

SICK

AFM60B-TGRK000S07

AFS/AFM60 SSI

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.



Ordering information

Type	part no.
AFM60B-TGRK000S07	1142822

Illustration may differ

Other models and accessories → www.sick.com/AFS_AFM60_SSI



Detailed technical data

Features

Special device	✓
Specialty	Customized stator coupling 2047430 Cable, 12-wire, radial, 0.857 m, with M23 12-pin male connector Preprogramming of electrical interface with HTL setting, 2,048 pulses per revolution and pre-programming of SSI 8,192 pulses per revolution LENZE material number (13655259) on the label
Standard reference device	AFM60B-TGRK032768, 1080475

Safety-related parameters

MTTF_D (mean time to dangerous failure)	250 years (EN ISO 13849-1) ¹⁾
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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)	32,768 (15 bit)
Number of revolutions	4,096 (12 bit)
Max. resolution (number of steps per revolution x number of revolutions)	15 bit x 12 bit (32,768 x 4,096)
Error limits G	0.05 ° ¹⁾
Repeatability standard deviation σ_r	0.002 ° 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
Communication Interface detail	SSI + incremental
Initialization time	50 ms ¹⁾
Position forming time	< 1 μs
Code type	Gray

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

²⁾ Minimum, LOW level (Clock +): 250 ns.

Code sequence parameter adjustable	CW/CCW (V/R) parameter adjustable
Clock frequency	$\leq 2 \text{ MHz}^{2)}$
Set (electronic adjustment)	H-active (L = 0 - 3 V, H = 4,0 - U_s V)
CW/CCW (counting sequence when turning)	L-active (L = 0 - 1,5 V, H = 2,0 - U_s V)
Pulses per revolution	1/4 of number of SSI steps per revolution
Output frequency	$\leq 600 \text{ kHz}$
Load current	$\leq 30 \text{ mA}$

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

²⁾ Minimum, LOW level (Clock +): 250 ns.

Electronics

Connection type	Special version
Connection type Detail	Cable, 12-wire, radial, 0.857 m, with M23 12-pin male connector
Supply voltage	4.5 ... 32 V DC
Power consumption	$\leq 0.7 \text{ W}$ (without load)
Reverse polarity protection	✓

Mechanics

Mechanical design	Through hollow shaft
Shaft diameter	14 mm
Characteristics of the shaft	Front clamp
Weight	0.2 kg ¹⁾
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum die cast
Start up torque	$< 0.8 \text{ Ncm}$ (+20 °C)
Operating torque	$< 0.6 \text{ Ncm}$ (+20 °C)
Permissible movement static	$\pm 0.3 \text{ mm}$ (radial) $\pm 0.5 \text{ mm}$ (axial)
Permissible movement dynamic	$\pm 0.1 \text{ mm}$ (radial) $\pm 0.2 \text{ mm}$ (axial)
Operating speed	$\leq 9,000 \text{ min}^{-1}$ ²⁾
Moment of inertia of the rotor	40 gcm ²
Bearing lifetime	3.0×10^9 revolutions
Angular acceleration	$\leq 500,000 \text{ rad/s}^2$

¹⁾ Based on devices 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 ¹⁾
Enclosure rating	IP65, shaft side (IEC 60529)

¹⁾ EMC according to the standards quoted is achieved if shielded cables are used.

²⁾ For devices with male connector: with mounted mating connector.

³⁾ Stationary position of the cable.

	IP67, housing side (IEC 60529) ²⁾
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	-40 °C ... +100 °C ³⁾
Storage temperature range	-40 °C ... +100 °C, without package
Resistance to shocks	70 g, 6 ms (EN 60068-2-27)
Resistance to vibration	30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

¹⁾ EMC according to the standards quoted is achieved if shielded cables are used.

²⁾ For devices with male connector: with mounted mating connector.

³⁾ Stationary position of the cable.

Certificates

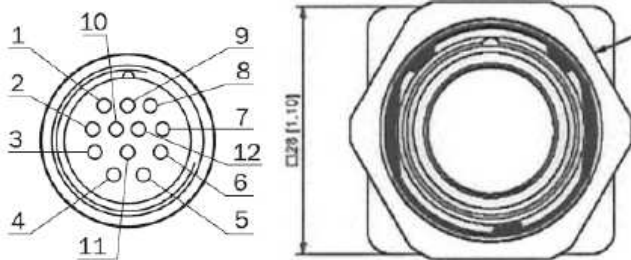
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

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

Anschlussbelegung

Pin	Signal	Explanation
1	+U _s	Supply voltage
2	GND	Ground connection
3	Clock+	Interface signal
4	Data+	Interface signal
5	SET	Electronic adjustment
6	Data-	Interface signal
7	Clock-	Interface signal
8	\bar{B}	Signal line
9	CW/CCW	Counting sequence when turning
10	\bar{A}	Signal line
11	A	Signal line
12	B	Signal line
	Screen	Screen on the encoder side connected to the housing. On the control side connected to earth.



Diagrams



The maximum speed is also dependent on the shaft type.

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:

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