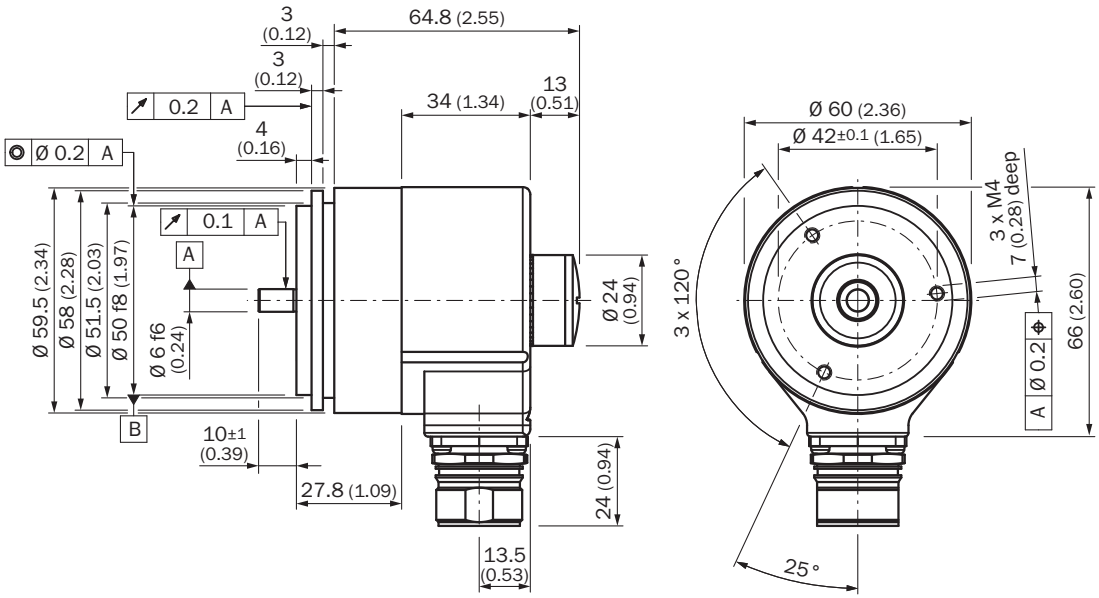
	IP65, without shaft seal, on encoder flange sealed (IEC 60529) [1]
Permissible relative humidity	98 %
Operating temperature range	–20 °C ... +85 °C
Storage temperature range	–40 °C ... +100 °C, without package
Resistance to shocks	100 g, 6 ms (EN 60068-2-27)
Resistance to vibration	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

[1] With mating connector fitted.

CERTIFICATES

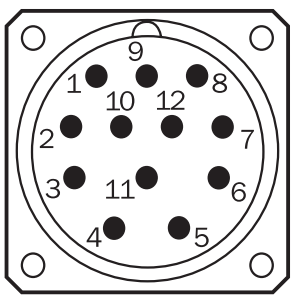
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓
cULus certificate	✓

DIMENSIONAL DRAWING



Dimensions in mm (inch)

VIEW OF M23 MALE DEVICE CONNECTOR ON ENCODER



view of M23 male device connector on encoder

PIN	Signal	Wire colors (cable connection)	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
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	V/R[2)]	Orange-black	Sequence in direction of rotation
–	Shielding	–	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 O 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).			

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at www.sick.com/1034294

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SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

SICK

Sensor Intelligence