Data sheet



ATM90-AXL12x12

ATM90

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

Type	part no.
ATM90-AXL12x12	1030040

Other models and accessories → www.sick.com/ATM90

Detailed technical data

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)	4,096 (12 bit)
Number of revolutions	4,096 (12 bit)
Max. resolution (number of steps per revolution x number of revolutions)	12 bit x 12 bit (4,096 x 4,096)
Resolution	Ex-works: 4,096 steps x 4,096 revolutions, Gray-Code, Set = 0 factory-programmed. Other configurations on request.
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]
Parameterising data	Number of steps per revolution Number of revolutions Code type Electronic adjustment
Code type	Gray, binary
Code sequence parameter adjustable	CW/CCW (V/R)
Clock frequency	1 MHz [2]

[1] Valid positional data can be read once this time has elapsed.
[2] Minimum, LOW level (Clock +): 500 ns.

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	Cable, 12-wire, radial, 3 m
Supply voltage	10 ... 32 V
Power consumption	≤ 0.8 W (without load)
Reverse polarity protection	✓

Mechanics

Mechanical design	Through hollow shaft
Shaft diameter	16 mm
Weight	0.8 kg [1]
Shaft material	Stainless steel
Flange material	Aluminum
Start up torque	0.5 Ncm (+20 °C)
Operating torque	0.4 Ncm (+20 °C)
Operating speed	≤ 2,000 min^{-1} [2]
Moment of inertia of the rotor	153.77 gcm^2
Bearing lifetime	3.6 x 10^9 revolutions
Angular acceleration	≤ 600,000 rad/s^2

[1] Based on encoder with male connector.
[2] 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	IP65, with shaft seal (IEC 60529) [1]
Permissible relative humidity	98 %
Operating temperature range	–20 °C ... +70 °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 (EN 60068-2-6)

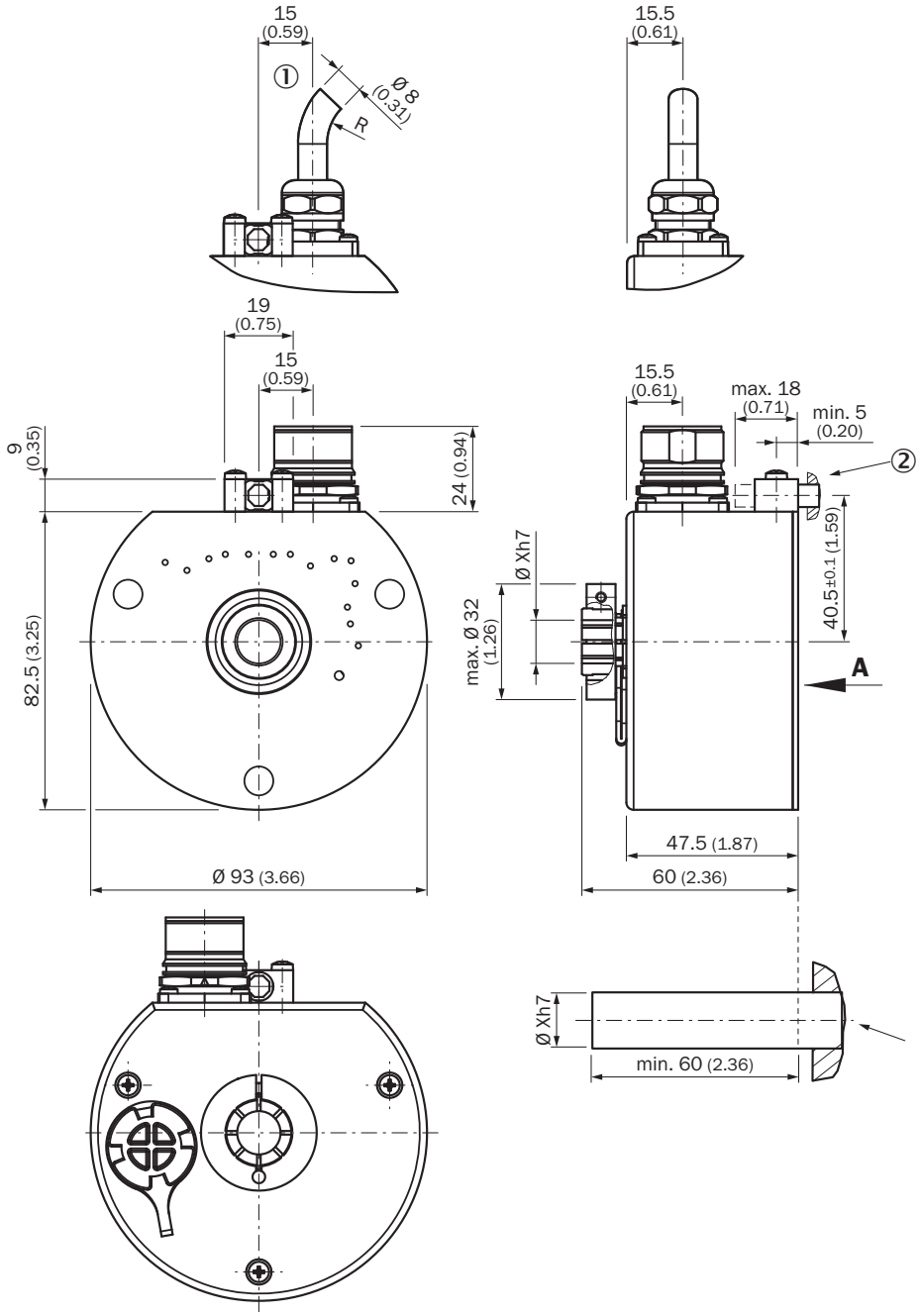
[1] With mating connector fitted.

