AFM60B-TGRK000S14

AFS/AFM60 SSI

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

Ordering information

Type	Part no.
AFM60B-TGRK000S14	1077724

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 male connector on cable end HTL preprogrammed Preprogrammed number of SSI steps: 8,192 Preprogrammed preset position: 16,777,215
Standard reference device	AFM60B-TGRK032768, 8012885

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
Code sequence parameter adjustable	CW/CCW (V/R) parameter adjustable
Clock frequency	≤ 2 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 - Us V)
Pulses per revolution	1/4 of number of SSI steps per revolution

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

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

Output frequency	≤ 600 kHz
Load current	≤ 30 mA

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

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

Electrical data

Connection type	Cable, 12-wire, radial, 1.5 m
Supply voltage	4.5 ... 32 V DC
Power consumption	≤ 0.7 W (without load)
Reverse polarity protection	✓
MTTFd: mean time to dangerous failure	250 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 design	Through hollow shaft
Shaft diameter	14 mm
Weight	0.2 kg [1]
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum die cast
Start up torque	< 0.8 Ncm (+20 °C)
Operating torque	< 0.6 Ncm (+20 °C)
Permissible movement static	± 0.5 mm (axial) ± 0.3 mm (radial)
Permissible movement dynamic	± 0.2 mm (axial) ± 0.1 mm (radial)
Operating speed	≤ 9,000 min^{-1} [2]
Moment of inertia of the rotor	40 gcm²
Bearing lifetime	3.0 x 10^9 revolutions
Angular acceleration	≤ 500,000 rad/s²

[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) 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

[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.

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.

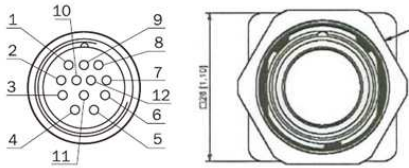[3] Stationary position of the cable.

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))
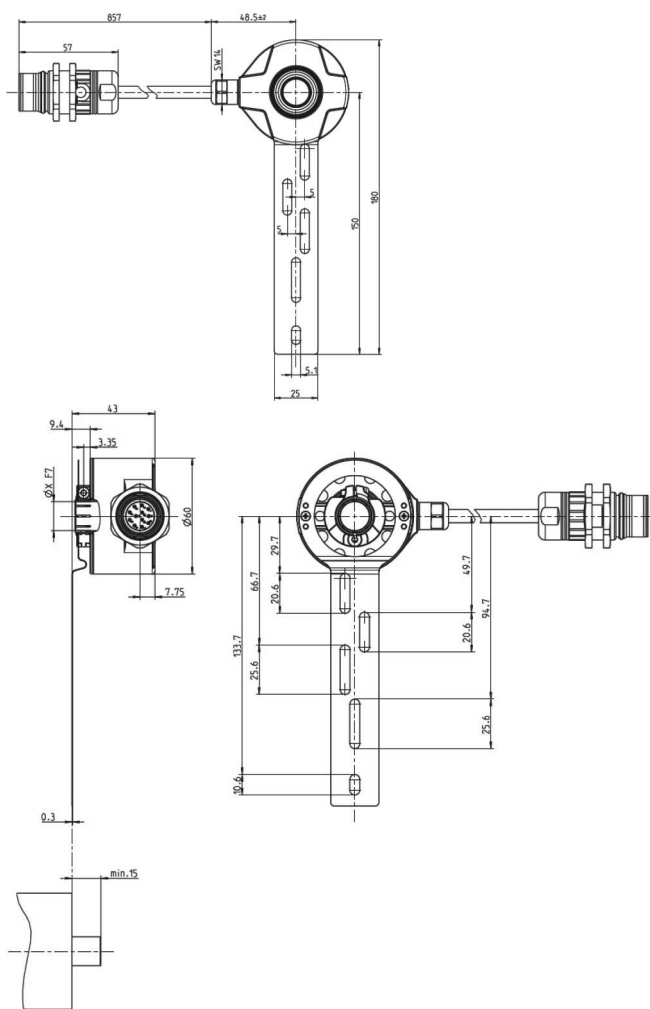
PIN assignment

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	$\overline{B}$	Signal line
9	CW/$\overline{CCW}$	Counting sequence when turning
10	$\overline{A}$	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

Speed consideration (n)

Steps per revolution vs Speed N [min⁻¹]

The maximum speed is also dependent on the shaft type.
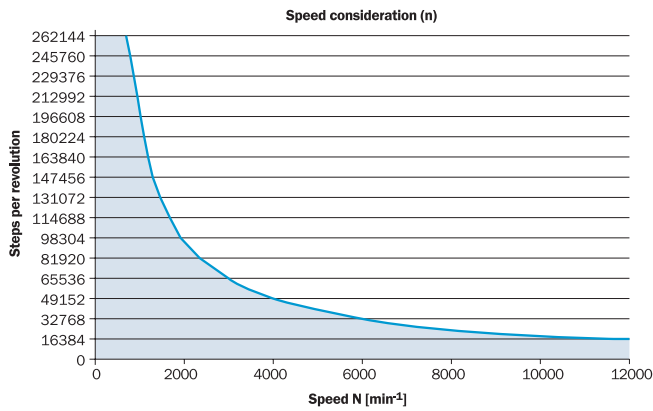
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