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

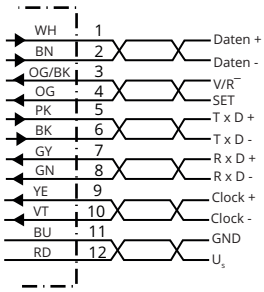
ECLASS 8.1	27270502
ECLASS 9.0	27270502
ECLASS 10.0	27270502
ECLASS 11.0	27270502
ECLASS 12.0	27270502
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing



Dimensions in mm (inch)
① Minimum bend radius 40 mm
② Torque support of the encoder via cylindrical pin Ø 6 mm DIN EN 28734 provided by the customer

PIN assignment



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
–	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/ATM90

	Brief description	Type	part no.
programming devices			
	• **Product segment:** Programming devices • **Product:** PGT-01-S • **Description:** Programming tool for ATM60, ATM90, and KH53 • **Items supplied:** Power supply, interface, link cable, encoder cable, and software	PGT-01-S	1030111

	Brief description	Type	part no.
connectors and cables			
	• **Description:** SSI, shielded, Incremental • **Connection type head A:** Flying leads • **Connection type head B:** Flying leads • **Signal type:** SSI, Incremental • **Items supplied:** By the meter • **Cable:** 12-wire, PUR, halogen-free	LTG-2512-MW	6027531
	• **Description:** SSI, shielded, TTL, HTL, Incremental • **Connection type head A:** Flying leads • **Connection type head B:** Flying leads • **Signal type:** SSI, TTL, HTL, Incremental • **Items supplied:** By the meter • **Cable:** 12-wire, UV and saltwater-resistant, PUR, halogen-free	LTG-2612-MW	6028516
	• **Description:** HIPERFACE®, shielded, SSI, Incremental • **Connection type head A:** Female connector, M23, 12-pin, straight, A-coded • **Signal type:** HIPERFACE®, SSI, Incremental • **Connection systems:** Solder connection	DOS-2312-G	6027538
	• **Description:** HIPERFACE®, shielded, SSI, Incremental, RS-422 • **Connection type head A:** Male connector, M23, 12-pin, straight, A-coded • **Signal type:** HIPERFACE®, SSI, Incremental, RS-422 • **Connection systems:** Solder connection	STE-2312-G	6027537
	• **Description:** HIPERFACE®, shielded, SSI, Incremental • **Connection type head A:** Female connector, M23, 9-pin, straight, A-coded • **Signal type:** HIPERFACE®, SSI, Incremental • **Connection systems:** Solder connection	DOS-2309-G	6028533
	• **Description:** HIPERFACE®, shielded, SSI, Incremental • **Connection type head A:** Female connector, M23, 12-pin, angled, A-coded • **Signal type:** HIPERFACE®, SSI, Incremental • **Connection systems:** Solder connection	DOS-2312-W01	2072580

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.”

WORLDWIDE PRESENCE:

Contacts and other locations –www.sick.com